B. A. English
Semester V
Course – A9
Title of the Course – Literary Criticism

Course	A9
Type of Course	DSC
Theory/ Practical	Theory
Credits	4
Instruction hours per week	4
Total No. of Lectures/Hours Semester	60
Duration of Exam	2 ½ hours
Formative Assessment Marks	40
Summative Assessment Marks	60
Total Marks	100

Content of Course A9: Literary Criticism	**60 Hrs**
Unit - 1 Introduction to Criticism	15
Beginning Theory: An Introduction to Literary and Cultural Theory- Peter Barry Theory before 'theory'- Liberal Humanism Structuralism Post-structuralism and Deconstruction	
Unit - 2 Classical Criticism	15
Poetics- Aristotle's Concept of Tragedy *Book X of Republic* -Plato on Poetry	
Unit – 3 Romantic Criticism	15
Biographia Literaria- Coleridge's Theory of Imagination and Fancy *Preface to the Lyrical Ballads* – William Wordsworth	
Unit – 4 Modern Criticism	15
Creative Writers and Day Dreaming - Sigmund Freud *Four of Kinds of Meaning* – I A Richards *The Great Tradition*-"Introduction"- F R Leavis	

Suggested Reading

Adams, Hazard. *Critical Theory Since Plato*. New York, Harcourt Brace Jovanovich, 1971.

Abrams, M. H. *A Glossary of Literary Terms*. (8th Edition) New Delhi: Akash Press, 2007.

Baldick, Chris. *The Oxford Dictionary of Literary Terms*. Oxford: Oxford University Press, 2001.

Barry, Peter. *Beginning Theory: An Introduction to Literary and Cultural Theory.* New Delhi: Viva Books, 2008.

Drabble, Margaret and Stringer, Jenny. *The Concise Oxford Companion to English Literature.* Oxford: Oxford University Press, 2007.

Fowler, Roger. Ed. *A Dictionary of Modern Critical Terms.* Rev. ed. London: Routledge & Kegan Paul, 1987.

Habib, M. A. R. *A History of Literary Criticism: From Plato to the Present*. London: Blackwell, 2005.

Hall, Donald E. *Literary and Cultural Theory: From Basic Principles to Advanced Application*. Boston: Houghton, 2001.

Hudson, William Henry. *An Introduction to the Study of Literature*. New Delhi: Atlantic, 2007.

Culler, Jonathan. *Literary Theory: A Very Short Introduction.* New York: Oxford University Press, 1997.

Pedagogy: Lectures, Seminar, Role play, Group discussion

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
First Internal Test	10
Assignment	10
Class Activity	10
Project/Seminar	10
Total	**40**

B. A. English
Semester V
Course - A11
Title of the Course: Subaltern Studies

Content of the Course A11: Subaltern Studies	
Course	A11
Type of Course	DSC
Theory/ Practical	Theory
Credits	4
Instruction hours per week	4
Total No. of Lectures/Hours Semester	60
Duration of Exam	2 ½ hours
Formative Assessment Marks	40
Summative Assessment Marks	60
Total Marks	100

Content of Course A11: Subaltern Studies	**60 Hrs**
Unit –1 Introduction	15
The Imaginary Institution of India- Sudipta Kaviraj *On Some Aspects of Historiography of Colonial India* – Ranajit Guha *" Dalits as Political Minority"* in *The Caste Question* - Anupama Rao	
Unit – 2 Short Stories	15
Shishu– Mahasweta Devi *Tar Comes*- Devanooru Mahadeva *Woh*- Rasheed Jahan *Guddi and Aasu*- Maya Sharma	
Unit – 3 Film Text	15
Faandry- Nagraj Manjule Aligarh-Hansal Mehta Court-Chaitanya Tamhane	
Unit – 4 Novel	15

Uchalya- Laxman Gaikwad *Karukku*- Bama	

Suggested Reading

Guha, Ranajit (ed.). *A Subaltern Studies Reader*. Oxford University Press, Delhi, 2000.

Guha, Ranajit (ed.). *Subaltern Studies: Writings on South Asian History and Society*. OUP, New Delhi, 19822.

Cary Nelson and Lawrence Grossberg (eds.). *Marxism and the Interpretation of Culture*. University of Illionois Press, 1987.

Vinayak Chaturvedi (ed.). *Mapping Subaltern Studies and the Postcolonial*. Verso, London, 2000.

Chakrabarty, Dipesh. "Subaltern Studies in Retrospect and Reminiscence," *South Asia: Journal of South Asian Studies*, vol. 38, no. 1, 2015.

Chibber, Vivek. *Postcolonial Theory and the Specter of Capital.* Verso Books, 2014.

Guha, Ranajit., and Gayatri Chakravorty. Spivak. *Selected Subaltern Studies*. Oxford University Press, 1988.

Kaviraj, Sudipta. *The Imaginary Institution of India*. Columbia University Press, 2010.

Ludden, David E. *Reading Subaltern Studies: Critical History, Contested Meaning, and the Globalisation of South Asia*. Permanent Black, 2001.

Rao, Anupama. The Caste Question: Dalits and the Politics of Modern India. University of California Press, 2009.

Spivak, Gayatri Chakravorty. *Can the Subaltern Speak? Reflections on the History of an Idea*, 1988.

Spivak, Gayatri Chakravorty. *A Critique of Postcolonial Reason: Toward a History of the Vanishing Present*. Harvard UP, 1999.

Pedagogy: Lectures, Seminar, Role play, Group discussion

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
First Internal Test	10
Assignment	10
Class Activity	10
Project/Seminar	10
Total	**40**

BA English
Semester V
Course: A12
Title of the Course: Life Narratives

Course	A12
Type of Course	DSC
Theory/ Practical	Theory
Credits	4
Instruction hours per week	4
Total No. of Lectures/Hours Semester	60
Duration of Exam	2 ½ hours
Formative Assessment Marks	40
Summative Assessment Marks	60
Total Marks	100

Content of Course A12 - Life Narratives	**60 Hrs**
Unit –1 Introduction to Life Narratives	15
"Life Narrative: Definitions and Distinctions" In *Reading Autobiography: A guide for Interpreting Life Narratives* -Sidonie Smith and Julia Watson "Introduction" , *Autobiography* - Linda Anderson	
Unit – 2 Autobiography-The Early Phase	15
Confessions Book I- Rousseau – *A Brief Relation of the Exceeding Mercy of God in Christ, to his Poor Servant*- John Bunyan *Confessions*- book 2- St. Augustine	
Unit – 3 Gendering Life Narratives	15
The Autobiography of a Sex worker- Nalini Jameela *Amar Jiban*- Rassundari Devi	
Unit – 4 Life Narratives from the Margins	15
"I know why the Caged Bird Sings"-Maya Angelou "Government Brahmana"- Aravind Malagatti "Red Lipstick: The Men in my life"- Laxmi	

Suggested Reading

Anderson, Linda. *Autobiography.* Routledge, London, 2011.

Anderson, Linda. *Women and Autobiography in the Twentieth Century: Remembered Futures*. Prentice hall, Harvester Wheatsheaf, London,1997.

Andrews, William L, and Douglas Taylor. *Richard Wright's Black Boy (American Hunger): A Casebook.* Oxford University Press, New York, 2003.

Baggerman et al (eds.). *Controlling Time and Shaping the Self: Developments in Autobiographical Writing since the Sixteenth Century*. Brill, Leiden, 2011.

Lejeune, Philippe. *On Autobiography*. U of Minnesota P, Minneapolis,1988.

Lionett, Françoise. *Autobiographical Voices: Race, Gender, Self-Portraiture*. Cornell UP, Ithaca, 1991.

Smith, Sidonie A. & Julia Watson, eds. *Reading Autobiography: A Guide for Interpreting Life Narratives.* U of Minnesota P, Minneapolis, 2001.

Weintraub, Karl J. *The Value of the Individual: Self and Circumstance in Autobiography*. Chicago UP, Chicago, 1982.

Pedagogy: Lectures, Seminar, Role play, Group discussion

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
First Internal Test	10
Second Internal Test	10
Class Test/Oral Test	10
Project/Seminar	10
Total	**40**

B. A. English
Semester VI
Course – A13
Title of the Course: Postcolonial Studies

Course	A13
Type of Course	DSC
Theory/ Practical	Theory
Credits	4
Instruction hours per week	4
Total No. of Lectures/Hours Semester	60
Duration of Exam	2 1/2 Hours
Formative Assessment Marks	40
Summative Assessment Marks	60
Total Marks	100

Content of Course A13: Postcolonial Studies	**60 Hrs**
Unit - 1 Introduction to Postcolonial Studies	15
Post-Colonial Studies: The Key concepts Bill Ashcroft, Gareth Griffiths & Helen Tiffin 1. Aboriginal, Anti-colonialism, Centre/Margin (Periphery) 2. Colonialism, Discourse, Hegemony 3. Hybridity, Imperialism, Orientalism, Orient/Occident 4. Nation/Nationalism, Post Colonialism/Postcolonialism, Postcolonial reading, 5. Race, Slave/Slavery, Subaltern.	
Unit - 2 Essays on Postcolonial Studies	15
"The Language of African Literature" in *Decolonizing the Mind* – Ngugi Wa Thiong'o *"Introduction to Orientalism*- Edward Said *Introduction to The Empire Writes Back* – Bill Ashcroft, Gareth Griffiths and Helen Tiffin	
Unit – 3 Postcolonial Texts and Talks	15

The Danger of a Single Story – Chimamanda Adichie (TED Talk, Transcript) Source: https://www.hohschools.org/cms/lib/NY01913703/Centricity/Domai	

n/817/English%2012%20Summer%20Reading%20-%202018.pdf *Tizzic*- Edward Brathwaite *Let them Call it Jazz* – Jean Rhys	
Unit – 4 **Fiction**	15
Things Fall Apart - Chinua Achebe	

Suggested Reading

Ashcroft, Bill, Gareth Griffith, Helen Tiffin. *The Empire Writes Back*. Taylor & Francis: 1989.

Barry, Peter. *Beginning theory: An introduction to literary and cultural theory*. *MUP*, Manchester, 2017.

Wa Thiong'o, Ngugi *Decolonizing the Mind* .James Curry.1981.

Said, Edward. *Orientalism*. Vintage Books: 1979. Said, Edward. *Orientalism*. Vintage Books: 1979.

Vincent B. , et al., *The Norton Anthology of Theory and Criticism*, WW Norton and Company, London, 2018.

Young, Robert J.C. Postcolonialism a Very Short Introduction. Oxford University Press: 2020.

Huggan, Graham (Ed.). *The Oxford Handbook of Postcolonial Studies*. Oxford University Press: 2013.

Pedagogy: Lectures. Seminar, Role play, Group discussion

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
First Internal Test	10
Assignment	10
Class Activity	10
Project/Seminar	10
Total	40

B. A. English
Semester VI
Course - A15
Title of the Course: World Literature in Translation

Course	A15
Type of Course	DSC
Theory/ Practical	Theory
Credits	4
Instruction hours per week	4
Total No. of Lectures/Hours Semester	60 Hours
Duration of Exam	2 ½ Hours
Formative Assessment Marks	40
Summative Assessment Marks	60
Total	100

Content of Course A15: World Literature in Translation	**60 Hrs**
Unit –1 Introduction to World Literature	15
What is World Literature? "Introduction"- David Damrosch *Conjectures on World Literature*. New Left Review, Franco Moretti	
Unit – 2 Novel	15
Notes From Underground- Fyodor Dostoevsky *Norwegian Wood*- Haruki Murakami	
Unit – 3 Short Stories	15
The Diamond Necklace - Guy de Maupassant *The War* - Luigi Pirandello *The Blue Light- Vaikom Muhammahd Basheer* *Crossing the Ravi*- Gulzar	
Unit – 4 Plays	15

The Good Woman of Setzuan– Bertolt Brecht *A Doll's House*-Henrik Ibsen	

Suggested Reading

Damrosch, David. *What is World Literature*. Princeton University Press: 2003.

Franco Moretti *Conjectures on World Literature*. New Left Review.

Richardson William Lee and Jesse M Owen. *Literature of the World: An Introductory Study.* Sagwan Press, New York, 2018.

D'haen Theo. *The Routledge Concise History of World Literature.* Routledge, India, 2011.

D'haen Theo, et al. *World Literature: A Reader.* Routledge, India, 2012

Das, Sisir Kumar and Sukanta Chaudhuri (eds.). *Selected Writings* on *Literature* and *Language*: *Rabindranath Tagore*. Das Gupta & Co. Pvt. Ltd., Kolkata, 2001.

D'haen Theo, et al., editors. *World Literature: A Reader.* Princeton University Press, Routledge, India, 2012.

Pedagogy: Lectures, Seminar, Role play, Group discussion

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
First Internal Test	10
Assignment	10
Class Activity	10
Project/Seminar	10
Total	40

B.A. English
Semester VI
Course - A16
Title of the Course: Women's Writing

Course A16: Women's Writing	
Course	A16
Type of Course	DSC
Theory/ Practical	Theory
Credits	4
Instruction hours per week	4
Total No. of Lectures/Hours Semester	60
Duration of Exam	2 ½ hours
Formative Assessment Marks	40
Summative Assessment Marks	60
Total Marks	100

Content of Course A16 - Women's Writing	**60 Hrs**
Unit –1 Minority Women's Writing	15
1. Mukta Sarvagod- Writing Gender Writing Caste- Sharmila Rege 2. " *Avatarika" Radhika Santwanam* (P 1-12)- Muddupalani 3. Mother -Forest: The Unfinished Story of C K Janu 4. " Will I ever be Free?" Sophie, from *Facing the Mirror: Lesbian Writing from India*	
Unit – 2 Poems	15
1. *She* - Lakshmi Kannan 2. *Women Like Me* - Maram Al-Massri 3. *A Letter* – Amrita Pritam 4. *Flying Inside Your Own Body* - Margaret Atwood 5. *You Can confiscate*- Akkamahadevi	
Unit – 3 Feminist writings	15
1. *A Room of her own*- Virginia Woolf 2. *In Search of our Mothers' Gardens* – Alice Walker	
Unit – 4 Feminist retellings of Myths and fables	15
1. *An Afternoon with Shakuntala*- Vaidehi	

2. *The Shroud- Penelopiad*- Margret Atwood 3. *The Monkey and the Crocodiles*- Suniti Namjoshi	

Suggested Reading

- Lalita K, Susie J. Tharu, editors. *Women Writing in India: 600 B.C. to the earlytwentieth century*. Feminist Press, New York, 1991.
- Woolf Virginia. *A Room of One's Own*. Hogarth Press, London, 1929.
- Simone de Beauvoir. *The Second Sex*. Penguin Random House, New York, 1972.
- Gilbert Sandra M and Susan Guber, editors. *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination*. Yale University Press, New Heaven Conn. and London, 2000.
- Elaine Showalter, *A Literature of Their Own*. Princeton University Press, U.S.A.,1999.
- Plain Gill and Susan Sellers, editors. *A History of Feminist Literary Criticism*.Cambridge University Press. 2007.
- Rege Sharmila, *Writing Caste/ WritingGender*, Kali for Women:2006.
- Essay to be read: Helen Carr, "A History of Women's Writing" and Mary Eagleton,"Literary Representations of Women" https://mthoyibi.files.wordpress.com/2011/09/05-history-of-feminist- literarycriticism_gill-plain-andsus.pdf

Pedagogy: Lectures, Seminar, Role play, Group discussion

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
First Internal Test	10
Second Internal Test	10
Class Test/Oral Test	10
Project/Seminar	10
Total	**40**

PROJECT

In lieu of Internship in the VI Semester it was decided that students should be given a project. Project will be conducted under the guidance of the teachers in the Department and will be allotted two hours per week.

Project must be on any one of the following areas and can be selected by the student.

1. Film Reviews
2. Book Reviews
3. Interviewing authors/ translators
4. Gathering local folk stories or proverbs, translating and compiling them
5. Interviewing subaltern groups of people/ communities
6. Regional history from a postcolonial perspective

The project should be submitted at the end of the semester. It should comprise of 20-25 typed sheets / 12 font size /Times New Roman/double spaced.

If possible, the student can get his/ her project published.

The project should be spiral bound.

The project will be evaluated as follows

Viva voce of ten minutes - 20 marks

Written Submission- 80 marks

Government of Karnataka

Curriculum Framework for Undergraduate

V and VI Semester Model Syllabusfor BA

HISTORY

Submitted ty

Vice Chairman
Karnataka State Higher Education Council
s30, Prasanna Kumar Block, Bengaluru City University Campus,
Bengaluru, Karna

taka – 560009

Table of Contents

Sd/-

Subject Committee Chairperson

Structure for History Discipline

Core paper no.	Paper Title	Credit	No. of Teaching Hours/ Week	Total Marks/ Assessment
	V Semester			
DSC-9	History of Western Civilization – (6BC-1200 AD)	4	4	**100 (60+40)**
DSC-10	Colonialism And Nationalism in Asia(1900 to 1970)	4	4	**100 (60+40)**
DSC-11	European History	4	4	**100 (60+40)**
DSC-12	Contemporary History of India from 1947-1990s	4	4	**100 (60+40)**
DSE-1	A. History of Tourism in India	3	4	**100 (60+40)**
	B. Heritage Tourism in Karnataka	3	4	**100 (60+40)**
VOC	Principles of Field study	3	4	**100 (60+40)**
	Communicating Culture: Tellings, Representations and Leisure	3	4	**100 (60+40)**
	VI Semester			
DSC13	History of Freedom Movement and unification in Karnataka	4	4	**100 (60+40)**
DSC14	History of India. (CE1761-CE 1857)	4	4	**100 (60+40)**
DSC15	History of United States of America – I (c.1776 – 1945)	4	4	**100 (60+40)**
DSC16	Process of Urbanization in India	4	4	**100 (60+40)**
DSE-2	A. Dr.B.R Ambedkar's Social and Political Philosophy	3	4	**100 (60+40)**
	B. Heritage Sites in your own District	3	4	**100 (60+40)**
VOC	A. Introduction to archives	3	4	**100 (60+40)**
	B. History of Indian Numismatics	3	4	**100 (60+40)**

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 9-16)

Programe Outcome	**DSC-9**	**DSC-10**	**DSC-11**	**DSC-12**	**DSE-1**	**DSC-13**	**DSC-14**	**DSC-15**	**DSC-16**	**DSE-2**
Disciplinary knowledge	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Professional skills	**Y**	**Y**	**Y**	**Y**	**-**	**Y**	**Y**	**Y**	**Y**	**Y**
Application of skills to chosen specialization	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**-**
Experimental learning and critical thinking	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**-**	**Y**	**Y**	**-**
Application on to administration related problems	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Knowledge ofe resources and social media	**Y**	**Y**	**Y**	**Y**	**-**	**Y**	**Y**	**Y**	**Y**	**Y**
Skills in scientific writing and effective presentation	**Y**	**Y**	**Y**	**Y**	**-**	**-**	**-**	**Y**	**Y**	**-**
Critical evaluation of theoretical approaches	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**

Semester V

Government of Karnataka

Model Curriculum

Course Title: History of Western Civilization – (6BCto1200 AD)	
Semester: 5	**Course Code:** DSC-9
Total Contact Hours: 60	**Course Credits:** 4
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:**2 Hours
Formative Assessment Marks: 40	**Summative Assessment Marks:** 60+40=100

Course Objectives:

Western civilization traces its roots back to Europe and the Mediterranean. It is linked to ancient Greece, the Roman Empire and Medieval Western Christendom which emerged during the Middle Ages and experienced such transformative episodes as the development of Scholasticism, the Renaissance, the Reformation, the Enlightenment, the Industrial Revolution, the Scientific Revolution, and the development of liberal democracy. The civilizations of Classical Greece and Ancient Rome are considered seminal periods in Western history.

Major cultural contributions also came from the Christianized Germanic peoples, such as the Franks, the Goths, and the Burgundies. Charlemagne founded the Carolingian Empire and he is referred to as the "Father of Europe. Contributions also emerged from pagan peoples of pre-Christian Europe, such as the Celts and Germanic pagans as well as some significant religious contributions derived from Judaism and Hellenistic Judaism stemming back to Second Temple Judea, Galilee, and the early Jewish diaspora; and some other Middle Eastern influences.

Western Christianity has played a prominent role in the shaping of Western civilization, which throughout most of its history, has been nearly equivalent to Christian culture. (There were Christians outside of the West, such as China, India, Russia, Byzantium and the Middle East). Western civilization has spread to produce the dominant cultures of modern Americas and Oceania, and has had immense global influence in recent centuries in many ways.

Learning Outcome:

At the end of the Course the students Shall –

Students will relate the History of Western civilization to that of other regions of the world.

1. Students will compare the evolution of intellectual, cultural and technologicalexchange of different regions.
2. Students will understand the diffusion of ideas and culture of

western civilization.

Unit	Contents of Course- DSC-9	60 Hours
Unit-I	**Chapter-1:** Introduction - Ancient Civilizations- Greek City States. **Chapter-2:** The Golden Age of Greece - Hellenistic World- The Roman Republic. **Chapter-3:** The Roman Empire and the Birth of Christianity.	**15 Hours**
Unit-II	**Chapter-4:** Official Christianization and the fall of the western Empire, Byzantium. **Chapter-5:** New Kingdoms in Western Europe, The Rise of Islam. **Chapter-6:** Feudalism and the Commercial Revolution, Church Reforms, The Crusades.	**15 Hours**
Unit-III	**Chapter-7:** The Twelfth-Century Renaissance, Heights of Medieval Culture **Chapter-8**: New Religious Orders **Chapter-9:** The Rediscovery of Aristotle and the Medieval Synthesis	**15 Hours**
Unit-IV	**Chapter-10:** Medieval World in Crisis and the Black Death **Chapter-11:** The Hundred Year's War, Renaissance, Humanism. **Chapter-12:** The New World, The Protestant Reformation, Wars of Religion and the Thirty Years War, The Scientific Revolution	**15 Hours**

Exercises:

- Students can be asked to study the Principles democracy followed by ancient Greek.
- They may be asked to survey the ideas of Renaissance, Humanism.
- They can be asked to go to the nearest Church and study the Christianized practices followed in the church of their place.

Suggested Readings

References	
1	The Making of the West: Peoples and Cultures: Volume 1, to 1750 5a ed. **by Lynn Hunt, Thomas R. Martin**
2	Western Civilization: Ideas, Politics, and Society: From the 1400s. **by Marvin Perry (Author), Theodore H. Von Laue (Author),Margaret Jacob (Author), James Jacob (Author)**
3	History of Western Civilizations 15e V 1: From Prehistory to the Present Vol. 1 **by Judith G Coffin, Robert C Stacey.**
4	Western Civilization: A Social and Cultural History, Vol. I, Prehistory-1750 **by Margaret L. King**
5	Western Civilizations 16e V 2 by Judith Coffin and Robert Stacey
6	Western Civilization **by Jackson Spielvogel (Author)**
7	**History of Western Civilization by William H. McNeill**

Pedagogy:

The course shall be taught through the lecture methods, interactive sessions,assignments and seminars

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: Colonialism And Nationalism in Asia(1900 to 1970)	
Semester: V	**Course Code:** DSC-10
Total Contact Hours: 60	**Course Credits:** 4
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:** 2 Hours
Formative Assessment Marks: 40	**Summative Assessment Marks:** 60+40=100

Course Objectives:

To understand and analyze the manner in which the different manifestations of colonialism were at work in India, China, Japan, Indonesia and Indo-China, and the nationalist responses in these countries. To provide substantial theoretical knowledge by way of analyzing the two concepts of colonialism and nationalism through the works of notable scholars on Colonialism, Dependency theory, World System and Nationalism. To understand the concepts and policies like De- colonialism and Neo-colonialism. To analyze the theory and practice of colonialism and nationalism in Asia.

Learning Outcome:

- Analyse the main theories and interpretations on colonialism and nationalism.
- Understand the emergence of the Modern World System and its impact on Asia.
- Analyse the dynamics and dimensions in the colonial working and nationalist movements in the five countries of Asia.
- Understand the concepts of decolonisation and neo- colonialism in the context of Asia.

Unit	Contents of Course- DSC-10	60 Hours
Unit-I	**Chapter-1:** What is Asia: (a) Land and its people. (b) Pre colonial Society. **Chapter-2:** The Advent of Western Powers: (a) The early Europeans. (b) The Portuguese, Spanish. (c) The Dutch, French and the English. **Chapter-3:** Introduction to Modern World System Theory	**15 Hours**
Unit-II	**Chapter-4:** Perceptions on Colonialism J. A. Hobson. Theory of Underdevelopment: Paul Baran - A.G. Frank - Samir Amin. **Chapter-5:** Manifestations of Colonialism and their Functioning **Chapter-6:** Colony-Protectorate - Spheres of Influence.	**15 Hours**
Unit-III	**Chapter-7:** The Colonial Experience: Case of India. **Chapter-8:** The Colonial Experience: China, Japan, Indo China and Indonesia. **Chapter-9:** Nationalism: Meaning. Factors for the Genesis of Nationalism.	**15 Hours**
Unit-IV	**Chapter-10:** Genesis of Congress -Moderates and Extremists. **Chapter-11:** Gandhi era and Freedom Movements **Chapter-12:** De-colonization and Neo-colonialism	**15 Hours**

Exercise:

- Students can be asked to study the main theories and interpretations on colonialism and nationalism.
- They may be asked to survey the causes for the emergence of the Modern World System and its impact on Asia.

- They can be asked to analyze the dynamics and dimensions in the colonialworking and nationalist movements in the five countries of Asia.

Suggested Readings

References	
1	Amin, Samir, Imperialism and Unequal Development England, The Harvester Press, 1977
2	Anderson, Benedict, Imagined Communities: Reflections onthe Origin and Spread of Nationalism London, Verso, Revised edition, 1991.
3	Bandyopadhyaya, Sekhar, Decolonization in South Asia, London, Routledge, 2009
4	Gellner, Ernest, Encounters with NationalismU.K. WileyBlackwell Publishers, 1997.
5	Wallerstein, Immanuel, The Modern World System(3vols.), New York, Academic Press, 1974
6	Sardesai, D.R., South East Asia: Past and Present NewDelhi, Vikas, 1981
7	Desai, A.R., Social Background of Indian NationalismBombay, Popular Prakashan, 1982.
8	Edwardes, Michael, Asia in the European Age 1498-1955New Delhi, Asia Publishing House, 1961.
9	Frank, A.G., World Accumulation 1492-1789 Basingstoke, Palgrave Macmillan,1978.
10	Hall, D.G.E., A History of South East Asia London, Macmillan, 1964.

Pedagogy

The course shall be taught through the Lectures/ tutorials/assignments/self-study/seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: European History	
Semester: V	**Course Code:** DSC-11
Total Contact Hours: 60	**Course Credits:** 4
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:** 2 Hours
Formative Assessment Marks: 40	**Summative Assessment Marks:** 60+40=100

Course Objectives:

Course Objectives

- To study the history of a region that is often left out of, or given short shriftin, mainstream "South Indian History"

Unit	Contents of Course- DSC-11	60 Hours
The French Revolution and Napoleonic Era (1789-1815)		
Unit-I	**Chapter-1:** The causes of French Revolution – The consequences of Revolution **Chapter-2:** Napoleon rise to power - Creation of Empire **Chapter-3:** The Continental system - The fall of Napoleon	**15 Hours**
The Concert of Europe (1815-1830)		
Unit-II	**Chapter-4:** The Congress of Vienna **Chapter-5:** Metternich's Era **Chapter-6:** The Concert of Europe and Congress System, Balance of Power	**15 Hours**
Forces of Continuity and Change in Europe (1815-1848)		

Unit-III	**Chapter-7:** Nationalism –Liberalism - Romanticism **Chapter-8**: Socialism - Industrial Revolution **Chapter-9:** Colonialism -Cosequences	**15 Hours**
The Eastern Question (1804-1856)		
Unit-IV	**Chapter-10:** Nationalism and Unification Movements **Chapter-11:** The Unification of Italy **Chapter-12:** German unification and role of Bismarck	**15 Hours**

Exercise:

- Students can be asked to study the main theories and interpretations on South Indian Civilization.

Suggested Readings

References	
1	A History of Modern Europe (1789-1991) H.L. Peacock,
2	The Struggle forMastery in Europe: 1848-1918 A.J.P Taylor
3	The Cold War: Ideological Conflict or Power Struggle Normali A. Grabener
4	The USSR: A Share History Vladimir Polrtayen,
5	Development in Russian Politics Stephen White
6	Mastering Modern European History Stuart Miller,
7	A Text Book of European History by Southgate, G.W.
8	Aspects of European History 1789-1980. Stephen J. Lee
9	Europe Since Napoleon Thompson, D
10	European Union: European politics. Tim Bale.

Pedagogy

The course shall be taught through the Lectures/ tutorials/assignments/self-study/seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10

Total	**40**

Course Title: Contemporary History of India from 1947-1990s	
Semester: V	**Course Code:** DSC-12
Total Contact Hours: 60	**Course Credits:** 4
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:** 2 Hours
Formative Assessment Marks: 40	**Summative Assessment Marks:** 60+40=100

Course Objectives:

This chapter will discuss the political legacies of colonialism in India. After studying this lesson the students will be able to:

- know the meaning of legacy of Colonialism
- understand the legacy of Colonialism.
- assess the political legacy of Colonialism.
- identify the important legacies in the form of political legacy of British Colonialism in India.

Learning Outcome:

- Analyse the main theories and interpretations on Contemporary History of India from 1947-1990s
- Analyse the dynamics and dimensions in the Contemporary History of India from 1947-1990s

Unit	Contents of Course- DSC-12	60 Hours
Unit-I	**Chapter-1:** Political legacy of Colonialism. **Chapter-2:** Economic and Social Legacy of Colonialism. **Chapter-3:** National movements: Its significance, Value and Legacy	15 Hours

Unit-II	**Chapter-4:** Framing of Indian Constitution - Constituent Assembly – Draft Committee Report – declaration of Indian Constitution, Indian constitution- Basic Features and Institutions **Chapter-5:** The Initial Years: Process of National Consolidation and Integration of /Indian States – Role of Sardar Patel – Kashmir issue, Indo – Pak war 1948; the Linguistic Reorganization of the States, Regionalism and Regional Inequality. **Chapter-6:** Political development in India since Independence.	**15 Hours**

Unit-III	**Chapter-7:** Politics in the States: Tamil Nadu, Andhra Pradesh, Assam, West Bengal and Jammu and Kashmir, the Punjab Crisis. **Chapter-8:** The Post-Colonial Indian State and the Political Economy of Development : An Overview **Chapter-9:** Foreign policy of India since independence.	**15 Hours**
Unit-IV	**Chapter-10:** Indian Economy, 1947-1965: the Nehruvian Legacy Indian Economy, 1965-1991, Economic Reforms since 1991 and LPG. **Chapter-11:** Caste, Untouchability, Anti-caste Politics and Strategies,. **Chapter-12:** Land Reforms: Zamindari Abolition and Tenancy Reforms, Ceiling and the Bhoodan Movement, Cooperatives and an Overview, Agriculture Growth and the Green Revolution And Agrarian Struggles Since Independence	**15 Hours**

Exercise:

- Examine the impact of colonial legacy on the post-independent Indian Political System
- Discuss the political legacy under colonialism in India.
- Highlight the different factors of political legacy of colonialism
- What is legacy? Write a note on political legacy of colonialism.
- Critically examine the important legacies in the form of political legacy of British Colonialism in India
- Discuss the economic legacy of British Colonialism
- High the different fields of economic legacy of colonialism in India.
- Make an analysis on the social legacy of British colonialism.

Suggested Readings

References	
1	South Indian Studies : Ed. By Dr.H. M. Nayak & B.R. Gopal
2	History of South India : K.A. Neelakantha Sastry
3	Karnataka Through the Ages - R. R. Diwakar
4	Karnataka Samskriti Darshana - M.V. Krishna Rao and T. Keshava Bhat
5	Karnataka Parampare - Ed. By R. R. Diwakar
6	Dakshina Bharatada Ithihasa - B. Sheik Ali G. R. Rangaswamaiah
7	Karnataka Samskritika Ithihasa - Tipperudraswamy
8	Karnatakadalli Chitrakale - Shivarama Karantha
9	Karnataka Parampare - Ed. By R. R. Diwakar
10	Bharatiya Rangabhoomi - Adya Rangacharya

Pedagogy

The course shall be taught through the Lectures/ tutorials/assignments/self-study/seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: History of Tourism in India	
Semester: V	**Course Code:** DSE-1 (A)
Total Contact Hours: 60	**Course Credits: 3**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives:

The objective of the course is to:

- Familiarize students with the basic concepts of travel and tourism
- discuss the terminology used
- Give an insight into how travel and tourism evolved over a period of time andreached the modern stage.
- Enhance the knowledge of students in various areas related to tourism and howit affects the destination.
- Explore the selected issues that currently influence the tourism industry both locally and globally.

Learning Outcome

By the end of this course, learners would be able to:

- Understand fundamentals of tourism from the management, marketing andfinancial perspectives.
- Understand the concepts of travel and tourism, the framework of the system,types and form of tourism as well as the impacts of tourism.
- Describe the different types tourism resources of India, their importance intourism and management.

Unit	Contents of Course- DSE-1 (A)	60 Hours
Unit-I	**Chapter-1:** Tourism: Definition -Nature and Meaning – Need for Tourism – Origin and Growth of tourism. **Chapter-2:** Tourism through the ages ancient and Medieval tourism in India - Domestic and International Tourism. **Chapter-3:** Natural Tourist Resources – Rich Diversity in landform and landscape, geographic features of India, water bodies of India,, Flora and Fauna of India,.	**15 Hours**
Unit-II	**Chapter-4:** Tourism and perspectives. National parks andart galleries. **Chapter-5:** Components of tourism - Medical tourism –Adventure tourism, Healthtourism, Business tourism, Conference, Conventions, Sports tourism. **Chapter-6:** Religious Resources: introduction places of pilgrimage	**15 Hours**
Unit- III	**Chapter-7:** Hindu - Temples, Muslim - Mosques, Darghas, Christian- Churches, Jain - Basadi Buddhists - Stupas, Viharas. Sikhs - Gurdwaras **Chapter-8:** Monuments of Historical importants, Naturalplaces of interest in India. **Chapter-9:** Coastal areas, beaches and islands.	**15 Hours**

Exercise:

- Students can be asked to study and understand fundamentals of tourism fromthe management, marketing and financial perspectives
- They may be asked to survey the concepts of travel and tourism.
- They can be asked to analyze the different types tourism resources of India, theirimportance in tourism and management.

Suggested Readings

References	
1	Bhatia, A.K.: International Tourism : Fundamentals and Practices, Sterling Publishers Pvt. Ltd, New Delhi, 1911.
2	Bhatia, A.K.: Tourism Development: Principles and Practices, Sterling Publishers Pvt. Ltd., New Delhi, 1989.
3	Bhatia, A.K.: Tourism in India History and Development, sterling publishers Pvt. Ltd., New Delhi, 1978.
4	Brown Percy, Indian Architecture (Islamic period), Bombay.
5	Gupta, SP, Lal, K, Bhattacharya, M. (2002) Cultural Tourism in India, DK Print.
6	Robinet Jacob etal (2012), Tourism Products of India, Abhijeeth Publications, New Delhi.
7	Michell, George, Monuments of India, Vol. 1. London.
8	Dr.I.C.Gupta and Dr.S.Kasbekar, Tourism products of India.
9	Dixit, M and Sheela, C. (2001), Tourism Products, New Royal Book

Pedagogy:

The course shall be taught through the Lectures/ tutorials/assignments/self-study/seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: Heritage Tourism in Karnataka	
Semester: V	**Course Code: DSE-1 (B)**
Total Contact Hours: 60	**Course Credits: 3**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives:

The objective of the course is to:

- To study the vast Tourist resources of Karnataka.
- To conceptualize a tour itinerary based on variety of themes;
- To identify and manage emerging tourist destinations.
- To make Karnataka one among the top States of India in terms of domestic andinternational tourist visits.
- To harness Karnataka's tourism potential for its effects on employment generationand economic development.
- To instill confidence in tourists to visit Karnataka and ensure their comfort, convenience, and safety throughout their journey in Karnataka.
- To promote Karnataka in domestic and international markets through a multitudeof marketing channels

Learning Outcome

After studying the chapter, the reader will be able to

- Take students to the tourist places of your district/ Taluk. Ask them to prepare a report and submit for internal assessment.
- Differentiate tourism product from other manufactured products from a marketingview point
- To comprehend the vast Tourist resources of Karnataka;
- To conceptualize a tour itinerary based on variety of themes; and
- To identify and manage emerging tourist destinations.

Unit	Contents of Course- DSE-1 (B)	60 Hours
Unit-I	**Chapter-1:** Introduction to Karnataka Culture and Heritage Tourism. **Chapter-2:** Concept and Significance of the history of cultural heritage of Karnataka. History of Cultural Heritage Tourism in Karnataka, Glimpses of Karnataka's cultural history. **Chapter-3:** Cultural heritage of the Mauryan Period, Satavahanas, Gangas, Chalukyas, Hoysalas, Vijayanagara, Bahamanis and wodeyars of Mysore.	**15 Hours**
Unit-II	**Chapter-4:** Preservation and Conservation of Monuments of karnataka. **Chapter-5:** Indo-Islamic Architecture & Modern Architecture, **Chapter-6:** Important features of Karnataka Paintings & Dance Forms of Karnataka (classical and folk traditions).	**15 Hours**
Unit- III	**Chapter-7:** Hill Stations of karnataka Chikkamagalur hills, Agumbe hills, Malemahadeshwara hills, B R hills. **Chapter-8:** Famous Forts & Palaces **a.** Bangalore fort, Gulbarga Fort, Chitradurga Fort, Gajendragad fort, Malkheda fort. **b.** Mysore Palace, Shivappanayaka Palace, Shivamugga palace, Tippu Palace Bengalore. **Chapter-9:** Museums of Karnataka. Railway Museum Mysore, Folklore Museum Mysore, Hasta Shilpa Heritage Museum Manipal, National gallery of Morden art Bangalore, Janapada loka Manjusha Museum Dharmasthala, venkatappa art gallery Bengalore.	**15 Hours**

Exercise:

- Students can be asked to study and understand fundamentals of tourism fromthe management, marketing and financial perspectives
- They may be asked to survey the concepts of travel and tourism.
- They can be asked to analyze the different types tourism resources of Karnataka,their importance in tourism and management.

Suggested Readings

References	
1	Michell, George, Monuments of India, Vol. 1. London.
2	Davies, Philip, Monuments of India, Vol. II.,London.
3	Brown Percy, Indian Architecture (Buddhist and Hindu), Bombay.
4	Brown Percy, Indian Architecture (Islamic period), Bombay.
5	Vatsayana, Kapila, Indian Classical Dance, New Delhi.
6	Mehta. R. J. Handicrafts & Industrial Arts of India, New York.
7	Hussain, S. A.: The national cultural of India, National Book Trust, New Delhi, 1987
8	Heinrich Zimmer, Philosophies of India, Routledge
9	Swami, Prayaganand, History of Indian Music.

Pedagogy:

The course shall be taught through the Lectures/ tutorials/assignments/self-study/seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: Principles of Field study	
Semester: V	**Course Code:** VOC
Total Contact Hours: 60	**Course Credits: 3**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

What is Field Study?

Field Study is defined as a qualitative method of data collection that aims to observe, interact and understand people ,society and History of the place of study while they are in a natural environment.

Steps in Conducting Field Study

1. **Build the Right Team:** To be able to conduct field Study, having the right team is important. The role of the student and any team members is very important and defining the tasks they have to carry out with defined relevant milestones is important.
2. **Recruiting People for the Study:** The success of the field Study depends on the data collected in the study is being conducted on. Using sampling methods, it is important to derive proper result oriented study.
3. **Data Collection Methodology:** data collection methods for field Study are varied. They could be a mix of surveys, interviews, case studies and observation. All these methods have to be chalked out and the milestones for each method too have to be chalked out at the outset. For example, in the case of a survey, the survey design is important that it is created and tested even before the Study begins.
4. **Site Visit:** A site visit is important to the success of the field Study and it is always conducted in historical /cultural/heritage based /traditional locations and in the actual natural environment of the respondent/s. Hence, planning a site visit along with the methods of data collection is important
5. for example,if a student is working on Mysore Dasara he should visit Mysore during this time.
6. **Data Analysis:** Analysis of the data that is collected is important to validate the premise of the field Study and decide the outcome of the field Study.

7. **Communicating Results:** Once the data is analyzed, it is important to communicate the results to the stakeholders of the Study so that it could be actioned upon.

Field Study Notes

Keeping a record is very important in conducting field Study. Field notes make up one of the most important aspects of the record. The process of field notes begins as the student is involved in the observational Study process that is to be written down later.

Project report

Based on the field study student should submit a project report of 50 pages for evaluation to the guide.

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Semester VI

Course Title: HISTORY OF FREEDOM MOVEMENT AND UNIFICATION of KARNATAKA	
Semester: VI	**Course Code:** DSC13
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives:

Learning Outcome

- To get familiarized with impact of the rebellion of 1857 on Karnataka
- To get acquainted with National Movement in Karnataka
- To know about Belgaum Congress Session
- To understand about Origin and development of unification movement in Karnataka 5. Toknow about Contributions of Various Kannada Organizations

Unit	Contents of Course- DSC13	60 Hours
Unit-I	**Chapter-1:** Introduction: Historical background The disintegration of Karnataka and absorption of Karnataka areas into Madras, Bombay provinces and Hyderabad state. Armed Resistances against the British rule in Karnataka Revolt of Veerappa Deshmukh of Kappa in 1819. **Chapter-2:** Rani of Kittur 1824, Sangoli Rayanna (1829-30), Nagar revolt of 1830-Resistance in Kodagu. **Chapter-3:** The impact of the rebellion of 1857 on Karnataka Bedars of Halagali against Anti arms Act.	**15 Hours**
Unit-II	**Chapter-4:** Venkatappa Nayaka of Surapura, Babasaheb of Naragunda, Bhima rao of Mundargi - effects of the Struggle. **Chapter-5**: The National Movement in Karnataka - Early activities the response to Swadeshi and Non Co- operation Movements in Karnataka-Influence of Tilak and Gandhi. **Chapter-6:** Belgaum Congress Session (1924) Satygraha campaigns in Karnataka (1930-34)	**15 Hours**
Unit- III	**Chapter-7:** Quit India Movement in Karnataka-its effects **Chapter-8:** Movement for Responsible Government in Princely Mysore state. **Chapter-9:** Origin and development of unification movementin Karnataka: Factors responsible for unification Movement:	**15 Hours**
Unit- IV	**Chapter-10:** Views of different Committees on the issue ((Dhar, JVP, SRC): Contributions of Various Kannada Organizations **Chapter-11:** The Kannada Renaissance role of Kannada literature and Journalism in bringing about Karnataka Consciousness **Chapter-12:** The ultimate move towards the formation of Karnataka.	**15 Hours**

Exercise:

Suggested Readings

References	
1	S.Chandrashekahar - Karnataka Ekikaranada Charitre
2	R.R.Diwakar - Karnataka through the ages
3	P.B.Desai - History of Karnataka
4	G.S.Halappa - History of Freedom Movement in Karnataka
5	Basavaraja.K.R. - History of Karnataka
6	K. Veerathappa - Studies in Karnataka History and Culture.
7	James Manor - Political change in an Indian State Mysore 1917-
8	M.Shamarao - 1955 - Modern Mysore (2 vols.)
9	H.S. Gopal Rao - Karnataka Ekikaranada Ithihasa

Pedagogy:

The course shall be taught through the lectures, assignments, group discussions and week-end seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: History of India. (CE1761-CE 1857)	
Semester: VI	**Course Code:** DSC14
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives:

This course is designed to

- Student will be able to formulate basis of modern India through different conceptslike modernity, Rule of Law etc
- Students will be able to analyze the process of rise modern India and its foundationmade by Socialreformer and freedom fighters.
- Students will be able to analyze social background of Indian Nationalism
- Students will be able to categorize different school of thoughts about Modern Indiahistory
- Students will be able to illustrate rise and growth of Economic Nationalism inIndia.

Learning Outcome

At the end of the course the students shall –

- Be in a position to understand the Dynamics of expansion, with special reference to Bengal, Mysore, Awadh, Punjab.
- Be familiar with Land revenue systems- Permanent, Ryotwari and Mahalwari system, Commercialization of Agriculture- Consequences.
- Be in a position to understand the Drain of Wealth-causes and consequences, Growth of modern industry.

Unit	Contents of Course- DSC14	60 Hours
Unit-I	**Chapter-1:** Indian Polity, Society and Economy in mid- 18th century. Mercantile Policies and Indian Trade. **Chapter2:**ColoniaExpansion :Bengal,Mysore,Marathas. Punjab. **Chapter-3:** Imperial Ideologies and Psyche: Orientalists Construction of India and the Utilitarians.	**15 Hours**
Unit-II	**Chapter-4:** British Administration and Law. The Spread of English Education. **Chapter-5**: The New Land Settlements. **Chapter-6:** Commercialization of Agriculture.	**15 Hours**
Unit- III	**Chapter-7:** Ruination of Handicrfts and cottage industries – British Industrial Policy **Chapter-8:** Economic Impact of the Colonial Rule. **Chapter-9:** Social Discrimination and Colonial Rule	**15 Hours**
Unit- IV	**Chapter-10:** Tribal and Peasant Movements in Colonial India **Chapter-11:** Revolt of 1857 **Chapter-12:** The Beginnings of Indentured Labour .	**15 Hours**

Suggested Readings

References	
1	Bandopadhyaya, Sekhara (2004), From Plassey to Partition: A History of Modern India, Orient Blackswan.
2	Bayly, C.A. (1988), Indian Society and The Making of British Empire, Cambridge University Press
3	Bhatia, B. M. (1967), Famines in India, Asia Publishing House.
4	Brown, Judith M. (1972), Gandhi's Rise to Power: Indian Politics, 1915 -1922, CambridgeUniversity Press.
5	Chandra, Bipan, (2010), Rise and Growth of Economic Nationalism in India, Har Anand
6	Chaudhuri, B.B. (2008), Peasant History of Late Pre-Colonial and Colonial India, PearsonEducation.
7	Gadgil, D. R. (1939), Industrial Evolution of India Marshal, P.J. (ed.) : Eighteenth Century in Indian History,Oxford University Press, Delhi, 2007
8	Hasan, Mushirul (1991), Nationalism and Communal Politics in India: 1885-1932, Manohar.

Pedagogy:

The course shall be taught through the lectures, interactive session, outdoor visits and week-end seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: History of United States of America – I (c.1776 – 1945)	
Semester: V	**Course Code:** DSC-15
Total Contact Hours: 60	**Course Credits:** 4
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:** 2 Hours
Formative Assessment Marks: 40	**Summative Assessment Marks:** 60+40=100

Unit	Contents of Course- DSC-15	60 Hours
	The Background & Making of the Republic	
Unit-I	**Chapter-1:** The land and indigenous people: settlement and colonization by Europeans; early colonial society and politics; indentured labour- White and Black. **Chapter-2:** a) Revolution : Sources of conflict : Revolutionary groups, Ideology: The War of Independence and its historical interpretations. **Chapter-3:** b) Processes and Features of Construction making:Debates, Historical interpretations.	**15 Hours**
	Evolution of American Democracy	
Unit-II	**Chapter-4:** Federalists: Jeffersonianism: Jacksonianism, Rise of political parties- 1840 – 1960; judiciary roleof the Supreme Court **Chapter-5:** Expansion of Frontier: Turner's Thesis; Marginalization, displacement and decimation of native Americans; Case histories of Tecumseh, Shawnee Prophet. **Chapter-6:** Limits of Democracy: Blacks and Women	**15 Hours**
	Early Capitalism & The Agrarian South	
Unit-III	**Chapter-7:** Beginnings of Industrialization - Immigrants and changing composition of Labour; Early Labour Movements. **Chapter-8:** a) Plantation economy **Chapter-9:** b) Slave Society and Culture: Slave resistance.	**15 Hours**
	Ante Bellum Foreign Policy & Civil War	

Unit-IV	**Chapter-10:** War of 1812: Monroe Doctrine: Manifest Destiny. **Chapter-11:** Abolitionism and Sectionalism – Issues and Interpretations. **Chapter-12:** Rise of Republicanism, Emancipation and Lincoln.	**15 Hours**

References	
1	Bailyn Bernard, The Great Republic 1985
2	Bailyn Bernard, The Ideological Origins of the American Revolution. HarvardUniversity Press 1967
3	Beard Charles, An Economic Interpretation of the American Constitution. Macmillan, 1921
4	Brown Dee, Bury My Heart at Wounded Knee, An Indian History of the AmericanWest. Grover Gardner 1970
5	Carroll Peter and Noble David, Free and Unfree: A New History of the UnitedStates. Penguin Books, 1977.
6	Davis David B., The Problem of Slavery in the Age of Revolution 1770-1823. NewYork: Oxford University Press, 1999.
7	Faulkner U., American Economic History . New York, Harper, 1960
8	Fogel Robert, Railroads and American Economic Growth Baltimore: Johns Hopkins Press, 1964
9	Foner Eric, America's Black Past. Harper collins, 1970
10	Franklin, John Hope, From Slavery to Freedom. New York: Alfred A Knopf, 1947

Pedagogy

The course shall be taught through the Lectures/ tutorials/assignments/self-study/seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage inMarks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: Process of Urbanization in India	
Semester: V	**Course Code:** DSC-16
Total Contact Hours: 60	**Course Credits:** 4
No. of Teaching Hours/Week:4	**Duration of ESA/Exam:** 2 Hours
Formative Assessment Marks: 40	**Summative Assessment Marks:** 60+40=100

Course Objectives:

- They should understand that the urban centres due to their production and mercantile activities.
- They should be able to understand the historical process of urbanization.

Learning Outcome:

- Enable students to critically engage with the concept of urbanizationthrough both texts and audio visual media.
- Help to connect with the earliest planned urban settlements.
- Enable students to understand that they are the engines of economicgrowth.
- They should understand that they are centres of innovation, knowledge and political power.

Unit	Contents of Course- DSC-16	60 Hours
Unit-I	**Chapter-1:** Introduction – Urbanization – Definition Urbanizationin India – A historical perspective – process of Urbanization. **Chapter-2:** Classification of traditional towns- a) trading Town, b)Manufacturing Towns – Military Towns **Chapter-3:** Features of Urbanization in Ancient India.	**15 Hours**
Unit-II	**Chapter-4:** First phase of Urbanization Indus Valley civilization **Chapter-5:** Importance of cities – Harappa – mohanjadaroDolavira- Chanhudaro - Lothal **Chapter-6:** Features of Urbanization – City Planning – Agricultural Surplus – bronze tools – Growth of trade – Crafts	**15 Hours**

Unit-III	**Chapter-7:** Second phase of Urbanization – 6th BC **Chapter-8:** Northern India - Mohanjadaro period – Ganga Yamuna basin. **Chapter-9:** Sangam age in Southern India – Amaravathi paithan Nagarjuna konda – Kaveri pattanam – Madurai.	**15 Hours**
Unit-IV	**Chapter-10:** Types of Traditional towns in second phase **Chapter-11:** Capital city – Rajadhani nagara – Pataliputra Mahanagara – Hasthinapura- Mathura – vaishah –Nigana- pattana. **Chapter-12:** Layout of a city in ancient India	**15 Hours**

Exercise:

Suggested Readings

References	
1	
2	
3	
4	
5	
6	

Pedagogy

The course shall be taught through the Lectures/ tutorials/assignments/self-study/seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10

Total	**40**

Course Title: Dr.B.R Ambedkar's Social and PoliticalPhilosophy	
Semester: VI	**Course Code:** DSE-2 (A)
Total Contact Hours: 60	**Course Credits: 3**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives

- Conceptually understand the Political Philosophy of Ambedkar.
- Assess the Movements of Amebedkar.
- Asses the challenges in implementation of Dr. Ambedkar's Policies.

Learning Outcome:

Course outcomes (Cos): After the successful completion of the course, the studentwill be able to:

- To define the Dr. B.R. Ambedkar's Social and political philosophy
- To examine different types of Dr. B.R. Ambedkar's Social and political philosophy
- To understand Dr. B.R. Ambedkar's Social and political philosophy
- To realize the importance Dr. B.R. Ambedkar's Social and political philosophy

Unit	Contents of Course- DSE-2 (A)	60 Hours
Unit-I	**Chapter-1:** Life and works of Dr. B.R. Ambedkar- Early influences of Dr. B.R. Ambedkar through Visits intellectuals, Companyand his Bitter Experiences. **Chapter-2:** Dr. B.R. Ambedkar's Reactions to British Political Reforms- Symon Commission, Three Round Table Conference, Ramse MacDonald Declaration (1932) Doable Voting, Poon-Pact, Govt of India Act 1935. **Chapter-3:** Dr. B.R. Ambedkar's Conception of Freedom & His Role in the Freedom Struggle, Mukanayaka, Janatha, BahiskrithBharatha, Prabudda Bharatha. Ambedkar's Perception of New India.	**15 Hours**
Unit-II	**Chapter-4**: Dr. B.R. Ambedkar's the Quest for Social Justice, Analysis of Indian Social Problems & Its Solutions, Mahad Satyagraha, Kalara Temple Moment, Caste System, Untouchability, Adivasis & Minorities. **Chapter-5:** Dr. B.R. Ambedkar's views on Annihilation of Caste, Education and Social Uplift of Scheduled Cast, Tribes & Backward Classes, the Untouchables in Contemporary India. **Chapter-6:**Social Justice Role of Ambedkar as a Chairman of the Constituent Assembly.	**15 Hours**
Unit-III	**Chapter-7:** Role of Ambedkar as a Chairman of the Constituent Assembly. **Chapter-8:** Ambedkar's view on Social Justice- Preamble of the Constitution- Fundamental Rights (Part III) Article 14,15,16,17,19,21,22. Importance of Directive Principles of State Policy in Securing Social Justice **Chapter-9:** Ambedkar's Conception on 'Constitutional Remedies'. The Role of Judiciary in Upholding Social Justice to the Weaker Sections of the Society	**15 Hours**

Exercise:

- Evaluation of Role of Ambedkar as a Chairman of the Constituent Assembly
- Group discussion to generate new ideas related to the Role of Ambedkar as a Chairman of the ConstituentAssembly.

Suggested Readings

References

1	Booker T. Washington-Up from Slavery.
2	Dhananjay Keer - Life and Mission of Dr. B.R.Ambedkar
3	A.M. Rajashekharaiah - The Quest for Social Justice

4	Computer fundamentals a / s - B B.Ram
5	Fundamentals of computers - V.Rajaraman
6	Scholered T, Valaraie & Brown, Pam - Martin Luther King: America's Great Non-Violent Leader
7	W.N. Kuber - Ambedkar - A Critical Study
8	A first course in computers rs - S S.Jaiswal, Galgotia publications
9	Nissim Ezekiel - A Martin Luther King Reader

Pedagogy:

The course shall be taught through the lecture methods, lab teaching, visits to field and week-end seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: Heritage Sites in your own District- (Bangalore)	
Semester: VI	**Course Code: DSE-2 (B)**
Total Contact Hours: 60	**Course Credits: 3**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives:

This course will help to understand Components and Evolution of Indian Heritage

- understand the concept and meaning of Indian cultural history
- establish the link between culture and heritage
- discuss the role and impact of culture in human life

Learning Outcome:

At the end of the course the students shall –

- Describe the distinctive features of Indian culture.
- Identify the sources of culture.
- Explain the components of culture.
- Trace the stages of evolution of Indian culture
- Describe the distinctive features of Indian culture.
- Identify the sources of cultural heritage of your place.
- Explain the components of cultural heritage of your place.

Unit	Contents of Course- DSE-2 (B)	60 Hours
Unit-I	**Chapter-1:** Bangalore Palace-History, architecture of Bangalore Palace-Palace ground **Chapter-2:** Tipu Sultan Palace-ALBERT Victor road-Rashe-E JANNATH-History-Architecture museum in Tipu's Palace-Tipu Sultans' Throne-Artistic features of the Throne. **Chapter-3:** Bangalore Fort-Legend of Bangalore Fort, History of Bangalore fort, Architectureof Bangalore Fort.	**15 Hours**
Unit-II	**Chapter-4:** Vidhana soudha-Tajmahal of South India Neo-Dravidian style of Architecture History-Construction of Vidhana Soudha **Chapter-5:** Athara Kacheri-History-Gothic style of Architecture **Chapter-6:** Halasuru Someshwara temple- History Architectural features of Dravidian style	**15 Hours**
Unit- III	**Chapter-7:** Mayo Hall and its history **Chapter-8**: St. Mark's Cathedral Church and itshistory**.** **Chapter-9:** Botanical Gardens and its history.	**15 Hours**

Exercise:

- Students can visit the Botanical Gardens of Banagalore.
- Write a report on St. Marks Cathedral.

Suggested Readings

References	
1	**Discovering Bengaluru** by **Meera Iyer (Author),**
2	**Nature in the City: Bengaluru in the Past, Present, and Future** by Harini **Nagendra (Author)**
3	PAST & CURIOUS - Forty Tales of Good Old Bangalore Paperback, by Stanley Carvalho
4	**Discovering Bengaluru Perfect Paperback** , by Meera, **yer (Author),** Chiranjiv **Singh (Introduction)**
5	**Glimpses of Vintage Bengaluru**, **by Sushil Mehra**
6	**Bangalore: Roots and Beyond**, **by Maya Jayapal**

Pedagogy:

The course shall be taught through the Classroom lectures, Open Educational Resourses (OER) as reference materials, assignments and group

discussions.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: Introduction to Archives	
Semester: VI	**Course Code:** VOC
Total Contact Hours:45	**Course Credits: 3**
No. of Teaching Hours/Week:3	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives:

- Students will understand the importance of archives is not only to study the past but also for the impact knowledge of the past, that have on the presentand the future.
- They understand the changing trends in the society, different levels of government's policies, organizations/ institutions regulation etc., are some of the efficient utilization of archives.
- They will know that Everyone benefit from archives, they are the institutional memory. Archives permit continuity and consistency and accountability to the people.

Learning Outcome:

- After seeing archives students shall understand that Archives provide citizens with a sense of national identity and are of great value to them in establishing and protecting individual and property right and privileges.
- They educate, entertain, and enrich our lives by providing appealing and tangible heritage of our society. In short, archives provide the basic for understanding of our past, they help orient us to our present, and they provide guidance for our progress into the future.

Unit	Contents of Course- VOC	45 Hours
Unit-I	**Chapter-1:** Definition of Archives - Creation of Archives -Uses of Archives **Chapter-2:** Archives and Library - Various types of Archives - Materials used for creation – Birth of a document **Chapter-3:** History of Archives in Europe and India - Preservation techniques	**15 Hours**
Unit-II	**Chapter-4:** Enemies of Records - Rehabilitation of Records - Functions of Archivist **Chapter-5:** Functions and Administration: Role of IT inthe Development of Archives – Rules relating to the accession of records in Archives **Chapter-6:** Appraisal of Records- Retention Schedule -Compilation and Publication	**15 Hours**
Unit- III	**Chapter-7:** Various aspects of records management such as Documentation practices and filing system, life cycle ofa file and nature of 1odern records **Chapter-8:** Classification of records and methods of control on mass production. **Chapter-9:** National Archives of India and Karnataka State Archives - Requirement of Record Room - Administration of Karnataka Archives - Saraswathi Padasala of Tanjore - Jesuits Archives in Shenbaganur - Field Work	**15 Hours**

Exercise:

- Visit Vidhana soudha Archives
- Read literature in a group regarding Archives and digital Archives
- Listen to lectures by experts maintained in archives.

Suggested Readings

References	
1	Introduction to Archives and Museum by Madhurima Sen
2	The Great Archives : A Historical Account by Thakur Rudra Pratap Singh
3	Studies On Archives And History Hardcover by T. R. Sareen (Author)
4	Introduction to archives Book by F. G. Emmison
5	Archives Principles & Practices Hardcover by Kumar S (Author)

Pedagogy:

The course shall be taught through interactive sessions, assignments, group discussions and week-end seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Course Title: History of Indian Numismatics	
Semester: VI	**Course Code: VOC**
Total Contact Hours: 45	**Course Credits: 3**
No. of Teaching Hours/Week:3	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course Objectives:

To highlight the importance of Coins not only in corroborating Indian History but also in modifying it

- To elucidate the information derived from coins across various streams of History i.e Polity, Economy,Religion, Culture, Technology, Trade & Commerce
- To explain the interaction of Coins with the allied fields of Archaeology, Palaeography and Epigraphyresulting in generation of factual data to Historians
- To introduce students to Numismatic methodologies such as Regio Specificity, Numismatic type continuity, Provenance study,Hoard Study.

Learning Outcome:

At the end of the course the students shall –

A chronological coverage of Indian coins from the Mahajanapada period to the latest coins with due focuson non-political aspects such as economy, religion, metallurgy etc,.

- Hands on where the students will handle genuine coins (and not replicas) pertaining to the varioushistorical time periods.
- Workshop involving working on a hoard of coins. Students need to group coins by implementingtypological similarities, similarities in coin fabric, Iconography etc.
- An end of session Quiz to reiterate the important aspects covered during the course.

Unit	Contents of Course- VOC	45 Hours
Unit-I	**Chapter-1:** Meaning, scope and definitions of Numismatics **Chapter-2:** Identification and classification of coins - Mode of occurrence of coins - excavations, hoards, individual collections - Shape & Size, Metals/Alloys, weight metrology and denominations. **Chapter-3:** Techniques of manufacturing coins - punching, casting, die-struck.	**15 Hours**
Unit-II	**Chapter-4:** Typology: Obverse - reverse device, .legend, symbols, mint marks. **Chapter-5:** Decipherment and dating - Knowledge of scripts, Brahmi, Kharoshthi, Greek. Numismatics as a source of Political, Cultural and Economic history; counterfeit coins. **Chapter-6:** An outline history of Punched marked, Janapada & Tribal coins, coins of foreign invaders (Indo-Greeks, Shaka, Parthian), Kushanas	**15 Hours**
Unit- III	**Chapter-7:** Western Kshatrapa coins - Guptas, Post-Guptas and early medieval coinage **Chapter-8:** Salient features of medieval Indian coins, An outline history of the coinage of Mahmud Ghazanavi, Delhi Sultanate (Mamluk, Khilji, Tughlaq, Lodis .....), Shershah Suri, Mughals. Successors of the Mughals **Chapter-9:** Hindu rulers during the Sultanate and Mughal period. Coinage of the Sultans of Malwa and Gujarat. Coinage of Rajputana.	**15 Hours**

Exercise:

- The students may choose a topic of his/her interest dynatic coins and submit a project
- May invite a numismatist and organize an exhibition of coins
- May read collectively recent articles about Numismatics.

References	
1	Historical Studies In Mughal Numismatics by Hodivala Shahpurshah Hormasji
2	A Study of Ancient Indian Numismatics by Surendra Kisor Chakrabortty (Author)
3	Indian Numismatics- From the Earliest Times to the Rise of the Imperial Guptas by S.K. Chakrabortty (Author)
4	Numismatic Art of India: Historical and Aesthetic Perspectives by B.N. Mukherjee (Author)
5	Indian Numismatics by Devendra Handa (Author)
6	A Study of Indian Numismatics by Dr Anup Kumar

Pedagogy:

The course shall be taught through the lecture, tutorial, interactive sessions, assignments, seminars, group discussions and week-end seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

General Pattern of History Question Paper

I. Term End Examination for Discipline Specific Core (DSC) Papers

Each paper will be for maximum of **60 mark.** The minimum mark to pass the examination is 40% (24 mark) in each theory paper.

Note: Duration of Examination for Discipline Specific Core (DSC) Papers is **3 hours.**

Question paper pattern for **Discipline Specific Core (DSC) Papers** –

Section A: Multiple Choice Questions
Section B: Short Answer Questions
Section C: Long Answer Questions

Section A: Multiple Choice Questions

All Questions are Compulsory (10x1=10)

1.

2.

3.

4.

5.

6.

Section B: Short Answer Questions (2x10=20)

Answer any Two questions. Answer the following questions in not more than 500 words

11.

12.

13.

Section C: Long Answer Questions (2x15=30)

Answer any Two questions. Answer the following questions in not more than 800 words

14.

15.

16.

I. Term End Examination for Discipline Specific Elective (DSE) Papers

Each paper will be for maximum of 60 mark. The minimum mark to pass the examination is40% (24 mark) in each theory paper.

Note: Duration of Examination for Discipline Specific Elective (DSE) Papers is **2 hours.**

Question paper pattern for **Discipline Specific Elective (DSE) Papers** –

Section A: Short Answer Questions

Section A: Short Answer Questions

Answer any thirty (30x2=60)

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MANGALORE UNIVERSITY

SUBMITTED BY THE BOS COMMITTEE

BOS DESIGNED AND APPROVED SYLLABUS FOR UG PROGRAM IN JOURNALISM

(NEP 2021)

2023-24

UG SYLLABUS FOR JOURNALISM

Programme: Four-year Programme in Journalism to be introduced under NEP
Programme Objectives:

- Four-year Course in Journalism would aim to familiarize students with all aspects of the field of Journalism. They become more proficient in both theory and practical skills of the media in general.
- The programme would prepare the students 'ready-to-be recruited by media, advertising & corporate houses. The content of the programme is designed to be dynamic and incorporate changes to meet requirements of the industry.

Learning Outcome:

- The programme aims to churn out responsible media professionals who would contribute positively to the society.
- The programme aims to facilitate better career opportunities for all those students of this course and get them ready to tackle challenges in the professional setup.
- The programme aims to strike a balance between the dynamic working environment and professional ethics in the field of Journalism.

Need for Curriculum Development:

NEP 2020 initiative is intended to formulate a curriculum to bring about uniformity among the students studying in different Universities/Institutes. The need for the curriculum development in Journalism emerges due to the following reasons:

Changing Media Scenario: The curriculum has been designed keeping with the industry requirements and includes subjects such as Multimedia, Photojournalism, Short Film Making, Creating Blogs and Vlogs, Mobile Journalism, Writing for Media, Producing News Bulletins for Radio and TV, Advertising and Corporate Communications, among several others. The rapid growth in media industry demands highly skilled human resource.

Credit transfer: Credit transfer is approved by the UGC and the Government that allows the students to transfer course from their existing university to a new UGC approved university.

The same number of credits in all the Universities in Karnataka is the first step towards the credit transfer from University to University.

Skill Enhancement: The new curriculum focuses more on hands on training, internship and thereby enhancing the skills of the students. It not only aims at producing responsible communication professionals but also citizens with a humane approach in day-to-day life. The papers like Writing for Media, Photojournalism, Computer Applications for Media etc., further helps in skill development of students.

Pedagogy:

The goal of Journalism pedagogy is offered with an objective to train and prepare professionally skilled media persons and communication experts. It lends exposure to a wide range of meticulously framed syllabi.

Importance to Theory and Practical's and its application: The Journalism curriculum focuses on innovative components in theory and practice, which in turn equips students to be full-fledged media men. It is suggested that students be divided in to batches of not more than 10 each under a teacher to enable effectiveness of teaching in practicals.

Utilization of ICT: The global media industry is in anticipation of ICT trained communication experts. To enhance critical and creative thinking amongst students, ICT tools are incorporated into the teaching methods which include research-led teaching, via presentations through smart classrooms, and practical productions.

Research-based and research-led teaching: The Research Projects are introduced in the curriculum to strengthen the research concepts among the budding researchers. The students are introduced to various facets of Journalism research such as print, electronic and new media research, global, health and political communication research, folk media, intercultural communication and research on development issues and so on in accordance to the relevance of the profession. The students will be required to do research project on a topic of their choice under the supervision of a research guide.

Brain Storming Approach: Students will be involved in groups and individual discussions. This will help the students to develop and involve in the process of critical thinking and analyzing. It further helps them in decision making and crisis management and also boosts self-confidence.

Exit Options and Credit Requirements:

A Certificate / Diploma/ Bachelor Degree or Bachelor Degree with Honours in Journalism is awarded at the completion of every progressive year.

Exit Option with	Certificate/Diploma/Degree/ Honors
Successful completion of First year (two semesters) of the Four years multidisciplinary undergraduate Degree programme.	Certificate in Journalism
Successful completion of Second year (four semesters) of the four years multidisciplinary undergraduate Degree programme	Diploma in Journalism
Successful completion of Three year (six semesters) of the four years multidisciplinary undergraduate degree Programme	BA Degree in Journalism
Successful completion of Four year (eight semesters) of the four years multidisciplinary undergraduate degree Programme	BA Degree with Honors in Journalism
Successful completion of Five year (Ten semesters) of theFour years multidisciplinary degree programme	Master of Arts Degree with Honors in Journalism & Mass Communication

A student will be allowed to enter/re-enter only after the odd semester and they can only exit after even semester. Re-entry at various as lateral academic programmes based on the above mentioned earned proficiency test records. The validity of the earned credit will be for a maximum period year or as specified by the academic bank of credits (ABC).

Acronyms Expanded	
AECC	Ability Enhancement Compulsory Course
DSCC	Discipline Specific Core Course
SEC/SB/VB	Skill Enhancement Course- Skill Based/Value Based
OEC	Open Elective Course
DSE	Discipline Specific Elective

Continuous Internal Evaluation and Semester End Examination:

Total marks for each course shall be based on continuous assessments and term end examinations. As per the decision of the Karnataka State Higher Education Council, it is necessary to have uniform pattern of Class Internal Assessment and Semester End examinations respectively, among all the Universities, their affiliated and autonomous colleges. The state level committee deliberated on the same and suggested the following pattern for the CIE Marks. The BOS has also approved to follow the same pattern.

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

FIRST SEMESTER

DSCCA 1: INTRODUCTION TO JOURNALISM- (BASJRCN 101)

Course Title and Code	DSCCA 1-Introduction to Journalism		
Programme Title	BA in Journalism		
Credits	06	Semester	I
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory: 4hrs/week
Practical: 4hrs/week
Total: 6 credits

Theory Marks – 100 = 60 T + 40 IA
Practical Marks 50 = 25 T + 25 PR
Total Marks = 150

Course objectives:

- To introduce the concept of media and mass communication in general and journalism in particular
- To familiarize the students with different facets of journalism
- To educate about the role of journalism in society and development

Learning Outcome:

Students will be able to

1. Understand and appreciate various dimensions of mass communication
2. Develop an understanding of the fundamental concepts of Journalism
3. Analyze the scope and various dimensions in Journalism
4. Discuss the recent trends in Mass Media

Pedagogy:

Direct Method, ICT, Digital Resources, Collaborative and cooperative learning, Experimental Learning, Flipped Classroom

Unit I

Definition, Meaning, Nature, Scope, Functions and Principles of Journalism, Types of Mass Media – Traditional, Folk Media, Print, Electronic, Digital and New Media **15 Hrs**

Unit II

History of Journalism: Origin and Growth of Journalism in India – History of Kannada Journalism – Development of Coastal Journalism - History of Media Education in Karnataka. **15 Hrs**

Unit III

Modern Journalism: Citizen Journalism – Advocacy Journalism - Yellow Journalism - Mobile Journalism – Use of Social Media as a Part of Journalism: Facebook, YouTube, Instagram – Journalism Ethics.

15 Hrs

Unit IV

Photo Journalism: Importance, Scope, Types of Photography, Caption Writing - Importance of Language in Journalism – Journalistic Writing.

15 Hrs

Exercises / Assignments

1. Reading of newspapers in the class particularly the front page and the local news.
2. Prepare questions for a specific interview
3. Rewriting news stories from newspapers converting them for magazine.
4. Filing report on the basis of mock press conference.
5. Filing report after attending one press conference after going to the field.
6. Preparing minimum 3 speech reports
7. Writing minimum 2 Letters to the Editor

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

FIRST SEMESTER

DSCCA 2: INTRODUCTION TO JOURNALISM – PRACTICAL (BASJRPN 102)

Total Hours: 40 **Hours/Week: 4**

Max Marks: 50 **Credits: 2**

1. Letters to the Editor (2 Letters)
2. Review of content of Newspapers / Magazines
3. Reporting of any 5 different kinds of College Level incidents.
4. Translation of 5 newspaper reports
5. Preparing 2 social Media content

Reference Books

- Theory and Practice of Journalism - B N Ahuja
- Professional Journalism - M V Kamath
- Mass Communication & Journalism in India - Keval J Kumar
- AdhunikaBharathiyaParthrikodhyma - Shree L Bhandarkar
- Professional Journalist John Hohenberg
- Mass Communication & Journalism in India - Mehta
- Eradu Dadagala Nadhuve – Niranjana Vanalli
- Pathrikodyama - Ranganath Rao
- Indian Journalism - Nadig Krishnamurthy

- Journalism in India- R.Parthasarathy
- New History of Indian Journalism - G N S Raghavan
- Berlo, D. K. (I960). The process of communication: An introduction to theory and practice. Holt, Rinehart and Winston.
- Schramm, w.L. Ed). (1960). Mass Communications: a book of readings selected and ed. for the Institute of communications research in the Univ. of Ilinois. University of illinois Press.
- McQuail, D. (2010). McQuail's mass communication theory. Sage publications..
- Uma, N. (2011). Mass Communication Theory and Practice. New Delhi, Har-Anad publication Pvt Ltd.
- Kumar, Keval J. (2020) Mass Communication in Indin- (5th Revised Edition), Jaico Publishing house, Mumbai.Singh, C. P. (Ed.). (2004). Dictionary of Media and Journalism: TV, Radio, Print and Internet. IK International Pvt.
- Jeffery, R. (2000) India's Newspaper Revolution. Oxford University Press, New Delhi.
- Mehta, D.S. (2014) Mass Communication and Journalisım in India. Allied Publications, New Delhi.
- Natarajan.J (2000) History of Indian Journalism: Part II Of The Report Of The Press Commission. Publications Division.
- Krishnamurthy, N. (1969) Indian Journalism, Mysore University Press.

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

FIRST SEMESTER

DSE (OE) 1: WRITING FOR MEDIA (BASJREN 101)

Course Title and Code	OE 1-Writing for Media		
Programme Title	BA in Journalism		
Credits	03	Semester	I
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory: 3hrs/week
Total: 3 credits
Theory Marks – 100 = 60 T + 40 IA

Total Marks = 100

Course Objectives:

1. To make them familiar with writing for media and develop interest in writing
2. Introduce the students to cultivating of sources
3. Equip the students with new trends in media writing

Learning Outcome:

- Learning various writing techniques for different media
- Creating content for various social media platforms
- Students become industry-ready

Unit - I

Writing for print media, Role and responsibilities of a Journalist, Forms of Journalistic writing - News, Feature, Editorial, Letter to the Editor, Press Releases. **15 Hrs**

Unit - II

Writing for Radio, Importance of language and grammar, Techniques of TV writing, writing different types of TV scripts.

15 Hrs

Unit - III

New Media, Writing for social media (Facebook, Twitter, and Instagram), Introduction to Blogging and Vlogging, Current Trends in Web Journalism.

15 Hrs

Practical Exercise:

1. Letters to Editor - 02
2. Writing Headlines – 05
3. Preparing caption writing - 05
4. Preparing Scripts for a Radio Talk and Jingles of 02 Minutes Each- 02
5. Preparing Package story using Mobile – 1
6. Create your own E-mail address, Facebook, Twitter, LinkedIn, Instagram accounts.
7. Creating Blog/Vlog

Reference Books:

1. Berger, Arther Asa (2009) Scripts: *Writing for Radio and TV,* SAGE Publications.
2. Craig Richard (2004). *Online Journalism Report Writing and Editing for New Media,* Belmont Thomson, Wadsworth Publishing Company, USA.
3. Ellen Sandler. *The TV writer's Work Book – A creative Approach to TV scripts,* Delta Publications (2007 Edition).
4. Gupta and Jasra AS (2007). *Information Technology on Journalism,* Kanishka Publishers, New Delhi.
5. Lyndra Felder (2011). *Writing for the Web Creating, Compelling Web Content Using Words, Pictures and Sound,* New Riders, Denmark.
6. Ravindra R.K (1999). *Handbook of Reporting and Editing,* Anmol Publications, New Delhi.
7. Roy Barun (2004). *Beginners Guide to Journalism, Pusthak Mahal, Delhi.*

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

SECOND SEMESTER

DSCCA 3: COMPUTER APPLICATIONS FOR MEDIA (BASJRCN 201)

Course Title and Code	**DSCCA 3**- Computer Applications for Media		
Programme Title	BA in Journalism		
Credits	06	Semester	II
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory: 4hrs/week
Practical: 4hrs/week
Total: 6 credits

Theory Marks – 100 = 60 T + 40 IA
Practical Marks 50 = 25 T + 25 PR
Total Marks = 150

Course Objectives:

- To introduce students to the basics of computer
- To familiarize the students to the applications of computers in print and electronic journalism
- To facilitate the students to learn the practical applications of computers at different levels in media
- To expose the students to the world of internet and its extensive use for interactivity
- To familiarize the students with web-based broadcasting

Learning Outcome:

Students will be able to

- Understand the basic concepts of computer
- Develop an understanding of the applications of computers in print and electronic journalism

- Get acquainted with internet applications
- Apply information technology skills in print and broadcast projects
- Demonstrate web-based broadcasting skills

Pedagogy

Direct Method, ICT, Digital Resources, Collaborative and Cooperative Learning, Experimental Learning, Flipped Classroom

Unit I

and TV Production: Page Maker, Adobe InDesign, Adobe Premier, Edius, Photoshop. **15 Hrs**

Unit II

Media Convergence – News Composing, Uploading write-ups to Websites. Transferring reports and stories to Media - File Transfer Protocol (FTP) – Backpack – Facebook and YouTube Live **15 Hrs**

Unit III

MS Office – Word, Power Point, Photo editing, uploading images, visuals and text - Nudi software. **15 Hrs**

Unit IV

Fundamentals of Multimedia – Definition, Elements of multimedia – Fundamentals of visual communication – Video Conferencing. Blogs, Vlogs and Email – OTT Platform **15 Hrs**

EXCERCISES / ASSIGNMENTS

Create your own Email ID, Facebook, Twitter and Instagram Accounts
Submission of Visual Stories (Minimum 2)
Publish minimum 2 Facebook Stories

Compare any two news / sports portals of your choice.

Preparations of a lab journal of at least two pages by each individual.

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

SECOND SEMESTER

DSCCA 3: COMPUTER APPLICATIONS FOR MEDIA (BASJRPN 202)

Total Hours: 40 **Hours/Week: 4**

Max Marks: 50 **Credits: 2**

1. Creating Power Points Presentation using Multimedia tools
2. Designing an e-paper page using InDesign / Quark Xpress
3. Creating social media content
4. Creating blog

Reference Books

1. Sunder, R,2000. *Computers Today* Ed.2, John Wiley
2. Benedict, M, *Cyberspace: First steps,* ed. Cambridge, MA. MIT Press
3. Chapman and Chapman, *Digital Multimedia*, Wiley Publication.
4. James C. Foust, *Online Journalism: Principles and Practices of News for the Web.3* Scottsdale, AZ: Holcomb Hathaway.
5. Janet H. Murray, *Hamlet on the Holodeck :The Future of Narrative in Cyberspace in New York:* Free Press, 1997.
6. Macintosh, *Advanced Adobe Photoshop*, Adobe Publishers.
7. Satyanarayana, R., *Information Technology and its Facets*, Delhi, manak 2005.
8. Smith, Gene, *Tagging: People Powered Meta data for the Social Web, Indianpolis, Indiana:* New Riders Press, 2008.

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

SECOND SEMESTER

DSE (OE) 2: PHOTO JOURNALISM (BASJREN 201)

Course Title and Code	OE-2 Photo Journalism		
Programme Title	BA in Journalism		
Credits	03	Semester	II
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory: 3hrs/week
Total: 3 credits
Theory Marks – 100 = 60 T + 40 IA

Total Marks = 100

Course Objectives:

- To attract students towards photo journalism
- To familiarize the students to techniques of photography and photo journalism
- To give a practical knowledge in the field of photography

Learning Outcome:

Students will be able to

- Students will get hands on experience on visual communication
- Students will learn the significance of pictures in various media
- Students will upgrade their knowledge on various photos - editing software

Unit - I

Evolution of Photography, Different Types of Cameras--Manual, Digital and Phone Cameras, Types of Photography – Portrait, Landscape, Street Photography, Wildlife, News Photography. **15 Hrs**

Unit - II

Photo Journalism, Role and Responsibilities of Photo Journalists, Photo

Features, Techniques of Photo Editing, Caption Writing.

Unit - III

15 Hrs

Mobile Journalism - Using Smartphones for News Reporting, Photo Editing,and Publishing News Content using Smartphones on Digital Platforms.

15 Hrs

Practical

- Students to shoot and submit nature photos (5), news photos (5) portraits (5) Human interest photos (5)
- Students to edit at least 10 photographs
- Caption Writing (10 captions)

Books for Reference:

1. Ang, T. (2013). *Digital Photography Masterclass.* Dorling Kindersley Ltd.
2. Beaumont Newhall (1982). *The History of photography*, The Museum of Modern Art,New York
3. Brenda Tharp (2010). *Creative Nature and Outdoor Photography*, Amphok Books,New York.
4. Erickson B and Romano. F (1999). *Professional Digital Photography*, HallInternational, London.
5. Feinberg, M. (1970). *Techniques of Photojournalism*: Available Light and the 35mmcamera (vol.15). Wiley.
6. JonaiWabwire (2014). *Photo Journalism Distinguished From Other Branches OfPhotography*, Lam Lambert Academic Publishing Germany.
7. Kenneth Kobre (2008). *Photo journalism*. The professional Approach, Focal Press, Massachusetts.
8. Rothstein A(1980). *Photo Journalism*. The History of Photography, The museum ofModern Art, New York.

FROM 2023- 24 ONWARDS)

THIRD SEMESTER

DSCCA 5- NEWS REPORTING AND ANALYSIS- BASJRCN 301

Program Title	**BA (Journalism and Mass Communication)**			Semester	**Third Semester**
Course Code	**DSCCA 5**			Type of Course	**Discipline core**
Course Name	**News Reporting and Analysis**			Contact hours	**4 hours/ week Theory** **4 hours/ week Practical**
Course Credits	**06 {Theory: 4 credits and Practical: 2 credits}**			Academic Year	**2021-22 Batch**
CIE Marks	**40**	SE Exam Marks	**60**	Practical Marks	**50 (25 IE+25 SE)**

Course Outcomes: On completion of the course, the student teacher will be able to:

- ❖ Organize and articulate new stories understanding the concepts, structure, and types of news.
- ❖ Evaluate and analyse the importance of sources and types of information that provide the basis for news stories.
- ❖ Formulate skills for news selection, processing, prioritizing and finally, designing the end-product, identify the basic ethical issues confronting editors and can practice fair play.

Course Content:

Unit–1
News: Definitions, nature, concepts, elements, and values, inverted pyramid;
Leads and types of leads in news story.

Unit-II

Reporting and Reporters: Organization of reporting section, principles of reporting; **Reporter**: Functions, qualities, and responsibilities of a Reporter.

Unit-III

News Sources: Speeches, Press Conferences, Press Note, Demonstrations, Rallies and agitations, Public and Private. **Interviewing**: Principles, importance, techniques and types of news interviews.

Unit- IV

Types and Trends in Reporting: Political, Sports, Crime, Investigation, Court, Education, Agriculture, Film, City, Cultural Events. **Trends** - Political beats, viral news fact checking.

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT

FROM 2023- 24 ONWARDS)

THIRD SEMESTER

DSCCA 6- NEWS REPORTING AND ANALYSIS- PRACTICAL (BASJRPN 302)

1. **Event reporting** - Students have to identify 2 major events and provide a detailed news report on it.
2. **Press conference** - Have to attend the press conferences of a day, and prepare a report based on it.
3. **Press Notes**– Get the 05 Press Notes from your local news media and prepare the news item.
4. **Interview news story** – Conduct at least two in-person interviews to write a news story on a timely topic in consultation with your professor from primary sources (400- 500 words).
5. **Write the following news items already published in the different newspapers.**

Press notes- 1, Speech Reporting- 1, Protest- 1, accidents- 1, Obituary-1, disaster-1, Communal riots-1, Political reporting-1, election-1, legislature-1, judiciary-1, weather-1,seminars/ workshops-1, science & technology-1, environmental issues-1, Sucide-1, Women Issues-1, Health-1, Agriculture-1, investigative-1, defence-1, human rights-1, tourism-1, education-1, cultural events-1, Govt news-1.

Note: Each student shall compulsorily maintain assignments and record book, submit the same at the end of the semester in the form of Project Report.

Reference Textbooks	
1	**Bill Kovach and Tom Rosenstiel,** (2001) The Elements of Journalism, Three Rivers Press.
2	**Brooks, B. S., Pinson, J. L., & Wilson, J. G.** (2013). "Writing as a Journalist," chapter11 in working with words: A handbook for media writers and editors. Boston; New York: Bedford/St. Martin's.
3	**Deborah Potter,** (2006) Handbook of Independent Journalism, Bureau of International-Information Programs, U.S. Department of State.
4	**Brooks, B. S., Kennedy, G., Moen, D. R., &Ranly, D**. (2014). The inverted pyramid. In News reporting and writing (11th edition). Boston; New York: Bedford / St. Martin's.
5	**Lorenz, Alfred L, and John Vivian**. (1995) News: Reporting and Writing Pearson Education POD.
6	**Izard, Ralph S.** (1994) Fundamentals of News Reporting, 6th edition. Dubuque, Iowa: Kendall/Hunt.
7	**Melvin Mencher,** (2010), News Reporting and Writing, 12th Ed McGraw-Hill, New York.
8	**The Missouri Group.** (2014) News Reporting and Writing, 11th edition, Bedford-St. Martin.
9	**Steward, Charles J., and William B. Cash, Jr.** (2003) Interviewing: Principles and Practices; Boston: McGraw-Hill.
10	**Tompkins, A.** (2012). The art of the interview. In Aim for the heart: Write, shoot, report and produce for TV and multimedia (pp. 77-96). Washington, D.C.: CQ Press.
11	**Kumar, J Keval. (2003).** Mass communication in India. Delhi: Jaico Publishing House.
12	**Parthasarathy, Rangaswami**. (2001). Journalism in India (4th Ed). New Delhi: Sterling Publishers.

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

THIRD SEMESTER

DSE3 - FEATURE WRITING AND FREELANCING – BASJREN 301

Program Title	**BA (Journalism and Mass Communication)**		Semester	**Third Semester**
Course Code	**OE-3**		Type of Course	**Core Elective**
Course Name	**Feature Writing and Freelancing**		Contact hours	**3 hours Theory**
Course Credits	**03**		Academic Year	**2021-22 Batch**
CIE Marks	**40**	SE Marks	**60**	**PRACTICAL- NIL**

Course Outcomes: On completion of the course, the student teacher will be able to:

- Organize and articulate competent feature stories understanding the concepts, structure, and types of features.
- Write different types of feature stories and get published.
- The students should turn into serious freelancers understanding ups and downs in the freelancing.

Course Content:

Unit–1

Features: Definition and characteristics, process and techniques of feature writing, language and structure of a feature, difference between news and features. Types of feature stories: News features, profiles, human interest and travel.

Unit-II

Freelancing – Meaning, definition, qualities of a freelancer, trends in freelancing. Legal and ethical aspects of freelancing.

Unit-III

Scope for freelancing- in print and electronic media, freelancing for social media, tools and resources for freelance writers, freelancing as a profession in India and elsewhere. Career in feature writing.

Practical Exercises for OE- 3 - Feature Writing and Freelancing

1. Write different types of features at least two each.
2. Write different headlines for 5 features.
3. Re-write any 2 published features.

Reference books	
1	Alexander, L. (1982) Beyond the Facts: A Guide to the Art of Feature Writing (2nd ed.). Houston, Texas: Gulf Publishing Company.
2	Boynton, R.S. (2005) The New New Journalism: Conversations on Craft With America's Best Nonfiction Writers. New York: Vintage Books.
3	Blundell, W.E. (1988) The Art and Craft of Feature Writing. New York: Plume.
4	Garrison, B. (2004) Professional Feature Writing (4th ed.) Mahwah, NJ: Lawrence Erlbaum Assoc Inc
5	Harrington, H.F. (1912) Essentials in Journalism. A Manual in Newspaper Making for College Classes. Boston: Ginn and Company. Retrieved from http://openlibrary.org/details/essentialsinjour00harrrich
6	Harrington, H.F. (1925) Chats on Feature Writing. New York and London: Harper & Brothers.
7	Harrington, W. (1997) Intimate Journalism: The Art and Craft of Reporting Everyday Life. Thousand Oaks: Sage.
8	Pape, S., & Featherstone, S. (2006) Feature Writing a Practical Introduction. London: Sage Publications.
9	Stephen John Tanner, Molly Kasinger, Nick Richardson (2009) Feature Writing: Telling the Story. Oxford University Press
10	Williamson, D.R. (1977) Feature Writing for Newspapers (2nd ed.). New York: Hastings House

REVISED SYLLABUS FOR FIRST SEMESTER TO FOURTH SEMESTER (EFFECT FROM 2023- 24 ONWARDS)

FOURTH SEMESTER

DSCCA 7- NEWS PROCESSING AND EDITING – BASJRCN 401

Program Title	**BA (Journalism and Mass Communication)**			Semester	**Fourth Semester**
Course Code	**DSCCA 7**			Type of Course	**Discipline core**
Course Name	**News Processing and Editing**			Contact hours	**4 hours/ week Theory** **4 hours/ week Practical**
Course Credits	**06 {Theory: 4 credits and Practical: 2 credits}**			Academic Year	**2021-22 Batch**
CIE Marks	**40**	SE Exam Marks	**60**	Practical Marks	**50 (25 IE+25 SE)**

Course Outcomes: On completion of the course, the student teacher will be able to:

- Understand the role of editors. Edit copy precisely and consistently, using correct grammar and eliminating libelous passages and items in poor taste.
- Be able to write clear and accurate headlines, decks, and captions.
- Be able to design basic news pages. Understand the basic ethical issues confronting editors.

Course Content:

Unit–1

Introduction: Editing- definitions, importance, principles, functions, and techniques of editing. Editing in the age of convergence. Style sheet.

Unit-II

Newsroom Setup: Structure and functions of a typical newsroom. Editor/executive editor, roles of editor, news editor, sub-editor, sections in News Desk- Mofussil, Translation, Sports, Editorial, Magazine/Supplements, State and City.

Unit-III

Headline and Designing terminologies: Writing headlines, different types of headlines; Mast head, deadline, going to bed, panels, lead, brief, bastardisation, tint, hamper, flyer, dummy, power jacket, kerning, template, by-line, blurb, date-line, credit-line, attribution, quotation, Imprint line, photo caption.

Unit-IV

Skills required: News judgment, mastery over language, interpretation in the context, giving perspective, creative headlines, preparing the layout of the page, rewriting news stories.

DSCCA-8 - NEWS PROCESSING AND EDITING – PRACTICAL (BASJREN 402)

1. Written exercise on similar sounding words with different meanings.
2. Editing copies with spelling mistakes and redundancies.
3. Giving headlines for news stories.
4. Selecting stories for a campus newspaper.
5. Designing a dummy newspaper.
6. Designing special pages.
7. Photo selection and cropping.
8. Writing Captions for photos.
9. Writing editorials.

Note: Each student shall compulsorily maintain assignments and record book, submit the same at the end of the semester in the form of Project Report.

Reference books

1	**Bodian, Nat G.** (1984). Copywriter's Handbook. ISI Press,
2	**Brooks, B. S., & Pinson, J. L.** (2015).The art of editing in the age of convergence. BocaRaton, FL: CRC Press.
3	**Brooks, B., George, K., Moen, D. & Ranly, D**. (2010). News reporting and writing. Publisher: Bedford/St. Martin's.
4	**Ellis, B**. (2001).The copyediting and headline handbook. Berkeley: University of California Press.
5	**Emenanjo, N.E.** (2010). Editing and writing. Aba: E-Front Publishers.
6	**Idemili, S.** (2002). News editing. In Wilson D. (ed.) Introduction to the print media, Ibadan: Sterling-Horden Publishers
7	**K.M. Srivastava** (2003) News Reporting and Editing;Sterling Publishers Pvt Ltd.
8	**Kovach, B., & Rosenstiel, T.** (2014).The elements of journalism: What news people should know and the public should expect. New York, NY: Three Rivers Press.
9	**Michael O. Ukonu**. (2013) News Editing and Design. Grand Heritage Global Communications, Nsukka.
10	**Strunk, William, Jr. and E. B. White**. (1978) Elements of Style, 3rd edition. Macmillan Publishing Company.

Translation for Media – BASJREN 401

Program Title	**BA (Journalism and Mass Communication)**	Semester	**Fourth Semester**
Course Code	**OE-4**	Type of Course	**Core Elective**
Course Name	**Translation for Media**	Contact hours	**3 hours Theory**
Course Credits	**03**	Academic Year	**2021-22 Batch**
CIE Marks	**40**	SE Marks	**60 PRACTICAL- NIL**

Course Outcomes: On completion of the course, the student teacher will be able to:

- ❖ Translate the given stories keeping in mind the requirements of the client.
- ❖ Understand the difference between translations for different media and practice it.
- ❖ Gain a mastery over the techniques of translation.

Course Content:

Unit–1

Translation: Meaning, definition, nature, scope, and significance of translation, difference between literary translation and translation for media. Types of Translation: Word to word, literal, summarized, free.

Unit-II

Process and Techniques of Translation: Source language, target language, co-ordination.

Unit-III

Challenges of Translation from English to regional languages and vice versa, modern opportunities in media translations, difference between print and electronic media translations.

Practical Exercises for OE-4 - Translation for Media

1. News translations at least 5 exercises
2. Article translations at least 2 exercises
3. Giving headlines to translated stories- 3

Reference books	
1	**Bassnett, S. & Bielsa, E.** (2009) Translation in Global News. London: Routledge.
2	**Bassnett, S.** (2004) 'Trusting the Reporters: Translation and the News' The Linguist.
3	**Cronin, M** (2013). Translation in the Digital Age. Oxton and New York: Routledge.
4	**Delabastita, D.** (1989) 'Translation and Mass Communication: Film and Tv Translation as Evidence of Cultural Dynamics' Babel.
5	**Diaz Cinta, J**.(2007) Audiovisual Translation: Subtitling. Manchester: St.Jerome.
6	**Esser, A., Bernal-Merino, M. and Smith, I** (2015). Media across borders: localizing TV, film, and video games. New York: Routledge.
7	**Friedrich, H.** (1992).On the Art of Translation.
8	**Gadamer, H. G.** (1989). Introduction. In J. Biguenet and R. Schulte (Eds.), The Craft of Translation. Chicago: U of Chicago Press
9	**Jain R.** (1995). Machine vision. London: McGraw Hill Books Company Ltd.
10	**R. L. Trask and Bill Mayblin**: Introducing Linguistics: A Graphic Guideb

SEMESTER – V

DSCC Paper-A9 (Theory)|: Introduction to Communication
DSCC -A10 (Practical): Introduction to Communication
DSCC Paper-A11 (Theory): Fundamentals of Radio and TV
DSCC -A12 (Practical): Fundamentals of Radio and TV

(DISCIPLINE SPECIFIC CORE COURSES (DSCC) for 12 Credits)

SEMESTER – VI

DSCC Paper-A13 (Theory): Introduction to Digital Media
DSCC -A14 (Practical): Introduction to Digital Media
DSCCPaper-A15 (Theory) Advertising and Corporate Communication
DSCC -A16 (Practical): Advertising and Corporate Communication
(DISCIPLINE SPECIFIC CORE COURSES (DSCC) for 12 Credits)

SEC: Internship/ Field report/Project report (2 *Credits)*

Effective from 2023-24

AS PER NEP – 2020-21

SEMESTER – V

Effective from 2023-24

Sem.	Type of Course	Theory /Practical	Course Code	Course Title	Instruction hour/week	Total hours / sem	Duration Of Exam	Marks			Credits
								Formative	Summative	Total	
V	DSCCA-9	Theory		**Introduction to Communication**	04hrs	60	2 hours	40	60	100	04
	DSCCA-10	Practical		**Introduction to Communication**	04hrs	60	02hrs	25	25	50	02
	DSCCA-11	Theory		**Fundamentals of Radio and TV**	04hrs	60	2 hours	40	60	100	04
	DSCCA-12	Practical		**Fundamentals of Radio and TV**	04hrs	60	02hrs	25	25	50	02
	DSCCB										04
	DSCCB										04
	DSCCB										04
	SEC			**Cyber security**							**02**
	DSCCA (300) + DSCCB (300) + SEC (50)							**275**	**375**	**650**	**26**
	Total										
VI	DSCCA-13	Theory		**Introduction to Digital Media**	04hrs	60	2 hours	40	60	100	04
	DSCCA-14	Practical		**Introduction to Digital Media**	04hrs	60	02hrs	25	25	50	02
	DSCCA-15	Theory		**Advertising and Corporate Communication**	04hrs	60	2 hours	40	60	100	04
	DSCCA-16	Practical		**Advertising and Corporate Communication**	04hrs	60	02hrs	25	25	50	02
	DSCCB										04
	DSCCB										04
	DSCCB										04
	***SEC-Internship-1/Minor Project/Dissertation**							**50**	**0**	**50**	**02**
	DSCCA (300) + DSCCB (300) + SEC (50)							**275**	**375**	**650**	**26**
	Total Credits of 5th and 6th semester (26+ 26)										**52**

B.A. SEMESTER–V: DISCIPLINE SPECIFIC COURSE (DSCCA-9)

FIFTH SEMESTER: INTRODUCTION TO COMMUNICATION – BASJRCN 501

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No .of Lectures /Hours/Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
DSCC-9	**Theory**	**04**	**04**	**60hrs.**	**2 Hrs.**	**40**	**60**	**100**

Course Out comes (COs): After the successful completion of the course, the student will be able to:

CO 1: Demonstrate knowledge and understanding of the major communication theories and key concepts Relevant to the field of communication.

CO 2: Demonstrate awareness of the diversity of approaches to understanding communication, media and Culture in both historical and contemporary contexts, and of the uses and significance of those approaches.

CO 3: Demonstrate understanding of the dynamics of media discourses in the shaping of culture and Social attitudes.

CO 4: Select and apply arguments and positions related to media theory to examine a contemporary issue Or phenomenon in concerning the mass media

CO 5: Demonstrate knowledge of the regulatory frameworks that affect media and cultural production and Consumption.

Unit	Title:	60 hrs/ sem
Unit I	**UNIT-I** Definition of Communication- Need for Communication- Process of Communication- Understanding Communication through models- Aristotle's model, Shannon- Weaver model, Harold Lass well model, Wilbur Schramm model- scope and functions of Communication.	15
Unit II	**UNIT-II** Types of Communication- verbal and non-verbal Communications, Essentials of good writing, Techniques of public speaking, Types of non-verbal communication- Parts of nonverbal communication- Sign language- Body language- Touch and Space language, Techniques to improve communication skills.	15
Unit III	**UNIT-III** Levels and Essentials of Communication- Intra-personal communication- Interpersonal communication- Group communication- Mass communication, The process of Mass communication, scope and Functions of Mass Communication –The role of Mass Communication in national development.	15
Unit IV	**UNIT-IV** Introduction to Mass media, Mass media and society, Types of mass media-Print-Electronic, (Radio and Television)-Folk-Web media, Social media and Digital Status of Mass media. Contemporary issues in Mass media	15

References:

Sl .No	Title of the book	Authors	Publisher	Edition	Year of Publication
1	Introduction to Mass Communication.	Keval J Kumar	Jaico	4th	1994
2	Introduction to Mass Communication	Stanley J. Baran	New York: McGraw Hill.	2nd	2002
3	Communication	C.S.Rayadu	Himalaya Publishing House, Mumbai	9th	2010
4	Mass Communication Theory	Denis Mc Quail	Sage Publication	6th	2010
5	Communication Models for the Study of Mass Communication	Denis Mc Quail & Sven Windahl	Singapore: Longman Publications	2nd	1981
6	Mass Communication Theory	Denis Mc Quail	Sage Publication	6th	2010
7	An Introduction to Communication	Lynn H. & Turner West	Cambridge University Press	1st	2019
8	The Dynamics of Mass Communication	Joseph R. Dominick	Mc Graw Hill,	12th	2013

Formative Assessment for Theory	
Assessment Occasion/type	**Marks**
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Quiz/Assignment/Small Project	10
Seminar	10
Total	**40 Marks**
Formative Assessment as per guidelines.	

Discipline Specific Course (DSCC A-10)

PRACTICAL- INTRODUCTION TO COMMUNICATION- BASJRPN 502

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
DSCC A -10	**Practical**	**02**	**04**	**60hrs.**	**2 Hours**	**25**	**25**	**50**

Course Out comes (Cos): After the successful completion of the course, the student will be able to:

CO 1: Demonstrate knowledge and understanding of the major communication theories and key concepts Relevant to the field of communication.

CO 2: Demonstrate awareness of the diversity of approaches to understanding communication, media and Culture in both historical and contemporary contexts, and of the uses and significance of those approaches.

CO 3: Demonstrate understanding of the dynamics of media discourses in the shaping of culture and social

Attitudes.

CO 4: Select and apply arguments and positions related to media theory to examine a contemporary issue Or phenomenon in concerning the mass media

CO 5: Demonstrate knowledge of the regulatory frameworks that affect media and cultural production and Consumption

Activity. No	Title	60 hrs/ sem
1	Characteristics of good writing. The art of writing letters – Minimum of 2 exercises each in letter writing like letters to editor/letter to a friend/letter to parents	
2	Characteristics of good public speech. Practicing public speaking- Minimum of 2 exercises of public speaking	
3	Communication Skill – Practicing Group Discussion- 02 exercises	
4	Interview- Practicing Job Interview (Mock Interview) – 02 exercises	
5	Practicing Editorial writing minimum 02 exercises.	
6	Film Reviews – 02 exercises	

Instruction to the Examiners

- Each Course shall have two evaluation components – Formative (Internal-25 Marks) Assessment (IA) and the Summative(Semester End 25 Marks)Exams.
- The IA component and the Semester-end Examination shall carry 25 Marks.
- Whereas IA component in Practical course shall carry25 Marks.
- Internal Assessment (IA) shall be based on 01 written tests, seminars, assignments/any other practical activity and attendance.
- All students should prepare and maintain a practical record and submit the same on the day of practical examination.

Formative Assessment for Practical	
Assessment	**Distribution of Marks**
Test	10
Record book	15
	25Marks
Summative Assessment for Practical	
Semester End practical Exam	20
Viva Voce Exam	05
Total	**25Marks**
Formative assessment as per guidelines	

The same shall be used for semester end examination

Discipline Specific Course (DSCC A-11)

Fundamentals of Radio and TV- BASJRCN 503

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
DSCC A-11	**Theory**	**04**	**04**	**60hrs.**	**2hrs**	**40**	**60**	**100**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1: To introduce the concepts, technology and skills behind audio and video production
CO2: To introduce the students TV as a medium
CO3: To highlight the techniques of program production in Radio
CO4: To highlight the techniques of program production in TV
CO5: To discuss the past and present status of these two media

Unit	Title:	60 hrs/ sem.
Unit I	**UNIT-I: Characteristics of Audio-Visual Media: C**haracteristics of Radio & Television as a medium of mass communication. Effective communication skills for Radio and TV, Presentation techniques-Voice modulation, appearance, Facial expression, Body language ,General knowledge	15
Unit II	**UNIT-II: Introduction to Radio:** Nature and characteristics of radio, Evolution of radio in India, Types of radio stations (AM/FM), Community radio, Impact and reach of radio, Present status of radio in India, Impact and reach of radio. Program pattern of AIR.	15
Unit III	**UNIT-III: Introduction to Television:** Nature and characteristics of television, Growth of television in India, Organizational structure of television channel, Major TV networks in India. Recent trends in television field.	15
Unit IV	**UNIT–IV: Script writing of Radio &TV:** writing skills for broadcast media. Importance of language and grammar in scripting. Various types of script for radio and TV etc.	15

References:

Sl.No	Title of the book	Authors	Publisher	Edition	Year of Publication
1	Mastering Digital Audio Production	Cliff Truesdell	Wiley Publishing, Inc.	1st	2017
2	Audio Production Work text: Concepts, Techniques, and Equipment	David Reese ,Lynne Gross, Brian Gross	Focal Press	1st	2009
3	Television Production Handbook	Zettl	Wadsworth Pub Co	12th	2012
4	Writing for Television, Radio, and New Media	Robert Hilliard	Taxmann Publications Private Limited	11th	2013

5	Video Production	Vasuki Belavadi	Oxford University Press	2nd	2013

Formative Assessment for Theory	
Assessment Occasion/type	**Marks**
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Quiz/Assignment/Small Project	10
Seminar	10
Total	**40Marks**
Formative Assessment as per guidelines.	

Discipline Specific Course (DSCC A-12)

PRACTICAL: FUNDAMENTALS OF RADIO AND TV- BASJRPN 504

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
DSCCA-12	**Practical**	**02**	**02**	**30 hrs.**	**2hrs.**	**10**	**40**	**50**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1: Write the scripts for radio announcements.

CO2: Write the scripts for radio Jingles.

CO3: Practice news reading for radio.

CO4: Practice news reading for TV.

CO5: Plan programs for radio.

CO6: Plan programs for TV.

Activity No.	Title:	60 Hrs
1	Scripting for Radio announcements and recording-03	
2	Scripting for Radio Jingles- 02	
3	News reading for Radio-2 (2 min)	
4	Writing news for TV and recording -3 (1 min)	
5	Scripting of program for TV-2 (2 min)	
6	Peace to camera (P. TO. C)	

Instruction to the Examiners

- Each Course shall have two evaluation components – Formative (Internal-25 Marks) Assessment (IA) and the Summative (Semester End 25 Marks) Exams.
- The IA component and the Semester-end Examination shall carry 25 Marks.
- Whereas IA component in Practical course shall carry25 Marks.
- Internal Assessment(IA)shall be based on 01written tests, seminars, assignments/any other practical activity and Attendance
- All prepare students should and maintain a practical journal and submit the same on the day of practical examination

Formative Assessment for Practical	
Assessment	**Distribution of Marks**
Test	10
Record Book	15
	25 Marks
Summative Assessment for Practical	
Semester End practical Exam	20
Viva Voce Exam	05
Total	**25 Marks**
Formative assessment as per guidelines	
The same shall be used for semester end examination	

SEC- 4 (Compulsory Course)

COURSE TITLE: CYBER SECURITY

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
SEC- 4	**Theory**	**02**	**02**	**30hrs.**	**02 hrs.**	**30**	**20**	**50**

B.A. Semester–VI

Discipline Specific Course (DSCC A-14)

INTRODUCTION TO DIGITAL MEDIA - BASJRCN 601

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No .of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-14	**Theory**	**04**	**04**	**60hrs.**	**2hrs.**	**40**	**60**	**100**

Course Outcomes (COs): At the end of the course students will be able to:

CO 1: The student will discuss the influence of target audience on digital media production with identify deployment strategies for various types of digital media formats.

CO 2: The student will be able to know about the basics of photography and videography The student Will explore a variety of programs used to create digital media along with team teamwork in digital media production.

CO 3: The student will create a simple multimedia presentation.

Unit	Title: Introduction to Digital Media	60.hrs/ sem
Unit I	**UNIT-I: Introduction to the Digital Media:** Concept and Definitions of Digital Media, Evolution and Development, Nature and Scope of Digital Media, Characteristics of Digital Media, Advantages and Disadvantages of Digital Media. Trends in Digital Media.	15
Unit II	**UNIT –II: Digital Media Platform:** Website, Face Book, *WhatsApp*, You Tube, Instagram, LinkedIn, X (Twitter), News Portals, e-Papers, Wikis and Blogs	15
Unit III	**Unit -III: Emerging trends in Digital media:** AI in news rooms, Augmented reality, Virtual Reality and Mixed Reality, Introduction to data driven journalism	15
Unit IV	**Unit -IV: Digital media Literacy**: Creation of digital media content, Concept of Misinformation and disinformation, fact checking tools, Fact checking initiatives in	15

	India.	

References:

DSCCA-14 and 15 -Fundamentals of Digital Media (Theory and Practice)

1. Digital Media: Concepts and Applications - Tena B. Crews, Karen Bean May
2. Introduction to Digital Media - Alessandro Delfanti, Adam Arvidsson
3. Routledge Handbook of Digital Media and Communication - Leah A. Lievrouw, Brian D. Loader
4. Digital Media and Society: An Introduction - Adrian Athique
5. An Introduction to Digital Media - Tony Feldman
6. A History of Digital Media: An Inter media and Global Perspective - Gabriele Balbi, Paolo Magaudda
7. Affective Politics of Digital Media: Propaganda by Other Means - Megan Boler, Elizabeth Davis

Formative Assessment for Theory	
Assessment Occasion/type	**Marks**
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Quiz/Assignment/Small Project	10
Seminar	10
Total	**40Marks**
Formative Assessment as per guidelines.	

Discipline Specific Course (DSCC A15)

Practical: Introduction to Digital Media- BASJRPN 602

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC A-15	**Practical**	**02**	**04**	**60hrs.**	**2hrs.**	**25**	**25**	**50**

DSCC A- 15 Introduction to Digital Media –Practical

Course Outcomes (COs): At the end of the course, students will be able to:

CO 1: The student will discuss the influence of target audience on digital media production with identify deployment strategies for various types of digital media formats.
CO 2: The student will be able to know about the basics of photography and videography.
CO 3: The student will explore a variety of programs used to create digital media along with Team work in digital media production.
CO 4: The student will create a simple multimedia presentation.

Activity No	**Title: Introduction to Digital Media**	**60hrs/ sem**
1	Write blog and post it – 4 assignments	
2	Create Social media post on social cause and post it on your wall– 5 assignments	
3	Create 2-3 min video for You tube channel-3 assignments	
4	Short news writing for TV-05 assignments	
5	Creation of news reels-3 assignments	

Instruction to the Examiners

- Each Course shall have two evaluation components – Formative (Internal-25 Marks) Assessment (IA) and the Summative(Semester End 25 Marks)Exams.
- The IA component and the Semester-end Examination shall carry 25 Marks.
- Whereas IA component in Practical course shall carry25 Marks.
- InternalAssessment(IA)shallbebasedon01writtentests,seminars,assignments/anyotherpractical activity and Attendance
- All students should prepare and maintain a practical journal and submit the same on the day of practical examination

Formative Assessment for Practical	
Assessment	**Distribution of Marks**
Test	10
Practical Record	15
	25 Marks
Summative Assessment for Practical	
Semester End practical Exam	20
Viva Voce Exam	05
Total	**25 Marks**
Formative assessment as per guidelines	
The same shall be used for semester end examination	

Discipline Specific Course (DSCC A-16)

ADVERTISING AND CORPORATE COMMUNICATION- BASJRCN 603

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC A-16	**Theory**	**04**	**04**	**60hrs.**	**2 hrs**	**40**	**60**	**100**

Course Outcomes (COs)/ Learning Outcome :(LOs): At the end of the course, students will be able to:

CO 1: To introduce students to basic concept of advertising

CO 2: To familiarize the students with the concept of copywriting as selling through writing

CO 3: To learn the process of create in original, strategic, compelling copy for various media

CO 4: To train students to generate, develop and express ideas effectively.

CO 5: Understand the basics of advertising and script writing.

Unit	**Title:**	**60 hrs/ sem**
Unit I	**Unit- I: Understanding Advertising:** Definition, nature and scope of advertising, Role of advertising, Evolution of advertisement in India, current trends, Advertising as a Tool of Communication.	15
Unit II	**Unit-II: Basics of Advertising:** Types of Advertisements- Classifieds, Retail, Display, Corporate, Product and Public Service, Ad Agency- Functions, Structure, Advertising copy-elements of ad copy, techniques of developing ad copy	15
Unit III	**Unit-III : Introduction to Corporate Communication:** Definition, nature and scope, and functions of corporate communications, Qualities of a Corporate Communication officer, crisis management, Corporate Social Responsibilities	15
Unit IV	**Unit-IV: Corporate Communication Tools:** Internal and external communication tools**,** Print–House Journals, Newsletters, and Brochures &Handouts/Flyers. Electronic - Ads& Corporate Films, Digital platform–Social Media, Blogs, Vlogs.	15

References:

1. Kleppner, Otto; Fundamentals of Advertising; Prentice Hall; New Jersey. 1980.
2. Gupta, Sen; Brand Positioning; Tata McGraw Hill; New Delhi; 1990.
3. Hart, Norman; The practice of advertising; Heinemann Pub.; London. 1990.
4. Mooij, Mariekae de; Advertising Worldwide (2nd edn.); Prentice Hall; UK.1994
5. Cornelissen, Joep; Corporate Communication: A Guide to Theory and Practice; Sage. 2011

Formative Assessment for Theory	
Assessment Occasion/type	**Marks**
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Quiz/Assignment/Small Project	10
Seminar	10
Total	**40Marks**
Formative Assessment as per guidelines.	

Discipline Specific Course (DSCC A-17)

PRACTICAL: ADVERTISING AND CORPORATE COMMUNICATION- BASJRPN 604

Type of Course	Theory /Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours /Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC A-17	**Practical**	**02**	**04**	**60hrs.**	**2 hrs.**	**25**	**25**	**50**

Course Outcomes (COs): At the end of the course, students will be able to:

CO 1: To introduce students to basic concept of advertising

CO 2: To familiarize the students with the concept of copywriting as selling through writing

CO 3: To learn the process of creating original, strategic, compelling copy for Various mediums

CO 4: To train students to generate, develop and express ideas effectively.

CO 5: Understand the basics of advertising and script writing.

Activity No.	**Title:**	**60 hrs/ sem**
1	Prepare Classified Advertisements – 05 assignments	
2	Preparing Brochures-01 assignment	
3	Ad Copy content writing-05 assignments	
4	Prepare Display Advertisements – 02 assignments	
5	Prepare media kit – 1 assignment	

References:

1. Foundations of the Theory and Practice of Advertising - S.A. Chunawalla and F.C. Scythia
2. Advertising as Communication - Dyer Gillian
3. Advertising - Dunn S. Watson
4. Advertising: A critical Approach - Keval J. Kumar
5. Advertising Procedure - Kleppner Otto
6. Practical Public Relations - Anil Basu
7. Organizational Communication – Gary Kreps
8. Inside Organizational Communication – Gary L Kreps
9. Corporate Communications – Argenti
10. Corporate Communication – Paul A. Argenti

Instruction to the Examiners

- Each Course shall have two evaluation components – Formative (Internal-25 Marks) Assessment (IA) and the Summative (Semester End 25 Marks) Exams.
- The IA component and the Semester-end Examination shall carry 25 Marks.
- Whereas IA component in Practical course shall carry25 Marks.
- Internal Assessment(IA)shall be based on 01written tests, seminars ,assignments/any other practical activity and Attendance
- All students should prepare and maintain a practical journal and submit the same on the day of practical examination

Formative Assessment for Practical	
Assessment	**Distribution of Marks**
Test	10
Practical Record	15
	25Marks
Summative Assessment for Practical	
Semester End practical Exam	20
Viva Voce Exam	05
Total	**25Marks**
Formative assessment as per guidelines	
The same shall be used for semester end examination	

SEC 5 INTERNSHIP (Mandatory)

Course Title: ***INTERNSHIP***

Type of Course	Theory /Practical	Credits	Formative Assessment Marks	Summative assessment Marks	Total Marks
Internship/ Project work/Dissertation		**02**	**50**	**0**	**50**

Internship

All the students, after their Fifth semester examination should go for an internship at any of the recognized mediahouses – print and electronic in both public and private enterprises/advertising agencies/corporate houses, NGOs approved by the Department Council, for a period of four weeks (one month)**.**

The foreign national students shall also mandatorily do their internship within India only, failing which their course will thereby remain incomplete and become ineligible to secure the degree.

The students must mandatorily submit a letter of internship, which shall be evaluated by the Department Council based on the nature, quality and quantity of work undertaken. Failure to complete the internship and submit the internship letter will render the candidate ineligible for the award of the degree.

Marks allotment:

Byline news/articles/feature writing during the internship period - 5 marks each (maximum 25 marks)
Successful completion of internship- 25 marks

OR

Project Work / Dissertation

Students shall carry out a Project Work / Dissertation Work after their Fifth semester examination under the guidance of a faculty member. Project Work / Dissertation work is compulsory for all the students. The topics shall be approved by the department council. All the faculty members shall guide the students.

Dissertation Work Evaluation

Right from the stage of defining the problem, the candidate has to submit the progress report periodically and also present his/her progress in the form of seminars in addition to the regular discussion with the guide.

Components of evaluation are as follows:

Component – I (C1): Periodic progress and progress reports (10 marks) Component – II (C2): Results of work and draft report (10 marks)
Component – III (C3): Final viva-voce and evaluation [The report evaluation is for 20 marksand the viva-voce examination is 10 marks]

The (C3) (Component-III) for both Dissertation works shall be evaluated by the departmental council consisting of the guide and other members of teaching faculty.

Question Paper Pattern for UG Semester
DSC, DSEC & OEC

Paper Code: Paper Title:
Duration of Exam: 2 Hours Max Marks 60
Instruction: Answer all the section

Section-A

Paper Code:		**PaperTitle:**			
Duration ofExam	**2 Hours**			Max Marks	**60**
Instruction:	**Answer all the sections**				

Section-A

Answer any five of the following (5x2=10)	**(5x2=10)**
1) 2) 3) 4) 5) 6) 7)	

Section-B

Answer any Four of the following (4x5=20)	**(4x5=20)**
8 9 10 11 12 13	

Section-C

Answer any TWO of the following (2x15 =30)	**30 Marks**
14 15 16	

Programme Name	BSC in Physics	Semester	V
Course Title	Classical Mechanics and Quantum Mechanics-I (Theory)		
Course Code	PHY C9-T	No. of Credits	04
Contact hours	52	Duration of SEA/Exam	2 hours
Formative Assessment Marks	40	Summative Assessment Marks	60

Course Pre-requisite(s):

Course Outcomes (COs): After the successful completion of the course, the student will be able to

- **Identify the failure of classical physics at the microscopic level.**
- **Find the relationship between the normalization of a wave function and the ability to correctly calculate expectation values or probability densities.**
- **Explain the minimum uncertainty of measuring both observables on any quantum state.**
- **Describe the time-dependent and time-independent Schrödinger equation for simple potentials like for instance one-dimensional potential well and Harmonic oscillator.**
- **Apply Hermitian operators, their eigenvalues and eigenvectors to find various commutation and uncertainty relations.**

Contents	52 Hrs
Introduction to Newtonian Mechanics: Frames of references (Definition), Newton's laws of motion (statement), inertial and non-inertial frames (Statement). Mechanics of a particle: Conservation of linear momentum (Derivation), Angular momentum and torque, (Relation) conservation of angular momentum,(Derivation) work done by a force, conservative force and conservative energy.(Statement with equation) Lagrangian formulation: Constraints, Holonomic constraints, non-holonomic constraints, Scleronomic and Rheonomic constraints (Statement, Differences and examples). Generalized coordinates (statement).Degrees of freedom (Statement).Principle of virtual work (Derivation).D'Alembert's principle,(Derivation). Lagrange equations (qualitative). Newton's equation of motion from Lagrange equations (Derivation). Examples i: simple pendulum (Derivation) ii: Atwood's machine (Derivation) and iii: linear harmonic oscillator (Derivation) ,problems.	13 Hrs
Variational principle: Hamilton's principle (Statement), Deduction of Hamilton's principle (Derivation), Lagrange's equation of motion from Hamilton's principle (Derivation), (Examples same as Lagrangian) Hamilton's principle for non-holonomic systems. (Qualitative). **Hamiltonian Mechanics:** The Hamiltonian of a system (statement), Hamilton's equations of motion,(Derivation) Hamilton's equations from variational principle, (derivation) Integrals of Hamilton's equations, energy integrals (Expression), Canonical Transformations (quantitative), Poison Brackets (Qualitative), fundamental properties and equations of motion in Poison Brackets (Derivation), Problems.	13 Hrs
Introduction to Quantum Mechanics	13 Hrs

Brief discussion about the failure of classical theory of physics in the experimental observations of black body radiation (Qualitative), Photoelectric effect (Quantitative), stability of atoms and spectra of atoms (quantitative),Compton Effect: Compton scattering: Expression for Compton shift (derivation). Matter waves: de Broglie hypothesis of matter waves,(Definition, relation), Experimental evidence for matter waves: Davisson-Germer experiment, (Quantitative) and its significance. Electron microscope(Qualitative), Wave description of particles by wave packets, Group velocity, Phase velocity, Particle velocity and relation between them(Definition, derivation),Heisenberg uncertainty principle: Elementary proof of Heisenberg's relation between momentum and position, energy and time, angular momentum and angular position. (Definition, relation, examples).Illustration of uncertainty principle by Gamma ray microscope thought experiment (Derivation), Consequences of the uncertainty relations: why electron cannot exist in nucleus? (Quantative). Diffraction of electrons at a single slit (Derivation), G.P Thomson's experiment Double slit experiment with photons and electrons,(Qualitative). Linear superposition principle as a consequence(Qualitative)	
Foundation of Quantum Mechanics Schrödinger equation: time-dependent and time-independent wave equations, (Derivation). Schrodinger wave equation for a free particle in one and three-dimension, (Derivation, problems).Probabilistic interpretation of the wave function: normalization and orthogonality of wave functions(Qualitative). Probability current density, equation of continuity and its physical significance(Definition, equation) Postulates of Quantum mechanics: First Postulate representation of states. Second postulates representation of dynamical variable as linear operators (Qualitative). Third postulate as representation of expectation values of operators (Qualitative). Ehrenfest theorem. (Statement and Significance). Eigen values and Eigen functions. (Qualitative) Particle in a one-dimensional infinite potential well (Derivation),. Particle in a finite potential well (Qualitative), Transmission across a potential barrier (Qualitative), the tunnel effect (Qualitative), scanning tunnelling microscope, One-dimensional simple harmonic oscillator (Qualitative) - concept of zero - point energy (Qualitative).	**13 Hrs**

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe-Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc. Formative Assessment for Theory Assessment Occasion/ type Marks Total 40 Marks Formative Assessment as per UNIVERSITY guidelines are compulsory.

Formative Assessment for Theory	
Assessment Occasion Type	Marks
Total	40 marks

References	
1	Classical Mechanics, H.Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education.
2	Classical Mechanics: An introduction, Dieter Strauch, 2009, Springer
3	Classical Mechanics, G. Aruldhas, 2008, Prentice-Hall of India Private limited, New Delhi.
4	Classical Mechanics, Takwale and Puranik-1989, Tata Mcgraw Hill, new Delhi
5	Concepts of Modern Physics, Arthur Beiser, McGraw-Hill, 2009
6	Physics for Scientists and Engineers with Modern Physics, Serway and Jewett, 9th edition, Cengage Learning, 2014.
7	Quantum Physics, Berkeley Physics Course Vol. 4. E.H. Wichman, Tata McGraw-Hill Co., 2008.
8	Six Ideas that Shaped Physics: Particle Behave like Waves, Thomas A. Moore, McGraw Hill, 2003.
9	P M Mathews and K Venkatesan, A Textbook of Quantum Mechanics, Tata McGraw Hill publication, ISBN: 9780070146174.
10	Ajoy Ghatak, S. Lokanathan, Quantum Mechanics: Theory and Applications, Springer Publication,ISBN 978-1-4020-2130-5.
11	Modern Physics; R.Murugeshan & K.Sivaprasath; S. Chand Publishing.
12	G Aruldhas, Quantum Mechanics, Phi Learning Private Ltd., ISBN: 97881203363.
13	Gupta, Kumar & Sharma, Quantum Mechanics, Jai Prakash Nath Publications.
14	Physics for Degree Students B.Sc., Third Year, C.L.Arora and P.S.Hemne, 1st edition, S.Chand & Company Pvt. Ltd., 2014.

Course Title	Classical Mechanics and Quantum Mechanics-I Lab **(Practical)**		No of Credits 02
Course Code	PHY C10-P	**Contact Hours : 04 Hours**	
Formative Assessment	25 Marks	**Summative Assessment**	**25 Marks**
Practical Content			

Lab experiments: (Minimum 8 experiments must be completed by the students)

1) To determine 'g', the acceleration due to gravity, at a given place, from the L – T 2 graph, for a simple pendulum.
2) Studying the effect of mass of the bob on the time period of the simple pendulum.
3) Studying the effect of amplitude of oscillation on the time period of the simple pendulum.
4) Determine the acceleration of gravity is to use an Atwood's machine.
5) Study the conservation of energy and momentum using projectile motion.
6) Verification of the Principle of Conservation of Linear Momentum
7) Determination of Planck constant and work function of the material of the cathode using Photo-electric cell.
8) To study the spectral characteristics of a photo-voltaic cell (Solar cell).
9) Determination of electron charge 'e' by Millikan's Oil drop experiment.
10) To study the characteristics of solar cell.
11) To find the value of e/m for an electron by Thomson's method using bar magnets.
12) To determine the value of e/m for an electron by magnetron method.
13) To study the tunnelling in Tunnel Diode using I-V characteristics.
14) Determination of quantum efficiency of Photodiode.
15) A code in C/C++/Scilab to find the first seven eigen states and eigen functions of Linear Harmonic Oscillator by solving the Schrödinger equation.
16) A code in C/C++/Scilab to plot and analyse the wavefunctions for particle in an infinite potential well.
17) Damped oscillations
18) q by stretching.
19) Monte-Carlo experiment
20) Study of tunnel diode as oscillator
21) Fourier analysis of square wave

Formative Assessment for Theory	
Assessment Occasion Type	Marks
Total	25 marks

References
1 B.Sc Practical Physics by C.L Arora.
2 B.Sc Practical Physics by Harnam Singh and P.S Hemne.
3 Practical Physics by G.S Squires.
4 Scilab Manual for CC-XI: Quantum Mechanics &Applications (32221501) by Dr Neetu Agrawal, Daulat Ram College, of Delhi.
5 Scilab Textbook Companion for Quantum Mechanics by M. C. Jain.
6 Computational Quantum Mechanics using Scilab, BIT Mesra.
7 Advanced Practical Physics for Students by Worsnop B L and Flint H T.

For Lab Activity refer the KSHEC web Site.

Programme Name	BSC in Physics	Semester	V
Course Title	Elements of Atomic, Molecular & Laser Physics (Theory)		
Course Code	PHY C11-T	No. of Credits	04
Contact hours	52	Duration of SEA/Exam	2 hours
Formative Assessment Marks	40	Summative Assessment Marks	60

Course Pre-requisite(s): PUC Science Knowledge

Course Outcomes (COs): After the successful completion of the course, the student will be able to

- Describe atomic properties using basic atomic models.
- Interpret atomic spectra of elements using vector atom model.
- Interpret molecular spectra of compounds using basics of molecular physics.
- Explain laser systems and their applications in various fields.

Contents	52 Hrs
Unit 1: Basic Atomic models: Thomson's atomic model; Rutherford atomic model Theory of alpha particle scattering,(Idea of Distance of closest approach, impact parameter and scattering cross section), Rutherford scattering formula;(Mention) Bohr atomic model – postulates, Derivation of expression for radius, total energy of electron; Origin of the spectral lines; Spectral series of hydrogen atom; Effect of nuclear motion on atomic spectra - derivation; Ritz combination principle; Correspondence principle; Critical potentials-excitation potential and ionisation potential; Atomic excitation and its types, Franck-Hertz experiment; Sommerfeld's atomic model – model, Derivation of condition for allowed elliptical orbits.(Qualitative) **11Hours** **Activities: 02 Hours** 1. Students to estimate radii of orbits and energies of electron in case of hydrogen atom in different orbits and plot the graph of radii / energy versus principal quantum number 'n'. Analyse the nature of the graph and draw the inferences. 2. Students to search critical, excitation and ionisation potentials of different elements and plot the graph of critical /excitation / ionisation potentials versus atomic number/mass number/neutron number of element. Analyse the nature of the graph and draw the inferences.	**13 Hrs**
Unit 2: Vector atomic model and optical spectra: Concept of spin, Stern-Gerlach experiment – Experimental arrangement, principles and results. Vector atom model – model fundamentals, spatial quantisation, spinning electron; Quantum numbers associated with vector atomic model; Coupling schemes – L-S and j-j schemes; Spin-orbit coupling/Spin-Orbit Interaction – qualitative; Pauli's exclusion principle; Magnetic dipole moment due to orbital motion of electron – derivation; Magnetic dipole moment due to spin motion of electron; Lande g-factor and its calculation for different states;(Singlet and Doublet); Fine structure of spectral lines with examples; Optical spectra – spectral terms, spectral notations, selection rules, intensity rules; Fine structure	**13 Hrs**

of the sodium D-line; Zeeman effect: Types, Experimental study and classical theory of normal Zeeman effect, Zeeman shift expression (no derivation), examples; Stark effect: Experimental study, Types and examples.(Qualitative). **11 Hours** **Activities: 02 Hours** 1. Students to couple a p-state and s-state electron via L-S and j-j coupling schemes for a system with two electrons and construct vector diagrams for each resultant. Analyse the coupling results and draw the inferences. 2. Students to estimate magnetic dipole moment due to orbital motion of electron for different states 2P1/2, 2P3/2, 2P5/2, 2P7/2, 2P9/2 and 2P11/2 and plot the graph of dipole moment versus total orbital angular momentum "J'. Analyse the nature of the graph and draw the inferences.	
Unit 3: Molecular Physics; Types of molecules based on their moment of inertia; Types of molecular motions and energies; Born-Oppenheimer approximation; Origin of molecular spectra; Nature of molecular spectra; Theory of rigid rotator – energy levels and spectrum, Qualitative discussion on Non- rigid rotator. Theory of vibrating molecule as a simple harmonic oscillator – energy levels and spectrum; Electronic spectra of molecules – fluorescence and phosphorescence; Raman effect – Stoke's and anti-Stoke's lines, characteristics of Raman spectra, classical and quantum approaches, Experimental study of Raman effect; Applications of Raman effect. **11 Hours** **Activities: 02 Hours** 1. Students to estimate energy of rigid diatomic molecules CO, HCl and plot the graph of rotational energy versus rotational quantum number 'J'. Analyse the nature of the graph and draw the inferences. Also students study the effect of isotopes on rotational energies. 2. Students to estimate energy of harmonic vibrating molecules CO, HCl and plot the graph of vibrational energy versus vibrational quantum number 'v'. Analyse the nature of the graph and draw the inferences.	**13 Hrs**
Unit 4: Laser Physics: Ordinary light versus laser light; Characteristics of laser light; Interaction of radiation with matter - Induced absorption, spontaneous emission and stimulated emission with mention of rate equations; Assuming the Einstein's A and B coefficients – Derivation of relation between Einstein's coefficients and radiation energy density; Possibility of amplification of light; Population inversion; Methods of pumping; Metastable states; Requisites of laser – energy source, active medium and laser cavity; Difference between Three level and four level lasers with examples; Types of lasers with examples; Construction and Working principle of Ruby Laser and He-Ne Laser; Application of lasers (qualitative) in science & research, isotope separation, communication, fusion, medicine, industry, and space. **11 Hours** **Activities: 02 Hours** 1. Students to search different lasers used in medical field (ex: eye surgery, endoscopy, dentistry etc.), list their parameters and analyse the need of these	**13 Hrs.**

parameters for specific application, and draw the inferences. Students also make the presentation of the study. 2. Students to search different lasers used in defence field (ex: range finding, laser weapon, etc.), list their parameters and analyse the need of these parameters for specific application, and draw the inferences. Students also make the presentation of the study.	

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe-Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Formative Assessment for Theory	
Assessment Occasion Type	Marks
Total	40 marks

References	
1	Modern Physics, R. Murugeshan, Kiruthiga Sivaprakash, Revised Edition, 2009, S. Chand & Company Ltd.
2	Atomic & Molecular spectra: Laser, Raj Kumar, Revised Edition, 2008, Kedar Nath Ram Nath Publishers, Meerut
3	Atomic Physics, S.N. Ghoshal, Revised Edition, 2013, S. Chand & Company Ltd.
4	Concepts of Atomic Physics, S.P. Kuila, First Edition, 2018, New Central Book Agency (P) Ltd.
5	Concepts of Modern Physics, Arthur Beiser, Seventh Edition, 2015, Shobhit Mahajan, S. Rai Choudhury, 2002, McGraw-Hill.
6	Fundamentals of Molecular Spectroscopy, C.N. Banwell and E.M. McCash, Fourth Edition, 2008, Tata McGraw-Hill Publishers.
7	Elements of Spectroscopy – Atomic, Molecular and Laser Physics, Gupta, Kumar and Sharma, 2016, Pragati Publications.

Course Title	Elements of Atomic, Molecular& Laser Physics Lab Practicals		**Practical Credits 02**
Course Code	PHY C12-P	Contact Hours	04 Hours
Formative Assessment	25 Marks	Summative Assessment	25 marks

Practical Content

LIST OF EXPERIMENTS

1. To determine Planck's constant using Photocell-.
2. To determine Planck's constant using LED.
3. To determine the value of Rydberg's constant using diffraction grating and hydrogen discharge tube/solar radiation.
4. To determine the wavelength of H-alpha emission line of Hydrogen atom.
5. To determine fine structure constant using fine structure separation of sodium D-lines using a plane diffraction grating.
6. To determine the ionization potential of mercury.
7. To determine the absorption lines in the rotational spectrum of Iodine vapor.
8. To determine the force constant and vibrational constant for the iodine molecule from its absorption spectrum.
9. To determine the wavelength of laser using diffraction by single slit/double slits.
10. To determine wavelength of He-Ne laser/Semiconductor laser using plane diffraction grating.
11. To determine angular spread of He-Ne laser/Semiconductor laser using plane diffraction grating.
12. Study of Raman scattering by CCl_4 using laser and spectrometer/CDS.
13. M and C by Carey-Foster method
14. ECE of copper
15. Earth inductor
16. Intensity of spectral lines
17. L and C by Anderson's bridge.
18. Spectral response of LDR

NOTE: Students have to perform at-least EIGHT Experiments from the above list.

References

1 Practical Physics, D.C. Tayal, First Millennium Edition, 2000, Himalaya Publishing House.

2 B.Sc. Practical Physics, C.L. Arora, Revised Edition, 2007, S. Chand & Comp.Ltd.

3 An Advanced Course in Practical Physics, D. Chatopadhyaya, P.C. Rakshith, B. Saha, Revised Edition, 2002, New Central Book Agency Pvt. Ltd.

4 Physics through experiments, B. Saraf, 2013, Vikas Publications.

Formative Assessment for Theory	
Assessment Occasion Type	Marks
Total	25 marks

Program Name	**B Sc Physics**	Semester	VI
Course Title	Elements of Condensed Matter & Nuclear Physics		
Course Code:	PHY C14 - T	No. of Credits	**4**
Contact hours	**52 Hours**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s):

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Explain the basic properties of nucleus and get the idea of its inner information.
- Understand the concepts of binding energy and binding energy per nucleon v/s mass number graph.
- Describe the processes of alpha, beta and gamma decays based on well-established theories.
- Explain the basic aspects of interaction of gamma radiation with matter by photoelectric effect, Compton scattering and pair production.
- Explain the different nuclear radiation detectors such as ionization chamber, Geiger-Mueller counter etc.
- Explain the basic concept of scintillation detectors, photo-multiplier tube and semiconductor detectors

Contents	52 Hrs
Crystal systems and X-rays: Crystal structure: Space Lattice, Lattice translational vectors, Basis of crystal structure, Types of unit cells, primitive, non-primitive cells. Seven crystal system, Coordination numbers, Miller Indices, Expression for inter planner spacing. **X Rays**: Production and properties of X rays, Coolidge tube, Continuous and characteristic X-ray spectra; Moseley's law. **X-Ray diffraction**, Scattering of X-rays, Bragg's law. **Crystal diffraction:** Bragg's X-ray spectrometer- powder diffraction method, Intensity vs 2θ plot (qualitative). **Free electron theory of metals:** Classical free electron model (Drude-Lorentz model), expression for electrical and thermal conductivity, Weidman-Franz law, Failure of classical free electron theory; Quantum free electron theory, Fermi level and Fermi energy, Fermi-Dirac distribution function (expression for probability distribution F(E), statement only); Fermi Dirac distribution at T=0 and $E<E_f$, at $T\neq 0$ and $E>E_f$, F(E) vs E plot at $T = 0$ and $T\neq 0$. Density of states for free electrons (statement only, no derivation). Qualitative discussion of lattice vibration and concept of Phonons.; Specific heats of solids: Classical theory, Einstein's and Debye's theory of specific heats. Hall Effect in metals.	13 Hrs
Magnetic Properties of Matter, Dielectrics and Superconductivity **Magnetic Properties of Matter**	13 Hrs

Review of basic formulae: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility, magnetization (M), Classification of Dia, Para, and ferro magnetic materials; Langevin Classical Theory of dia – and Paramagnetism. Curie's law, Ferromagnetism and Ferromagnetic Domains (qualitative). Discussion of B-H Curve. Hysteresis and Energy Loss, Hard and Soft magnetic materials **Dielectrics**: Static dielectric constant, polarizability (electronic, ionic and orientation), calculation of Lorentz field (derivation), Clausius-Mosotti equation (derivation), dielectric loss. Piezo electric effect, cause, examples and applications. **Superconductivity:** Definition, Experimental results – Zero resistivity and Critical temperature– The critical magnetic field – Meissner effect, Type I and type II superconductors.	
General Properties of Nuclei: Constituents of nucleus and their intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy ,main features of binding energy versus mass number curve, angular momentum, parity, magnetic moment, electric moments **Radioactivity decay:** Radioactivity: definition of radioactivity, half life, mean life, radioactivity equilibrium (a) Alpha decay: basics of α-decay processes, theory of α emission (brief), Gamow factor, Geiger-Nuttall law. (b) β-decay: energy kinematics for β-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion (Definition)	13 Hrs
Interaction of Nuclear Radiation with matter: Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, Energy loss due to ionization (quantitative description of Bethe Block formula), energy loss of electrons, introduction of Cerenkov radiation **Detector for Nuclear Radiations:** Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility) qualitative only, Accelerators: Cyclotrons and Synchrotrons	13 Hrs
Suggested Activities:	
1) Students to construct seven crystal systems with bamboo sticks and rubber bands. Use foam ball as atoms and study the BCC and FCC systems. 2)Students to search the characteristic X ray wavelength of different atoms/elements and plot characteristic wavelength vs atomic number and analyse the result and draw the inference. 3)Magnetic field lines are invisible. Students to trace the magnetic field lines using bar magnet and needle compass. https://nationalmaglab.org/magnet-academy/try-this-at-home/drawing-magnetic-field-lines/ , 4)Using vegetable oil and iron fillings students to make ferrofluids and see how it behaves in the presence of magnetic field. https://nationalmaglab.org/magnet-academy/try-this-at-home/making-ferrofluids/ 1) Study the decay scheme of selected alpha, beta & gamma radioactive sources with the help of standard nuclear data book. 2) Calculate binding energy of some selected light, medium and heavy nuclei. Plot the graph of binding energy versus mass number A 3) Study the decay scheme of standard alpha, beta and gamma sources using nuclear data book. 4) Make the list of alpha emitters from Uranium series and Thorium series. Search the kinetic energy of alpha particle emitted by these alpha emitters. Collect the required data such as half life or decay constant. Verify Geiger-Nuttal in each series. 5) Study the Z dependence of photoelectric effect cross section. 6) Study the Z dependence of common cross section for selected gamma energies and	

selected elements through theoretical calculation. 7) List the materials and their properties which are used for photocathode of PMT. 8) Study any two types of PMT and their advantages and disadvantages.	

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe-Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Total	**40 Marks**
Formative Assessment as per UNIVERSITY guidelines are compulsory	

References

Text Books

1. Solid State Physics-R. K. Puri and V.K. Babber., S.Chand publications,1st Edition(2004).
2. Fundamentals of Solid State Physics-B.S.Saxena,P.N. Saxena,Pragati prakashan Meerut(2017).
3. Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
4. Nuclear Physics, Irving Kaplan, Narosa Publishing House

Reference Books

1. Introduction to solid State Physics, ***Charles Kittel***, VII edition, (**1996**)
5. Solid State Physics- **A J Dekker**, MacMillan India Ltd, (**2000**)
6. Essential of crystallography, **M A Wahab**, Narosa Publications (**2009**)
7. Solid State Physics-**S O Pillai**-New Age Int. Publishers (**2001**).
8. Concepts of nuclear physics by Bernard L. Cohen. (Tata McGraw Hill, 1998).
9. Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004).
10. Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press
11. Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (Institute of Physics (IOP) Publishing, 2004).
12. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
13. Physics and Engineering of Radiation Detection, Syed Naeem Ahmed (Academic Press, Elsevier, 2007).

Course Title	Elements of Condensed Matter & Nuclear Physics Lab (Practical)	Practical Credits	02
Course Code	A15	Contact Hours	04 Hours
Formative Assessment	25 Marks	Summative Assessment	25 Marks

Practical Content

List of experiments: (Minimum 8 experiments must be completed by the students.)

1. Determination of Plank's constant by Photo Cell
2. Hall Effect in semiconductor: determination of mobility, hall coefficient.
3. Energy gap of semiconductor (diode/transistor) by reverse saturation method
4. Thermistor energy gap
5. Fermi Energy of Copper
6. Analysis of X-ray diffraction spectra and calculation of lattice parameter.
7. Specific Heat of Solid by Electrical Method
8. Determination of Dielectric Constant of polar liquid.
9. Determination of dipole moment of organic liquid
10. B-H Curve Using CRO/By conventional method.
11. Spectral Response of Photo Diode and its I-V Characteristics.
12. Determination of particle size from XRD pattern using Debye-Scherrer formula.
13. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method).
14. Measurement of susceptibility of paramagnetic solid (Gouy's Method)
15. Energy gap of photodiode
16. B_H by Tangent galvanometer
17. Specific heat by cooling.
18. Thermocouple – Determination of Thermo emf
19. Refractive index of material of convex lens and focal length
20. Study the characteristics of Geiger-Mùller Tube. Determine the threshold voltage, plateau region and operating voltage.
21. Study the absorption of beta particles in aluminium foils using GM counter. Determine mass attenuation coefficient of Aluminium foils.
22. Study the absorption of beta particles in thin copper foils using G M counter and determine mass attenuation coefficient.
23. Study the attenuation of gamma rays in lead foils using Cs-137 source and G M counter. Calculate mass attenuation coefficient of Lead for Gamma.
24. Determine the end point energy of Tl-204 source by studying the absorption of beta particles in aluminium foils.
25. Study the attenuation of absorption of gamma rays in polymeric materials using Cs-137 source and G M counter.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Total	**25 Marks**

Program Name	**BSc in Physics**		Semester	**VI**
Course Title	Electronic Instrumentation & Sensors **(Theory)**			
Course Code:	PHY C16 - T		No. of Credits	**04**
Contact hours	**52 Hours**		Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**		Summative Assessment Marks	**60**

Course Pre-requisite(s):

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Identify different types of tests and measuring instruments used in practice and understand their basic working principles.
- Get hands on training in wiring a circuit, soldering, making a measurement using an electronic circuit used in instrumentation.
- Have an understanding of the basic electronic components viz., resistors, capacitors, inductors, discrete and integrated circuits, colour codes, values and pin diagram, their practical use.
- Understanding of the measurement of voltage, current, resistance value, identification of the terminals of a transistor and ICs.
- Identify and understand the different types of transducers and sensors used in robust and hand-held instruments.
- Understand and give a mathematical treatment of the working of rectifiers, filter, data converters and different types of transducers.
- Connect the concepts learnt in the course to their practical use in daily life.
- Develop basic hands-on skills in the usage of oscilloscopes, multimeters, rectifiers, amplifiers, oscillators and high voltage probes, generators and digital meters.
- Servicing of simple faults of domestic appliances: Iron box, immersion heater, fan, hot plate, battery charger, emergency lamp and the like.

Contents	**52 Hrs**
Power supply AC power and its characteristics, Single phase and three phase, Need for DC power supply and its characteristics, line voltage and frequency, Rectifier bridge, Filters: Capacitor and inductor filers, L-section and π-section filters, ripple factor, electronic voltage regulators, stabilization factor, voltage regulation using ICs. (5 hours) **Basic electrical measuring instruments** Cathode ray oscilloscope- Block diagram, basic principle, electron beam, CRT features, signal display. Basic elements of digital storage oscilloscopes. Basic DC voltmeter for measuring potential difference, Extending Voltmeter range, AC voltmeter	13 Hrs

using rectifiers Basic DC ammeter, requirement of a shunt, Extending of ammeter ranges. (5 hours) *Topics for self-study:* *Average value and RMS value of current, Ripple factor, Average AC input power and DC output power, efficiency of a DC power supply. Multirange voltmeter and ammeter.* **Activities (3 hours)** 1. Design and wire your own DC regulated power supply. Power output: 5 V, 10 V, ± 5 V. Components required: A step down transformer, semiconductor diodes (BY126/127), Inductor, Capacitor, Zener diode or 3-pin voltage regulator or IC. Measure the ripple factor and efficiency at each stage. Tabulate the result. 2. Extend the range of measurement of voltage of a voltmeter (analog or digital) using external component and circuitry. Design your own circuit and report. 3. Measure the characteristics of the signal waveform using a CRO and function generator. Tabulate the frequency and time period. Learn the function of Trigger input in an CRO. 4. Learn to use a Storage Oscilloscope for measuring the characteristics of a repetitive input signal. Convince yourself how signal averaging using Storage CRO improves S/N ratio.	
Unit-II: Wave form generators and Filters Basic principle of standard AF signal generator: Fixed frequency and variable frequency, AF sine and square wave generator, basic Wein-bridge network and oscillator configuration, Triangular and saw tooth wave generators, circuitry and waveforms. (5 hours) Passive and active filters. Fundamental theorem of filters, Proof of the theorem by considering a symmetrical T-network. Types of filters, Circuitry and Cut-off frequency and frequency response of Passive (RC) and Active (op-amp based) filters: Low pass, high pass and band pass. (5 hours) **Activities (3 hours)** 1. Measure the amplitude and frequency of the different waveforms and tabulate the results. Required instruments: A 10 MHz oscilloscope, Function generators (sine wave and square wave). 2. Explore where signal filtering network is used in real life. Visit a nearby telephone exchange and discuss with the Engineers and technicians. Prepare a report. 3. Explore op-amp which works from a single supply biasing voltage (+15V). Construct an inverting/non-inverting amplifier powered by a single supply voltage instead of dual or bipolar supply voltage. 4. Op-amp is a linear (analog) IC. Can it be used to function as logic gates? Explore, construct and implement AND, OR NAND and NOR gate functions using op-amps. Verify the truth table. Hint: LM3900 op-amp may be used. The status of the output may be checked by LED.	13 Hrs
Unit-III: Data Conversion and display Digital to Analog (D/A) and Analog to Digital (A/D) converters – A/D converter with pre-amplification and filtering. D/A converter - Variable resistor network, Ladder type (R-2R) D/A converter, Op-amp based D/A converter. (4 hours) Digital display systems and Indicators- Classification of displays, Light Emitting Diodes (LED) and Liquid Crystal Display (LCD) – Structure and working. (3 hours) Data Transmission systems – Advantages and disadvantages of digital transmission over analog transmission, Pulse amplitude modulation (PAM), Pulse time modulation (PTM) and Pulse width	13Hrs

modulation (PWM)- General principles. Principle of Phase Sensitive Detection (PSD). *Topic for self-study: Lock-in amplifier and its application, phase locked loop.* (3 hours) **Activities (3 hours)** 1. Explore where modulation and demodulation technique is employed in real life. Visit a Radio broadcasting station. (Aakashavani or Private). Prepare a report on different AM and FM stations. 2. Explore and find out the difference between a standard op-amp and an instrumentation op-amp. Compare the two and prepare a report.	
Unit-IV: Transducers and sensors Definition and types of transducers. Basic characteristics of an electrical transducer, factors governing the selection of a transducer, Resistive transducer-potentiometer, Strain gauge and types (general description), Resistance thermometer-platinum resistance thermometer. Thermistor. Inductive Transducer-general principles, Linear Variable Differential Transducer (LDVT)- principle and construction, Capacitive Transducer, Piezo-electric transducer, Photoelectric transducer, Photovoltaic cell, photo diode and phototransistor – principle and working. **Activities (3 hours)** (10 hours) 1. Construct your own thermocouple for the measurement of temperature with copper and constantan wires. Use the thermocouple and a Digital multimeter (DMM). Record the emf (voltage induced) by maintaining one of the junctions at a constant temperature (say at 0° C, melting ice) and another junction at variable temperature bath. Tabulate the voltages induced and temperatures read out using standard chart (Chart can be downloaded from the internet). 2. Observe a solar water heater. Some solar water heaters are fitted with an anode rod (alloy of aluminium). Study why it is required. Describe the principle behind solar water heater.	13Hrs

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe-Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Total	**40 Marks**
Formative Assessment as per UNIVERSITY guidelines are compulsory	

References

1. Physics for Degree students (Third Year) – C.L. Arora and P.S. Hemne, S, Chand and Co. Pvt. Ltd. 2014 (For Unit-1, Power supplies)
2. Electronic Instrumentation, 3rd Edition, H.S. Kalsi, McGraw Hill Education India Pvt. Ltd. 2011 (For rest of the syllabus)
3. Instrumentation – Devices and Systems (2nd Edition)– C.S. Rangan, G.R. Sarma, V.S.V. Mani, Tata McGraw Hill Education Pvt. Ltd. (Especially for circuitry and analysis of signal generators and filters)

Course Title	Electronic Instrumentation & Sensors Lab **(Practical)**	Practical Credits	**02**
Course Code	**PHY C17 - P**	Contact Hours	**04 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

List of experiments (At least 8 experiments to be performed)

1. **Construct a DC power supply using a bridge rectifier and a capacitor filter. Use a Zener diode or a 3-pin voltage regulator and study the load and line regulation characteristics. Measure ripple factor with and without filter and compare with theoretical values.**
2. **Calibration of a low range voltmeter using a potentiometer**
3. **Calibration of an ammeter using a potentiometer**
4. Design and construct a Wien bridge oscillator (sine wave oscillator) using µA 741 op-amp. Choose the values of R and C for a sine wave frequency of 1 KHz. Vary the value of R and C to change the oscillation frequency.
5. Design and construct a square wave generator using *µA* 741 op-amp. Determine its frequency and compare with the theoretical value. Also measure the slew rate of the op-amp. If the 741 is replace by LM318, study how does the waveform compare with the previous one.
6. Study the frequency response of a first order op-amp low pass filter
7. Study the frequency response of a first order op-amp high pass filter
8. Study the frequency response of a first order op-amp band pass and band stop filters
9. Study the characteristics of *pn*-junction of a solar cell and determine its efficiency.
10. Study the illumination intensity of a solar cell using a standard photo detector (e.g., lux meter).
11. Study the characteristics of a LED (variation of intensity of emitted light).
12. Study the characteristics of a thermistor (temperature coefficient of resistance)
13. Determine the coupling coefficient of a piezo-electric crystal.
14. Study the amplitude modulation using a transistor.
15. Performance analysis of A/D and D/A converter using resistor ladder network and op-amp.
16. Clipping and clamping circuits
17. Study of OPAMP as integrator
18. Study of OPAMP as differentiator

20. frequency of AC by AC and DC meters
21. Measurement of frequency, voltage, types of waves and testing components using CRO

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Total	**25 Marks**

22

MANGALORE UNIVERSITY

National Education Policy – 2020
[NEP-2020]

CURRICULUM STRUCTURE

FOR

V AND VI SEMETER BCOM
COMPUTER APPLICATION

C5 (I) Model Curricular Framework for B.Com with Computer Application (Vocational) (Basic/Hons.) Programme with practical)

Sem.	Discipline Core (DSC) (Credits)	Discipline Elective (DSE) / Open Elective (OE) (Credits)	Ability Enhancement Compulsory Courses (AECC), Languages (Credits) (L+T+P)		Skill Enhancement Courses (SEC)		Total Credits
					Skill based (Credits) (L+T+P)	Value based (Credits) (L+T+P)	
I	DSC-A1 (4) B1 (3) B2(3) B3(2)	OE-1(3)	L1-1(3), L2-1(3) (4 hrs. each)	Env. Studies (2) (2+0+0)	SEC-1: Digital Fluency (2) (2+0+0)	Yoga / Sports/Health & Wellness/NCC/NSS/R&R(S&G)/ Cultural/any other (2) (0+0+2)	25
II	DSC-A2 (4) B4 (3) B5(3) B6(2)	OE-2(3)	L1-2(3), L2-2(3) (4 hrs. each)	SEC-1: Digital Fluency (2) (2+0+0)	Env. Studies (2) (2+0+0)		25
Exit option with Undergraduate Certificate in completion of courses equivalent to a minimum 48 credits, followed by an exit 10 credit skills enhancement course(s) for two months, including at-least 6 credit job-specific internship/apprenticeship to acquire job-ready competencies required to enter a job							
III	DSC-A3 (4) B7 (3) B8(3) B9(2)	OE-3 (3)	L1-3(3), L2-3(3) (4 hrs each)	Indian Constitution (3) (3+0+0)	SEC-2: AI/Financial Edu. &Inv.Aw. (2) (2+0+0)	Yoga/ Health & Wellness/ Sports/NCC/NSS/R&R(S&G)/C ultural/any Others (2) (0+0+2)	25
IV	DSC-A4 (4) B10 (3) B11(3) B12(2)	Indian Constitution (3) (3+0+0)	L1-4(3), L2-4(3) (4 hrs each)	OE -3 (3)	SEC-3: Financial Edu. & Inv. Aw. /AI (2) (2+0+0)		25
Exit option with Undergraduate with the completion of courses equal to minimum 96 credits followed by an exit 10 credit skill enhancement course for two months, including at-least 6 credit job-specific internship/apprenticeship to acquire job-ready competencies required to enter a job							
V	DSC-A5 (4) B13 (3) B14(3) B15(2)	DSE-E1 (3) E2 (3)		Gender Sensitization (3)	SEC-4: Cyber Security (2) (2+0+0)/Internship (2)	Yoga/ Health & Wellness/ Sports/NCC/NSS/R&R(S&G)/C ultural/any other (2) (0+0+2)	25
VI	DSC-A6 (4), B16 (3), B17(3) B18(2)	DSE-E3 (3) Vocational-2(3) Res.Methodology-1(3)					23
Exit option with award of Bachelor of Commerce with Computer Application Vocational degree completion of courses equal to 132-140 credits							
VII	DSC-C19(4) C20(4), C21(4)	DSE-E4(3) Res.Methodology-2 (3) * Res. Proposal (4)*					22
VIII	DSC-C22(4), C23(4), C24(4)	Res. Internship (4) * Research Project (6) *					22
Award of Bachelor of Commerce Degree with Honours B. Com **with Computer Application Vocational** (Hons.) with the completion of courses equal to a minimum of 176-180 credits							

Model Curriculum Structure for B.Com (Computer Application)

Semester	Course No	Theory/ Practical	Credits	Paper Title	S.A	L.A
V	CA5.2	Theory	3	C# and Dot Net Framework	60	40
	CA5.3	Theory	3	Python Programming	60	40
	CA5.4	Practical	2	C#& Python Programming Lab	25	25
	CA5.5-E1	Theory (Elective)	3	A. Digital Marketing B. Business Intelligence	60	40
	SEC-4	SEC	2	Cybersecurity	40	10
VI	CA6.2	Theory	3	PHP and MySQL	60	40
	CA6.3	Theory	3	Software Engineering	60	40
	CA6.4	Practical	2	PHP and MySQL Lab	25	25
	CA6.5-Voc	Theory	3	R Programming	60	40
	CA6.6	Project	3	Project Work	60	40

Program Name	**B.Com (Computer Application)**	Semester	**V**
Course Title	**C# and Dot Net Framework(Theory)**		
CourseCode:	**CA5.2**	No.of Credits	**3+2**
Contact hours	**42Hours**	Duration of SEA/Exam	**2hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Understand programming algorithm, process, and structure; Design/develop programs with GUI interfaces.BL (L1,L2)

CO2.Understand and identify the fundamental concepts of object-oriented programming. BL (L1, L2, L3)

CO3.Assemble multiple forms, modules, and menus into working .NET solutions.BL (L1, L2, L3, L4)

CO4.Prepare various projects, Manage and analyse prepared projects, interpret and report results..BL (L1, L2, L3, L4)

CO5. Understand the impact of .NET on real world business applications.BL (L1, L2, L3)

Note: Blooms Level (BL): L1=Remember, L2=Understand, L3=Apply, L4=Analyze, L5= Evaluate, L6= Create

Unit	Description	Hours
1	**Introductionto.NetTechnologies:** Introduction to Web Technologies. HTML Basics, Scripts. Sample Programs. Advantages and Disadvantages of Client-side and Server-side Scripts. Overview of Client-side Technologies and Server-side Technologies. **Introduction to C#:** Overview of C#, Literals, Variables, DataTypes, Operators, Expressions, Control Structures-Methods, Arrays, Strings, Structures, Enumerations.	11
2	**OOPS with C#:**Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading	11
3	**Delegates & Events** : Delegates – Declaration, Methods, Instantiation, Invocation; Events **Managing Errors and Exceptions**: Types of Errors, exceptions, catch, Finally, Try, checked and unchecked operators.	10
4	**Multithreading in C#: Threading** – Namespace, creating, scheduling, synchronizing, pooling **Windows Forms and Web based Application Development**: Creating Windows Forms, customizing a Form, understanding Microsoft Visual Studio 2005, creating and running a sampleWinApp Windows Application, Web based Application in .NET	10

Text Books:

"Programming C#: A Primer"–E.Balagurusamy,3rdEdition,TMH publications

Reference Books:

1. "Computing with C# and the .NET Framework", Arthur Gittleman, 2nd Edition, Jones &Bartlett Publishers, 2011
2. C# 7.0 in a Nutshell (7th Edition), the Definitive Reference, Joseph Albahari& Ben Albhari, O'Reilly.
3. Microsoft Visual C# Step by Step (9th Edition), John Sharp, Pearson Education.
4. C# 7.0 All-in-One for Dummies (1st Editiion), John Paul Mueller, Bill Sempf, Chuck Sphar, John Wiley & Sons, Inc.
5. Professional C# 7 and .NET Core 2.0 (7th Edition), Christian Nagel, John Wiley & Sons, Inc.

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes(COs) with Program Outcomes

Course Outcomes (COs)/ Program Outcomes(POs)	**Program Outcomes(POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Discuss the fundamentals of the .Net Technologies.															
Discuss fundamental concepts of object-oriented programming															
Describe the programming elements and structures of C#															
Describemultiple forms, modules, and menus into working.NET solutions															
Discuss application development using .NET															
Discuss Data Access Connectivity.															

Program Name	**B.Com (Computer Application)**	Semester	**V**
Course Title	**Python Programming (Theory)**		
Course Code:	**CA5.3**	No.of Credits	**3+2**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Understand Python programming Basics, Python Control Flow, ExceptionHandling.BL (L1, L2)

CO2.Understand and identify the fundamental concepts of object-oriented programming. BL (L1, L2, L3)

CO3. Understand usage of strings, lists, tuples and sets. BL (L1, L2, L3, L4)

CO4. Understand file handling, design of GUI. BL (L1, L2, L3, L4)

CO5. Understand SQlite database, data analysis, data visualization using Python. BL (L1, L2, L3)

Note: Blooms Level (BL):L1=Remember, L2=Understand, L3=Apply, L4=Analyze, L5= Evaluate, L6= Create

Unit	Description	42 Hours
1	**Introduction to Features and Applications of Python;** Python Versions; Installation of Python; Python Command Line mode and Python IDEs; Simple Python Program. **Python Basics:** Identifiers; Keywords; Statements and Expressions; Variables; Operators; Precedence and Association; Data Types; Indentation; Comments; Built-in Functions-Console Input and Console Output, Type Conversions; Python Libraries; Importing Libraries with Examples. **Python Control Flow:** Types of Control Flow; Control Flow Statements- if, else, elif, while loop, break, continue statements, for loop Statement; range () and exit () functions. **Exception Handling:** Types of Errors; Exceptions; Exception Handling using try, except and finally. **Python Functions:** Types of Functions; Function Definition-Syntax, Function Calling, Passing Parameters/arguments, the return statement; Default Parameters; Command line Arguments; Key Word Arguments; Recursive Functions; Scope	11

	and Lifetime of Variables in Functions	
2	**Strings:** Creating and Storing Strings; Accessing Sting Characters; the str() function; Operations on Strings- Concatenation, Comparison, Slicing and Joining, Traversing; Format Specifies; Escape Sequences; Raw and Unicode Strings; Python String Methods. **Lists:** Creating Lists; Operations on Lists; Built-in Functions on Lists; Implementation of Stacks and Queues using Lists; Nested Lists. **Dictionaries:** Creating Dictionaries; Operations on Dictionaries; Built-in Functions on Dictionaries; Dictionary Methods; Populating and Traversing Dictionaries. **Tuples and Sets:** Creating Tuples; Operations on Tuples; Built-in Functions on Tuples; Tuple Methods; Creating Sets; Operations on Sets; Built-in Functions on Sets; Set Methods.	11
3	**File Handling:** File Types; Operations on Files– Create, Open, Read, Write, Close Files; File Names and Paths; Format Operator. **Object Oriented Programming:** Classes and Objects; Creating Classes and Objects; Constructor Method; Classes with Multiple Objects; Objects as Arguments; Objects as Return Values; Inheritance- Single and Multiple Inheritance, Multilevel and Multipath Inheritance; Encapsulation- Definition, Private Instance Variables; Polymorphism- Definition, Operator Overloading. **GU Interface:** The tkinter Module; Window and Widgets; Layout Management- pack, grid and place	10
4	**Python SQLite:** The SQLite3 module; SQLite Methods- connect, cursor, execute, close; Connect to Database; Create Table; Operations on TablesInsert, Select, Update. Delete and Drop Records. **Data Analysis:** NumPy- Introduction to NumPy, Array Creation using NumPy, Operations on Arrays; Pandas- Introduction to Pandas, Series and DataFrames, Creating DataFrames from Excel Sheet and .csv file, Dictionary and Tuples. Operations on DataFrames. **Data Visualisation:** Introduction to Data Visualisation; Matplotlib Library; Different Types of Charts using Pyplot- Line chart, Bar chart and Histogram and Pie chart	10

References:

1. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition, Green Tea Press. Freely available online @

https://www.greenteapress.com/thinkpython/thinkCSpy.pdf, 2015.
2. Introduction to Python Programming, Gowrishankar S et al., CRC Press, 2019.
3. Python Data Analytics: Data Analysis and Science Using Pandas, matplotlib, and the Python Programming Language, Fabio Nelli, Apress®, 2015
4. Advance Core Python Programming, MeenuKohli, BPB Publications, 2021.
5. Core PYTHON Applications Programming, Wesley J. Chun, 3rd Edition, Prentice Hall, 2012.
6. Automate the Boring Stuff, Al Sweigart, No Starch Press, Inc, 2015.
7. Data Structures and Program Design Using Python, D Malhotra et al., Mercury
   Learning and Information LLC, 2021.
8. http://www.ibiblio.org/g2swap/byteofpython/read/
9. https://docs.python.org/3/tutorial/index.html

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes

Course Outcomes(COs)/Program Outcomes(POs)	**Program Outcomes(POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Discuss Python programming Basics															
Describe Python Control Flow															
Discuss ExceptionHandling.															
Discuss fundamental concepts of object-oriented programming.															
Discuss usage of strings, lists, tuples and sets															
Discuss file handling															
Discuss design of GUI															
Discuss SQlite database															
Discuss data analysis, data visualization using Python.															

Program Name	**B.Com (Computer Application)**		Semester	**V**
Course Title	**C#& Python Programming Lab**			
Course Code:	**CA5.4**		No.of Credits	**02**
Contact hours	**04 Hours per week**		Duration of SEA/Exam	**3hours**
Formative Assessment Marks		**25**	Summative Assessment Marks	**25**

Sl.No	**Program Name**
1.	Write a Program in C# to check a number if it is Prime; otherwise display the factor of the number.
2.	Write a Programin C# to define a Class "Salary" which will contain member variable Emp_no, Emp_name, Dob,Basic Write a program using constructor and methods to calculate the DA,HRA,PF,IT,GROSS and NETPAY using appropriate condition. If Basic<= 20000 D.A is 40% Basic H.R.A is 10% Basic. P.F12% of Gross; PT is Rs.100 If Basic.> 20000 D.A is 50% Basic. H.R.A15% Basic. P.F 12% of Gross; PT is Rs.150 Gross = Basic.+D.A+HRA and Net=Gross-PT –PF
3.	Write a Program in C# to find addition and Multiplication operation on two complex number using operator overloading.
4.	Admission to a Professional Course is subject to the following condition. Marks in Maths>= 60 Marks in Physics >= 50 Marks in Chemistry >= 40 Total in all the three subjects >=200 Total in Maths and Physics >= 150 Given the marks in the three subjects, write a program to process the applications to list the eligible candidates.
5	Write a program to evaluate the following equation. $V = P(1+r)^n$ and print the tables which would give the value of V for various combination of the following values of P, r,n. P : 1000, 2000, 3000, …, 10000 r: 0.10, 0.11, 0.12 …, 0.20 n: 1, 2, 3, …, 10

	Hint: P is the Principal amount and V is the value of money at the end of n years. This equation can be recursively written as V = P(1+r) P = V That is the value of the money at the end of first year becomes the Principal amount for the next year and so on.
6	An Election is contested by five candidates. The candidates are numbered 1 to 5 and the voting is done by marking the candidate's number on the ballot paper. Write a program to read the ballots and count the votes cast for each candidate using an array variable count. In case a number is read outside a range 1 to 5, the ballot should be considered as a spoilt ballot and the program should also count the number of spoilt ballots.
7	Design a class named Date with the following members. Data members Day, month and Year A constructor to provide values to the data members (using three parameters) A method to display the date in the format day/month/year (Eg: 15/08/1945 for August 15, 1945) Write a program to implement the class Date.
8	Create a class Matrix of Size mxn. Define all possible matrix operations for Matrix type objects.
9	Develop a program that is likely to throw multiple exceptions that are handled using catch and finally blocks.
	PART-B
1	Write a Python program create list with N elements. Find all unique elements in the list. If an element is found only once in the list, then add that element to the unique list.
2	Write a Python program using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
3	Consider a tuple t1= (1,2,5,7,9,2,4,6,8,10). Write a Python program to perform following operations: Print half the values of tuple in one line and the other half in the next line. Print another tuple whose values are even numbers in the given tuple. Concatenate a tuple t2= (11,13,15) with t1. Return maximum and minimum value from this tuple.

4	Write a function that takes a sentence as input from the user and calculates the frequency of each letter. Use a variable of dictionary type to maintain the count.
5	Write a function nearly equal to test whether two strings are nearly equal. two strings a and b are nearly equal if one character change in b results in string a.
6	Write a Python program to create a text file and compute the number of characters, words and lines in a file.
7	Write a Python Program using user defined exception class that will ask the user to enter a number until he guesses a stored number correctly. To help them figure it out, a hint is provided whether their guess is greater than or less than the stored number using user defined exceptions.
8	Write a Pandas program to join the two given data frames along rows. Sample Data frame may contain details of student like rollno, name, Total Marks.
9	Python Program to create a class Employee with empno, name, depname, designation, age and salary and perform the following function. Accept details of N employees Search given employee using empno Display employee details in neat format.
10	Write a Python program menu driven to create a BankAccount class. class should support the following methods for i) Deposit ii) Withdraw iii) Get Balance. Create a subclass SavingsAccount class that behaves just like a BankAccount, but also has an interest rate and a method that increases the balance by the appropriate amount of interest.
11	Create a GUI to input Principal amount, rate of interest and number of years, Calculate Compound interest. When button submit is pressed Compound interest should be displayed in a textbox. When clear button is pressed all contents should be cleared.
12	Write a GUI program to implement Simple Calculator
13	Create a table student table (regno, name and marks in 3 subjects) using MySQL and perform the followings To accept the details of students and store it in database. To display the details of all the students Delete particular student record using regno.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:5 Marks Execution:5Marks**	**10 Marks**
Program-2	**PART-B** **Writing:5 Marks Execution:5Marks**	**10 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**B.Com (Computer Application)**	Semester	**V**
Course Title	**Business Intelligence(Theory)**		
Course Code:	**CA5.5-E1**	No.of Credits	**03**
Contact hours	**42Hours**	Duration of SEA/Exam	**2hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1 Describe the Decision Support systems and Business Intelligence framework.
- CO2 Explore knowledge management, explain its activities, approaches and its implementation.
- CO3 Describe business intelligence, analytics, and decision support systems

Unit	Description	Hours
1	Information Systems Support for Decision Making, An Early Framework for Computerized Decision Support, The Concept of Decision Support Systems, A Framework for Business Intelligence, Business Analytics Overview, Brief Introduction to Big Data Analytics	**10**
2	Introduction and Definitions, Phases of the Decision, Making Process, The Intelligence Phase, Design Phase, Choice Phase, Implementation Phase, Decision Support Systems Capabilities, Decision Support Systems Classification, Decision Support Systems Components.	**10**
3	Basic Concepts of Neural Networks, Developing Neural Network-Based Systems, Illuminating the Black Box of ANN with Sensitivity, Support Vector Machines, A Process Based Approach to the Use of SVM, Nearest Neighbor Method for Prediction, Sentiment Analysis Overview, Sentiment Analysis Applications, Sentiment Analysis Process,, Sentiment Analysis, Speech Analytics.	**11**
4	Decision Support Systems modeling, Structure of mathematical models for decision support, Certainty, Uncertainty, and Risk, Decision modeling with spreadsheets, Mathematical programming optimization, Decision Analysis with Decision Tables and Decision Trees, Multi-Criteria Decision Making With Pairwise Comparisons.	**11**

	Automated Decision Systems, The Artificial Intelligence field, Basic concepts of Expert Systems, Applications of Expert Systems, Structure of Expert Systems, Knowledge Engineering, and Development of Expert Systems.	

Text Books:

Ramesh Sharda, Dursum Delen, Efraim Turban, J.E. Aronson, Ting-Peng Liang, David King, "BussinessIntelegence and Analytics: System for Decision Support", 10th Edition, Pearson Global Edition.

Reference books

Data Analytics: The Ultimate Beginner's Guide to Data Analytics Paperback-12 November 2017 by Edward Miz

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

CourseArticulationMatrix: Mapping of CourseOutcomes (COs) withProgramOutcomes

CourseOutcomes(COs)/ProgramOutcomes(POs)	**ProgramOutcomes(POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Describe the Decision Support systems and Business Intelligence framework.															
Explore knowledge management; explainits activities, approaches and it simple mentation.															
Describe business intelligence, analytics,and decision support systems															

Program Name	**B.Com (Computer Application)**	Semester	**V**
Course Title	**Digital Marketing(Theory)**		
Course Code:	**CA5.5-E2**	No.of Credits	**03**
Contact hours	**42Hours**	Duration of SEA/Exam	**2hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

1. Understand the fundamental concepts and principles of digital marketing.
2. Develop practical skills to implement various digital marketing strategies and techniques.
3. Analyze and evaluate the effectiveness of digital marketing campaigns.
4. Apply critical thinking and problem-solving skills to real-world digital marketing scenarios.
5. Create comprehensive digital marketing plans and strategies.

Note: Blooms Level (BL):L1=Remember, L2=Understand, L3=Apply, L4=Analyse, L5=Evaluate, L6=Create

Unit	Description	Hours
1	**Introduction to Digital Marketing:** Overview of digital marketing, Evolution of digital marketing, Importance and benefits of digital marketing, Digital marketing channels and platforms Digital Marketing Strategy and Planning: Developing a digital marketing strategy, Setting goals and objectives, Budgeting and resource allocation.	**10**
2	Campaign planning and execution, Monitoring and adjusting digital marketing campaigns **Social Media Marketing:** Overview of social media marketing, Social media platforms and their features, Creating and optimizing social media profiles, Social media content strategy, Social media advertising and analytics	**10**
3	**Email Marketing:** Introduction to email marketing, Building an email list, Creating effective email campaigns, Email automation and segmentation, Email marketing metrics and analytics Content Marketing: Understanding content marketing, Content strategy and planning,	**11**

4	Content creation and distribution, Content promotion and amplification, Content marketing metrics and analytics. **Mobile Marketing:** Mobile marketing overview, Mobile advertising strategies, Mobile app marketing, Location-based marketing, Mobile marketing analytics **Analytics and Reporting:** Importance of analytics in digital marketing, Setting up web analytics tools (e.g., Google Analytics), Tracking and measuring key performance indicators (KPIs), Conversion tracking and optimization, Reporting and data visualization	**11**

Text Books:

1 "Digital Marketing Strategy: An Integrated Approach to Online Marketing" by Simon Kingsnorth.

References

1. "Email Marketing Rules: How to Wear a White Hat, Shoot Straight, and Win Hearts" by Chad S. White
2. "Content Inc.: How Entrepreneurs Use Content to Build Massive Audiences and Create Radically Successful Businesses" by Joe Pulizzi
3. "Mobile Marketing: How Mobile Technology is Revolutionizing Marketing, Communications and Advertising" by Daniel Rowles
4. "Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity" by Avinash Kaushik

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Course ArticulationMatrix: Mapping of Course Outcomes (COs) with Program Outcomes)

Course Outcomes(COs)/Program Outcomes(POs)	**Program Outcomes(POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Understand the fundamental concepts and principles of digital marketing.															
Develop practical skills to implement various digital marketing strategies and techniques.															
Analyze and evaluate the effectiveness of digital marketing campaigns.															
Apply criticalthinking and problem-solving skills to real-world digital marketing scenarios.															
Create comprehensive digital marketing plans and strategies.															

Program Name	**BCOM**	Semester	**V**
Course Title	**Cyber Security (Theory)**		
Course Code:	**SEC-4**	No.of Credits	**02**
Contact hours	**30 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**30**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1: Understand the concept of Cyber security and issues and challenges associated with it.

CO2: Understand the cybercrimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures.

CO3: Appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

CO4: On completion of this course, students should be able to appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

Module	Description	Hours
1	**Introduction to Cyber security**: Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.	**10**

2	**Cybercrime and Cyber law:** Classification of cybercrimes, Common cyber-crimes- cyber-crime targeting computers and mobiles, cyber-crime against women and children, financial frauds, social engineering attacks, malware and ransom ware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, Reporting of cyber-crimes, Remedial and mitigation measures, Legal perspective of cyber-crime, IT Act 2000 and its amendments, Cyber-crime and offences, Organizations dealing with Cybercrime and Cyber security in India, Case studies.	**10**
3	**Social Media Overview and Security**: Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies.	**10**
	Practicals: 1. Checklist for reporting cyber crime at Cyber crime Police Station. 2. Checklist for reporting cyber crime online. 3. Reporting phishing emails. 4. Demonstration of email phishing attack and preventive measures. 5. Setting, configuring and managing three password policy in the computer (BIOS, Administrator and Standard User). 6. Setting and configuring two factor authentication in the Mobile phone. 7. Security patches management and updates in Computer and Mobiles. 8. Managing Application permissions in Mobile phone. 5. Installation and configuration of computer Anti-virus. 9. Installation and configuration of Computer Host Firewall. 10. Wi-Fi security management in computer and mobile	

Text Books:

1. Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010

References

1. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
2. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001
3. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd
4. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
5. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
6. Fundamentals of Network Security by E. Maiwald, McGraw Hill.

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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes

Course Out comes(COs) /Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Quickly understand the given problem and come up with the correct answer															
Identify, construct and compute numerical situations by work with numbers															
Conceive and develop a methodology for analyzing data and solving a problem.															
Define, modify and apply critical thinking to real time situations.															

QUESTION PAPER PATTERN
Skill Enhancement Course
CYBER SECURITY
V SEMESTER
COMMON TO ALL

Duration: 2 Hour Max.Marks:30

Module-1

Answer any five questions from Eight (2x5 = 10)

Module-2

Answer any five questions from Eight (2x5 = 10)

Module-3

Answer any five questions from Eight (2x5 = 10)

Program Name	**B.Com (Computer Application)**	Semester	**VI**
Course Title	**PHP and MySQL (Theory)**		
Course Code:	**CA6.2**	No.of Credits	**3**
Contact hours	**42Hours**	Duration of SEA/Exam	**2hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes: After the successful completion of the course, the student will be able to:

1. Design dynamic and interactive web pages and websites.
2. Run PHP scripts on the server and retrieve results.
3. Handle databases like MySQL using PHP in websites.

Unit	Description	Hours
1	Introduction to PHP: Introduction to PHP, History and Features of PHP, Installation & Configuration of PHP, Embedding PHP code in Your Web Pages, Understanding PHP, HTML and White Space, Writing Comments in PHP, Sending Data to the Web Browser,Data types in PHP, Keywords in PHP, Using Variables, Constants in PHP, Expressions in PHP, Operators in PHP.	**11**
2	Programming with PHP: Conditional statements: if, if-else, switch, The ? Operator, Looping statements: while Loop, do-while Loop, for Loop Arrays in PHP: Introduction- What is Array?, Creating Arrays, Accessing Array elements, Types of Arrays: Indexed v/s Associative arrays, Multidimensional arrays, Creating Array, Accessing Array, Manipulating Arrays, Displaying array, Using Array Functions, Including and Requiring Files- use of Include() and Require(), Implicit and Explicit Casting in PHP.	**11**
3	Using Functions , Class- Objects, Forms in PHP: Functions in PHP, Function definition, Creating and invoking user-defined functions, Formal parameters versus actual parameters, Function and variable scope, Recursion, Library functions, Date and Time Functions Strings in PHP: What is String?, Creating and Declaring String, String Functions	**10**
4	Class &Objects in PHP: What is Class & Object, Creating and accessing a Class &Object, Object properties, object methods, Overloading, inheritance, Constructor and Destructor Form Handling: Creating HTML Form, Handling HTML Form data in PHP Database Handling Using PHP with MySQL: Introduction to MySQL: Database terms, Data Types.Accessing MySQL –Using MySQL Client and Using php MyAdmin, MySQL Commands, Using PHP with MySQL: PHP MySQL Functions, Connecting to MySQL and Selecting the Database, Executing Simple Queries, Retrieving Query Results,	**10**

	Counting Returned Records, Updating Records with PHP	

Text Books:

1. PHP & MySQL for Dynamic Web Sites- Fourth Edition By Larry Ullman.

References

1. Learning PHP, MySQL and JavaScript By Robin Nixon –O‟REILLY Publications
2. Programming PHP By Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre
3. SAMS Teach Yourself PHP in 24 hours, Author: Matt Zandstra, Sams Publishing

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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the PHP.															
Problem solving using PHP.															
Discuss various OOPS concepts in PHP.															
Discuss the Database Conectivity in PHP.															
Study about Query handling in MySQL															
Discuss PHP forms.															

Program Name	**B.Com (Computer Application)**	Semester	**VI**
Course Title	**Software Engineering(Theory)**		
Course Code:	**CA6.3**	No.ofCredits	**04**
Contact hours	**42Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- CO1 How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment.
- CO2 An ability to work in one or more significant application domains.
- CO3 Work as an individual and as part of a multidisciplinary team to develop anddeliver quality software.
- CO4 demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.
- CO5 Demonstrate an ability to use the techniques and tools necessary for engineeringpractice.

Unit	Description	Hours
1	**OVERVIEW:** Introduction; Software engineering ethics; Software process models; Process activities; Coping with change; Agile software development: Agile methods; Plan- driven and agile development. **REQUIREMENTS ENGINEERING:** Functional and non-functional requirements; Software requirements document; Requirement's specification; Requirements engineering processes; Requirement's elicitationand analysis; Requirement's validation; Requirements management	13
2	**SYSTEM MODELING:** Context models; Interaction models- Use case modeling, Sequence diagrams; Structural models- Class diagrams, Generalization,Aggregation; Behavioral models- Data-driven modeling, Event-driven modeling; Model-driven engineering.	13
3	**ARCHITECTURAL DESIGN**: Architectural design decisions; Architectural views; Architectural patterns- Layered architecture, Repository architecture, Client–server architecture Pipe and filter architecture.	13

	DESIGN AND IMPLEMENTATION: Object-oriented design using the UML- System context and interactions, Architectural design, Object class identification, Design models, Interface specification; Design patterns; Implementation issues. 12	
4	**SOFTWARE TESTING:** Development testing- Unit testing, Choosing unit test cases, Component testing, System testing. Test-driven development; Release testing; User testing- Alpha, Beta, Acceptance testing	13

Text Books:

1 Waman S Jawadekar, "Software Engineering Principles and Practice", Tata McGrawHill, 2004.

References Books:

1. Roger S. Pressman, "A Practitioners Approach",7th Edition, McGraw-Hill, 2007.
2. P Jalote, "An Integrated Approach to software Engineering", Narosa Publication.

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

CourseArticulationMatrix: Mapping of Course Outcomes (COs)with Program Outcomes (POs1-15)

Course Outcomes (COs) /Program Outcomes (POs)	Program Outcomes(POs)														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
How to apply the software Engineering life cycle by demonstrating competence in communication, planning, analysis, design,construction,anddeployment.															
An ability to work in one or more significant applicationdomains.															
Work as an individual and as part of a multi disciplinary team to develop and deliver quality software.															
Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software life cycle.															
Demonstrate an ability to use the techniques and tools necessary for engineering practice.															

Program Name	**B.Com (Computer Application)**	Semester	**VI**
Course Title	**PHP and MySQL Lab**		
Course Code:	**CA6.4**	No.ofCredits	**02**
Contact hours	**04Hoursperweek**	Duration of SEA/Exam	**2hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PART-A

1. Write a PHP script to compute addition and Multiplication of two matrices as a form input.
2. Write a PHP script to design Age calculator.
3. Write a PHP script to generate a Fibonacci series using Recursive function
4. Write a PHP program to insert new item in array on any position in PHP.
5. Write a PHP script to implement constructor and destructor
6. Write a PHP script to implement form handling using get method
7. Write a PHP script to implement form handling using post method
8. Write a PHP scripts that receive string as a form input.
9. Create a web application using PHP which receives a line of text and split it into words and in each of those words calculate number of letters, digits & special characters and display the result for each word. The application should also display the entire sentence by replacing a specific word with another word and represent the replaced word with uppercase letters.

PART-B

1. Write a PHP script to implement multiple inheritances.
2. .Create a web application that manages hotel reservations using Object Oriented PHP. Room no (primary key), Type of room (may take values like single semi, single deluxe, single ac, double semi, double deluxe, double ac, dormitory), capacity, and status (booked or available) must all be present in the database table. The webpage should list all of the rooms that are available for reservation. The user must enter the room number and the date when making a reservation. When a user checks in, the booking status must be changed to booked, and when they check out, the room status must be changed to available. The list of available rooms on the web page must be updated during both booking and check-out. The proper message must appear after a successful booking or check out. If the entered room number is not present or is not in the concerned status when booking or checking out, an appropriate message should be displayed.

3. Create a web application using Object Oriented PHP to insert manage library application in which user can insert a book information containing accession number (primary key), title, author, publication, no. of pages, price and availability status (issued or available). The user must be able to issue and return books depending on their accession number. If the book has already been issued, an appropriate message should be displayed; similarly, when returning a book, an appropriate message should be presented if the book has already been returned. If issue and return are successful, the success message must be displayed.
4. Create a web application using PHP which takes two non-numerically indexed arrays and append both if they have same elements and store the content of only one array in a file. If the arrays do not have same elements file should contain appended content of both the arrays.
5. Develop a PHP program to design a college admission form using MYSQL database.
6. To create a php page for login without using SQL connection.
7. Create a PHP page for login system using session.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Progra mName	**B.Com (Computer Application)**	Semester	**VI**
CourseTitle	**R Programming(Theory)**		
CourseCode:	**CA6.5**	No.ofCredits	**03**
Contacthours	**42Hours**	DurationofSEA/Exam	**2hours**
FormativeAssessment Marks	**40**	SummativeAssessmentMarks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- CO1. Explore fundamentals of statistical analysis in R environment.
- CO2. Describe key terminologies, concepts and techniques employed in Statistical Analysis.
- CO3. Define Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.
- CO4. Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.
- CO5. Understand, Analyse, and Interpret Correlation Probability and Regression to analyse the underlying relationships between different variables.

Unit	Description	Hours
1	Introduction of the language, numeric, arithmetic, assignment, and vectors, Matrices and Arrays, Non-numeric Values, Lists and Data Frames, Special Values, Classes, and Coercion, Basic Plotting.	**10**
2	Reading and writing files, Programming, Calling Functions, Conditions and Loops: stand- alone statement with illustrations in exercise, stacking statements, coding loops, Writing Functions, Exceptions, Timings, and Visibility. Basic Data Visualization. Advanced graphics: plot customization, plotting regions and margins, point and click coordinate interaction, customizing traditional R plots, specialized text and label notation. Defining colors and plotting in higher dimensions, representing and using color, 3D scatter plots.	**10**
3	**Descriptive Statistics:** Types of Data, Nominal, Ordinal, Scale and Ratio, Measures of Central Tendency, Mean, Mode and Median,Percentailes,Quartiles, Measures of Variability,	**11**

	Mean Absolute Deviation Range, Inter-Quartile-Range, Standard Deviation,Z-Scores.Cofficient of Variation, Measure of shaper-Skewness and Kurtosis, Bar Chart, Pie Chart and Box Plot, Histogram, Frequency Polygon, Stem and Leaf Diagram. **Probability, Probability and Sampling Distribution:** Methods of assigning probability, Structure of probability, Marginal, union, joint and conditional probabilities. Discrete Probability Distributions: Binomial, Poisson, Continuous Probability Distribution, Normal Distribution, Uniform Distribution. Estimating the population mean using the and t-distribution..	
4	**Statistical Inference and Hypothesis Testing:** Types of Hypothesis, and Sample, Null and Alternate Hypothesis, Level of Significance, Type I and Type II Errors, One Sample t-Test, One Sample Proportion Test, Paired Sample t-Test, Independent Samples t-Test, Two Sample Proportion Tests, One Way Analysis of Variance and Chi Square Test. **Correlation and Regression:** Analysis of Relationship, Positive and Negative Correlation, Perfect Correlation, Karl Pearson Coefficient of Correlation, Correlation Matrix, Scatter Plots, Simple Regression Analysis.	**11**

Text Books:

1. Tilman M. Davies, "The book of R: A first course in programming and statistics", San Francisco, 2016.
2. Ken Black, Business Statistics, New Delhi, Wiley, 2013.

References:

1. Vishwas R. Pawgi, "Statistical computing using R software", Nirali prakashan publisher, e1 edition, 2022.
2. https://www.youtube.com/watch?v=KlsYCECWEWE
3. https://www.geeksforgeeks.org/r-tutorial/
4. https://www.tutorialspoint.com/r/index.html

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

CourseArticulationMatrix: Mapping of Course Outcomes(COs)with Program Outcomes (POs1-15)

CourseOutcomes(COs)/ProgramOutcomes(POs)	ProgramOutcomes(POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Explore fundamentals of statistical analysis in R environment.															
Describe key terminologies, concepts and techniques employed in Statistical Analysis.															
Define Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.															
Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.															
Understand, Analyse, and Interpret Correlation Probability and Regression to analyse the underlying relationships between different variable															

"The

"Statistical

ProgramName	**B.Com (Computer Application)**		Semester	**VI**
CourseTitle	**Project Work**			
CourseCode:	**CA6.6**		No.of Credits	**03**
Contact hours	**04 Hoursperweek**		Duration of SEA/Exam	**3 hours**
Formative AssessmentMarks		**40**	Summative Assessment Marks	**60**

PROJECT GUIDELINES

Preamble: Project work has been made a part of B.Com (CA) programme to give students exposure toSoftware development process. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices. As such, during the development of the project students shall involve themselves in all the stages of the Software Development life cycle (SDLC) Like Requirements analysis, systems design, software development/coding, testing and documentation, with an overall emphasis on the development ofreliable software systems. Since, the project work is a part of the Sixth semester, the students shall be advised to take up projects of real world software applications suggested by the faculty in-charge of project work. Topics thus chosen should be nontrivial, analytical and application-oriented. It must involve substantial original work or extension of already successfully completed work on the subject. Ready-made, pre-solved, off-the-shelf and pirated work shall not be entertained. Any attempt at plagiarism or use of unfair means will result in rejection of the work. All activitiesof the Project Development process must be time-bound and equal participation of all the team members are expected through out the Development process.

GENERAL GUIDELINES TO THE INSTITUTIONS

- Calendar of Project Work shall be announced before the commencement of the Sixth

Semester .Calendar should contain tentative schedules for the submission of Project Proposal, Project Acceptance, Project Synopsis,Problem Analysis Document,System Design Document, Database Design, Detailed Design, Coding and Testing, Final Report,Internal Assessment exams (at least two), Viva/Voce etc.

- Live/demonstrative projects can be undertaken in the college (in house) by identifying problems in consultation with the guides and thereby come up with

solutions either based on the technologies you have learnt in your studies or explore and adopt new technologies if they choose to do so. However, the project should demonstrate your understanding and ability to exploit and integrate the material you have learnt from the courses you have taken.

- Thereshallbenotmorethanthreemembersin aProjectteam.
- At least two internal assessment exams shall be conducted to evaluate the progress made bythe students at different stages of project work. Such exams may include written tests, document verification and presentations, work demonstration, group discussion, viva-voceetc. so as to objectively assess the understanding gained by the students in course of theirprojectwork.

PROJECT VALUATION

External and Internal Examiners together conduct project valuation objectively. To begin with, thefiner details about various points contained in the scheme of valuation may be conclusively agreed upon through mutual consultation. During project evaluation, a student shall present his/her workthrough live demonstration of the software application developed as a part of project. However, if live demonstration is notpossible due to the reason that some companies do not divulge source code on accoun t of ownership rights or copyrights, students may be Allowed to make Power Point presentation of their authentic works. In such cases, candidates shall produce necessary declarations issued by the companies/staff to this effect. However, students shall present their work inentirety. The primary objective of project evaluation shall be to assess the extent of effort that wasput in to meet the objectives of the project and also to gauge the understanding gained by the students in the course of their project work.While evaluating Project Reports,examiners shalls crutinize whether Software Development Life Cycle (SDLC) principles have been consistently followed in the project work and the same have been documented substantively in the Project Report.However,the relative and overall emphasis of these principles to a particular problem domain chosen may be taken into account so that project evaluations remain fairand objective.

SCHEMEOFVALUATIONANDMARKSDISTRIBUTION

<table>
<tr><th colspan="2"></th><th colspan="2">Particus</th><th>Marks</th></tr>
<tr><td colspan="5">InternalAssessment</td></tr>
<tr><td colspan="2"></td><td colspan="2">Progressassessmentat least two</td><td>40</td></tr>
<tr><td colspan="5">ProjectReportValuation:60marks</td></tr>
<tr><td rowspan="4">1</td><td colspan="4">Project Report – Documentation: : 40 marks</td></tr>
<tr><td>3.1</td><td>ProblemAnalysis</td><td rowspan="3">40</td></tr>
<tr><td>3.2</td><td>SystemDesign</td></tr>
<tr><td>3.3</td><td>DatabaseDesign</td></tr>
</table>

	3.4	DetailedDesign	
	3.5	Implementation	
	3.6	Testing	
	Othermandatorydocuments&information (certificates,contents,tables,figures, bibliographyetc.)		
Final Viva-Voce:20 marks			
2	**LiveDemonstration** – demonstrating all the features and utilities of the Application developed (Software Run) or Dryruns(Presentation of authentic screenshots or captured videos may be used to walk through variouss cenarios)		10
3	**Viva-Voce (Oral/Oral and written)**		10
TotalMarks			**60**

MANGALORE UNIVERSITY

National Education Policy – 2020
[NEP-2020]

CURRICULUM STRUCTURE

FOR

V AND VI SEMETER B.Sc.
COMPUTER SCIENCE

Program: B.Sc Subject: Computer Science

Model Curriculum for B.Sc

Semester	Course No	Theory/Practical	Credits	Paper Title	S.A	L.A
V	DSC5	Theory	4	Programming in Python	60	40
	DSC5-Lab	Practical	2	Python Programming Lab	25	25
	DSC6	Theory	4	Computer Networks	60	40
	DSC6-Lab	Practical	2	Computer Networks Lab	25	25
	SEC-4	Theory/Practical	**2**	Cyber Security	25	25
VI	DSC8	Theory	4	Web Technologies	60	40
	DSC8-Lab	Practical	**2**	Web Technologies Lab – Java Script, HTMS, CSS Lab	25	25
	DSC9	Theory	4	Statistical Computing & R Programming	60	40
	DSC9-Lab	Practical	**2**	R Programming Lab	25	25
	SEC-5	Theory/Practical	**2**	Logical Reasoning	25	25

V SEMESTER

Program Name	B.Sc	Semester	**V**
Course Title	**Programming in Python (Theory)**		
Course Code:	**DSC5**	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**

Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Setup python to develop simple applications
- Understand the basic concepts in Python Programming
- Learn how to write, debug and execute Python programs
- Understand and demonstrate the use of advanced data types such as tuples, dictionaries and lists, Tuples and Sets
- Design solutions for problems using object-oriented concepts in Python
- Use and apply the different Python Libraries for GUI Interface, Data Analysis and Data Visualization.
- Extend the knowledge of python programming to build successful career in software development.

Unit	Description	52 Hours
1	**Introduction to Features and Applications of Python;** Python Versions; Installation of Python; Python Command Line mode and Python IDEs; Simple Python Program. **Python Basics:** Identifiers; Keywords; Statements and Expressions; Variables; Operators; Precedence and Association; Data Types; Indentation; Comments; Built-in Functions-Console Input and Console Output, Type Conversions; Python Libraries; Importing Libraries with Examples. **Python Control Flow:** Types of Control Flow; Control Flow Statements- if, else, elif, while loop, break, continue statements, for loop Statement; range () and exit () functions. **Exception Handling:** Types of Errors; Exceptions; Exception Handling using try, except and finally. **Python Functions:** Types of Functions; Function Definition-Syntax, Function Calling, Passing Parameters/arguments, the return statement; Default Parameters; Command line	13

	Arguments; Key Word Arguments; Recursive Functions; Scope and Lifetime of Variables in Functions	
2	**Strings:** Creating and Storing Strings; Accessing Sting Characters; the str() function; Operations on Strings- Concatenation, Comparison, Slicing and Joining, Traversing; Format Specifies; Escape Sequences; Raw and Unicode Strings; Python String Methods. **Lists:** Creating Lists; Operations on Lists; Built-in Functions on Lists; Implementation of Stacks and Queues using Lists; Nested Lists. **Dictionaries:** Creating Dictionaries; Operations on Dictionaries; Built-in Functions on Dictionaries; Dictionary Methods; Populating and Traversing Dictionaries. **Tuples and Sets:** Creating Tuples; Operations on Tuples; Built-in Functions on Tuples; Tuple Methods; Creating Sets; Operations on Sets; Built-in Functions on Sets; Set Methods.	13
3	**File Handling:** File Types; Operations on Files– Create, Open, Read, Write, Close Files; File Names and Paths; Format Operator. **Object Oriented Programming:** Classes and Objects; Creating Classes and Objects; Constructor Method; Classes with Multiple Objects; Objects as Arguments; Objects as Return Values; Inheritance- Single and Multiple Inheritance, Multilevel and Multipath Inheritance; Encapsulation- Definition, Private Instance Variables; Polymorphism- Definition, Operator Overloading. **GU Interface:** The tkinter Module; Window and Widgets; Layout Management- pack, grid and place	13
4	**Python SQLite:** The SQLite3 module; SQLite Methods- connect, cursor, execute, close; Connect to Database; Create Table; Operations on TablesInsert, Select, Update. Delete and Drop Records. **Data Analysis:** NumPy- Introduction to NumPy, Array Creation using NumPy, Operations on Arrays; Pandas- Introduction to Pandas, Series and DataFrames, Creating DataFrames from Excel Sheet and .csv file, Dictionary and Tuples. Operations on DataFrames.	13

	Data Visualisation: Introduction to Data Visualisation; Matplotlib Library; Different Types of Charts using Pyplot- Line chart, Bar chart and Histogram and Pie chart	

Text Books

1. Introduction to Python Programming, Gowrishankar S et al., CRC Press, 2019.
2. R. Nageswara Rao, ―Core Python Programming‖, dreamtech.

References:

3. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition, Green Tea Press. Freely available online @ https://www.greenteapress.com/thinkpython/thinkCSpy.pdf, 2015.
4. Introduction to Python Programming, Gowrishankar S et al., CRC Press, 2019.
5. Python Data Analytics: Data Analysis and Science Using Pandas, matplotlib, and the Python Programming Language, Fabio Nelli, Apress®, 2015
6. Advance Core Python Programming, MeenuKohli, BPB Publications, 2021.
7. Core PYTHON Applications Programming, Wesley J. Chun, 3rd Edition, Prentice Hall, 2012.
8. Automate the Boring Stuff, Al Sweigart, No Starch Press, Inc, 2015.
9. Data Structures and Program Design Using Python, D Malhotra et al., Mercury
   Learning and Information LLC, 2021.
10. http://www.ibiblio.org/g2swap/byteofpython/read/
11. https://docs.python.org/3/tutorial/index.html

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

CourseOutcomes(COs)/ProgramOutcomes(POs)	ProgramOutcomes(POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss Python programming Basics															
Describe Python Control Flow															
Discuss ExceptionHandling.															
Discuss fundamental concepts of object-oriented programming.															
Discuss usage of strings, lists, tuples and sets															
Discuss file handling															
Discuss design of GUI															
Discuss SQlite database															
Discuss data analysis, data visualization using Python.															

Program Name	B.Sc	Semester	**V**
Course Title	**Python Programming Lab (Practical)**		
Course Code:	**DSC5-Lab**	No.of Credits	**02**
Contact hours	**04 Hours**	Duration of SEA/Exam	**3 hour**
Formative Assessment Marks	**25 Marks**	Summative Assessment Marks	**25 Marks**

S.L NO	**PROGRAM** **PART-A**
1.	Write a program create list with N elements. find all unique elements in the list. If an element is found only once in the list, then add that element to the unique list.
2.	Program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
3.	Consider a tuple t1= (1,2,5,7,9,2,4,6,8,10). Write a program to perform following operations: a. Print half the values of tuple in one line and the other half in the next line. b. Print another tuple whose values are even numbers in the given tuple. c. Concatenate a tuple t2= (11,13,15) with t1. d. Return maximum and minimum value from this tuple.
4.	Write a function that takes a sentence as input from the user and calculates the frequency of each letter. Use a variable of dictionary type to maintain the count.
5.	Write a function nearly equal to test whether two strings are nearly equal. two strings a and b are nearly equal if one character change in b results in string a.
6.	Write a program to create a text file and compute the number of characters, words and lines in a file.
7.	Program using user defined exception class that will ask the user to enter a number until he guesses a stored number correctly. To help them figure it out, a hint is provided whether their guess is greater than or less than the stored number

	using user defined exceptions.
8.	Write a Pandas program to join the two given data frames along rows. Sample Data frame may contain details of student like rollno , name , Total Marks.
1.	Program to create a class Employee with empno, name, depname, designation, age and salary and perform the following function. i) Accept details of N employees ii) Search given employee using empno iii) Display employee details in neat format.
2.	Write a program menu driven to create a BankAccount class. class should support the following methods for i) Deposit ii) Withdraw iii) GetBalanace . Create a subclass SavingsAccount class that behaves just like a BankAccount, but also has an interest rate and a method that increases the balance by the appropriate amount of interest.
3.	Create a GUI to input Principal amount, rate of interest and number of years, Calculate Compound interest. When button submit is pressed Compound interest should be displayed in a textbox. When clear button is pressed all contents should be cleared.
4.	Write a GUI program to implement Simple Calculator
5.	Create a table student table (regno, name and marks in 3 subjects) using MySQL and perform the followings a. To accept the details of students and store it in database. b. To display the details of all the students c. Delete particular student record using regno.
6.	Create a table employee (empno, name and salary) using MySQL and perform the followings a. To accept the details of employees and store it in database. b. To display the details of a specific employee c. To display employee details whose salary lies within a certain range
7.	Create a table electricity_bill(TariffCode, Customer_Name, Meter Number, Previous_Reading and Current_Reading) using MySQL and perform the followings

a. To accept the details of employees and store it in database.

b. To Update the Customer details by Meter Number.

c. Calculate Bill of Particular Customer using below criteria.

Tariff Code	Units Consumed	Rate/Unit
LT1	0-30	2.0
	31-100	3.5
	101-200	4.5
	Above 200	5.0
LT2	0-30	3.5
	31-100	5.0
	101-200	6.0
	Above 200	7.5

8. Consider following data and draw the bar graph using matplot library.(Use CSV or Excel).Add the data Using GUI.

Batsman	**2017**	**2018**	**2019**	**2020**
Virat Kohli	2501	1855	2203	1223
Steve Smith	2340	2250	2003	1153
Babar Azam	1750	2147	1896	1008
Rohit Sharma	1463	1985	1854	1638
Kane Williamson	1256	1785	1874	1974
Jos Butler	1125	1853	1769	1436

Display appropriate title for axis and chart. Also show legends.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**B.Sc**	Semester	**V**
Course Title	**Computer Networks (Theory)**		
Course Code:	**DSC6**	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

- After the successful completion of the course, the student will be able to:
- Define various data communication components in networking.
- Describe networking with reference to different types of models and topologies.
- Understand the need for Network and various layers of OSI and TCP/IP reference model.
- Explain various Data Communications media.
- Describe the physical layer functions and components CO6 Identify the different types of network topologies and Switching methods.
- Describe various Data link Layer Protocols.
- Identify the different types of network devices and their functions within a network.
- Analyze and interpret various Data Kink Layer and Transport Layer protocols.
- Explain different application

Unit	**Description**	**52 Hours**
1	**Introduction: Uses of Computer Networks and its Applications**-Business Applications, Home Applications, Mobile Users, Social Issues. **Network Toplogies**:Bus,Star,Ring **Network Hardware**-Local Area Networks, Metropolitan Area Networks, Wide Area Networks, and Internetworks. **Reference Models**-The OSI Reference Model, The TCP\IP Reference Model,A Comparison of the OSI and TCP Reference Models.	13

2	**The Physical Layer**: **Transmission Media**- Twisted Pair, Coaxial Cable and Fiber Optics. **Wireless Transmission**- Radio Transmission, Microwave Transmission, Infrared, Light Transmission.Multiplexing-Frequency division, time division, code division, Switching. **The Data Link Layer: Data** link layer design issues-Services Provided to the Network Layer, Framing, Error Control, and Flow Control.Error Detection and Correction-Error-Correcting Codes, Error –Detecting Codes.Elementary Data Link Protocols-An Unrestricted Simplex Protocol, A Simplex Stop-and-Wait Protocol for an Error-Free Channel, A Simplex Protocol for a Noisy Channel.Sliding Window Protocols –A One Bit Sliding Window Protocol, A Protocol Using Go back n, A Protocol using Selective Repeat.	13
3	**The Network Layer:** Network layer design issues-Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service,Implementation of Connection-Oriented Service, Comparison of Virtual Circuit and Datagram Networks.Routing Algorithms-Flooding, Distance Vector Routing, Link State Routing,Hierarchical ,Routing,Broadcast Routing, Multicast Routing, Anycast Routing.Congestion Control Algorithms-Approaches to Congestion Control, Approaches to Congestion Control, Admission Control.The network layer in the Internet-The IP Version 4 Protocol, IP Address, IP Version 6,Internet Control Protocol, The Interior Gateway Routing Protocol: OSPF,The Exterior Gateway Routing Protocol: BGP.	13
4	**The Transport Layer:** The Transport Service-Services Provided to the Upper Layers.Elements of Transport Protocols-Addressing, Connection Establishment, connection Release, Error control and Flow Control.The Internet Transport Protocols-(TCP and UDP)-UDP- Introduction to UDP, Remote Procedure Call, Real-Time Transport Protocols, TCP- Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, TCP Connection Management Modeling, TCP Sliding Window, **The Application Layer:** DNS – Domain Name System-The DNS Name Space, Domain Resource Records, Name Servers.Electronic Mail-Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery, The Word Wide Web- Architectural Overview,Static Web Pages,	13

	Dynamic Web Pages and Web Applications, HTTP—The HyperText Transfer Protocol	

Text Book

1. Computer Networks, Andrew S. Tanenbaum, 5th Edition, Pearson Education, 2010.

References:

2. Data Communication & Networking, Behrouza A Forouzan, 3rd Edition, Tata McGraw Hill, 2001.
3. Data and Computer Communications, William Stallings, 10th Edition, Pearson Education, 2017.
4. Data Communication and Computer Networks, Brijendra Singh, 3rd Edition, PHI, 2012.
5. Data Communication & Network, Dr. Prasad, Wiley Dreamtech.
6. http://highered.mheducation.com/sites/0072967757/index.htmls

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the Computer Networks.															
Study about OSI reference mode.															
Study about TCP/IP reference mod															
Describe various problems using Decrease-and-Conquer.															
Discuss various Network layer protocol															

Program Name	**B.Sc.**	Semester	**V**
Course Title	**Computer Networks Laboratory (Practical)**		
Course Code:	**DSC6 Lab**	No.of Credits	**02**
Contact hours	**04 Hours per week**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PART-A

1. Implement connecting two nodes using network simulator.
2. Implement connecting three nodes considering one node as a central node using network simulator.
3. Implement star topology using network simulator.
4. Implement Bus Topology using network simulator
5. Implement ring topology using network simulator
6. Simulate and to study stop and Wait protocol using network simulator.
7. Simulate and to study SLIDING WINDOW PROTOCOL using network simulator.
8. To simulate and study the Distance Vector routing algorithm using simulation.
9. To simulate and study the link state routing algorithm using simulation.

PART-B

10. To Simulate and to study of Go Back N protocolusing network simulator
11. To Simulate and to study of SELECTIVE REPEAT using network simulator
12. Write a java Program to study the client/server model of socket programming.
13. Write a Java program to implement ping command.
14. Implement connecting multiple routers and nodes and building a Hybrid topology network simulator
15. Demonstrate the use of wireless LAN using network simulator.
16. Write a Java Program to implement Data encryption and decryption
17. Write a Java program to implement error detection and error correction technique

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Links for open source simulation software:

o NS3 software: https://www.nsnam.org/releases/ns-3-30/download/

o Packet Tracer Software: https://www.netacad.com/courses/packet-tracer

o GNS3 software: https://www.gns3.com/

Links for open source simulation software:

https://www.nsnam.com/2018/06/installation-of-ns2-in-ubuntu-1804.html#:~:text=Unlike%20earlier%20version%20of%20ubuntu,then%20ns2%20and%20then%20configuration

https://www.howtoinstall.me/ubuntu/18-04/nam/

Program Name	**BSC**	Semester	**V**
Course Title	**Cyber Security (Theory)**		
Course Code:	**SEC-5**	No.of Credits	**02**
Contact hours	**30 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**30**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1: Understand the concept of Cyber security and issues and challenges associated with it.

CO2: Understand the cybercrimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures.

CO3: Appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

CO4: On completion of this course, students should be able to appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

Module	Description	Hours
1	**Introduction to Cyber security**: Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.	**10**
2	**Cybercrime and Cyber law:** Classification of cybercrimes, Common cyber-crimes- cyber-crime targeting computers and mobiles, cyber-crime against women and children, financial frauds, social engineering attacks, malware and ransom ware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, Reporting of cyber-crimes, Remedial and mitigation measures, Legal perspective of cyber-crime, IT Act 2000 and its amendments, Cyber-crime and offences, Organizations dealing with Cybercrime and Cyber security in India, Case studies.	**10**
3	**Social Media Overview and Security**: Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies.	**10**
	Practicals: 1. Checklist for reporting cyber crime at Cyber crime Police Station. 2. Checklist for reporting cyber crime online. 3. Reporting phishing emails. 4. Demonstration of email phishing attack and preventive measures. 5. Setting, configuring and managing three password policy in the computer (BIOS, Administrator and	

	Standard User). 6. Setting and configuring two factor authentication in the Mobile phone. 7. Security patches management and updates in Computer and Mobiles. 8. Managing Application permissions in Mobile phone. 5. Installation and configuration of computer Anti-virus. 9. Installation and configuration of Computer Host Firewall. 10. Wi-Fi security management in computer and mobile	

Text Books:

1. Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010

References

1. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
2. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001
3. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd
4. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
5. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
6. Fundamentals of Network Security by E. Maiwald, McGraw Hill.

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes

Course Out comes(COs) /Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Quickly understand the given problem and come up with the correct answer															
Identify, construct and compute numerical situations by work with numbers															
Conceive and develop a methodology for analyzing data and solving a problem.															
Define, modify and apply critical thinking to real time situations.															

QUESTION PAPER PATTERN

Skill Enhancement Course

CYBER SECURITY

V SEMESTER

COMMON TO ALL

Duration: 2 Hour Max.Marks:30

Module-1

Answer any five questions from Eight (2x5 = 10)

Module-2

Answer any five questions from Eight (2x5 = 10)

Module-3

Answer any five questions from Eight (2x5 = 10)

Program Name	**B.Sc.**	Semester	**VI**
Course Title	**Web Technologies (Theory)**		
Course Code:	**DSC8**	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:
CO1 Understand basics of web technology
CO2 Recognize the different Client-side Technologies and tools like, HTML, CSS, JavaScript
CO3 Learn Java Servlets and JDBC
CO4 Web Technology for Mobiles and Understand web security

Unit	Description	Hours
1	**Introduction and Web Design:** Introduction to Internet, WWW and Web 2.0,Web browsers, Web protocols and Web servers, Web Design Principles and Web site structure, client-server technologies, Client side tools and technologies, Server side Scripting, URL, MIME, search engine, web server- Apache, IIS, proxy server, HTTP protocol. Introductions to HTML. HTML5 Basics tags, Formatting tags in HTML, HTML5 Page layout and Navigation concepts,Semantic Elements in HTML, List, type of list tags, tables and form tags in HTML, multimedia basics, images, iframe, map tag, embedding audio and video clips on webpage.	**11**
2	**Introduction to XML:** XML Syntax, XML Tree, Elements, Attributes, Namespace, Parser, XSLT DOM, DTD, Schema. Introduction to CSS, CSS syntax, CSS selectors, CSS Background Cursor, CSS text fonts, CSS-List Tables, CSS Box Modeling, Display Positioning, Floats, CSS Gradients, Shadows, 2D and 3 Transform, Transitions, CSS Animations.	**11**

3	**Introduction to JavaScript:** JavaScript Data type and Variables, JavaScript Operators, Conditional Statements, Looping Statements, JavaScript Functions, Number, Strings, Arrays, Objects in JavaScript, Window and Frame objects, Event Handling in JavaScript, Exception Handling, Form Object and DOM, JSON, Browser Object Model.	**11**
4	**Introduction to Servlets**: Common Gateway Interface (CGI), Lifecycle of a Servlets, deploying a Servlets, The Servlets API, Reading Servlets parameters, reading initialization parameters, Handling HTTP Request & Responses, Using Cookies and sessions, connecting to a database using JDBC. **Web Security:** Authentication Techniques, Design Flaws in Authentication, Implementation Flaws in Authentication, Securing Authentication, Path Traversal Attacks. Injecting into Interpreted Contexts, SQL Injection, NoSQL Injection, XPath Injection, LDAP Injection, XML Injection, HTTP Injection, Mail Service Injection. Types of XSS, XSS in Real World, Finding and Exploiting XSS Vulnerabilities, Preventing XSS Attacks.	**11**

References

1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dremtech
2. Java Server Pages – Hans Bergsten, SPD O'Reilly
3. Java Script, D.Flanagan, O'Reilly, SPD
4. Beginning Web Programming-Jon Duckett WROX.
5. Web Applications : Concepts and Real World Design, Knuckles, Wiley-India
6. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the HTML 5.															
Study about various concepts about XML.															
How to write Java Script.															
Describe various programming constructs about Java Script.															
Discuss Servelts.															

Program Name	**B.Sc.**	Semester	**VI**
Course Title	**Statistical Computing & R Programming(Theory)**		
Course Code:	**DSC9**	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

CO1 Explore fundamentals of statistical analysis in R environment.

CO2 Describe key terminologies, concepts and techniques employed in Statistical Analysis.

CO3 Define Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.

CO4 Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.

CO5 Understand, Analyse, and Interpret Correlation Probability and Regression to analyse the underlying relationships between different variables.

Unit	Description	Hours
1	Introduction of the language, numeric, arithmetic, assignment, and vectors, Matrices and Arrays, Non-numeric Values, Lists and Data Frames, Special Values, Classes, and Coercion, Basic Plotting.	**13**
2	Reading and writing files, Programming, Calling Functions, Conditions and Loops: stand- alone statement with illustrations in exercise, stacking statements, coding loops, Writing Functions, Exceptions, Timings, and Visibility. Basic Data Visualization.	**13**
3	**Descriptive Statistics:** Types of Data, Nominal, Ordinal, Scale and Ratio, Measures of Central Tendency, Mean, Mode and Median,Percentailes,Quartiles, Measures of Variability, Mean Absolute Deviation Range, Inter-Quartile-Range, Standard Deviation,Z-Scores.Cofficient of Variation, Measure of shaper-Skewness and Kurtosis, Bar Chart, Pie Chart and	**13**

	Box Plot, Histogram, Frequency Polygon, Stem and Leaf Diagram. **Probability, Probability and Sampling Distribution:** Methods os assigning probability, Structure of probability, Marginal, union, joint and conditional probabilities. Discrete Probability Distributions: Binomial, Poisson, Continuous Probability Distribution, Normal Distribution, Uniform Distribution. Estimating the population mean using the and t-distribution..	
4	**Statistical Inference and Hypothesis Testing:** Types of Hypothesis, and Sample, Null and Alternate Hypothesis, Level of Significance, Type I and Type II Errors, One Sample t-Test, One Sample Proportion Test, Paired Sample t-Test, Independent Samples t-Test, Two Sample Proportion Tests, One Way Analysis of Variance and Chi Square Test. **Correlation and Regression:** Analysis of Relationship, Positive and Negative Correlation, Perfect Correlation, Karl Pearson Coefficient of Correlation, Correlation Matrix, Scatter Plots, Simple Regression Analysis.	**13**

Text Books:

1. Tilman M. Davies, "The book of R: A first course in programming and statistics", San Francisco, 2016.
2. Ken Black, Business Statistics, New Delhi, Wiley, 2013.

References:

1. Vishwas R. Pawgi, "Statistical computing using R software", Nirali prakashan publisher, e1 edition, 2022.
2. https://www.youtube.com/watch?v=KlsYCECWEWE
3. https://www.geeksforgeeks.org/r-tutorial/
4. https://www.tutorialspoint.com/r/index.html

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

CourseOutcomes(COs)/ProgramOutcomes(POs)	ProgramOutcomes(POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Explore fundamentals of statistical analysis in R environment.															
Describe key terminologies, concepts and techniques employed in Statistical Analysis.															
Define Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.															
Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.															
Understand, Analyse, and Interpret Correlation Probability and Regression to analyse the underlying relationships between different variable															

Program Name	**B.Sc.**	Semester	**VI**
Course Title	**R Programming Lab**		
Course Code:	**DSC9-Lab**	No.of Credits	**02**
Contact hours	**04 Hours per week**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PART – A

1. Write a R program to create two 3 X 3 matrices A and B and perform the following Operations.
   a) Transpose of the matrix
   b) addition
   c) Subtraction.
   d) Multiplication
   e) Inversion
   f) A.B
   g) $A^T.B$
   h) $B^T.(A.A^T)$
   i) $(A.A^T). B^T$
   j) $[(B.B^T)+ (A.A^T)-100I_3]^{-1}$
2. Write a R program to create vector of 15 values as an object in your workspace: c(6,9,7,3,6,7,9,6,3,6,6,7,1,9,1). Identify the following elements:
   i. Those equal to 6
   ii. Those greater than or equal to 6
   iii. Those less than 6 + 2
   iv. Those not equal to 6

3. Write R program to find roots of quadratic equation using user defined function. Test the program user supplied values for all possible cases.
4. Write R program to generate first n prime numbers.
5. Write R program to solve

$$\sum_{i=1}^{10}\sum_{j=1}^{i}\frac{i^4}{(3+ij)}$$

6. Write R program to simulate Towers of Hanoi for n disks

7. Write R program to generate n Fibonacci numbers

8. Write an R program to create a list containing strings, numbers, vectors and logical values and do the following manipulations over the list.
   a. Access the first element in the list
   b. Give the names to the elements in the list
   c. Add element at some position in the list
   d. Remove the element
   e. Print the fourth element
   f. Update the third element

9. Write a R program to create a Vector containing following 8 values and perform the following operations.

   4 3 0 5 2 9 4 5

   a. Find mean, median, mode.
   b. Find the range.
   c. Find the 35^{th} and 78^{th} percentile.
   d. Find the mean absolute deviation.
   e. Find the variance and standard deviation
   f. Find the sample standard deviation.
   g. Find the interquartile range.
   h. Find the z-score for each value.

10. Create a new list with the factor vector from (a) as a component named "facs"; the numeric vector c(3,2.1,3.3,4,1.5,4.9) as a component named "nums"; and a nested list comprised of the first three members of the list from (a) (use list slicing to obtain this), named "oldlist". Then, do the following:
    i. Extract the elements of "facs" that correspond to elements of "nums" that are greater than or equal to 3.
    ii. Add a new member to the list named "flags". This member should be a logical vector of length 6, obtained as a twofold repetition of the third column of the logical matrix in the "oldlist" component.
    iii. Use "flags" and the logical negation operator ! to extract the entries of "num" corresponding to FALSE.
    iv. Overwrite the character string vector component of "oldlist" with the single character string "Don Quixote".

11. Create and store this data frame as dframe in your R workspace:

Person	**Sex**	**Funny**
Stan	M	High

Francine	F	Med
Steve	M	Low
Roger	M	High
Hayley	F	Med
Klaus	M	Med

The variables person, sex, and funny should be identical in nature to the variables in the mydata object studied throughout Section 5.2. That is, person should be a character vector, sex should be a factor with levels F and M, and funny should be a factor with levels Low, Med, and High.

12. Write an R program to create a Data Frame with following details and do the following operations.

itemCode	**itemCategory**	**ItemPrice**
1001	Electronics	700
1002	Desktop Supplies	300
1003	Office Supplies	350
1004	USB	400
1005	CD Drive	800

a. Subset the Data frame and display the details of only those items whose price is greater than or equal to 350.
b. Subset the Data frame and display only the items where the category is either "Office Supplies" or "Desktop Supplies"
c. Create another Data Frame called "item-details" with three different fieldsitemCode, ItemQtyonHand and ItemReorderLvl and merge the two frames.

13. Let us use the built-in dataset air quality which has Daily air quality measurements in New York, May to September 1973. Create a histogram by using appropriate arguments for the following statements.
a. Assigning names, using the air quality data set.
b. Change colors of the Histogram
c. Remove Axis and Add labels to Histogram
d. Change Axis limits of a Histogram
e. Create a Histogram with density and Add Density curve to the histogram

14. Design a data frame in R for storing about 20 employee details. Create a CSV file named "input.csv" that defines all the required information about the employee such as id, name, salary, start_date, dept. Import into R and do the following analysis.
    i. Find the total number rows & columns
    ii. Find the maximum salary
    iii. Retrieve the details of the employee with maximum salary
    iv. Retrieve all the employees working in the IT Department
    v. Retrieve the employees in the IT Department whose salary is greater than 20000 and write these details into another file "output.csv".

15. Create a dataset or table ['Smart Phone"] in an excel sheet that stores the mobile information [price, company name, model, SalePercent] of five different companies. Store at least 20 rows. Write the scripts and find out the output for the following information.
    a. Maximum price of the mobile of each company
    b. Minimum price of mobile of each company
    c. Average price of mobile of each company
    d. Total Price of mobile of each company

16. The Tooth Growth data are from a study which examined the growth of teeth in guinea pigs (n=10) in response to three dose levels of Vitamin C (0.5, 1, and 2 mg), which was administered using two delivery methods (orange juice or ascorbic acid). Data from the Tooth Growth Study is available as an R dataset and information about this study can be found by using R help.
    i. How many rows are there is ToothGrowth?
    ii. What is the mean and standard deviation of Tooth length
    iii. Which treatment is the best in terms of toothgrowth? Derive the findings based on correlation between Dosage and Length for both supplements.

17. Using the built in dataset mtcars which is a popular dataset consisting of the design and fuel consumption patterns of 32 different automobiles. The data was extracted from the 1974 Motor Trend US magazine, and comprises fuel consumption and 10 aspects of automobile design and performance for 32 automobiles (1973-74 models).
    Format
    A data frame with 32 observations on 11 variables
    [1] mpg Miles/(US) gallon, [2] cyl Number of cylinders
    [3] disp Displacement (cu.in.), [4] hp Gross horsepower
    [5] drat Rear axle ratio,[6] wt Weight (lb/1000)
    [7] qsec 1/4 mile time, [8] vs V/S, [9] am Transmission (0 = automatic, 1 = manual), [10] gear Number of forward gears, [11] carb Number of carburetors
    Answer the following using the functions from stats package.
    a. What is the total number of observations and variables in the dataset?

b. Plot three distributions for each variable and determine whether continuous variables are normally distributed or not. If not, what is their skewness?
c. What is the average difference of gross horse power(hp) between automobiles with 3 and 4 number of cylinders(cyl)? Also determine the difference in their standard deviations.
d. Which pair of variables has the highest Pearson correlation?
e. select quintiles by percent
f. create histogram for frequency

18. Using the built in dataset mtcars to perform the following operations
    i. Draw scatter plot for Miles Vs. Weight
    ii. Find Krl Pearson coefficient of correlation between mpg and wt variables
    iii. Find the type of correlation

19. Using the given Salary data set, perform simple Linear regression analysis.
    Note: Use the following file and package: Salary_Data.csv file, caTools package
    a. Split the given dataset using the given training dataset.
    b. Find the Linear Simple Regression to the Training Dataset.
    c. Predict the best set results
    d. Visualizing the Training Set results
    e. Visualizing the Test Set Results

20. Write R program to create data frame for given data set and perform following operations.

Data set:

Name	**Age**	**City**
Raja	25	Delhi
Mike	30	Parris
Pinky	35	Canada
Jane	28	Pune

i) Display the created dataframe
ii) Display Only Name
iii) Display data of Jane
iv) Display Names whose age is >28
v) Add a column Salary with data: 10000,20000,12000 and 34000
vi) Display summary
vii) Display average salary

viii) Display mean age
ix) Sort by age
x) Export the data frame to a CSV file emp.csv
xi) Find minimum and maximum salary.

21. Use of library (standard data set-iris)
    i. Import the `iris` dataset
    ii. Print the first 6 rows of the data frame
    iii. Get the column names of the data frame
    iv. Calculate the mean, standard deviation, minimum, and maximum of the Sepal.Length column
    v. Create a new data frame that only contains the Sepal.Length and Petal.Length columns
    vi. Plot the Sepal.Length and Petal.Length columns
    vii. Save the new data frame to a file
    viii. create a histogram for Sepal length
    ix. draw scatter plot for Sepal length and width
    x. draw box plot for each species.
    xi. Draw bar chart for species count.
    xii. Draw line chart for Sepal length and width
    xiii. Draw pie chart for species.

22. You have a dataset containing the monthly sales revenue for different products in a store. Use the **sapply** function in R to calculate the total revenue, maximum and average generated by each product category.

Category = c("Electronics", "Clothing", "Home Decor"),
Jan = 2500, 1500, 1800
Feb =3000, 2000, 2200
Mar = 2800, 1800, 2100

Expected Answer:

	Category	MaxSales
1	Electronics	3000
2	Clothing	2000
3	Home Decor	2200

Total:

	Category	Total
1	Electronics	8300
2	Clothing	5300
3	Home Decor	6100

23. You are organizing a marathon event and have a list of registered participants along with their corresponding ages and t-shirt sizes. Using the **mapply** function in R, write a code to generate a table that displays the participant name, age, t-shirt

size, and a flag indicating if the t-shirt size is appropriate for their age group. Assume that participants below 18 years old should receive a "Youth" size t-shirt, while participants 18 years and older should receive an "Adult" size t-shirt. Use function to check size;

participants [
  Name = "John", "Emma", "David", "Sophia", "Michael"
  Age = 20, 16, 25, 14, 19
TShirtSize = "Adult", "Youth", "Adult", "Youth", "Adult"
]

Expected Answer:

	Name	Age	TShirtSize	AppropriateSize
1	John	20	Adult	Yes
2	Emma	16	Youth	Yes
3	David	25	Adult	Yes
4	Sophia	14	Youth	Yes
5	Michael	19	Adult	Yes

24. Write R script for the following

a) Perform the following using binomial distribution
   i. If n=4 and p=0.10 , find P(x=3)
   ii. If n=10 and p=0.8 , find P(x>=7)
   iii. If n=12 and p=0.45, find P(5<=x<=7)

b) Perform the following using poisson distribution
   i. $P(x=5|\lambda=2.3)$
   ii. $P(x\leq 2|\lambda=4.1)$
   iii. $P(x=0|\lambda=2.7)$

c) Perform the following using uniform distribution between 200 and 240
   i. $P(x>230)$
   ii. $P(205\leq x\leq 220)$

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**B.Sc**	Semester	**VI**
Course Title	**Logical Reasoning**(Theory)		
Course Code:	**SEC-5**	No.of Credits	**02**
Contact hours	**30 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**30**	Summative Assessment Marks	**20**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1- Quickly understand the given problem and come up with the correct answer

CO2 -Identify,constructandcomputenumericalsituationsbyworkwithnumbers

CO3 -Conceiveanddevelopamethodologyforanalyzingdataandsolvingaproblem

CO4 -Define, modify and apply critical thinking to real time situations

Unit	Description	Hours
1	**Arithmetic Reasoning**: Analytical Thinking, Syllogistic Logic, Problem solving; Number System; LCM &HCF; Divisibility Test; Surds and Indices; Logarithms; Ratio, Proportions and Variations; Partnership; Time speed and distance; work time problems;	**10**
2	**Data Interpretation:** Numerical Data Tables; Line Graphs; Bar Charts and Pie charts; Mix Diagrams; Geometrical Diagrams, and other forms of Data Representation	**10**
3	**Lateral Thinking, Reasoning & Logic**: Verbal and Non-verbal Logic, Family Tree; Linear Arrangements; Circular and Complex Arrangement; Conditionality and Grouping; Sequencing and Scheduling; Selections; Networks; Venn Diagram in Logical Reasoning.	**10**

References

1 R.S.Aggarwal- ―A Modern Approach to Verbal and Non–Verbal Reasoning‖ Sultan Chand and Sons, New Delhi

2 R.S.Aggarwal–―Quantitative Aptitude‖, Sultan Chand and Sons, New Delhi

3 Dr.Ravi Chopra – ―Verbal and Non–Verbal Reasoning‖, MacMillan India

4 Dr.Edward DeBono – ―Lateral Thinking‖, Penguin Books, New Delhi

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the Logical Reasoning.															
Describe about Lateral Thinking															
Discuss various problems using Data Interpretation															
Describe various problems using HCF and LCM.															
Describe various problems using Number System															
Discuss Verbal and Non-verbal logic.															

MANGALORE UNIVERSITY

National Education Policy – 2020
[NEP-2020]

CURRICULUM STRUCTURE

FOR

V AND VI SEMETER BCA

CURRICULUM STRUCTURE FOR V AND VI SEMETER BCA

Semester	Course No	Theory/Practical	Credits	Paper Title	S.A	L.A
V	DSC13	Theory	4	Design & Analysis of Algorithms	60	40
	DSC13-Lab	Practical	2	Design & Analysis of Algorithms Lab	25	25
	DSC14	Theory	4	Statistical Computing and R Programming	60	40
	DSC14-Lab	Practical	2	R Programming Lab	25	25
	DSC15	Theory	4	Software Engineering	60	40
	DSE-E1	Theory	3	A. Cloud Computing B. Business Intelligence	60	40
	Voc-1	Theory	3	Digital Marketing	60	40
	SEC-4	Theory/Practical	2	Cyber Security	30	20
VI	DSC16	Theory	4	Artificial Intelligence and Applications	60	40
	DSC17	Theory	4	PHP and MySQL	60	40
	DSC17-Lab	Practical	2	PHP and MySQL Lab	25	25
	DSC18-Project	Project	6	Project Work	100	50
	DSE-E2	Theory	3	A.Fundamentals of Data Science B. Mobile Application Development	60	40
	Voc-2	Theory	3	Web Content Management System	60	40
	SEC-5	Theory/Practical	2	Professional Development Skills	30	20

Program Name	**BCA**	Semester	**V**
Course Title	**Design And Analysis of Algorithms(Theory)**		
Course Code:	**DSC 13**	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- CO1. Understand the fundamental concepts of algorithms and their complexity, including time and space complexity, worst-case and average-case analysis, and Big-O notation.
- CO2. Design algorithms for solving various types of problems, such as Sorting, Searching, and Graph traversal, Decrease-and-Conquer, Divide-and-Conquer and Greedy Techniques.
- CO3. Analyze and compare the time and space complexity of algorithms with other algorithmic techniques.
- CO4. Evaluate the performance of Sorting, Searching, Graph traversal, Decrease-and-Conquer, Divide-and-Conquer and Greedy Techniques using empirical testing and benchmarking, and identify their limitations and potential improvements.
- CO5. Apply various algorithm designs to real-world problems and evaluate their effectiveness and efficiency in solving them.

Unit	Description	Hours
1	**Introduction:** What is an Algorithm? Fundamentals of Algorithmic problem solving, Important Problem Type Fundamentals of Data Structures,Fundamentals of the Analysis of Algorithm Efficiency, Analysis Framework, Measuring the input size, Units for measuring Running time, Orders of Growth, Worst-case, Best-case and Average-case efficiencies. **Asymptotic Notations and Basic:** Efficiency classes, Informal Introduction, O-notation, Ω-notation, θ-notation,	**13**

	mathematical analysis of non-recursive algorithms, and mathematical analysis of recursive algorithms.	
2	**Brute Force & Exhaustive Search:** Introduction to Brute Force approach, Selection Sort and Bubble Sort, Sequential search- -Closest-Pair and Convex-Hull Problems by Brute Force, Exhaustive Search -Travelling Salesman Problem and Knapsack Problem.	**13**
3	**Decrease-and-Conquer:** Introduction, Insertion Sort, Depth First Search, Breadth First Search Topological Sorting. **Divide-and-Conquer:** Introduction, Merge Sort, Quick Sort, Binary Search, Binary Tree traversals and related properties, Multiplication of large Integers and Strassen's Matrix Multiplication.	**13**
4	**Greedy Technique:** Introduction, Prim's Algorithm, Kruskal's Algorithm, Dijkstra's Algorithm, Huffman Trees, Lower-Bound Arguments, Decision Trees, P Problems, Challenges of Numerical Algorithms.	**13**

Text Books:

1. Introduction to the Design and Analysis of Algorithms, Anany Levitin: 2nd Edition, 2009, Pearson.

References:

1. Computer Algorithms/C++, Ellis Horowitz, SatrajSahni and Rajasekaran, 2nd Edition, 2014, Universities Press.
2. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronal L. Rivest, Clifford Stein, 3rd Edition, PHI.
3. Design and Analysis of Algorithms, S. Sridhar, Oxford (Higher Education)
4. Weblinks and Video Lectures (e-Resources): http://elearning.vtu.ac.in/econtent/courses/video/CSE/06CS43.html https://nptel.ac.in/courses/106/101/106101060/ http://elearning.vtu.ac.in/econtent/courses/video/FEP/ADA.html http://cse01-iiith.vlabs.ac.in/ http://openclassroom.stanford.edu/MainFolder/CoursePage.php?course=IntroToAlgorithms

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the algorithms.															
Describe the analysis of algorithm efficiency using different notations.															
Discuss various problems using Brute force technique.															
Describe various problems using Divide and-Conquer Technique.															
Describe various problems using Decrease-and-Conquer.															
Discuss Greedy Techniques.															
Devise an algorithm using appropriate design strategies for problem solving.															
Estimate the computational complexity of different algorithms.															
Demonstrate the hardness of simple NP- complete problems.															

Program Name	**BCA**	Semester	**V**
Course Title	**Design and Analysis of Algorithms Lab**		
Course Code:	DSC13-Lab	No.of Credits	**02**
Contact hours	04 Hours per week	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PART-A

1. Write a program to find minimum and maximum value in an array using divide and conquer.
2. Sort a given set of n integer elements using Merge Sort method and compute its time complexity. Run the program for varied values of n> 5000, and record the time taken to sort.
3. Sort a given set of n integer elements using Quick Sort method and compute its time complexity. Run the program for varied values of n> 5000 and record the time taken to sort.
4. Write a program to perform Travelling Salesman Problem
5. Write program to implement Dynamic Programming algorithm for the 0/1 Knapsack Problem.
6. Write a program to perform Knapsack Problem using Greedy Solution
7. Write program to implement the DFS
8. Write program to implement BFS .

PART-B

1. Write C program that accepts the vertices and edges for a graph and stores it as an adjacency matrix.
2. Implement function to print In-Degree, Out-Degree and to display that adjacency matrix.
3. Write program to implement backtracking algorithm for solving problems like N queens.

4. Write a program to implement the backtracking algorithm for the sum of subsets problem
5. Write program to implement greedy algorithm for job sequencing with deadlines.
6. Write program to implement Dynamic Programming algorithm for the Optimal Binary Search Tree Problem.
7. Write a program that implements Prim's algorithm to generate minimum cost spanningTree.
8. Write a program that implements Kruskal's algorithm to generate minimum cost spanning tree.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**BCA**	Semester	**V**
Course Title	**Statistical Computing & R Programming (Theory)**		
Course Code:	**DSC 14**	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- CO1. Explore fundamentals of statistical analysis in R environment.
- CO2. Describe key terminologies, concepts and techniques employed in Statistical Analysis.
- CO3. Define Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.
- CO4. Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.
- CO5. Understand, Analyse, and Interpret Correlation Probability and Regression to analyse the underlying relationships between different variables.

Unit	Description	Hours
1	Introduction of the language, numeric, arithmetic, assignment, and vectors, Matrices and Arrays, Non-numeric Values, Lists and Data Frames, Special Values, Classes, and Coercion, Basic Plotting.	**13**
2	Reading and writing files, Programming, Calling Functions, Conditions and Loops: stand- alone statement with illustrations in exercise, stacking statements, coding loops, Writing Functions, Exceptions, Timings, and Visibility. Basic Data Visualization.	**13**
3	**Descriptive Statistics:** Types of Data, Nominal, Ordinal, Scale and Ratio, Measures of Central Tendency, Mean, Mode and Median,Percentailes,Quartiles, Measures of Variability, Mean Absolute Deviation Range, Inter-Quartile-Range, Standard Deviation,Z-Scores.Cofficient of Variation, Measure	**13**

	of shaper-Skewness and Kurtosis, Bar Chart, Pie Chart and Box Plot, Histogram, Frequency Polygon, Stem and Leaf Diagram. **Probability, Probability and Sampling Distribution:** Methods of assigning probability, Structure of probability, Marginal, union, joint and conditional probabilities. Discrete Probability Distributions: Binomial, Poisson, Continuous Probability Distribution, Normal Distribution, Uniform Distribution. Estimating the population mean using the and t-distribution.	
4	**Statistical Inference and Hypothesis Testing:** Types of Hypothesis, and Sample, Null and Alternate Hypothesis, Level of Significance, Type I and Type II Errors, One Sample t-Test, One Sample Proportion Test, Paired Sample t-Test, Independent Samples t-Test, Two Sample Proportion Tests, One Way Analysis of Variance and Chi Square Test. **Correlation and Regression:** Analysis of Relationship, Positive and Negative Correlation, Perfect Correlation, Karl Pearson Coefficient of Correlation, Correlation Matrix, Scatter Plots, Simple Regression Analysis.	**13**

Text Books:

1. Tilman M. Davies, "The book of R: A first course in programming and statistics", San Francisco, 2016.
2. Ken Black, Business Statistics, New Delhi, Wiley, 2013.

References:

1. Vishwas R. Pawgi, "Statistical computing using R software", Nirali prakashan publisher, e1 edition, 2022.
2. https://www.youtube.com/watch?v=KlsYCECWEWE
3. https://www.geeksforgeeks.org/r-tutorial/
4. https://www.tutorialspoint.com/r/index.html

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game

Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes(COs)/ProgramOutcomes(POs)	**ProgramOutcomes(POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Explore fundamentals of statistical analysis in R environment.															
Describe key terminologies, concepts and techniques employed in Statistical Analysis.															
Define Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.															
Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.															
Understand, Analyse, and Interpret Correlation Probability and Regression to analyse the underlying relationships between different variable															

Program Name	**BCA**	Semester	**V**
Course Title	R Programming Lab		
Course Code:	DSC14-Lab	No.of Credits	**02**

Contact hours	04 Hours per week	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PART – A

1. Write a R program to create two 3 X 3 matrices A and B and perform the following Operations.
   a) Transpose of the matrix
   b) addition
   c) Subtraction.
   d) Multiplication
   e) Inversion
   f) A.B
   g) $A^T.B$
   h) $B^T.(A.A^T)$
   i) $(A.A^T). B^T$
   j) $[(B.B^T)+ (A.A^T)-100I_3]^{-1}$
2. Write a R program to create vector of 15 values as an object in your workspace: c(6,9,7,3,6,7,9,6,3,6,6,7,1,9,1). Identify the following elements:
   i. Those equal to 6
   ii. Those greater than or equal to 6
   iii. Those less than 6 + 2
   iv. Those not equal to 6

3. Write R program to find roots of quadratic equation using user defined function. Test the program user supplied values for all possible cases.
4. Write R program to generate first n prime numbers.
5. Write R program to solve

$$\sum_{i=1}^{10} \sum_{j=1}^{i} \frac{i^4}{(3 + ij)}$$

6. Write R program to simulate Towers of Hanoi for n disks
7. Write R program to generate n Fibonacci numbers

8. Write an R program to create a list containing strings, numbers, vectors and logical values and do the following manipulations over the list.

a. Access the first element in the list
b. Give the names to the elements in the list
c. Add element at some position in the list
d. Remove the element
e. Print the fourth element
f. Update the third element

9. Write a R program to create a Vector containing following 8 values and perform the following operations.

   4 3 0 5 2 9 4 5

   a. Find mean, median, mode.
   b. Find the range.
   c. Find the 35^{th} and 78^{th} percentile.
   d. Find the mean absolute deviation.
   e. Find the variance and standard deviation
   f. Find the sample standard deviation.
   g. Find the interquartile range.
   h. Find the z-score for each value.

10. Create a new list with the factor vector from (a) as a component named "facs"; the numeric vector c(3,2.1,3.3,4,1.5,4.9) as a component named "nums"; and a nested list comprised of the first three members of the list from (a) (use list slicing to obtain this), named "oldlist". Then, do the following:
    i. Extract the elements of "facs" that correspond to elements of "nums" that are greater than or equal to 3.
    ii. Add a new member to the list named "flags". This member should be a logical vector of length 6, obtained as a twofold repetition of the third column of the logical matrix in the "oldlist" component.
    iii. Use "flags" and the logical negation operator ! to extract the entries of "num" corresponding to FALSE.
    iv. Overwrite the character string vector component of "oldlist" with the single character string "Don Quixote".

11. Create and store this data frame as dframe in your R workspace:

Person	**Sex**	**Funny**
Stan	M	High
Francine	F	Med
Steve	M	Low

Roger	M	High
Hayley	F	Med
Klaus	M	Med

The variables person, sex, and funny should be identical in nature to the variables in the mydata object studied throughout Section 5.2. That is, person should be a character vector, sex should be a factor with levels F and M, and funny should be a factor with levels Low, Med, and High.

12. Write an R program to create a Data Frame with following details and do the following operations.

itemCode	**itemCategory**	**ItemPrice**
1001	Electronics	700
1002	Desktop Supplies	300
1003	Office Supplies	350
1004	USB	400
1005	CD Drive	800

a. Subset the Data frame and display the details of only those items whose price is greater than or equal to 350.
b. Subset the Data frame and display only the items where the category is either “Office Supplies” or “Desktop Supplies”
c. Create another Data Frame called “item-details” with three different fieldsitemCode, ItemQtyonHand and ItemReorderLvl and merge the two frames.

13. Let us use the built-in dataset air quality which has Daily air quality measurements in New York, May to September 1973. Create a histogram by using appropriate arguments for the following statements.
    a. Assigning names, using the air quality data set.
    b. Change colors of the Histogram
    c. Remove Axis and Add labels to Histogram
    d. Change Axis limits of a Histogram
    e. Create a Histogram with density and Add Density curve to the histogram

14. Design a data frame in R for storing about 20 employee details. Create a CSV file named "input.csv" that defines all the required information about the employee such as id, name, salary, start_date, dept. Import into R and do the following analysis.
    i. Find the total number rows & columns
    ii. Find the maximum salary
    iii. Retrieve the details of the employee with maximum salary
    iv. Retrieve all the employees working in the IT Department
    v. Retrieve the employees in the IT Department whose salary is greater than 20000 and write these details into another file "output.csv".

15. Create a dataset or table ['Smart Phone"] in an excel sheet that stores the mobile information [price, company name, model, SalePercent] of five different companies. Store at least 20 rows. Write the scripts and find out the output for the following information.
    a. Maximum price of the mobile of each company
    b. Minimum price of mobile of each company
    c. Average price of mobile of each company
    d. Total Price of mobile of each company

16. The ToothGrowth data are from a study which examined the growth of teeth in guinea pigs (n=10) in response to three dose levels of Vitamin C (0.5, 1, and 2 mg), which was administered using two delivery methods (orange juice or ascorbic acid). Data from the Tooth Growth Study is available as an R dataset and information about this study can be found by using R help.
    i. How many rows are there is ToothGrowth?
    ii. What is the mean and standard deviation of Tooth length
    iii. Which treatment is the best in terms of toothgrowth? Derive the findings based on correlation between Dosage and Length for both supplements.

17. Using the built in dataset mtcars which is a popular dataset consisting of the design and fuel consumption patterns of 32 different automobiles. The data was extracted from the 1974 Motor Trend US magazine, and comprises fuel consumption and 10 aspects of automobile design and performance for 32 automobiles (1973-74 models).
    Format
    A data frame with 32 observations on 11 variables
    [1] mpg Miles/(US) gallon, [2] cyl Number of cylinders
    [3] disp Displacement (cu.in.), [4] hp Gross horsepower
    [5] drat Rear axle ratio,[6] wt Weight (lb/1000)
    [7] qsec 1/4 mile time, [8] vs V/S, [9] am Transmission (0 = automatic, 1 = manual), [10] gear Number of forward gears, [11] carb Number of carburetors
    Answer the following using the functions from stats package.
    a. What is the total number of observations and variables in the dataset?

b. Plot three distributions for each variable and determine whether continuous variables are normally distributed or not. If not, what is their skewness?
c. What is the average difference of gross horse power (hp) between automobiles with 3 and 4 number of cylinders (cyl)? Also determine the difference in their standard deviations.
d. Which pair of variables has the highest Pearson correlation?
e. select quintiles by percent
f. create histogram for frequency

18. Using the built in dataset mtcars to perform the following operations
    i. Draw scatter plot for Miles Vs. Weight
    ii. Find Krl Pearson coefficient of correlation between mpg and wt variables
    iii. Find the type of correlation

19. Using the given Salary data set, perform simple Linear regression analysis.
    Note: Use the following file and package: Salary_Data.csv file, caTools package
    a. Split the given dataset using the given training dataset.
    b. Find the Linear Simple Regression to the Training Dataset.
    c. Predict the best set results
    d. Visualizing the Training Set results
    e. Visualizing the Test Set Results

20. Write R program to create data frame for given data set and perform following operations.

Data set:

Name	**Age**	**City**
Raja	25	Delhi
Mike	30	Parris
Pinky	35	Canada
Jane	28	Pune

i) Display the created dataframe
ii) Display Only Name
iii) Display data of Jane
iv) Display Names whose age is >28
v) Add a column Salary with data: 10000,20000,12000 and 34000
vi) Display summary
vii) Display average salary
viii) Display mean age
ix) Sort by age

x) Export the data frame to a CSV file emp.csv
xi) Find minimum and maximum salary.

21. Use of library (standard data set-iris)
i. Import the `iris` dataset
ii. Print the first 6 rows of the data frame
iii. Get the column names of the data frame
iv. Calculate the mean, standard deviation, minimum, and maximum of the Sepal.Length column
v. Create a new data frame that only contains the Sepal.Length and Petal.Length columns
vi. Plot the Sepal.Length and Petal.Length columns
vii. Save the new data frame to a file
viii. create a histogram for Sepal length
ix. draw scatter plot for Sepal length and width
x. Draw box plot for each species.
xi. Draw bar chart for species count.
xii. Draw line chart for Sepal length and width
xiii. Draw pie chart for species.

22. You have a dataset containing the monthly sales revenue for different products in a store. Use the **sapply** function in R to calculate the total revenue, maximum and average generated by each product category.

Category = c("Electronics", "Clothing", "Home Decor"),
Jan = 2500, 1500, 1800
Feb =3000, 2000, 2200
Mar = 2800, 1800, 2100

Expected Answer:

	Category	MaxSales
1	Electronics	3000
2	Clothing	2000
3	Home Decor	2200

Total:

	Category	Total
1	Electronics	8300
2	Clothing	5300
3	Home Decor	6100

23. You are organizing a marathon event and have a list of registered participants along with their corresponding ages and t-shirt sizes. Using the **mapply** function in R, write a code to generate a table that displays the participant name, age, t-shirt size, and a flag indicating if the t-shirt size is appropriate for their age

group. Assume that participants below 18 years old should receive a "Youth" size t-shirt, while participants 18 years and older should receive an "Adult" size t-shirt. Use function to check size;

participants [
  Name = "John", "Emma", "David", "Sophia", "Michael"
  Age = 20, 16, 25, 14, 19
TShirtSize = "Adult", "Youth", "Adult", "Youth", "Adult"
]

Expected Answer:

	Name	Age	TShirtSize	AppropriateSize
1	John	20	Adult	Yes
2	Emma	16	Youth	Yes
3	David	25	Adult	Yes
4	Sophia	14	Youth	Yes
5	Michael	19	Adult	Yes

24. Write R script for the following

a) Perform the following using binomial distribution
   i. If n=4 and p=0.10 , find P(x=3)
   ii. If n=10 and p=0.8 , find P(x>=7)
   iii. If n=12 and p=0.45, find P(5<=x<=7)

b) Perform the following using poisson distribution
   i. $P(x=5|\lambda=2.3)$
   ii. $P(x\leq 2|\lambda=4.1)$
   iii. $P(x=0|\lambda=2.7)$

c) Perform the following using uniform distribution between 200 and 240
   i. P(x>230)
   ii. $P(205\leq x\leq 220)$

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**BCA**	Semester	**V**
Course Title	**Software Engineering (Theory)**		
Course Code:	DSC15	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- CO1 How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment.
- CO2 An ability to work in one or more significant application domains.
- CO3 Work as an individual and as part of a multidisciplinary team to develop anddeliver quality software.
- CO4 Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.
- CO5 Demonstrate an ability to use the techniques and tools necessary for engineeringpractice.

Unit	Description	Hours
1	**OVERVIEW:** Introduction; Professional and ethical responsibility; Software process models; Process Iteration; Process activities; The Rational Unified Process; Agile Software Development: Agile methods; Plan- driven and agile development. **REQUIREMENTS ENGINEERING:** Functional and non-functional requirements; Software requirements document;	13

	Requirement's specification; Requirements engineering processes; Requirement's elicitation and analysis; Requirement's validation; Requirements management	
2	**SYSTEM MODELS:** Context Models; Behavioral models- Data Flow Models, State Machine Models; Data Models; Object Models: Inheritance models, object aggregation, object behavior modeling, Structured methods.	13
3	**ARCHITECTURAL DESIGN**: Architectural design decisions; System Organization-The repository model, The layered model, The Client–server model; Modular decomposition styles. **DESIGN AND IMPLEMENTATION:** An Object-Oriented Design Process- System context and models of use, Architectural design, Object identification, Design models, Object Interface specification; Design Patterns.	13
4	**A STRATEGIC APPROACH TO SOFTWARE TESTING:** Verification and Validation, Unit testing, Integration Testing, Regression testing, Smoke Testing, Alpha and Beta Testing, System testing, Component testing, Release testing; Test Case Design, Test Automation.	13

Text Books:

1. Ian Somerville-Software Engineering 8th Edition,Pearson Education,2009
2. Roger S. Pressman, "A Practitioners Approach",7th Edition, McGraw-Hill, 2007.

References Books:

1.Waman S Jawadekar-Software Engineering Principles and Practice,Tata McGrawHill,2004

2. P Jalote, "An Integrated Approach to software Engineering", Narosa Publication.

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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) /Program Outcomes (POs)	Program Outcomes(POs)														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
How to apply the software Engineering life cycle by demonstrating competence in communication, planning, analysis, design,construction,anddeployment.															
An ability to work in one or more significant applicationdomains.															
Work as an individual and as part of a multi disciplinary team to develop and deliver quality software.															
Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software life cycle.															
Demonstrate an ability to use the techniques and tools necessary for engineering practice.															

Program Name	**B.C.A**	Semester	**V**
Course Title	**Cloud Computing (Theory)**		
Course Code:	**DSE-E1**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1 Explain the core concepts of the cloud computing paradigm such as how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- CO2 Apply the fundamental concepts in data centres to understand the trade-offs in power, efficiency and cost.
- CO3 Identify resource management fundamentals like resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
- CO4 Analyze various cloud programming models and apply them to solve problems on the cloud.

Unit	Description	Hours
1	**Introduction:** Different Computing Paradigms- Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing etc., Comparison of various Computing Technologies; Cloud Computing Basics- What is Cloud Computing? History, Characteristic Features, Advantages and Disadvantages, and Applications of Cloud Computing; Trends in Cloud Computing; Leading Cloud Platform Service Providers.	**10**
2	**Cloud Architecture:** Cloud Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS), Comparison of different Service Models; Cloud Deployment Models- Public Cloud; Private Cloud, Hybrid Cloud, Community Cloud; Cloud	**10**

	Computing Architecture- Layered Architecture of Cloud. Virtualization- Definition, Features of Virtualization; Types of Virtualizations- Hardware Virtualization, Server Virtualization, Application Virtualization, Storage Virtualization, Operating System Virtualization; Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples- Xen: Paravirtualization, VMware: Full Virtualization, Microsoft Hyper-V.	
3	**Cloud Application Programming and the Aneka Platform:** Aneka Cloud Application Platform- Framework Overview, Anatomy of the Aneka Container; Building Aneka Clouds (Infrastructure Organization, Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode); Cloud Programming and Management- Aneka SDK (Application Model and Service Model); Management Tools (Infrastructure, Platform and Application management).	**10**
4	**Cloud Platforms in Industry:** Amazon Web Services- Compute Services, Storage Services, Communication Services, Additional Services; Google AppEngine- Architecture and Core Concepts, Application Life-Cycle, Cost Model, Observations; Microsoft Azure- Azure Core Concepts (Compute, Storage, Core Infrastructure and Other Services), SQL Azure, Windows Azure Platform Appliance. **Cloud Applications:** Scientific Applications- Healthcare (ECG Analysis in the Cloud) Biology (Protein Structure Prediction and Gene Expression Data Analysis for Cancer Diagnosis), Geoscience (Satellite Image Processing); Business and Consumer Applications- CRM and ERP, Productivity, Social Networking, Media Applications, Multiplayer Online Gaming.	**12**

Text Books:

1 Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi: "Mastering CloudComputing- Foundations and Applications Programming", Elsevier, 2013

References Books:

1. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi: "Mastering CloudComputing- Foundations and Applications Programming", Elsevier, 2013
2. 2 Barrie Sosinsky: "Cloud Computing Bible", Wiley-India, 2010
3. K Chandrashekaran: "Essentials of Cloud Computing", CRC Press, 2015

4 Derrick Rountree, Ileana Castrillo: “The Basics of Cloud Computing”, Elsevier, 2014

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the Cloud Computing.															
Discuss about Cloud Application Programming and the Aneka Platform.															
Discuss about various Cloud Architecture.															
Study about AWS.															

Program Name	**BCA**	Semester	**V**
Course Title	**Business Intelligence (Theory)**		
Course Code:	**DSE-E1**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1 Describe the Decision Support systems and Business Intelligence framework.
- CO2 Explore knowledge management, explain its activities, approaches and its implementation.
- CO3 Describe business intelligence, analytics, and decision support systems

Unit	Description	Hours
1	Information Systems Support for Decision Making, An Early Framework for Computerized Decision Support, The Concept of Decision Support Systems, A Framework for Business Intelligence, Business Analytics Overview, Brief Introduction to Big Data Analytics	**10**
2	Introduction and Definitions, Phases of the Decision, Making Process, The Intelligence Phase, Design Phase, Choice Phase, Implementation Phase, Decision Support Systems Capabilities, Decision Support Systems Classification, Decision Support Systems Components.	**10**
3	Basic Concepts of Neural Networks, Developing Neural Network-Based Systems, Illuminating the Black Box of ANN with Sensitivity, Support Vector Machines, A Process Based Approach to the Use of SVM, Nearest Neighbor Method for Prediction, Sentiment Analysis Overview, Sentiment Analysis	**10**

	Applications, Sentiment Analysis Process,, Sentiment Analysis, Speech Analytics.	
4	Decision Support Systems modeling, Structure of mathematical models for decision support, Certainty, Uncertainty, and Risk, Decision modeling with spreadsheets, Mathematical programming optimization, Decision Analysis with Decision Tables and Decision Trees, Multi-Criteria Decision Making With Pairwise Comparisons. Automated Decision Systems, The Artificial Intelligence field, Basic concepts of Expert Systems, Applications of Expert Systems, Structure of Expert Systems, Knowledge Engineering, and Development of Expert Systems.	**12**

Text Books:

Ramesh Sharda, Dursum Delen, Efraim Turban, J.E. Aronson, Ting-Peng Liang, David King, "BussinessIntelegence and Analytics: System for Decision Support", 10th Edition, Pearson Global Edition.

Reference books

Data Analytics: The Ultimate Beginner's Guide to Data Analytics Paperback- 12 November 2017 by Edward Miz

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the Business Intelligence.															
Describe the various phases of Phases of the Decision, Making Process.															
Discuss about neural networks.															

Discuss the Architecture of Decision Support Systems modeling															

Program Name	**B.C.A**	Semester	**V**
Course Title	**Digital Marketing (Theory)**		
Course Code:	**Voc-1**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

CO1. Understand the fundamental concepts and principles of digital marketing.

CO2. Develop practical skills to implement various digital marketing strategies and techniques

Co3. Analyze and evaluate the effectiveness of digital marketing campaigns.

CO4. Apply critical thinking and problem-solving skills to real-world digital marketing scenarios.

CO5. Create comprehesive digital marketing plans and strategies.

Unit	Description	Hours
1	**Introduction to Digital Marketing:** Overview of digital marketing, Evolution of digital marketing, Importance and benefits of digital marketing, Digital marketing channels and platforms Digital Marketing Strategy and Planning: Developing a digital marketing strategy, Setting goals and objectives, Budgeting and resource allocation. Campaign planning and execution, Monitoring and adjusting digital marketing campaigns	**10**

2	**Social Media Marketing:** Overview of social media marketing, Social media platforms and their features, Creating and optimizing social media profiles, Social media content strategy, Social media advertising and analytics	**10**
3	**Email Marketing:** Introduction to email marketing, Building an email list, Creating effective email campaigns, Email automation and segmentation, Email marketing metrics and analytics Content Marketing: Understanding content marketing, Content strategy and planning, Content creation and distribution, Content promotion and amplification, Content marketing metrics and analytics	**11**
4	**Mobile Marketing:** Mobile marketing overview, Mobile advertising strategies, Mobile app marketing, Location-based marketing, Mobile marketing analytics **Analytics and Reporting:** Importance of analytics in digital marketing, Setting up web analytics tools (e.g., Google Analytics), Tracking and measuring key performance indicators (KPIs), Conversion tracking and optimization, Reporting and data visualization	**11**

Text Books:

1 "Digital Marketing Strategy: An Integrated Approach to Online Marketing" by Simon Kingsnorth.

References

1. "Email Marketing Rules: How to Wear a White Hat, Shoot Straight, and Win Hearts" by Chad S. White
2. "Content Inc.: How Entrepreneurs Use Content to Build Massive Audiences and Create Radically Successful Businesses" by Joe Pulizzi
3. "Mobile Marketing: How Mobile Technology is Revolutionizing Marketing, Communications and Advertising" by Daniel Rowles
4. "Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity" by Avinash Kaushik

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe-Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the Digital Marketing.															
Describe the issues of Mobile Marketing efficiency using different notations.															
Discuss various problems in Social Media Marketing.															
Describe various fundamentals of Social Media Marketing.															
Describe various problems using Mobile Marketing															
Discuss Email Marketing.															

Program Name	**BCA**	Semester	**V**
Course Title	**Cyber Security (Theory)**		
Course Code:	**SEC-5**	No.of Credits	**02**
Contact hours	**30 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**30**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1: Understand the concept of Cyber security and issues and challenges associated with it.

CO2: Understand the cybercrimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures.

CO3: Appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

CO4: On completion of this course, students should be able to appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

Module	Description	Hours
1	**Introduction to Cyber security**: Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet,	**10**

	World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.	
2	**Cybercrime and Cyber law:** Classification of cybercrimes, Common cyber-crimes- cyber-crime targeting computers and mobiles, cyber-crime against women and children, financial frauds, social engineering attacks, malware and ransom ware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, Reporting of cyber-crimes, Remedial and mitigation measures, Legal perspective of cyber-crime, IT Act 2000 and its amendments, Cyber-crime and offences, Organizations dealing with Cybercrime and Cyber security in India, Case studies.	**10**
3	**Social Media Overview and Security**: Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies.	**10**
	Practical: 1. Checklist for reporting cyber-crime at Cyber-crime Police Station. 2. Checklist for reporting cyber-crime online. 3. Reporting phishing emails. 4. Demonstration of email phishing attack and preventive measures. 5. Setting, configuring and managing three password policy in the computer (BIOS, Administrator and Standard User). 6. Setting and configuring two factor authentication in the Mobile phone. 7. Security patches management and updates in	

	Computer and Mobiles. 8. Managing Application permissions in Mobile phone. 5. Installation and configuration of computer Anti-virus. 9. Installation and configuration of Computer Host Firewall. 10. Wi-Fi security management in computer and mobile	

Text Books:

1. Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010

References

1. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
2. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001
3. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd
4. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
5. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
6. Fundamentals of Network Security by E. Maiwald, McGraw Hill.

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe-Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes

Course Out comes(COs) /Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Quickly understand the given problem and come up with the correct answer														
Identify, construct and compute numerical situations by work with numbers														
Conceive and develop a methodology for analyzing data and solving a problem.														
Define, modify and apply critical thinking to real time situations.														

QUESTION PAPER PATTERN

Skill Enhancement Course

CYBER SECURITY

V SEMESTER

COMMON TO ALL

Duration: 2 Hour Max.Marks:30

Module-1

Answer any five questions from Eight (2x5 = 10)

Module-2

Answer any five questions from Eight (2x5 = 10)

Module-3

Answer any five questions from Eight (2x5 = 10)

Program Name	**BCA**	Semester	**VI**
Course Title	Artificial Intelligence and Applications		
Course Code:	DSC16	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to

- Gain a historical perspective of AI and its foundations.
- Become familiar with basic principles and strategies of AI towards problem solving
- Understand and apply approaches of inference, perception, knowledge representation, and learning.
- Understand the various applications of AI

Unit	Description	Hours
1	**Introduction-** What is Artificial Intelligence, Foundations of AI, History, AI - Past, Present and Future. Intelligent Agents- Environments- Specifying the task environment, Properties of task environments, Agent based programs-Structure of Agents , Types of agents- Simple reflex agents, Model-based reflex agents, Goal-based agents; and Utility-based agents.	**13**
2	**Problem Solving by Searching**-Problem-Solving Agents, Well-defined problems and solutions, examples Problems, Searching for Solutions, Uninformed Search Strategies- Breadth-first search, Uniform-cost search, Depth-first search, Depth-limited search, Iterative deepening depth-first search, Bidirectional search, Greedy best-first search, A* Search, AO* search Informed (Heuristic) Search Strategies, Heuristic Functions	**13**
3	**Knowledge Representation** - Knowledge-Based Agents, The Wumpus World , Logic, Propositional Logic, Propositional Theorem Proving, Effective Propositional Model Checking, Agents Based on Propositional Logic, First-Order Logic- Syntax and Semantics of First-Order Logic, Using First-Order Logic, Unification and Lifting Forward Chaining, Backward	**13**

	Chaining.	
4	**Learning**– Forms of Learning, Supervised Learning, Machine Learning - Decision Trees, Regression and Classification with Linear Models, Artificial Neural Networks, Support Vector Machines **Applications of AI** - Natural Language Processing, Text Classification and Information Retrieval, Speech Recognition , Image processing and computer vision, Robotics	**13**

Text Books:

1. Stuart Russel, Peter Norvig: Artificial Intelligence A Modern Approach, 2nd Edition, Pearson Education, 2003

References

1. Tom Mitchell, "Machine Learning", 1st Edition, McGraw-Hill,2017

Elaine Rich, Kevin Knight, Shivashankar B Nair: Artificial Intelligence, Tata McGraw Hill 3rd edition,

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Develop systems that process unstructured, uncurated data automatically using artificial intelligence (AI) frameworks and platforms.															
Determine the framework in which AI bots may function, including interactions with users and environments.															

Design and implement cognitive automation for different industries.															
Describe various problems using Searching-Problem Technique.															
Devise an algorithm using appropriate design strategies for problem solving.															

Program Name	**B.C.A**	Semester	**VI**
Course Title	PHP & MySQL		
Course Code:	DSC17	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes: After the successful completion of the course, the student will be able to:

CO1. Design dynamic and interactive web pages and websites.

CO2. Run PHP scripts on the server and retrieve results.

CO3. Handle databases like MySQL using PHP in websites.

Unit	Description	Hours
1	**Introduction to PHP**: Introduction to PHP, History and Features of PHP, Installation & Configuration of PHP, Embedding PHP code in Your Web Pages, Understanding PHP, HTML and White Space, Writing Comments in PHP, Sending Data to the Web Browser,Data types in PHP, Keywords in PHP, Using Variables, Constants in PHP, Expressions in PHP, Operators in PHP.	**13**
2	**Programming with PHP**: Conditional statements: if, if-else, switch, The ? Operator, Looping statements: while Loop, do-while Loop, for Loop Arrays in PHP: Introduction- What is Array?, Creating Arrays, Accessing Array elements, Types of Arrays: Indexed v/s Associative arrays, Multidimensional arrays, Creating Array, Accessing Array, Manipulating Arrays, Displaying array, Using Array Functions, Including and Requiring Files- use of Include() and Require(), Implicit and Explicit Casting in PHP.	**13**
3	**Using Functions , Class- Objects, Forms in PHP**: Functions in PHP, Function definition, Creating and invoking user-defined functions, Formal parameters versus actual parameters, Function and variable scope, Recursion, Library functions, Date and Time Functions Strings in PHP: What is String?, Creating and Declaring String, String Functions	**13**

	Class &Objects in PHP: What is Class & Object, Creating and accessing a Class &Object, Object properties, object methods, Overloading, inheritance, Constructor and Destructor Form Handling:	
4	**Creating HTML Form**, Handling HTML Form data in PHP **Database Handling Using PHP with MySQL**: Introduction to MySQL: Database terms, Data Types.Accessing MySQL – Using MySQL Client and Using php MyAdmin, MySQL Commands, Using PHP with MySQL: PHP MySQL Functions, Connecting to MySQL and Selecting the Database, Executing Simple Queries, Retrieving Query Results, Counting Returned Records, Updating Records with PHP	**13**

Text Books:

1. PHP & MySQL for Dynamic Web Sites- Fourth Edition By Larry Ullman.

References

2. Learning PHP, MySQL and JavaScript By Robin Nixon –O‟REILLY Publications
3. Programming PHP By Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre
4. SAMS Teach Yourself PHP in 24 hours, Author: Matt Zandstra, Sams Publishing

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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the PHP.															

Problem solving using PHP.															
Discuss various OOPS concepts in PHP.															
Discuss the Database Conectivity in PHP.															
Study about Query handling in MySQL															
Discuss PHP forms.															

Program Name	**B.C.A**	Semester	**VI**
Course Title	**PHP and MySQL Lab**		
Course Code:	**DSC17-Lab**	No.of Credits	**02**
Contact hours	**4 Hours per week**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PART-A

1. Write a PHP script to compute addition and Multiplication of two matrices as a form input.
2. Write a PHP script to design Age calculator.
3. Write a PHP script to generate a Fibonacci series using Recursive function
4. Write a PHP program to insert new item in array on any position in PHP.
5. Write a PHP script to implement constructor and destructor
6. Write a PHP script to implement form handling using get method
7. Write a PHP script to implement form handling using post method
8. Write a PHP scripts that receive string as a form input.
9. Create a web application using PHP which receives a line of text and split it into words and in each of those words calculate number of letters, digits & special characters and display the result for each word. The application should also display the entire sentence by replacing a specific word with another word and represent the replaced word with uppercase letters.

PART-B

1. Write a PHP script to implement multiple inheritances.
2. .Create a web application that manages hotel reservations using Object Oriented PHP. Room no (primary key), Type of room (may take values like single semi, single deluxe, single ac, double semi, double deluxe, double ac, dormitory), capacity, and status (booked or available) must all be present in the database table. The webpage should list all of the rooms that are available for reservation. The user must enter the room number and the date when making a reservation. When a user checks in, the booking status must be changed to booked, and when they check out, the room status must be changed to available. The list of available rooms on the web page must be updated during both booking and check-out. The proper message must appear after a successful booking or check out. If the entered

room number is not present or is not in the concerned status when booking or checking out, an appropriate message should be displayed.

3. Create a web application using Object Oriented PHP to insert manage library application in which user can insert a book information containing accession number (primary key), title, author, publication, no. of pages, price and availability status (issued or available). The user must be able to issue and return books depending on their accession number. If the book has already been issued, an appropriate message should be displayed; similarly, when returning a book, an appropriate message should be presented if the book has already been returned. If issue and return are successful, the success message must be displayed.
4. Create a web application using PHP which takes two non-numerically indexed arrays and append both if they have same elements and store the content of only one array in a file. If the arrays do not have same elements file should contain appended content of both the arrays.
5. Develop a PHP program to design a college admission form using MYSQL database.
6. To create a php page for login without using SQL connection.
7. Create a PHP page for login system using session.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**B.C.A**	Semester	**VI**
Course Title	**Fundamentals of Data Science (Theory)**		
Course Code:	**DSE-E2**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Understand the concepts of data and pre-processing of data.
- Know simple pattern recognition methods
- Understand the basic concepts of Clustering and Classification
- Know the recent trends in Data Science

Unit	Description	Hours
1	**Data Mining**: Introduction, Data Mining Definitions, Knowledge Discovery in Databases (KDD) Vs Data Mining, DBMS Vs Data Mining, DM techniques, Problems, Issues and Challenges in DM, DM applications.	**11**
2	**Data Warehouse**: Introduction, Definition, Multidimensional Data Model, Data Cleaning, Data Integration and transformation, Data reduction, Discretization	**11**
3	**Mining Frequent Patterns**: Basic Concept – Frequent Item Set Mining Methods -Apriori and Frequent Pattern Growth (FPGrowth) algorithms -Mining Association Rules	**10**
	Classification: Basic Concepts, Issues, And Algorithms: Decision Tree Induction. Bayes Classification Methods, Rule-Based Classification, Lazy Learners (or Learning from your Neighbours), k Nearest Neighbour. Prediction - Accuracy-	**10**

4	Precision and Recall **Clustering**: Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering	

Text Books:

1. Jiawei Han and Micheline Kambar – "Data Mining Concepts and Techniques" Second Edition
2. Arun K Pujari – "Data Mining Techniques" 4th Edition, Universities Press 3
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Pearson Education, 2012.
4. 4 K.P.Soman, Shyam Diwakar, V.Ajay: Insight into Data Mining – Theory and Practice, PHI 5
5. Pang-Ning Tan, Michael Steinbach, Vipin Kumar - "Introduction to Data Mining", Pearson Education

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Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the DataMining.															
Describe the various models of DataMining..															
Discuss about Classfication Algorithms.															
Discuss Clustering Algorithms.															

Program Name	**B.C.A**	Semester	**VI**
Course Title	**Mobile Application Development (Theory)**		
Course Code:	**DSE-E2**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Create Servlets for server side programming Create, test and debug Android application by setting up Android development environment
- Critique mobile applications on their design pros and cons,
- Program mobile applications for the Android operating system and understand techniques for designing and developing sophisticated mobile interfaces
- Deploy applications to the Android marketplace for distribution.

Unit	Description	Hours
1	**Android OS design and Features**: Android development framework, SDK features, Installing and running applications on Android Studio, Creating AVDs, Types of Android applications, Best practices in Android programming, Android tools, Building your First Android application.	**11**
2	**Android Application Design Essentials**: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.	**11**

3	**Android User Interface Design Essentials**: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.	**10**
4	**Using Common Android APIs:** Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Deploying Android Application to the World.	**10**

Text Books:

1. Lauren Darcey and Shane Conder , "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)
2. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd
3. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
4. Android Application Development All in one for Dummies by Barry Burd, Edition: I
5. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013
6. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the															

Mobile Application.															
Describe the Android tool kit.															
Design the Andriod User Interface.															
Discuss about Common Android APIs.															

Program Name	**B.C.A**	Semester	**VI**
Course Title	**Web Content Management System (Theory)**		
Course Code:	**Voc-2**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

CO1 Understand content development basics;
CO2 Gain Knowledge of tools for multimedia content development for audio/ video, graphics, animations, presentations, screen casting
CO3 Host websites and develop content for social media platforms such as wiki and blog
CO4 Understand e-publications and virtual reality
CO5 Use of e-learning platform Moodle and CMS applications Drupal and Joomla

Unit	Description	Hours
1	Web Content Development and Management, Content Types and Formats, Norms and Guidelines of Content Development, Creating Digital Graphics, Audio Production and Editing,	**11**
2	Web Hosting and Managing Multimedia Content, Creating and Maintaining a Wiki Site. Presentation Software Part I, Presentation Software Part II, Screen casting Tools and Techniques, Multilingual Content Development.	**11**
3	Planning and Developing Dynamic Web Content Sites, Website Design Using CSS Creating and Maintaining a WIKI Site, Creating and Managing a Blog Site,	**10**

4	E- Publication Concept, E- Pub Tools, Simulation and Virtual Reality Applications, Creating 2D and 3 D Animations. Introduction to Moodle, Creating a New Course and Uploading, Create and Add Assessment, Add and Enroll User and Discussion Forum, Content Management System: Joomla, Content Management System: Drupal	**10**

Text Books:

1. Web Content Management: Systems, Features, and Best Practices 1st Edition by Deane Barker.
2. Content Management Bible (2nd Edition) 2nd Edition by Bob Boiko.
3. Content Management Bible (2nd Edition) 2nd Edition by Bob Boiko.
4. Using Joomla!: Efficiently Build and Manage Custom Websites 2nd Edition by Ron Severdia

Additional Reading:
https://onlinecourses.swayam2.ac.in/cec20_lb09/preview

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the Web Content Development and Management															
Understanding the role of content management technologies to acquire, organize and present web content.															
Understanding and exploring methods, tools and applications for															

content management.															
Understanding the knowledge cycle: acquisition, storing, application and maintenance															
Understanding key terms about semantic web, knowledge management and content management technologies															

Program Name	**B.C.A**	Semester	**VI**
Course Title	**Logical Reasoning (Theory)**		
Course Code:	**SEC-5**	No.of Credits	**02**
Contact hours	**30 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1: Quickly understand the given problem and come up with the correct answer

CO2: Identify, construct and compute numericals ituations by work with numbers

CO3: Conceive and develop a methodology for analyzing data and solving a problem

CO4: Define, modify and apply critical thinking to real time situations

Unit	Description	Hours
1	**Arithmetic Reasoning:** Analytical Thinking, Syllogistic Logic, Problem solving; Number System; LCM &HCF; Divisibility Test; Surds and Indices; Logarithms; Ratio, Proportions and Variations; Partnership; Time speed and distance; work time problems;	**10**
2	**Data Interpretation**: Numerical Data Tables; Line Graphs; Bar Charts and Pie charts; Mix Diagrams; Geometrical Diagrams, and other forms of Data Representation	**10**
3	**Lateral Thinking, Reasoning & Logic**: Verbal and Non-verbal Logic, Family Tree; Linear Arrangements; Circular and Complex Arrangement; Conditionality and Grouping; Sequencing and Scheduling; Selections; Networks; Venn Diagram in Logical Reasoning.	**10**

Text Book:

1. R.S.Aggarwal- "A Modern Approach to Verbal and Non–Verbal Reasoning" Sultan Chand and Sons, New Delhi
2. R.S.Aggarwal–"Quantitative Aptitude", Sultan Chand and Sons, New Delhi
3. Dr.Ravi Chopra – "Verbal and Non–Verbal Reasoning", MacMillan India
4. Dr.Edward DeBono – "Lateral Thinking", Penguin Books, New Delhi

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/ Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Discuss the fundamentals of the Logical Reasoning.															
Describe about Lateral Thinking															
Discuss various problems using Data Interpretation															
Describe various problems using HCF and LCM.															
Describe various problems using Number System															
Discuss Verbal and Non-verbal logic.															

Program Name	**B.C.A**	Semester	**VI**
Course Title	**PROJECT WORK**		
Course Code:	**DSC18-Project**	No.of Credits	**06**
Contact hours	**12 Hours per week**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**75**	Summative Assessment Marks	**75**

PROJECT GUIDELINES

Preamble: Project work has been made a part of BCA course to give students exposure to Software development exercises. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices. As such, during the development of the project students shall involve themselves in all the stages of the software development life cycle (SDLC) like requirements analysis, systems design, software development/coding, testing and documentation,with an overall emphasis on the development of reliable software systems.Since, the project work spans over the entire final semester,the students shall be advised to take up projects for solving problems of software industry or any research organization or the real life problems suggested by the faculty in- charge of BCA project work in the Institutions.Topic chosen of work must be nontrivial ,analytical and application–oriented.It must involve substantial original work and/or development effort based on the theme.Solved,off-the-shelf and pirated work is not entertained .Any attempt of plagiarism or use of unfair means will result in rejection of the work.All activities of the Project Development must be time-bound and the equal participation of the team members expected throughout the Development process.

GENERAL GUIDELINES TO THE INSTITUTIONS

- Calendar of Project Work shall be announced before the commencement of the Sixth semester. Calendar should contain tentative schedules for the submission of Project Proposal, Project Acceptance, Project Synopsis, Problem Analysis Document, System Design Document, Database Design , Detailed Design , Coding and Testing , Final Report, Internal Assessment exams (at least two), Viva/Voce etc.

- Students shall undertake projects with real life problems (that has direct relevance in day-to-day activities or to knowledge extension) either in their Colleges or in industry/research and development laboratories/software companies as recommended by the faculty in-charge of BCA project work in the Institutions. If a student intends to do industry project, the faculty in-charge shall ensure that the projects are genuine and original in nature.
- There shall be not more than three members in a Project team.
- At least two internal assessment exams shall be conducted to evaluate the progress made by the students at different stages of project work. Such exams may include written tests, document verification and presentations, work demonstration, group discussion, viva-voce etc. so as to objectively assess the understanding gained by the students in course of their project work.

PROJECT VALUATION

External and Internal Examiners together conduct project valuation objectively. To begin with, the finer details about various points contained in the scheme of valuation may be conclusively agreed upon through mutual consultation. During project evaluation, a student shall present his/her work through live demonstration of the software application developed as a part of project. However, if live demonstration is not possible due to the reason that some companies do not divulge source code on account of ownership rights or copyrights, students may be allowed to make PPT presentation of their authentic works. In such cases, candidates shall produce necessary declarations issued by the companies to this effect. However, students shall be enabled to present their work in entirety. The primary objective of project evaluation shall be to assess the extent of effort that was put in to meet the objectives of the project and also to gauge the understanding gained by the students in course of their project works. While evaluating Project Reports, examiners shall scrutinize whether Software Development Life Cycle (SDLC) principles have been consistently followed in the project work and the same are documented well in the Reports. However, the relative and overall emphasis of these principles to a particular problem domain chosen may be taken into account so that project evalutions remain fair and objective.

SCHEME OF VALUATION and Marks Distribution

	Particulars	**Marks**
Internal Assessment		
	Progress assessment for three Times @ 25 marks at each time	75
Project Report Valuation :50 marks		
1	Innovativeness and utility of the project for Industry/Academic or Society(Utility)	05

2	Related studies about the project (Adequacy)		05
3	Project plan & implementation-target achieved/output delivered(effectiveness)		
	3.1	Problem Analysis	05
	3.2	System Design	05
	3.3	Database Design	05
	3.4	Detailed Design	05
	3.5	Implementation	10
	3.6	Testing	05
4	Other mandatory documents & information (certificates, contents, tables, figures, bibliography etc.)		05
Viva-Voce : 25 marks			
1	Live Demonstration (Software execution) or Dry runs (Presentation of authentic screenshots or captured videos may be used to walk through complete scenarios)-consistency and completeness		15
2	Question and Answer (Oral only or Oral and written)		10
Total Marks			150

FORMAT OF PROJECT SYNOPSIS

Synopsis is a brief outline or general view, as of a subject or written work; an abstract or a summary of the Project Work. It must be as brief (NOT MORE THAN 20 A4 sized paper pages) as is sufficient enough to explain the objective and implimentation of the project that the candidate is going to take up.

The write up must adhere to the guidelines and should include the following;

1. Title of the Project.
2. Introduction, objectives and scope of the Project.
3. Project category (Database/WebApplication/Client-server/Networking/ Multimedia/gaming/Simulation etc).
4. Tools / Platform, Hardware and Software Requirement specifications.
5. Analysis (DFDs at least up to second level, ER Diagrams/ Class Diagrams, Database Design etc, as per the project requirements).
6. A complete structure which includes: Number of modules and their description to provide an estimation of the students effort on the project, Data Structures as per the project requirements for all the modules, Process logic of each module, testing process to be used, reports generation (Mention tentative content of report).
7. Whether Industry Defined/Client Defined/User Defined Project? Mention the type.Mention the name and Address of the Industry/Client.
8. Limitation of the project.
9. Future scope and further enhancement of the project.

GUIDELINES FOR PREPARATION OF DISSERTATION

1. ORGANISATION OF THE DISSERTATION

The dissertation shall be presented in a number of chapters; starting with Introduction and ending with Conclusion. Each of the chapters will have precise title reflecting the contents of the chapter. A chapter can be subdivided intosections, sub-sections and sub-sub-sectionso as to present the content discretely and with due emphasis.

Sequence of items in Dissertation Report

The following sequence may be followed in the preparation of the final dissertation report:

- Cover Page (On the hardbound cover)
- Title Page (Inner Cover Page)
- Certificate from the Institute
- Certificate from the Company
- Declaration
- Acknowledgement
- (Detailed) Table of Contents (with page numbers).
- List of Figures(with figure number, figure titles and page numbers)
- List of Tables with table number, table title and page number.
- Chapters

1. **Introduction**
    - **a.** Introduction of the System
        - i. Project Title
        - ii. Category
        - iii. Overview
    - **b.** Background
        - **i.** Introduction of the Company
        - **ii.** Brief note onn Existing System
    - **c.** Objectives of the System
    - **d.** Scope of the System
    - **e.** Structure of the System
    - **f.** System Architecture
    - **g.** End Users
    - **h.** Software/Hardware used for the development
    - **i.** Software/Hardware required for the implementation

2. **SRS**
    - **a.** Introduction (Brief write-up about SRS)
    - **b.** Overall Description
        - **i.** Product perspective
        - **ii.** Product Functions
        - **iii.** User characteristics.
        - **iv.** General constraints
        - **v.** Assumptions
    - **c.** Special Requirements (Software / Hardware-if any)
    - **d.** Functional requirement.
        - **i.** Module 1
        - **ii.** Module 2
    - **e.** Design Constraints
    - **f.** System Attributes
    - **g.** Other Requirements (if any)

3. **System Design (Functional Design)**
    - **a.** Introduction (brief write-up about System Design)
    - **b.** Assumptions and Constraints
    - **c.** Functional decomposition
    - **d.** Description of Programs
        - i. Context Flow Diagram (CFD)
        - ii. Data Flow Diagrams (DFDs–Level 0, Level 1, Level 2)
    - **e.** Description of components
        - i. Functional component 1
        - ii. Functional component 2
4. **Database Design (or Data structure)**
    - a. Introduction (brief write-up about Database design)
    - b. Purpose and scope
    - c. Table Definition
    - d. ER diagram
5. **Detailed Design (Logic design of modules)**
    - a. Introduction (brief write-up about Database design)
    - b. Structure of the software package (structure chart)
    - c. Modular decomposition of the System
        - i. Module1
            1. Inputs
            2. Procedural details
            3. File I/O interfaces
            4. Outputs
            5. Implementation aspects (if any)
        - ii. Module 2 …..

6. **Program code listing**
    a. Database connection
    b. Authorization / Authentication
    c. Data store / retrieval /update
    d. Data validation
    e. Search
    f. Named procedures / functions
    g. Interfacing with external devices (if any)
    h. Passing of parameters
    i. Backup/recovery
    j. Internal documentation
7. **User Interface (Screens and Reports)**
    a. Login
    b. Main Screen / Home page
    c. Menu
    d. Data store / retrieval / update
    e. Validation
    f. View
    g. On screen reports
    h. Data Reports
    i. Alerts
    j. Error messages
8. **Testing**
    a. Introduction (brief write-up about Software Testing)
        i. Unit Testing
        ii. Integrate Testing
        iii. System Testing
    b. Test Reports

- Conclusion
- Limitations
- Scope for enhancement (future scope)
- Abbreviations and Acronyms (list)
- Bibliography / References (list in specified format)

Do not include any header or footer in any page of the report. Only page numbers should be mentioned at the bottom center of each page. 'n'copies of dissertation along with soft copy in CD should be prepared by the candidate.

2. DISSERTATION FORMAT

2.1 Paper

2.1.1 Quality

The dissertation shall be printed on white bond paper, whiteness 95% or above, weight 70 gram or more per square meter.

2.1.2 Size

The size of the paper shall be standard A4; height 297 mm, width 210 mm.

2.1.3 Type-Setting, Text Processing and Printing

The text shall be printed employing Laserjet or Inkjet printer, the text having been processed using a standard text processor. The standard font shall be Times New Roman of 12 pts with 1.5 line spacing.

2.1.4 Page Format

The printed sheets shall have the following writing area and margins:
Top margin .5”
Bottom margin .5”
Left margin 1”
Right margin .75”

2.1.5 Pagination

Page numbering in the text of the dissertation shall be numerals starting from**‘1’ at the center of the footer**. The text of the written dissertation shall not beless than 60 pages excluding references, tables, questionnaires and other annexure.

Pagination for pages before the Introduction chapter shall be in lower case Roman numerals, e.g., ‘iv’.

2.1.6 Paragraph format

Vertical space between paragraphs shall be about 2.5 line spacing.

The first line of each paragraph should normally be indented by five characters or 12 mm. A candidate may, however, choose not to indent if (s) he has provided sufficient paragraph separation.

A paragraph should normally comprise more than one line. A single line of a paragraph shall not be left at the top or bottom of a page (that is, no windows or orphans should be left). The word at the right end of the first line of a page or paragraph should, as far as possible, not be hyphenated.

2.2 Chapter and Section format

2.2.1 Chapter

Each chapter shall begin number (in Hindu on a fresh page with an additional top margin of about 75 mm. Chapter Arabic) and title shall be printed at the center of the line in 6 mm font size (18 pt) in bold face using both upper and lower case (all capitals or small capitals sha ll not be used). A vertical gap of about 25 mm shall be left between the chapter number and chapter title lines and between chapter title line and the first paragraph.

2.2.2 Sections and Sub sections

A chapter can be divided into Sections, Sub sections and Sub different concepts separately. Sections and sub-- sub sections so as to present sections can be numbered using decimal points, e.g., 2.2 for the second Section in Chapter 2 and 2.3.4 for the fourth Sub Sections and Sub-- section in third Section of Chapter 2. Chapters, Sections shall be included in the Contents with page numbers flushed to the right. Further subsections need not be numbered or included in the contents. The Sections and Sub sections titles along with their numbers in 5 and 4mm (16 and 14 pt) fonts, respectively, in bold face shall be flushed to the left (not centered) with 15 mm space above and below these lines. In further subdivisions character size of 3 and 3.5 with bold face, small caps, all caps and italics may be sued for the titles flushed left or centered. These shall not feature in the contents.

2.2.3 Table / Figure Format

As far as possible tables and figures should be presented in portrait style. Small size table and figures (less than half of writing area of a page) should be incorporated within the text, while larger ones may be presented in separate pages. Table and figures shall be numbered chapter wise. For example, the fourth figure in Chapter 5 will bear the number Table Figure 5.4 or Fig.5.4

Table number and title will be placed above the table while the figure number and caption will be located below the figure. Reference for Table and Figures reproduced from elsewhere shall be cited in the last and separate line in the table and figure caption, e. g. (after McGregor [12]).

3 AUXILIARY FORMATS

1.1Binding

The dissertation shall be hard cover bound in leather or rexin.

1.2Front Covers

The front cover shall contain the following details:

- Full title of dissertation in 6 mm 22 point size font properly centered and positioned at the top.

- Full name of the candidate in 4.5 mm 15 point size font properly centered at the middle of the page.
- A 40 mm dia replica of the college emblem followed by the name of the Department and the year of submission, each in a separate line and properly centered and located at the bottom of the page.

1.2.1 Lettering

All lettering shall be embossed in gold.

1.2.2 Bound back

The degree, the name of the candidate and the year of submission shall also be embossed on the bound (side) in gold.

1.3 Blank sheets

In addition to the white sheets (binding requirement) two white shall be put at the beginning and end of the dissertation.

1.4 Title sheet

This shall be the first printed page of the dissertation and shall contain the submission statement: the Dissertation submitted in partial fulfillment of the requirements of the BCA, the name and Roll No. Of the candidate, name (s) of the supervisor and co- supervisor (s) (if any), Department and year of submission.

V SEMESTER BSc CHEMISTRY

PAPER - V : INORGANIC AND PHYSICAL CHEMISTRY
BSCCHCN501

Contact hours: 56 **Work Load: 4Hours/week** **Credit points:4**

Evaluation:Continuous Internal Assesment: 40Marks

Semester End Examination: 60Marks

Course Objectives:

i) To introduce the students to various theories of chemical bonding

ii) To make the students learn nuclear reactions and their applications.

iii)To introduce the students to quantum mechanical concepts, Schrodinger wave equation and its solutions.

iv) To make the students learn the structure and properties of main group elements which have large number of applications in daily life.

Course Specific outcomes:

After the completion of this course, students will

i) Understand the types of bonding in compounds and the theories to explain them

ii) Understand nuclear reactions, the importance of nuclear phenomenon, radiation chemistry & it's applications.

iii) Know the application of Quantum mechanics to particle in a box and hydrogen atom.

iv) Know chemistry of main group elements and acid base concepts.

v) Know chemical dynamics and kinetics of chemical reactions.

UNIT - I

Chemical Bonding: **8h**

VSEPR model, shapes of molecules-ClF_3, ICl_4^-, TeF_5^-, I_3^-, $TeCl_6^{2-}$, XeF_6, IF_7, Bent rules and energetics of hybridization; electronegativity and partial ionic character; Bonds- Multicenter, Synergic and Agostic bonding. Molecular orbital theory: LCAO and MO diagrams of heteronuclear diatomic (CO, HF, ICl) molecules.

M-M bond and metal atom clusters, halide clusters, bonding in $[Re_2Cl_8]^{2-}$.

Nuclear Chemistry: **6h**

The atomic nucleus-elementary particles, quarks, classification of nuclides based on Z and N values, nuclear stability, nuclear potential, binding energy. Nuclear Models: Liquid drop model, Fermi gas model. Radioactivity, radioactive decay kinetics, Parent-daughter decay-growth relationship-secular and transient equilibria. Applications of radioactive isotopes. (Numerical problems to be worked out wherever necessary).

UNIT – II

Chemistry of main group elements: 8**h**

Structure and bonding in boranes, carboranes, Styx Number, Wades rules, borazines, phosphazenes, S, N- compounds. Silicates- Classification, structures, isomorphous replacement, pyroxenes, layered and vitreous silicates, zeolites and molecular sieves.

HSAB concept: 6**h**

Basis of HSAB concept, acid-base strength, hardness and softness, symbiosis, applications of HSAB concept; Acid- base concept in non-aqueous media, reactions in BrF_3, N_2O_4, anhydrous H_2SO_4, CH_3COOH.

UNIT – III

Quantum Mechanics: **10h**

Concepts of Operators: Laplacian, Hamiltonian, Linear and Hermitian operators. Algebra of operators, commutator operator. Eigenfunctions and eigenvalues. Solutions of Schrödinger wave equation for a particle in a three-dimensional box, particle in a ring. Quantum mechanical degeneracy, tunneling (no derivation).

Formulation of Schrodinger equation to hydrogen atom in spherical polar co-ordinates (no derivation). Quantum numbers and their characteristics. Coupling of Angular momenta. Russell-Saunders and JJ-coupling, Term symbols. Zeeman effect.

Chemical Dynamics -I **4h**

Review of theories of reaction rate- Collision theory and Transition state theory, Comparison of collision theory with transition state theory, Arrhenius equation-characteristics, Significance of energy of activation, Temperature coefficient and its evaluation. Problems to be worked out wherever necessary. Introduction to fast reaction techniques.

UNIT – IV

Chemical Dynamics – II **6h**

Concept of Steady state kinetics, Chain reactions - chain length and chain inhibition, comparison of photochemical and thermal reactions, Mechanisms of thermal and photochemical reactions between hydrogen-bromine and hydrogen-chlorine. Comparative study of thermal and photochemical hydrogen-halogen reactions. Pyrolysis of acetaldehyde, Decomposition of ethane.

Radiation Chemistry: **4h**

Introduction. Radiation sources and units. Radiation dosimetry, dosimeter. Radiolysis of water (using gamma rays), radiolysis of gases and liquids. Application of radioisotopes in the study of organic reaction mechanism. Industrial applications.

Surface Chemistry: **4h**

Types of adsorption isotherms, Effect of temperature on adsorption. Gibbs adsorption isotherm and its significance, surface tension and surface energy. Derivation of BET equation. Determination of surface area using BET equation.

Recommended Books/References:

1. Basic Inorganic Chemistry- F. A. Cotton, G. Wilkinson and P. L. Gaus; John Wiley and sons. Inc, 6thedition (1999).
2. Advanced Inorganic Chemistry, 6th edition; F. A. Cotton and G. Wilkinson.
3. Inorganic Chemistry IV edition; J. E. Huheey, E. A. Keiter and R. L. Keiter, Addison; Wesley (1993).
4. Inorganic Chemistry, II edition, D. F. Shriver, P. W. Atkins and C. H. Langford, ELBS;

Oxford UniversityPress, 1994.
5. Chemistry of elements; N. N. Greenwood and A. E. Earnshaw, Butterworth Heinemann (1997).
6. Concise Inorganic Chemistry, 5th edition; J. D. Lee (1996).
7. Essentials of nuclear chemistry, 4th edition; H. J. Arniker, NAIL publishers (1995); Chapters 1, 3 and 4.
8.Nuclear and Radioactive chemistry; Friedlander, Kennedy and Miller; Chapters 8 and 9.
9. Inorganic Chemistry, 3rd Edition; Gary. L. Miessler and Donald . A. Tarr (2007).
10. Physical Chemistry, P. W. Atkins, Julio de Paula, ELBS, 7th edition, (2002).
11. Physical Chemistry: A Molecular Approach, McQuarie and Simon, Viva, New Delhi, (2001).
12. Introduction to Quantum Chemistry, A. K. Chandra, Tata McGraw Hill, (1988).
13. Quantum Chemistry, Ira. N. Levine, Prentice Hall, New Jersey, (1991).
14. Quantum Chemistry, R. K. Prasad, New Age International, 2nd edition, (2000).
15. Quantum Chemistry through problems and solutions, R. K. Prasad, New Age International (1997).
16. Chemical Kinetics- K. J. Laidler, McGraw Hill. Inc. New York (1988).
17. Principles of Chemical Kinetics - House J. E. Wm C Brown Publisher, Boston, (1997).
18. Kinetics and Mechanism - A. A. Frost and R. G. Pearson, John-Wiley, New York, (1961).
19. Chemical Kinetic Methods - C. Kalidas, New Age International Publisher, New Delhi (1995)
20. S.H. Maran and C. F. Pruton, 4th Edn., Oxford, & IBH publishing Co. Pvt. Ltd. New Delhi (1965).
21. Physical Chemistry- P. Atkins and J. D. Paula, 9th Edn., Oxford University Press (2010).
22. Biochemistry, - Geoffrey Zubay, 2nd Edn.,Macmillan Publishing Co. New York (1981).
23. Kinetics and Mechanism of Chemical Transformations- J. Rajaraman and J. Kuriakose, Mc Millan.

PRACTICAL V
INORGANIC & PHYSICAL CHEMISTRY PRACTICAL
BSCCHPN501

Work Load: 4Hours/week **Credit points:2**
Evaluation:Continuous Internal Assesment:25Marks
Semester End Examination: 25Marks

Course Objectives:
Students are made to learn
i) the practical aspects of preparation of complexes
ii) analysis of anions and cations. i
ii) instrumental methods of analysis

Course Specific outcomes:
i) Students will have practical experience in systematic semimicro qualiitative analysis of inorganic mixtures containing less familiar elements.

ii) Students acquire the knowledge in the preparation of inorganic complexes.

iii) Theoretical knowledge of students is strengthened with laboratory experiments using instruments like colorimeter, conductivity meter and potentiometer.

INORGANIC CHEMISTRY EXPERIMENTS

I Semi micro qualitative analysis of mixtures containing **two anions, two common cations and one less familiar elements**: W, Mo, Ce, Zr, V and Li. (Any five combinations).

II Preparation of inorganic complexes:

1. Cis- and trans- potassium dioxalatodiaquachromium(III) complex [analysis of oxalate and chromium]
2. Hexamminecobalt(III)chloride [analysis of cobalt]
3. Preparation of pentamminechlorocobalt(III)chloride.

PHYSICAL CHEMISTRY EXPERIMENTS

I Colorimetric Experiments

1. Verification of Beer's Law for Cu^{2+} ion/ Fe^{2+} ion.
2. Estimation of Fe^{2+} ion concentration using EDTA through colorimetric method.

II Conductometric Experiments

1. Precipitation titration: conductometric titration of lithium sulphate versus $BaCl_2$.
2. Conductometric titration of weak acid versus weak base.

III Potentiometric Experiments

1. Determination of single electrode potential of M^{2+}/M and estimate the given unknown concentration (Zn^{2+}/Zn, Cu^{2+}/Cu)
2. Titration of weak acid against a strong base using quinhydrone electrode and calculation of pKa and Ka of the weak acid.

Recommended Books/References:

1. Vogel's Text book of Qualitative Chemical Analysis, J. Bassett, G. H. Jeffery and J. Mendham, ELBS (1986).
2. Vogel's text book of Quantitative Chemical Analysis, 5th Edition, J. Bassett, G. H. Jeffery and J. Mendham, and R. C. Denny, Longman Scientific and Technical (1999).

3. Inorganic Semimicro Qualitative Analysis, V. V. Ramanujam; The National Pub. Co. (1974).
4. Practical Inorganic Chemistry, G. Marr and B. W. Rockett, Von Nostrand Reinhold Co., London (1972).
5. Findlays practical physical chemistry revised by P. B. Levitt, Longman's London (1966).
6. Experiments in Physical Chemistry by Shoemaker and Garland, McGraw Hill International Edn. (1966)
7. Advanced Practical Physical Chemistry by J. B. Yadav, Goel Publications Meerut (1988)
8. Senior Practical Physical Chemistry by B. C. Kosla, Simla Printers New Delhi (1987)
9. Experimental Physical Chemistry by Daniel et al., McGraw Hill, New York (1962).
10. Practical Physical Chemistry by A.M James and P. E. Pritchard, Longman's Group Ltd (1968)
11. Experimental Physical Chemistry by Wilson, Newcombe & others, Pergamon Press, New York (1962)
12. Experimental Physical Chemistry by R. C. Behra and B Behra, Tata McGraw, New Delhi (1983)
13. Experimental Physical Chemistry by V. D. Atavale and Parul Mathur, New Age International, New York (2
14. Physical Chemistry Laboratory Principles and Experiments by H. W. Salberg J. I. Morrow, S. R. Cohen an Green Macmillan publishing Co .new York.
15. Practical's in physical chemistry A. Modern Approach by P.S Sindhu, Mac. Millan Publishers Delhi (200 (1986).
16. Physical Chemistry of Surfaces- A. W. Adamson, Interscience Publisher Inc., New York (1967).
17. Surface Chemistry: Theory and Applications, J. J. Bikerman, Academic Press. New York (1972).

PAPER - VI: ORGANIC CHEMISTRY AND SPECTROSCOPY
BSCCHCN502
UNIT – I

Contact hours:56 Work Load:4Hours/week Credit points:4
Evaluation:
Continuous Internal Assesment:40Marks
Semester End Examination: 60Marks

Course Objectives:

i)To acquire detailed knowledge of the nature of bonding and reaction mechanism in organic molecules.

ii)To study carbohydrates, their Conformations and Configurations.

ii) To acquire the knowledge of structure and properties of heterocyclic compounds.

iv)To gain knowledge of molecular-vibrational, rotational, Raman and UV spectroscopic techniques.

Course Specific outcomes:
After the completion of the course students will be able to:

i) Differentiate aliphatic and aromatic compounds, understand the concept of resonance and write simple reaction mechanisms.
ii) Identify some of the heterocyclic compounds, their structure and physiological properties.
iii) have the basic knowledge of molecular spectroscopic methods like rotational, vibrational, Raman, NMR and UV Spectroscopy.

UNIT – I

Nature of Bonding in Organic Molecules: 4h

Delocalized chemical bonding, resonance, cross conjugation. Aromaticity. Huckel's rule of aromaticity. Aromatic systems with number of electrons other than six (azulene, tropone, tropolone and annulenes). Antiaromaticity. Aromaticity in benzenoids. Homo-aromaticity. Hyperconjugation. Tautomerism.

Reaction mechanism: 5h

Effect of structure on reactivity: - Resonance and field effects; steric effects.

Nucleophilic substitution reaction at a saturated carbon: S_N1, S_N2, and SET mechanisms. Effect of substrate structure, attacking nucleophile, leaving group.
Nucleophilic substitution in Aromatic compounds. S_NAr-Aryl mechanism.

Carbohydrates: 5h

Configuration, conformation of monosaccharides and classification. Interconversions of glucose and fructose, chain lengthening of aldoses (Kiliani-Fischer method), Chain shortening (Ruff degradation) Conversion of glucose and mannose-epimerisation, Mechanism of osazone formation-Amadori rearrangement, Formation of glycosides, ethers (methyl), esters (acetates). Configuration of glucose and fructose-deduction, Determination of ring size of monosaccharides (methylation and periodic acid method), Elucidation of cyclic structure of D(+) glucose, Mechanism of muta rotation.

.

UNIT – II

Heterocyclic Compounds: **7h**

Nomenclature of heterocyclic compounds. Structure, reactivity, synthesis and reactions of Pyrrole, Furan, Thiophene, pyrazole, oxazole, thiazole, pyrimidine, purine and indole.

Vitamins: **7h**

Biological importance and synthesis of Vitamins A, Vitamin B1 (thiamine), Vitamin B6 (pyridoxine), folic acid, pantothenic acid, riboflavin, Vitamin C, Vitamin E (α-tocopherol), Vitamin H (biotin), Vitamins K1 and K2.

UNIT – III

Molecular Spectroscopy – I

Interaction of electromagnetic radiation with molecules and various types of spectra; Born-Oppenheimer approximation(No mathematical derivation. Physical meaning only). **3h**

Rotation spectroscopy:

Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution. **4h**

Vibrational spectroscopy:

Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies. Fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic molecules, modes of vibration, concept of group frequencies. **4h**

Raman spectroscopy:

Qualitative treatment of Rotational Raman effect; Effect of nuclear spin, Vibrational Raman spectra, Stokes and anti-Stokes lines; their intensity difference. **3h**

UNIT – IV

Nuclear Magnetic Resonance (NMR) spectroscopy: **8h**

Introduction, origin of spectra, instrumentation of PMR spectrometer, solvents used, scales, number of signals for simple organic molecule, area of signals. Chemical shift and factors affecting chemical shift. Nuclear shielding and deshielding, Spin-spin splitting, coupling constants. Interpretation of PMR spectra of simple organic molecules such as ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane and ethyl acetate.

UV Spectroscopy: **6h**

Types of electronic transitions, λmax, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward Rules for calculation of λ max for the following systems: α,β-unsaturated aldehydes, ketones, carboxylic acids and esters; Conjugated dienes: alicyclic, homoannular and heteroannular; Extended conjugated systems (aldehydes, ketones and dienes); distinction between cis and trans isomers.

Recommended Books/References:

1. Advanced Organic Chemistry - Reactions, Mechanism and Structure, Jerry March, John Wiley (2008).
2. Advanced Organic Chemistry, F A Carey and R J Sundberg Plenum, (1990).
3. A Guide Book to Mechanism in Organic Chemistry, Peter Sykes, Longman, (2000).
4. Structure and mechanism of Organic Chemistry, C K Ingold, Cornell University Press (1999).
5. Organic Chemistry, R T Morrison and R N Boyd, Prentice-Hall, (1998).
6. Modern Organic Reactions, H O House, Benjamin, (1972).
7. Principles of Organic Synthesis, R O C Norman and J M Coxon, Blackie Academic

and Professional, (1996).
8. Stereochemistry of Organic Compounds, D Nasipuri, New-Age International, (1999).
9. Stereochemistry of Carbon Compounds, E L Eliel, S H Wilen and L N Mander, John Wiley, (1994).
10. Stereochemistry, Potapov, MIR, Moscow, 1984.
11. Organic Chemistry, Volumes I and II, I L Finar, Longman, (1999).
12. Laideler K. J. and Meiser J. M. Physical Chemistry Third Edition (International)1999
13. Levine I. N., Physical Chemistry, Fourth Edition), McGraw-Hill (International), 1995.
14. McQuarrie D. A. and Simon J. D. Physical Chemistry- A Molecular Approach, University ScienceBooks, 1998.
15. P.W. Atkins: Physical Chemistry.
16. G.W. Castellan: Physical Chemistry.
17. Banwell, C. N. & McCash, E. M. Fundamentals of Molecular Spectroscopy 4th Ed.Tata McGraw-Hill:New Delhi (2006).
18. Brian Smith: Infrared Spectral Interpretations: A Systematic Approach.
19. Kemp, W. Organic Spectroscopy, Palgrave
20. Principles of Instrumental Analysis - 6th Edition by Douglas A. Skoog, F. James Holler, and StanleyCrouch (ISBN 0-495-01201-7).
21. Instrumental Methods of Analysis, 7th ed, Willard, Merritt, Dean, Settle.

PRACTICAL VI
ORGANIC CHEMISTRY PRACTICAL
BSCCHPN502

Work Load: 4Hours/week **Credit points:2**
Evaluation:
Continuous Internal Assessment: 25Marks
Semester End Examination: 25Marks

Course Objectives:
i)To make students learn synthesis of simple organic compounds and analysis of organic compounds with bifunctional groups.

Course Specific outcomes:
i) Students will know how to systematically identify organic compounds containing two functional groups by qualitative method.

ii) Students will be able to do simple single stage organic synthesis.

I- Preparation (one stage)

1. Cannizarro reaction: Benzaldehyde.
2. Pechmann reaction: Resorcinol and ethylacetoacetate.
3. Oxidation of Cyclohexanol.
4. Preparation of S-Benzylisothiuronium chloride.
5. Synthesis of p-Iodonitrobenzene
6. Synthesis of N-Phenyl-2,4-dinitroaniline.
7. Synthesis of 2,4,6-Tribromoaniline.

II- Qualitative analysis of bifunctional organic compounds

Systematic analysis and identification of organic compounds:

1. p-nitrobenzoic acid	2. p-nitrophenol	3. salicylic acid,
4. anthranilic acid,	5. o-chloroaniline,	6. p-nitroaniline,
7. p-nitrobenzaldehyde		

Recommended Books/References:

1. Laboratory manual of Organic Chemistry- B. B. Dey, M V Sitaraman and T R Govindachari, Allied Publishers, NewDelhi, (1996).
2. Practical Organic Chemistry - Mann and Saunders, (1980).
3. Textbook of Practical Organic Chemistry- A. I. Vogel, (1996).
4. Textbook of Quantitative Organic Analysis- A. I. Vogel, (1996).
5. A Handbook of Organic Analysis - Clarke and Hayes, (1964).
6. Comprehensive practical organic chemistry: Preparation and quantitative Analysis, V. K. Ahluwalia, R. Aggarwal, Universities Press (India), 2000.
7. Comprehensive practical organic chemistry: Qualitative analysis, V. K. Ahluwalia, S. Dhingra, Universities Press (India), 2000.
8. An advanced course in practical chemistry, A. Ghoshal, B. Mahapatra and A. Kr. Nad, New central book agency, Calcutta, 2000.
9. Advanced practical organic chemistry, J. Mohan, Vol. I and II, Himalaya Publishing House, 1992.
10. Practical organic chemistry (Quantitative analysis), B. B. Dey, M. V. Sitaraman and T. R. Govindachari, Allied Publishers, New Delhi, 1992.

VI SEMESTER BSc CHEMISTRY
PAPER VII: INORGANIC AND PHYSICAL CHEMISTRY
BSCCHCN601

Contact hours:56 **Work Load:4Hours/week** **Credit points:4**

Evaluation:Continuous Internal Assesment:40Marks
Semester End Examination: 60Marks

Course Objectives:

i) To make the students aware of the kinetics, stability, electronic spectra and types of bonding in complex compounds.

ii)To make the students understand the theories of binary mixtures and thermal methods of analysis of compounds.

iii)To make the students learn the potentiometric methods of quantitative analysis.

Course Specific outcomes:

After the completion of course, the students will

i) know the Kinetics of complex formation and also the electronic spectra of complexes which will help them in selecting the methods of synthesis and identification of complex compounds.

ii) understand the theories of bonding in complex compounds.

iii) understand the principle of steam distillation and separation of components of binary mixtures.

iv) get introduced to thermal methods of analysis.

v) understand the concept of galvanic cells and potentiometric methods of quantitative analysis.

UNIT – I

Metal-Ligand equilibria in solution: 10h

Step-wise and overall formation constant and their relationship, trends in step-wise constant, kinetic and thermodynamic stability of metal complexes, factors affecting the stability of metal complexes with reference to the nature of the metal ion and ligand, chelate effect, macrocyclic effect and their thermodynamic origin.

Electronic spectra of coordination compounds: 4h

Spectroscopic terms for ground states, selection rules, term symbols for d^n ions, Racah parameters, Orgel diagrams, spectra of 3d metal-aqua complexes of trivalent V, Cr, calculation of Dq, B and β parameters, CT spectra.

UNIT – II

Metal- ligand bonding: 12h

Stereoisomerism- coordination numbers 4 and 6. Crystal field theory, salient features, spectrochemical series, splitting of d-orbitals in tetragonal, square planar, trigonal bipyramidal and square-pyramidal geometry, applications of CFT- colours of transition metal complexes, magnetic properties of octahedral complex, distortion of octahedral complex, CFSE and their uses, factors affecting CFSE, limitations of CFT, experimental evidence for metal-ligand covalent bonding in complexes, nephelauxetic effect,

Magnetic properties of coordination compounds: **2h**

Classification of magnetic materials, magnetic susceptibility, and its determination by Gouy method.

UNIT – III

Binary Mixtures **4h**

Ideal liquid mixtures - Raoult's law, Vapour pressure vs composition (mole-fraction) curves. Azeotropes - HCl-H_2O and Ethanol-Water system; Fractional distillation, partially miscible liquids - phenol-water, triethylamine-water and nicotine-water systems. Lower and upper critical temperature; Effect of impurity on critical temperature. Immiscible liquids – steam distillation.

Phase Equilibrium **5h**

Phase rule-Statement (mathematical expression) and meaning of the terms. Explanation for the terms phase, component and degrees of freedom with suitable examples for each. Derivation of phase rule from thermodynamic consideration. Explanation of phase equilibria of one component system (water and sulphur system) using phase diagram. Two component system - classification with examples, simple eutectic system (lead-silver system) - phase diagram and explanation, desilverisation of lead (Pattinson's Process). Compound formation with incongruent melting point (NaCl + water system) - phase diagram and explanation.

Thermo-analytical methods **5h**

TGA - Principle, instrumentation, types of thermo balances; Deflection and null type; Factors affecting TGA curves – rate of heating and furnace atmosphere; Determination of composition of a compound with example of $CaC_2O_4.H_2O$. Applications – evaluation of suitable standard, testing of sample purity, study of organic compound, drying and ignition temperature, determination of curie point. DTG – Advantages over TGA; Significance of DTG curves. DTA - Principle, Factors affecting DTA curves – rate of heating and furnace atmosphere with example of $CaC_2O_4.H_2O$; Simultaneous TGA and DTA curves; interpretation of DTA curve.

UNIT – IV

Dilute Solutions and Colligative Properties: **6h**

Ideal and non-ideal solutions - thermodynamic properties (ΔG, ΔH and ΔS) of ideal solutions, Activity and Activity coefficients, colligative properties – Definition and an elementary account of the four colligative properties. Raoult's Law of relative lowering of vapour pressure. Osmosis - Laws of osmotic pressure.

Elevation in boiling point and depression in freezing point. Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental determination of molecular weight by Walker-Lumsden method and Beckmann's method. Numerical Problems to be solved wherever necessary.

Electrochemistry: **8h**

Galvanic cells. Reference electrodes, Calomel, Quinhydrone, Ag-AgCl and glass electrode (Construction, Electrode reaction, Nernst equation), E.M.F. of cells and its

measurements by potentiometric method, calculation of electrode potential, computation of cell EMF, relation between ΔG^0 and K for cell reaction, calculations.

Concentration cells: Electrolyte concentration cells with/without transport, liquid junction potential, calculations. Applications of concentration cells: Determination of a) valency of ions, b) solubility product

Application of E.M.F. measurements: a) Potentiometric titrations (acid- base and redox), b) Determination of p^H using hydrogen electrode, Quinhydrone electrode and Glass electrode by potentiometric methods.

Recommended Books/References:

1. Basic Inorganic Chemistry- F. A. Cotton, G. Wilkinson and P. L. Gaus; John Wiley and sons. Inc, 6th edition (1999).
2. Chemistry of elements- N. N. Greenwood and A. E. Earnshaw, Butterworth Heinemann (1997).
3. Inorganic Chemistry IV edition; J. E. Huheey, E. A. Keiter and R. L. Keiter, Addison; Wesley (1993).
4. Inorganic Chemistry, II edition, D. F. Shriver, P. W. Atkins and C. H. Langford, ELBS; Oxford University Press, 1994.
5. Inorganic Electronic spectroscopy, A. B. P. Lever, Elsevier. (1968).
6. Magnetochemistry, R.L. Carlin, Springer Verlag.
7. Electronic Absorption Spectroscopy and related Techniques, D. N. Sathyanarayana, University Press (2001).
8. Inorganic Chemistry A Unified Approach by W. W. Porterfield, Elsevier 2005 2nd edition.
9. Textbook of inorganic chemistry by G. S. Sodhi, Viva books Pvt. Ltd (2011).
10. Molecular thermodynamics, Donald A. Mc Quarrie, John D. Simon University Science Books California, (1999).
11. Thermodynamics for Chemists, by S. Glasstone, East-West Press, New Delhi, (1960).
12. Thermodynamics, by Rajaraman and Kuriacose, East-West Press, (1986).
13. Statistical Thermodynamics, M. C. Gupta (Wiley Eastern Ltd.) 1993.
14. Elementary Statistical Thermodynamics, N. D. Smith, Plenum Press, NY, (1982).
15. Elements of Classical and Statistical Thermodynamics, L. K. Nash, Addison-Wiley (1979).
16. Thermodynamics, Statistical Thermodynamics and Kinetics by Thomas Engel & Philip Reid, Pearson Education inc. (2007)
17. Modern Electrochemistry Vol-1 and 2 J. O. M Bockris and A. K. N. Raddy, Plenum New York (1978)
18. An introduction to electrochemistry- Samuel Glastone East-West edition New Delhi (1942)
19. Text book of physical chemistry Samuel Glastone , 2nd edition, Mac Millan India Ltd (1991)
20. Electrochemistry, Principles and applications, Edmund, C. Potter, Cleaver-Hume press London (1961).
21. Principles and applications of Electrochemistry- D. R. Crow 3rd edition Chapmanhall London (1988).

PRACTICAL – VII

PHYSICAL & INORGANIC CHEMISTRY PRACTICAL

BSCCHPN601

Work Load: 4Hours/week **Credit points:2**
Evaluation: Continuous Internal Assesment: 25Marks
Semester End Examination: 25Marks

Course Objectives:

i) To introduce the students to gravimetric and volumetric methods analysis.
ii) To make students learn about physical properties of liquids.
iii) To make students learn some electrochemical methods of analysis.

Course Specific outcomes:

i) Students learn the application of gravimetry and volumetry in chemical analysis.
ii) Learn some of the instrumental and physical methods used in quantitative analysis.

PHYSICAL CHEMISTRY PRACTICAL

Chemical kinetics:

1. Study the hydrolysis of methyl acetate in presence of two different concentrations of HCl and report the relative strength.
2. Study the hydrolysis of methyl acetate in the presence of HCl at different temperatures and report the energy of activation.
3. Study of variation of viscosity of a liquid with temperature, determine the constant A and B.
4. Determination of pH of acetic acid -sodium acetate buffer by pHmetry.

Conductometric titration

1. Acid mixture versus NaOH.
2. Weak acid (CH_3COOH) with salt ($CuSO_4$) versus NaOH.
3. Strong acid (HCl) with salt (NH_4Cl) versus NaOH.

Potentiometric titration

1. $K_2Cr_2O_7$ versus FAS.
2. Weak acid versus NaOH

INORGANIC CHEMISTRY PRACTICAL

I-Gravimetric analysis

1.Gravimetric determination of Fe in iron ore as Fe_2O_3.

2.Gravimetric determination of Ni in Cu and Ni mixture.

3. Gravimetric estimation of Cu in Cu and Zn mixture.

II-Volumetric analysis

1.Volumetric estimation of Ca and Mg in Dolomite solution.

1. Volumetric estimation of Zn in Cu and Zn mixture.
2. Volumetric estimation of Ni in Ni and Zn mixture.

Recommended Books/References:

1. Vogel's text book of Quantitative Chemical Analysis, 5th Edition, J. Bassett, G. H. Jeffery and J. Mendham, and R. C. Denny, Longman Scientific and Technical (1999).
2. Practical Inorganic Chemistry, G. Marr and B. W. Rockett, Von Nostrand Reinhold Co., London (1972).
3. Findlays practical physical chemisty revised by P. B. Levitt, Longman's London (1966).
4. Experiments in Physical Chemistry by Shoemaker and Garland, McGraw Hill International Edn. (1966).
5. Advanced Practical Physical Chemistry by J. B. Yadav, Goel Publications Meerut (1988).
6. Senior Practical Physical Chemistry by B. C. Kosla, Simla Printers New Delhi (1987).
7. Experimental Physical Chemistry by Daniel et al., McGraw Hill, New York (1962).
8. Practical Physical Chemistry by A.M James and P. E. Pritchard, Longman's Group Ltd (1968)
9. Experimental Physical Chemistry by Wilson, Newcombe & others, Pergamon Press, New York (1962).
10. Experimental Physical Chemistry by R. C. Behra and B Behra, Tata McGraw, New Delhi (1983).
11. Experimental Physical Chemistry by V. D. Atavale and Parul Mathur, New Age International, New York (2001).
12. Physical Chemistry Laboratory Principles and Experiments by H. W. Salberg J. I. Morrow,S. R. Cohen and M. E. Green Macmillan publishing Co .new York.
13. Practical's in physical chemistry A. Modern Approach by P.S Sindhu, Mac. Millan Publishers Delhi (2006).

PAPER VIII: ORGANIC CHEMISTRY AND SPECTROSCOPY
BSCCHCN602

Contact hours:56 Work Load:4Hours/week Credit points:4
Evaluation:Continuous Internal Assesment:40Marks
Semester End Examination: 60Marks

Course Objectives:

i)To understand the mechanism of electrophilic and nucleophilic substitution reactions and addition reactions with suitable examples.
ii) To learn the basics of symmetry and group theory.
iii) To learn PES and flame photometry.

Course Specific outcomes:

After the completion of the course, the students will
i) know the mechanism of selected electrophilic and nucleophilic substitution reactions
ii) understand the mechanism of addition reactions in organic compounds.
iii) get exposure to symmetry and group theory.
iv) get introduction to photo electron spectroscopy and flame photometry.

UNIT – I

Aromatic Substitution Reactions: 4h

Electrophilic Substitution Reactions: Sulfonylation reactions; Diazonium coupling, Vilsmeier-Haack reaction, Gatterman reaction.

Nucleophilic substitution reactions: 3h

Goldberg reaction, Bucherer reaction, Schiemann reaction.

Rearrangements: 3h

Wagner-Meerwein, Curtius, Lossen and Schmidt rearrangements. Benzil-benzilic acid rearrangement, Baeyer-Villiger oxidation.

Amino acids and Peptides: 4h

Synthesis and reactions of amino acids. Classification and nomenclature of peptides. Edman methods of sequencing. Cleavage of peptide bond by chemical and enzymatic methods. Protection of amino group and carboxyl group as alkyl and aryl esters. Coupling of protected amino acids.

UNIT - II

Addition Reactions: 14h

Addition to carbon-carbon multiple bonds: mechanistic and stereochemical aspects of addition reactions involving electrophiles, nucleophiles, and free radicals. Regio, stereo- and chemoselectivities. Orientation and reactivity. Addition of halogens to alkenes-carbocation and halonium ion mechanisms. Stereo specificity of halogen addition. Addition to cyclopropane ring. Hydrogenation of double and triple bonds. Michael reaction.

Ozonolysis- Mechanism of ozonolysis of propene. Addition of hydrogen halides to alkenes- mechanism, regioselectivity and relative rates of addition. hydration, hydroxylation and epoxidation of alkenes-Explanation with examples. Electrophilic addition to conjugated dienes-effect of temperature. Free radical addition to 1,3-butadiene.

Addition to carbon-heteroatom multiple bonds: Addition of Grignard reagents and organolithium

reagents to carbonyl compounds and unsaturated carbonyl compounds. Wittig, Mannich and Stobbe reactions.

UNIT – III

Symmetry and Group Theory in Chemistry: 6h

Definition of groups, subgroups, simple theorems in group theory. Symmetry elements and symmetry operations, point groups, Schöenflies notations, representations of groups by matrices, reducible and irreducible representations, character tables, Great Orthogonality Theorem (without proof) and its applications.

Photochemistry 8h

Interaction of radiation with matter, difference between thermal and photochemical processes. primary and secondary processes of a photochemical reaction, Laws of photochemistry: Grothuss - Draper law, Stark - Einstein law, (only statement) Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing). Quantum yield- definition, reasons for low and high quantum yield. Explanation for low and high quantum yield reactions taking combination of H_2 and Br_2 and combination of H_2 and Cl_2 as examples. Photosensitized reactions-energy transfer processes definition of photosensitization.(e.g.: Photosynthesis in plants, dissociation of H_2, Isomerization of 2-butene and butadiene).

UNIT – IV

Photoelectron Spectroscopy 3h

Principle, valence and core binding energies, shifts in energies due to chemical forces, photoelectron spectra of simple molecules.

Electron Paramagnetic Resonance Spectroscopy 8h

Electron Paramagnetic Resonance (EPR) Spectroscopy: Basic principles, selection rules, intensity, width, position of spectral line, multiplet structure of EPR spectra, hyperfine interaction, spin-orbit coupling, zero field splitting and Kramer's degeneracy, rules for interpreting spectra, factors affecting the magnitude of values. Instrumentation. Applications to the study of free radicals, coordination compounds.

Flame photometry 3h

General principles, Instrumentation, Interference and applications

Recommended Books/References:

1. Advanced Organic Chemistry - Reactions, Mechanism and Structure, Jerry March, John Wiley (2008).
2. Advanced Organic Chemistry, F. A. Carey and R. J. Sundberg, Plenum (1990).
3. A Guide Book to Mechanism of Organic Chemistry, Peter Sykes, Longman (2000).
4. Structure and Mechanism of Organic Chemistry, C. K. Ingold, Cornell University Press.
5. Organic Chemistry, R. T. Morrison and R. N. Boyd, Prentice-Hall (1998).
6. Modern Organic Reactions, H. O. House, Benjamin (1972).
7. Principles of Organic Synthesis, ROC Norman and J. M. Coxon, Blackie Academic and Professional(1996).
8. Stereochemistry of Organic Compounds, D. Nasipuri, New-Age International (1999).
9. Stereochemistry of Carbon Compounds, E. L. Eliel, S. H. Wilen and L. N. Mander, John Wiley (1994).
10. Organic Chemistry, Volumes I and II, I L Finar, Longman. (1999).

11. Medicinal Chemistry, A Kar, Wiley (2000).
12. Peptides Chemistry: A practical text book, M. Bodansky, Springer-Verlag NY, 1988.
13. Solid-phase peptide synthesis: A practical approach-E. Artherton & R.C. Sheppard, I R L, Oxford Univ. Press, 1989.
14. Peptides: Chemistry and Biology, N Selwad and H.-D. Jakubke, Wiley-VCH, 2002.
15. Chemical Applications of Group Theory, F. A. Cotton, Wiley Eastern (1976).
16. Molecular Symmetry, D. S. Schonland, Van Nostrand (1965).
17. Introduction to Molecular Spectroscopy, C. N. Banwell, TMH Edition (1994).
18. Introduction to Molecular Spectroscopy, G. M. Barrow, McGraw Hill (Int. Students Edition) (1988).
19. Molecular Spectroscopy, J. D. Graybeal, McGraw Hill (Int. Students Edition) (1990).
20. Spectroscopy, Vols. 1-3, B. P. Straughan and W. Walker, Chapman Hall (1976).
21. Physical Methods in Chemistry - R .S. Drago, Saunder college.
22. Structural Methods in Inorganic Chemistry - E. A. Ebsworth, D. W. H. Ranbin and S.Cradock, ELBS.
23. Spectra of Inorganic and Coordination Compounds - K. Nakamoto.
24. 10.Infrared Spectroscopy - C.N.R. Rao.
25. Introduction to Spectroscopy - D.L.Pavia, G.M.Lampman and G.S.Kriz, Thomson Learning, Singapore (2001)
26. Spectroscopic Identification of organic compounds - R. M. Silverstein and F. X. Webster, 6th Edition, Wiley and Sons, India Ltd. (2006).
27. Interpretation of Mass Spectroscopy-McLafferty.

PRACTICAL – VIII

ORGANIC CHEMISTRY PRACTICAL

BSCCHPN602

Work Load:4Hours/week **Credit points:2**
Evaluation:Continuous Internal Assesment:25Marks
Semester End Examination: 25Marks

Course Objectives:

i) To learn two and three stage synthesis of selected organic compounds.

ii) To learn the volumetric analysis of selected organic compounds.

Course Specific outcomes:

After the practical course, the students will know

i) two and three stage synthesis of selected organic compounds .

ii) how to analyse amino acids, phthalic acid, glucose and phenol volumetrically.

iii) to determine the saponification and iodine value of oils

Preparation (Two and three stages)

1. 2,4-Dinitrophenylhydrazine from chloronitrobenzene.
2. Anthranilic acid from phthalic acid.
3. Benzanilide from benzophenone.
4. Benzilic acid from benzoin.
5. Synthesis of Acridone.

Quantitative analysis

1.Titrimetric estimation of amino acids.
2.Saponification value of oil.
3.Estimation of glucose by Feighling's method.
4.Estimation of phenols.
5.Iodine value of oil (chloramine-T method).

Recommended Books/References:

1. Laboratory manual of Organic Chemistry- B. B. Dey, M V Sitaraman and T R Govindachari, Allied Publishers, NewDelhi, (1996).
2. Practical Organic Chemistry - Mann and Saunders, (1980).
3. Text Book of Practical Organic Chemistry- A. I. Vogel, (1996).
4. Test Book of Quantitative Organic Analysis- A. I. Vogel, (1996).
5. Comprehensive practical organic chemistry : Preparation and quantitative Analysis, V. K. Ahluwalia, R. Aggarwal, Universities Press (India), 2000.
6. An advanced course in practical chemistry, A. Ghoshal, B. Mahapatra and A. Kr. Nad,

New central book agency, Calcutta, 2000.
7. Advanced practical organic chemistry, J. Mohan, Vol. I and II, Himalaya Publishing House, 1992.
8. Practical organic chemistry (Quantitative analysis), B. B. Dey, M. V. Sitaraman and T. R. Govindachari, Allied Publishers, New Delhi, 1992.

Government of Karnataka

Curriculum Framework for Undergraduate Programme in Colleges and Universities of Karnataka State

5th and 6th Semester Model Syllabus
for
B.Sc. in
MICROBIOLOGY

Submitted to

VICE CHAIRMAN
KARNATAKA STATE HIGHER EDUCATION COUNCIL
30, PRASANNA KUMAR BLOCK, BENGALURU CITY UNIVERSITY CAMPUS
BENGALURU, KARNATAKA – 560009

Government of Karnataka

Model Curriculum

Program Name	**BSc in MICROBIOLOGY**	Semester	**V**
Course Title	**MOLECULAR BIOLOGY (Theory)**		
Course Code:	**MIC C9-T**	No. of Credits	**04**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s) :

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Understand concepts involved in replication, transcription, translation, regulation of gene expression in bacteria and Eukaryotes.

CO2. Differentiate the process of replication, transcription, translation, regulation of gene expression in bacteria and Eukaryotes.

CO3. Understand the genetic switch in bacteriophages.

CO4. Compare and contrast housekeeping, constitutive, inducible and repressible genes

CO5. Outline regulatory mechanisms in bacteria to control cellular processes

Contents	
UNIT 1: DNA Replication and Prokaryotic transcription.	**15 Hrs**
DNA Replication : Central dogma of molecular biology, Genetic code, Structure and types of DNA and RNA, Bacterial Cell cycle. Replicon. *OriC*. Bidirectional replication. Steps in Initiation of replication. DNA polymerases, Replication fork, replisome. Mechanism of DNA polymerase III in detail. Ligase. Eukaryotic DNA polymerases. Termination of replication. Extrachromosomal replicons. Replication of DNA strand with 5' end,linear end, replication of adenovirus and ϕ29 DNAs, rolling circle in replication of phage genomes, F plasmid,. Replication of ColE1 DNA. Replication of mtDNA, D loop. Replication of telomeres **Prokaryotic transcription:** Transcription bubble, Stages of transcription, Bacterial RNA polymerase - structure and mechanism, recognition of promoters and DNA melting, abortive initiation. Elongation, Termination, antitermination. Phage T7 RNA polymerase, alternative sigma factors - transcription of heat shock genes, phage SPO1 genes, sporulation in *Bacillus*. Stringent response in *E.coli*.	

UNIT 2 Transcription **Eukaryotic Transcription**: Eukaryotic RNA polymerases - RNA polymerase I, II, III. Mechanism of RNA polymerase in detail. Promoters, Transcription factors, basal apparatus, promoter clearance, elongation. Enhancers, silencers, termination. **RNA splicing and Processing**: mRNA capping, pre-mRNA splicing, lariat, snRNPs, spliceosome, autocatalytic splicing, alternative splicing, polyadenylation, tRNA splicing and maturation, production of rRNA, Catalytic RNAs - auto splicing, ribozymes, rinonuclease P,viroids and virusoids, RNA editing	**15 Hrs**
UNIT 3 Translation Genetic code, tRNA structure, charging of tRNA, differences between initiator tRNA and elongator tRNA, ribosome structure. Accuracy of translation. Stages of translation. Role of IFs in initiation of bacterial translation, Formation of initiation complex. Initiation of eukaryotic translation - Scanning model of mRNA, IRES, Role of eIFs. Elongation of polypeptide - EF-Tu, EF-G, peptide bond formation, peptidyl transferase activity, translocation, eEFs. Termination. Regulation of translation. Post translational modifications of proteins. Protein maturation and secretion - protein splicing,molecular chaperones. Protein translocation and secretion in bacteria	**15 Hrs**
UNIT 4 Regulation of gene Expression **Control of gene expression in prokaryotes** Regulatory mechanisms in bacteria. Positive and negative transcriptional control in bacteria. Operon concept, polycistronic mRNA. *lac* operon - negative inducible, allolactose,mutants of *lac* operon structure of *lac* repressor, mechanism of binding of repressor to operator. Catabolite repression of *lac* operon.Regulation by lac repressor and CAP. *trp* operon regulation - repressor control & attenuator control. Arabinose operon - positive and negative transcriptional control by AraC. Riboswitch control of *rib* operon of *Bacillus subtilis*. Control of translation by riboswitches and small RNAs. Global regulatory mechanisms - *mal* regulon, two-component signal transduction systems.Regulation of lytic & lysogenic life cycle in bacteriophage λ. Control of lytic cycle by regulatory proteins - *cro* gene, *N* gene, lambda repressor - structure, DNA binding mechanism. Events in switch from lytic to lysogenic cycle. Maintenance of lysogeny. **Control of gene expression in eukaryotes** Regulation through modification of gene structure- DNase I hypersensitivity, histone modifications, chromatin remodeling, DNA methylation. Regulation through transcriptional activators, Co-activators and repressors, enhancers and insulators. Regulation through RNA processing and degradation. Regulation through RNA interference	**15 Hrs**

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	1	2	3	4	5	6	7	8	9	10	11	12
Understand concepts involved in replication, transcription, translation, regulation of gene expression in bacteria and eukaryotes		√	√		√							√
Differentiate the process of replication, transcription, translation, regulation of gene expression in bacteria and eukaryotes		√	√		√							√
Understand the genetic switch in bacteriophages		√	√		√							√
Compare and contrast housekeeping, constitutive, inducible and repressible genes		√	√		√							√
Outline regulatorymechanisms in bacteria to control cellular processes		√	√		√							√

Pedagogy: Lectures, Seminars, Industry/Institute Visits, Debates, Quiz, Project and Assignments

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Attendance	10
Seminar	10
Debate/Quiz/Assignment	10
Class test	10
Total	**40 Marks**
Formative Assessment as per guidelines are compulsory	

Government of Karnataka
Model Curriculum

Course Title	**MOLECULAR BIOLOGY (Practical)**	Practical Credits	**02**
Course Code	**MIC C10P**	Contact Hours	**4 Hours/ week**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1. Micropipeting: Moving Very Small Volumes Very Accurately
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Extraction of crude DNA from bacteria and yeast by phenol/chloroform method.
4. Determination of purity and quantity of DNA
5. Determination of DNA melting point and GC content
6. Extraction and visualization of plasmids from bacterial cultures
7. Extraction and visualization of genomic DNA from bacterial cultures
8. Measurement of β-galactosidase activity in stimulated and control cells of *E.coli*
9. β-galactosidase Activity Assay in Yeast
10. DNA extraction from agarose gel
11. RNA extraction and visualization from yeast.
12. Analysis of RNA quality and integrity
13. Determining nucleotide composition of RNA
14. Restriction enzyme digestion of DNA molecule - DNA fingerprinting
15. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE)

Pedagogy: Experiential learning, Problem solving, Project

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Class Records	05
Test	10
Attendance	05
Performance	05
Total	**25 Marks**

Formative Assessment as per guidelines are compulsory

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Government of Karnataka

Model Curriculum

Program Name	**BSc in Microbiology**	Semester	**V**
Course Title	**FOOD MICROBIOLOGY (Theory)**		
Course Code:	**MIC C13-T**	No. of Credits	**04**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s):

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. To understand the association of microbes in food and the quality testing of food
CO2. To understand the preservation and food safety protocols
CO3. To understand the methods of spoilage of food and the diseases associated with it
CO4. To learn the properties of milk and the types of preservation of milk.
CO5. To learn the types of fermented food and dairy products and its significance

CONTENTS	**45 Hrs**
Unit 1-Microbes and food : Food as a substrate for micoorganisms- Intrinsic and extrinsic parameters affecting the growth of microbes. Microorganismsin food and their sources(molds, yeats and bacteria) **Food borne infections** and intoxication *Staphylococcus, Clostridium. Salmonella, Bacillus, Brucella, Listeria.* Mycotoxin, Phycotoxins **Fermented Food :** Fermented vegetable-sauerkraut, pickles. Meat- sausage. Beverages kombucha. Sourdough.Microbes as food- SCP, SCO. Neutrceuticals and Synbiotics	15 hrs
Unit 2-Spoilage of Food, Preservationand Food safety- **Spoilage:** Principles of food spoilage. Sources of food contamination, Types of spoilage. Spoilage of meat and poultry, Fish and sea foods. Spoilage cereals, fruits and vegetables. Spoilage of canned food. **Preservation:** Principles of food Preservation. Methods of preservation-Physical(temperature, Drying, irradiation), chemical (Class I and Class II). Bio preservation.Canning.Food Packaging-Types of packaging materials, properties and benefits. **Quality testing of food**- Rapid microbiological methods, Examination of faecal streptococci	15hrs

Unit 3-Dairy Microbiology: History. Properties of milk. Types of milk- dried, liquid, Condensed. **Microorganisms in milk.** Starter culture and its types-(single, mixed) Sources of contamination of milk. Microbiological analysis of milk- Rapid platform tests(organoleptic, alcohol, COB, Alcohol test, Phosphatase test, DMC, sedimentation test.). Reductase tests. SPC. Preservation of milk- Pasteurization. Dehydration, sterilization. . Packing of milk and dairy products. **Fermentation in milk**: Lactic acid, gassy fermentation, souring **Dairy products:** Cheese- Types and production (Cheddar), Tofu, Yoghurt, Acidophilus milk. Prebiotics, Probiotics.	15 hrs
Unit 4: Food Standards, sanitation and quality control: Bacterial indicator organisms in food contamination. Food Safety –risk and hazards, Food safety standards in Poultry Egg, meat and food Industries. Food Safety Laws and Regulations- BIS FSSAI, Codex Alimentarius. Food quality and control.Good Hygiene practices, GLP, GMP(Waste treatment disposal methods), HACCP, Food control agencies and their regulation	15 hrs

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)														
	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1
To understand the association of microbes in food and the quality testing of food															
To understand the preservation and food safety Protocols															
To understand the methods of spoilage of food and the diseases associated with it															
To learn the properties of milk and the types of preservation of milk.															
To learn the types of fermented food and dairy products and its significance															

Pedagogy: Lectures, Seminars, Industry/Institute Visits, Debates, Quiz, Project and Assignments

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Attendance	10
Seminar	10
Debate/Quiz/Assignment	10
Class test	10
Total	**40 Marks**
Formative Assessment as per guidelines are compulsory	

Government of Karnataka

Model Curriculum

Course Title	**FOOD MICROBIOLOGY (Practical)**	Practical Credits	**02**
Course Code	**MIC C14-P**	Contact Hours	**4HRS/WEEK**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1.Isolation of bacteria and fungi from infected fruits and vegetables
2. Isolation of bacteria and fungi from fermented food and stored/ preserved food.
3.Reductase tests-MBRT/Resazurin
4.Estimation of Titrable acidity in milk.
5.Fat estimation – Gerber's method
6.Bacterial examination by SPC, DMC
7.Estimation of lactose in milk
8. Production of yoghurt
9.Study of food borne pathogens- *Staphylococcus, Salmonella, Aspergillus, Clostridium*
10.Significant microbes in Food and Dairy *Lactobacillus, Streptococcus, Penicillium, Rhizopus*
11**.** Standard analysis of water
12.Study of leavening properties of yeast
13. To study the normal flora of egg and fish
14.Wine preparation
15.Entrepreneurship –To study the necessary measures to be an entrepreneur in food industry

Pedagogy: Experiential learning, Problem solving, Project

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Class Records	05
Test	10
Attendance	05
Performance	05
Total	**25 Marks**
Formative Assessment as per guidelines are compulsory	

References	
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Government of Karnataka

Model Curriculum

Program Name	**BSc in Microbiology**	Semester	**VI**
Course Title	**IMMUNOLOGY AND MEDICAL MICROBIOLOGY (Theory)**		
Course Code:	**MIC C15-T**	No. of Credits	**4**
Contact hours	**60**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s): Common to the Course Programme at Entry Level

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1: To gain a preliminary understanding about various immune mechanisms.

CO2: To familiarize with Immunological techniques and serodiagnosis of infectious diseases

CO3: To understand pathogenic bacterial infections, symptoms, diagnosis and treatment process

CO4: To understand pathogenic bacterial infections, symptoms, diagnosis and To understand pathogenic bacterial infections, symptoms, diagnosis and treatment process treatment process

Contents	**60 Hrs**

UNIT-I-Normal microflora of the human body and host pathogen interaction — 15 hrs.

Normal microflora of the human body: Importance of normal microflora, normal microflora of skin, throat, gastrointestinal tract, urogenital tract. Host pathogen interaction: Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity, Carriers and their types, Opportunistic infections, Nosocomial infections. Transmission of infection, Pathophysiologic effects of LPS. Sample collection, transport and diagnosis**.**

Clinical Microbiology- Medical Bacteriology

The following diseases in detail with Symptoms, mode of transmission, prophylaxis and control respiratory diseases: *Streptococcus pyogenes, Haemophilus influenzae, Mycobacterium tuberculosis* Gastrointestinal Diseases: *Escherichia coli, Salmonella typhi, Vibrio cholerae,* Others: *Staphylococcus aureus, Bacillus anthracis, Clostridium tetani*,.

Unit-II Medical Virology, parasitology and Mycology	**15 Hrs**
The following diseases in detail with Symptoms, mode of transmission, prophylaxis and control Polio, Herpes, Hepatitis, Rabies, Dengue, AIDS, Corona, Influenza, swine flu, Ebola, Chikungunya, Japanese Encephalitis **Protozoan diseases**: Malaria, Giardia, Entamoeba **Fungal infections-** Cutaneous mycoses: Tinea, pedis (Athlete's foot) Systemic mycoses: **Parasitology-** Histoplasmosis, Opportunistic mycoses: Candidiasis (10Hrs) **Antimicrobial agents**: **General characteristics and mode of action** Antibacterial agents: Inhibitor of nucleic acid synthesis; Inhibitor of cell wall synthesis; Inhibitor of cell membrane function; Inhibitor of protein synthesis; Inhibitor of metabolism Antifungal agents: Mechanism of action of Amphotericin B, Griseofulvin Antiviral agents: Mechanism of action of Amantadine, Acyclovir, And Azidothymidine. **,** Antibiotic resistance, MDR, XDR, MRSA, NDM-1 5hrs	
Unit-III	**15 Hrs**
Historical perspective of immunology-Edward Jenner, Luis Pasteur, attenuation. **Immunity-** Natural (active and passive) and artificial (active and passive) with example, Innate and acquired, Humoral and cell mediated immunity. **Cells and organs of immune system:** Hematopoiesis, cytokines, properties and functions of B and T Lymphocytes, Natural killer (NK) cells, Granulocytes (Neutrophils, Eosinophils and Basophils), Monocytes and macrophages, Dendritic cells and Mast cells.Primary lymphoid organs; Bone marrow and Thymus. Secondary lymphoid organs; Spleen and Lymphnodes. **Antigen**: Immunogenicity and antigenicity, epitopes, haptens. Properties of antigencontribute to immunogenicity; Chemical nature (proteins, carbohydrates, lipids andnucleic acids), degree of foreignness, molecular weight, chemical composition and complexity, degradability. Adjuvants (alum, freunds incomplete and complete) and their importance. **Antibody**: Basic structure of antibody, light and heavy chain, variable and constant region, hinge region, Fab and Fc. Structure and functions of different types of antibodies (IgM, IgG, IgA, IgE, and IgD). Antibody mediated effector functions; opsonization, complement activation and antibody dependent cell mediated cytotoxicity (ADCC). Antigenic determinants on immunoglobulins: Isotype, allotype and idiotype. Monoclonal antibody production by hybridoma technology	

Unit-IV	**15 Hrs**
Principles and applications of antigen-antibody interactions: Definition of affinity an avidity. Immunoprecipitation; Radial (Mancini) and double (Ouchterlony) immunodiffusion. **Agglutination reactions**: Hemagglutination, Bacterial agglutination, passive agglutination, and agglutination inhibition. Enzyme linked immune-sorbent assay (ELISA): Direct, indirect ELISA. Radioimmunoassay (RIA). Immunofluorescence. **Complement system**: Functions of complement components, Complement activation by classical, alternative pathway to develop membrane attack complex (MAC). Complement fixation test. **Hypersensitive reactions:** Classification, Humoral Immunity mediated hypersensitivity; Type I (IgE), Type II (IgG and IgM-ADCC), Type III (Antigen-antibody complex), and Cell mediated hypersensitivity Type IV (DTH).	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**12**	**13**	**14**	**15**
To gain a preliminary understanding about various immune mechanisms.															
To familiarize with Immunological techniques and serodiagnosis of infectious diseases															
To understand pathogenic bacterial infections, symptoms, diagnosis and treatment process															
To understand pathogenic bacterial infections, symptoms, diagnosis and To understand pathogenic bacterial infections, symptoms, diagnosis and treatment process treatment process															

Pedagogy : Lectures, Seminars, Industry/Institute Visits, Debates, Quiz, Project and Assignments

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Attendance	10 Marks
Class Test	10 Marks
Debate/Quiz/Assignment	10 Marks
Seminar	10 Marks

Total	**40 Marks**
Formative Assessment as per guidelines are compulsory	

Government of Karnataka

Model Curriculum

Course Title	**IMMUNOLOGY AND MEDICAL MICROBIOLOGY (Practical)**	Practical Credits	**2**
Course Code	**MIC C16-P**	Contact Hours	**4 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**
Practical Content			

1	**Biosafety levels and guidelines to protect from Biorisk and Biohazard in the laboratory.**
2	Identify pathogenic bacteria (any three of *E. coli, Salmonella, Pseudomonas, Staphylococcu Bacillus*) on the basis of cultural, morphological and biochemical characteristics: IMViC,
3	Perform urease production and catalase tests
4	Perform TSI, nitratereduction Test
5	Study of composition and use of important differential media for identification of pathogenic bacteria: EMB Agar, McConkey agar, Mannitol salt agar, Deoxycholate citrate agar, TCBS
6	Study of bacterial flora of skin by swab method
7	Perform antibacterial sensitivity by Kirby-Bauer method
8	Study symptoms of the diseases with the help of photographs: Polio, anthrax, herpes, chicken pox,HPV warts, AIDS (candidiasis), dermatomycoses (ring worms)
9	Study of various stages of Malarial parasite in RBCs using permanent mounts.
10	Identification of human blood groups.
11	Perform Total and Differential Leukocyte Count of the given blood sample.
12	Separate serum from the blood sample and perform germ tube test of *candida albicans*
13	Perform KOH mounting and staining of fungal cells from infected keratin or nail.
14	Perform immunodiffusion by Ouchterlony method.
15	Perform DOT ELISA.

Pedagogy: Experiential learning, Problem solving, Project

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Attendance	05 Marks
Records	05 Marks
Performance	05 Marks
Test	10 Marks
Total	**25 Marks**
Formative Assessment as per guidelines are compulsory	

REFERENCES	
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Government of Karnataka

Model Curriculum

Program Name	**BSc in Microbiology**	Semester	**VI**
Course Title	**INDUSTRIAL MICROBIOLOGY**		
Course Code:	**MIC C19-T**	No. of Credits	**4**
Contact hours	**60**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s): Common to the Course Programme at Entry Level

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Learn the overview of scope and importance of industrially important microbes
CO2. Acquaint with different types of fermentation processes and equipments
CO3. Evaluate the factors influencing the enhancement of cell and product formation during fermentation
CO4. Acquire the knowledge of the production of value-added products
CO5. Acquire the knowledge of purification of value-added products

Contents	**45 Hrs**
Unit-I: Introduction to Industrial microbiology: Scope and concepts; Criteria for selection of industrially important microbes; Preservation of industrially important microbes. Types of fermentation process: Submerged fermentation, Solid state fermentation (Koji), batch fermentation, continuous fermentation, kinetics of fermentation process.	15 Hrs
Unit-II: Fermenter: Basic features; design and components of a bioreactor; Specialized bioreactors and their applications: tubular bio reactors, fluidized bed reactor, packed bed reactors, membrane bioreactors, Photo-bioreactors and anaerobic bioreactors; Sterilization of fermenter, Control of air, temperature, pH, foaming and feed; Aseptic inoculation and Sampling methods; Scale up of fermentation process-Merits and demerits. Fermentation media**:** Strategies for media formulation; Natural and synthetic media; Role of buffers, precursors, inhibitors, inducers and micronutrients.	15 Hrs
Unit-III: General production strategies of microbial products and Downstream processing: **Antibiotic, Enzymes, anti-cholesterol compound, anti-cancerous compound, hormones. Objectives and significance of downstream processing**: Overview of steps in extraction and Purification of product; Filtration and centrifugation; cell disruption- Physical, chemical and biological methods; Product extraction; product purification, recovery and product testing.	15 Hrs
Unit IV: Industrial production of secondary metabolites Brewing Science, microbes in brewery science, alcohol fermentation technology, Industrial production of Wine, Beer, Penicillin, Fungal amylase, Vit- B12, Bioenergy- Biofuel, Biodiesel, Biomethane, Bio hydrogen. Industrial safety measures. Industrial waste water management .IPR and patents.	15 hrs

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Learn the overview of scope and importance of industrially important microbes															
Acquaint with different types of fermentation processes and equipments															
Evaluate the factors influencing the enhancement of cell and product formation during fermentation															
Acquire the knowledge of the production of value-added products															
Acquire the knowledge of purification of value-added products															

Pedagogy: Lectures, Seminars, Industry/Institute Visits, Debates, Quiz, Project and Assignments

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Attendance	10 Marks
Class Test	10 Marks
Debate/Quiz/Assignment	10 Marks
Seminar	10 Marks
Total	**40 Marks**
Formative Assessment as per guidelines are compulsory	

Government of Karnataka

Model Curriculum

Course Title	**Industrial Microbiology (Practical)**	Practical Credits	**2**
Course Code	**MIC C20P**	Contact Hours	**Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

PRACTICAL CONTENT

1. Demonstration of a basic fermenter
2. Preparation of natural medium used in a industry
3. Preparation of synthetic medium used in a industry
4. Production of amylase/protease/cellulase/pectinase/invertase by solid substrate fermentation (with Atleast 2 substrates)
5. Production of enzyme (amylase/protease/cellulase/invertase by submerged fermentation
6. Preservation of microbes with glycerol/soil.
7. Preservation of microbes by Silica gel method/lyophilization
8. Study of growth and revival of Mammalian cell lines
9. Air filter challenge test
10. Production and estimation of any one secondary metabolite
11. Downstream technique- Solid-liquid separation by using a centrifugation
12. Downstream technique- Demonstration of Microfiltration technique
13. Downstream technique- cell disruption by sonicator/enzyme
14. Estimation of dissolved oxygen and free carbon di oxide.
15. Internship report

Pedagogy: Experiential learning, Problem solving, Project

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Attendance	05 Marks
Records	05 Marks
Performance	05 Marks
Test	10 Marks
Total	**25 Marks**
Formative Assessment as per guidelines are compulsory	

References

1. Arindam Kuilaand Vinay Sharma (2018) Principles and Applications of Fermentation Technology, Wiley.
2. Casida L E.J.R. (2016) Industrial Microbiology, 2nd edition, New Age International Publisher.
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Scheme and Syllabus for

B.Sc. Degree with Biochemistry

As one of the Two Major subjects (Double Major Model)

(NEP-2020, Model curriculum of KSHEC, Bengaluru)

For

V and VI Semesters

(With effect from 2023-24)

Department of Studies inBiochemistry

Mangalore University PG Centre, Chikka Aluvara, Kodagu - 571232

August, 2023

Approved by Board of Studies (UG & PG) Biochemistry, Mangalore University

LISTING OF COURSES V and VI SEMESTER FOR THE FOUR YEARUNDERGRATUE PROGRAMME IN BIOCHEMISTRY

Sem. No.	Course Category	Course Code	Course Title	Credits Assigned	Instructional hours per week		Duration of Exam (Hrs.)	Marks		
					T	P		IA	Exam	Total
I	DSC	BIO C1-T	CHEMICAL FOUNDATION OF BIOCHEMISTRY - 1	4	4		2	40	60	100
		BIOC2-P	VOLUMETRIC ANALYSIS	2		4	3	25	25	50
II	DSC	BIO C3-T	CHEMICAL FOUNDATION OF BIOCHEMISTRY -2	4	4		2	40	60	100
		BIOC4-P	QUALITATIVE AND QUANTITATIVE ANALYSIS	2		4	3	25	25	50
III	DSC	BIOC5-T	BIO-ORGANIC CHEMISTRY	4	4		2	40	60	100
		BIOC6-P	BIO-ORGANIC CHEMISTRY	2		4	3	25	25	50
IV	DSC	BIOC7-T	ANALYTICAL BIOCHEMISTRY	4	4		2	40	60	100
		BIOC8-P	ANALYTICAL BIOCHEMISTRY	2		4	3	25	25	50

OPEN ELECTIVES

Sem. No.	Course Category	Course Code	Course Title	Credits Assigned	Instructional hours per week		Duration of Exam (Hrs.)	Marks		
					T	P		IA	Exam	Total
I	OE	BIO – OE	BIOCHEMISTRY IN HEALTH AND DISEASE	03	03	-	02	40	60	100
			BIOCHEMISTRY OF CELL							
II	OE	BIO - OE	NUTRITION AND DIETETICS	03	03	-	02	40	60	100
			PROTEINS AND ENZYMES							
			BIOCHEMICAL TECHNIQUES	0	03		02	40	60	100

III	OE	BIO – OE		3						
			HORMONES-BIOCHEMISTRY AND FUNCTION							
IV	OE	BIO – OE	BIOCHEMICAL TOXICOLOGY	03	03		02	40	60	100
			PLANT BIOCHEMISTRY							
V	DSC	BIO C9-T	BIOCHEMISTRY OF MACROMOLECULES	4	4		2	40	60	100
		BIO C10-P	QUALITATIVE ANALYSIS OF MACROMOLECULES	2		4	3	25	25	50
		BIO C11-T	HUMAN PHYSIOLOGY AND ENZYMOLOGY	4	4		2	40	60	100
		BIO C12-P	HUMAN PHYSIOLOGY AND ENZYMOLOGY	2		4	3	25	25	50
VI	DSC	BIO C13-T	BIOENERGETICS AND METABOLISM	4	4		2	40	60	100
		BIO C14-P	BIOENERGETICS AND METABOLISM	2		4	3	25	25	50
		BIO C15-T	MOLECULAR BIOLOGY AND IMMUNOLOGY	4	4		2	40	60	100
		BIO C16-P	MOLECULAR BIOLOGY AND IMMUNOLOGY	2		4	3	25	25	50
		BIO C17-P*	PROJECT	2		4	3	25	25	50

Note:BIO C17P*:Evaluation must be done by two examiners-Internal examiner (Project guide) and External Examiner.

SEMESTER V

DSC – BIO C9

COURSE TITLE	BIOCHEMISTRY OF MACROMOLECULES
COURSE CREDITS	04
TOTAL CONTACT HOURS	56
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	40
SUMMATIVE ASSESSMENT MARKS	60

Course Outcome:

The course provides fundamental insights on the types of macromolecules; and unique structural features, chemical properties and biological importance of each.

Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12
Aptitude	x	x	x	x								
Critical thinking		x								x		x
Subject clarity	x	x					x					x
Analytical Skill	x				x	x				x		

UNIT I: Carbohydrates **14 hours**

Definition, empirical formulae, classification, biological importance. **Monosaccharides**: Configuration relationship of D-aldoses, D-ketoses. General properties of aldoses and ketoses. Oxidation, reduction, reducing property, formation of glycosides, acylation, methylation, condensation – phenyl hydrazine, addition – HCN. Interconversion of aldoses and ketoses by chemical method. Ascending and descending series by chemical methods. Stereochemistry of monosaccharides, (+) and (-), D and L, epimers, anomers, and diastreoisomers. Elucidation of open chain structure and ring structure of glucose. Conformation of glucose (only structures), mutarotation. Structure of galactose, mannose, ribose and fructose. Structure and biological importance of deoxy sugars and sugar acids.

Disaccharides: Establishment of structures of Sucrose and Lactose, Biological Importance and structure of Isomaltose, Trehalose and Maltose.

Polysaccharides: Partial structure, occurrence and importance of Starch, Glycogen, Inulin, Cellulose, Chitin, and Pectin.

Glycosaminoglycans: Structure of amino sugars, neuraminic and muramic acid. Occurrence, importance and the structure of the repeating units of heparin, hyaluronic acid, teichoic acid and chondroitin sulphate. Bacterial cell wall polysaccharide, peptidoglycans.

UNIT II: Lipids **14 hours**

Classification and biological role, fatty acids – nomenclature of saturated and unsaturated fatty acids.

Acylglycerols: Mono, di and triacylglycerols. Saponification, saponification value, iodine value, acid value and significance. Rancidity, hydrolysis.

Phosphoglycerides: Structure of lecithin (phosphatidyl choline), cephalins, phosphatidyl inositol, plasmalogens, and cardiolipin. Biological role of phosphoglycerides.

Sphingolipids: Structure and importance of sphingomyelin.

Glycerosphingolipids: Composition and importance of gangliosides and cerebrosides. Prostaglandins: Types, structure of PGE2, PGI2, PGD2 and PGF2 Alpha. Biological roles of thromboxanes, leukotrienes and prostaglandins.

Plasma lipoproteins: Types and functions.

UNIT III: Amino acids and Proteins **14 hours**

Amino acids: Structure and classification of amino acids based on polarity. Reactions of the amino groups with HNO_2, $LiAlH_4$. Ninhydrin, Phenyl isothiocyante, DANSYL Chloride, Flurodinitro benzene. Reaction of carboxyl group – Hydrazine. Zwitterionic properties. pKa values, D & L notation.

Peptides: Peptide bond, structure and biological importance of glutathione, Valinomycin. Synthetic peptides- polyglutamic acid, polylysine.

Proteins: Classification of proteins based on solubility, structure and functions with examples. Forces that stabilise the structure of proteins, Primary structure of proteins, methods of determining N- and C- terminal aminoacids, amino acid composition, sequencing by Edman's degradation method. Secondary Structure – α helix. β-sheet, β- bend. Tertiary and quaternary structures- hemoglobin, denaturation and renaturation of proteins. Anfinsen's experiment.

UNIT IV: Nucleic acids **14 hours**

Nucleic acids: Composition of DNA and RNA. Nucleosides and Nucleotides. Other functions of nucleotides – source of energy, component of coenzyme and second messengers. Chargaff's rule. Watson and Crick model of DNA. Nucleic acid chemistry- UV absorption, Effect of alkali and acid on DNA, Chemical reactions of RNA and DNA. Melting of DNA (Tm). Types of RNA (mRNA, tRNA and rRNA), Secondary structures of tRNA – clover leaf model.

REFERENCES

1. Principles of Biochemistry, Donald Voet, Judith G Voet, Charlotte W. Pratt, 4th Edition, John Wiley and Sons Inc, 2012
2. Lehninger- Principles of Biochemistry; DL Nelson and MM Cox [Eds), 6th Edn. Macmillan Publications 2012
3. Biochemistry- the chemical reactions of living cells, David E Metzler, 2nd Edition, Elsevier Academic Press,
4. Fundamentals of Biochemistry, Jain, J.L, S.Chand publication 6th Edition, 2005.
5. Biochemistry, Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, Freeman and company, 7th Edition, 2010.
6. Harper's Illustrated Biochemistry, Victor W Rodwell, et.al,31st edition, McGraw Hill Education Lange ® 2018.
7. Biochemistry, Lubert Stryer 5th edition 2015

PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
CLASS TEST (2 CLASS TEST)	**20**
SEMINARS/CLASS WORK	**10**
ASSIGNMENT/ OPEN DISCUSSION	**10**
TOTAL	**40**

SEMESTER V

DSC BIO - C 10 PRACTICAL

COURSE TITLE	QUALITATIVE ANALYSIS OF MACROMOLECULES
COURSE CREDITS	02
CONTACT HOURS	4 HOURS/WEEK
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25

Course Outcome:

The practical course will enable the students to learn the principles of reactions pertaining to different macromolecules. They will be able to qualitatively identify the presence of specific macromolecules or amino acids when provided with solution of a mixture of biomolecules.

EXPERIMENTS:

1. **Carbohydrates:** mono saccharides (glucose, fructose, galactose) disaccarides (lactose, maltose, sucrose) and polysaccharides (starch, glycogen), ribose, deoxy ribose- Molisch Test, Iodine Test, Benedict's Test, Barfoed's Test, Seliwanoff's test, Bial's test, DPA Test, Tollen's Test, Fehling's Test, Picric Acid Test, Osazone Test.
2. **Proteins:** Biuret Test, Ninhydrin Test, Precipitation reactions of proteins- Precipitation by salts (half-saturation test), precipitation by organic solvents, precipitation by acidic reagents, precipitation by heavy metal ion, precipitation by heat; colour reactions of proteins (gelatin and albumin) and any five amino acids (tryptophan, tyrosine, cysteine, methionine, arginine, proline and histidine)- Xanthoproteic test, Millon's Test, Sakaguchi Test, Hopkins- Cole Test, Lead acetate test, Sullivan and McCarthy's Test, Isatin Test, Pauly's Diazo Test.
3. **Lipids:** solubility, acrolein test, Salkowski test, Lieberman-Burchard test.
4. **Nucleic acids:** diphenylamine test, orcinol test

REFERENCES :

1. Practical Biochemistry, Geetha Damodaran, Jaypee, 2011
2. Biochemical methods, S. Sadasivam , A. Manickam, 3rd Edition, New Age International Pvt Ltd, 2007
3. An Introduction to Practical Biochemistry, David Plummer , 3rd edition 2017
4. Laboratory manual in Biochemistry , J. Jayaraman 2011

PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
RECORD / VIVA VOCE	**10**
CONTINUOUS EVALUATION AND CLASS TEST	**15**
TOTAL	**25**

SEMESTER V

DSC BIO C11

COURSE TITLE	HUMAN PHYSIOLOGY AND ENZYMOLOGY
COURSE CREDITS	04
TOTAL CONTACT HOURS	56
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	40
SUMMATIVE ASSESSMENT MARKS	60

Course Outcome:

- Describe cell structure and functions, how cells form and divide, and how they differentiate and specialize.
- Students will be able to describe the cyclical events of cell division and types of cell divisions. Student's knowledge with regard to the process of cell death and cellaging will enhance to its core.
- Physiology involves the study of how living systems function, from the molecular and cellular level to the system level, and emphasizes an integrative approach to studying the biological functions of the human body.
- Enzymology topics will enable students to describe structure, functions and the mechanism of action of enzymes. Learning kinetics of enzyme catalyzed reactions and enzyme inhibitions and regulatory process, Enzyme activity, Enzyme Units, Specific activity.

Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12
Aptitude	x	x	x									
Critical thinking		x										
Subject clarity	x	x									x	
Analytical Skill	x				x	x						

Part-A: HUMAN PHYSIOLOGY

UNIT I: **14 hours**

- Basic body plan in humans & Location of organs.

  Nervous System: Brief outline of nervous system, Neurons – types, structure of multipolar neuron, mechanism of nerve impulse transmission- along axon, across synapse. Action potential & resting potential. Neurotransmitters – Excitatory & Inhibitory with examples.

- **Respiratory system:** Functions of lungs, mechanism of respiration (pulmonary

ventilation), gas exchange mechanism, biochemical events in the transport of gases & factors affecting, role of lungs in acid-base balance. Hypoxia, emphysema.

- **Cardio-vascular system:** Structure and functions of heart. Blood vessels – types, Overview & functions: Cardiac cycle, cardiac output, regulation of CVS, blood pressure, heart rate, ECG. Body fluids – blood (composition, structure & functions of blood cells), blood clotting mechanism, Lymph and CSF.
- **Muscular System:** Types of muscles and their structure. Ultra structure of skeletal muscle. Contractile & regulatory proteins of muscle. Sliding filament model of skeletal muscle contraction.

UNIT II: **14 hours**

- **Bone and Cartilage:** Structure and types of bone and cartilage. Long bone – Composition, structure, growth & remodeling, factors affecting.
- **Digestive System and GIT:** GIT and accessory organs, Digestion, absorption & transport of carbohydrates, lipids and proteins. Role of various enzymes involved in digestive process.
- **Hepatic System:** Structure of a liver lobule. Role of liver in metabolic, storage and detoxification.
- **Excretory System:** Brief outline of excretory system, formation of urine – Glomerular filtration, tubular reabsorption & secretions. Role of kidney in acid-base balance.
- **Endocrine System:** Brief outline of various endocrine glands and their secretions. Classification of hormones based on structure and site of production. Physiological role of hormones of hypothalamus, pituitary, adrenal, thyroid, pancreas and gonads.

Part-B: ENZYMOLOGY

UNIT III: **14 hours**

Introduction to enzymes:

Nature of enzymes - protein and non-protein (ribozyme). Cofactor and prosthetic group, apoenzyme, holoenzyme, IUBMB classification of enzymes with examples. International Units of enzyme activity, specific activity.

Monomeric and oligomeric enzymes- Monomeric enzymes, multifunctional enzymes, oligomeric enzymes and multi- enzyme complexes, isoenzymes- lactate dehydrogenase.

Features of enzyme catalysis:

Catalysis, reaction rates and thermodynamics of reaction. Activation energy and transition state theory, catalytic power and specificity of enzymes (concept of active site), Theories of enzyme catalysis- Fischer's lock and key hypothesis, Koshland's induced fit hypothesis.

UNIT IV: **14 hours**

Enzyme kinetics of single substrate reactions:

Michaelis-Menten equation, equilibrium constant – mono substrate reactions, relationship between initial velocity and substrate concentration, Factors affecting the rate of chemical reactions - enzyme concentration, substrate concentration- pH, temperature and metal ions. Line weaver- Burk plot. Determination of Vmax & Km from L-B plot and their significance, Kcat and turnover number.

Enzyme inhibition:

Reversible inhibition- competitive, uncompetitive, non-competitive with graphical representations using L-B plots, Evaluation of Km and Vmax in presence of inhibitor mixed and substrate. Irreversible inhibition- Suicide inhibition - antibiotics as inhibitors- penicillin.

REFERENCES:

1. Chatterjee C C, Human physiology, Medical allied Agency. New Delhi 2020
2. Gerard J Tortora, Bryan H Derrickson. Principles of anatomy and physiology, 13th edition, John Wiley & Sons 2000
3. Gyton and Hall, Textbook of medical physiology, 10th edition, Elsevier Health Sciences 2015

4. Sembulingam K & Prema Sembulingam, Essentials of medical physiology, 3rd edition, Jaypee Brothers, 2019
5. Thomas D. Pollard, William C. Earnshaw, Jennifer Lippincott-Schwartz and Graham T. Johnson, Cell Biology, 3rd edition, Elsevier 2017.
6. Lodish, Berk, Kaiser, Krieger et al, Molecular Cell Biology, 6th edition, 2010
7. Bruce Alberts, Hopkin, Johnson Morgan, Raff, Roberts, and Walter, Essential Cell Biology, 5th edition, W.W. Norton & Company, 2019
8. Cox, Michael M. Lehninger principles of biochemistry. Freeman, 2013.
9. Lubert Stryer. Biochemistry, 5th edition , 2006
10. Palmer, Understanding enzymes, 4th edition, Prentice Hall/Ellis Horward, Landon 2000
11. Price, Nicholas C., and Lewis Stevens. Fundamentals of Enzymology. Oxford Science Publications. Second edition. New York, 2010
12. Buchholz, Klaus, Volker Kasche, and Uwe Theo Bornscheuer. Biocatalysts and enzyme technology. John Wiley & Sons, 2012.
13. Voet, Donald, Judith G. Voet, and Charlotte W. Pratt. "Fundamentals of Biochemistry." New York: John Wiley& Sons2008.
14. Devlin, Thomas M. Textbook of biochemistry: with clinical correlations. John Wiley & Sons, 2011.

PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
CLASS TEST (2 CLASS TEST)	**20**
SEMINARS/CLASS WORK	**10**
ASSIGNMENT/ OPEN DISCUSSION	**10**
TOTAL	**40**

SEMESTER V

DSC BIO C 12: PRACTICAL

COURSE TITLE	HUMAN PHYSIOLOGY AND ENZYMOLOGY
COURSE CREDITS	02
CONTACT HOURS	4 HOURS/WEEK
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25

Course Outcome:

At completion of this course, it is expected that the students will be able to : Determining the blood grouping and other physiological parameters, Identify of microscopical features of various types of cells and tissues: Understand the anatomy & Physiology of various systems and Learn the various cells and Demonstrate the principle and working of instruments used in cell biology.

EXPERIMENTS: HUMAN PHYSIOLOGY

1. Determination of ABO blood grouping
2. Determination of Blood clotting time
3. Enumeration of RBC and WBC count using Haemocytometer
4. Separation of Serum and Plasma from Blood
5. Estimation of hemoglobin content in blood
6. Study of pulmonary function test using spirometer
7. Determination of blood pressure
8. Understanding principle, working & handling of simple microscope
9. Examination of prokaryotic & eukaryotic cells
10. Study of different stages of mitosis & meiosis in onion root tip - squash preparation method
11. Gram staining
12. Demonstration of biosafety & sterilization techniques
13. Demonstration of preparation of culture media for bacterial cultivation
14. Demonstration of pure culture techniques – Streak, pour plate and serial dilution

EXPERIMENTS: ENZYMOLOGY

1. Isolation of Urease and demonstration of its activity.
2. Isolation of Acid phosphatase and demonstration of its activity.
3. Salivary amylase/β-amylase
    a) Construction of Maltose/glucose calibration curve by DNS method and determination of activity of amylase
    b) Determination of specific activity of amylase
    c) Determination of pH optimum of amylase.
    d) Determination of Km and Vmax of amylase.
    e) Determination of initial velocity [time kinetics] of amylase.
    f) Determination of optimum temperature of amylase.
    g) Effect of sodium chloride on amylase.
4. Determination of activity of yeast invertase.

REFERENCES

1. Essentials of Medical Physiology, K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi., 2019
2. Text book of Medical Physiology- C,Guyton and John.E. Hall. Miamisburg, OH, U.S.A, 12th edition 2011
3. Textbook of Practical Physiology , C.L. Ghai, Jaypee brother's medical publishers, New Delhi, 10th edition 2022
4. A Hand book of practical Microbiology, R. Saravanan , D. Dhachinamoorthi , CH. MM. Prasada Rao , 2019
5. Essentials of Medical Physiology , K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi., 2019
6. Text book of Medical Physiology- C,Guyton and John.E. Hall. Miamisburg, OH, U.S.A, 12th edition 2011
7. Textbook of Practical Physiology , C.L. Ghai, Jaypee brother's medical publishers, New Delhi, 10th edition 2022
8. A Hand book of practical Microbiology, R. Saravanan , D. Dhachinamoorthi , CH. MM. Prasada Rao , 2019
9. An introduction to Practical Biochemistry, David Plummer, 3r edition 2017
10. Laboratory manual in Biochemistry, Jayaraman J, New Age International publications, 2011
11. Practical Manual of Biochemistry, Sattanathan G., Swaminathan P. and Balasubramanian B. Sky fox press, 2020
12. Practical manual of Biochemistry, S.P Singh, 7th edition, CBS publications, 2013.
13. Sawhney, S. K., and Randhir Singh. Introductory practical biochemistry. Alpha Science Int'l Ltd., 2000.

PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
RECORD / VIVA VOCE	**10**
CONTINUOUS EVALUATION AND CLASS TEST	**15**
TOTAL	**25**

SEMESTER VI DSC

BIO - C13

COURSE TITLE	BIOENERGETICS AND METABOLISM
COURSE CREDITS	04
TOTAL CONTACT HOURS	56
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	40
SUMMATIVE ASSESSMENT MARKS	60

Course Outcome:

At the end of the course the students will be able to:

- Understand the concepts of metabolism, characteristics of metabolic pathways and strategies used to study these pathways.
  Gain a detailed knowledge of various catabolic and anabolic pathways and its regulation
- Systematically learn the breakdown and synthesis of amino acids and nucleotides in humans and recognize its relevance with respect to nutrition and human diseases
- Acknowledge the role of inhibitors of nucleotide metabolism which are potentially being used as chemotherapeutic drugs
- Comprehend how the amino acid and nucleotide metabolism are integrated with carbohydrate and lipid metabolism

Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12
Aptitude		x		x				x				
Critical thinking		x		x		x				x		
Subject clarity	x	x				x	x					x
Analytical Skill	x				x	x				x		

UNIT I: **14 hours**

Bioenergetics: Laws of thermodynamics, free energy change, equilibrium constant, energy charge, ATP cycle, phosphorylation potential, and phosphoryl group transfers. Chemical basis of high standard energy of hydrolysis of ATP, Oxidative phosphorylation: Proton gradient generation, redox loop, Q cycle, Proton pumping. The electron transport chain - Peter Mitchell's Chemiosmotic hypothesis and Proton motive force. Fo-F1 ATP synthase, structure

and mechanism of ATP synthesis.

UNIT II: **14 hours**

Metabolism: Anabolism and catabolism, compartmentalization of metabolic pathways.

Metabolism of Carbohydrates: Reactions and energetics of glycolysis, entry of fructose, galactose, mannose and lactose into glycolytic pathway. Fates of pyruvate - conversion of pyruvate to lactate, alcohol and acetyl CoA. Cori's cycle.

Reactions and energetics of TCA cycle, amphibolic and integrating roles of TCA cycle. Anaplerotic reactions. Regulatory steps of glycolysis and TCA cycle, Gluconeogenesis and glycogenolysis. Pentose phosphate pathway and its significance.

UNIT III: **14 hours**

Metabolism of Lipids:

Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria, β-oxidation of saturated and unsaturated fatty acids, ATP yield from fatty acid oxidation. Biosynthesis of saturated and unsaturated fatty acids. Fatty Acid Synthase complex, Lipogenesis (Denovo synthesis of Fatty acid), Elongation of Fatty acid (Mitochondrial elongation). Biosynthesis of TAG, Phospholipids (Lecithin and Cephalin).Cholesterol metabolism.

Nucleic Acid metabolism: Degradation of nucleic acids, action of nucleases-DNase I and II, RNase and phosphodiesterases. Catabolism of purines and pyrimidines. Salvage pathways. De novo biosynthetic pathways of purine and pyrimidine nucleotides. Conversion of ribonucleotides to deoxy ribonucleotides.

UNIT IV: **14 hours**

Metabolism of Amino acids: General mechanism of amino acid metabolism: Deamination-oxidative and non – oxidative deamination, transamination, decarboxylation (biologically important amines) and desulphuration. Catabolism of carbon skeleton of amino acids, glycogenic and ketogenic amino acids. Urea cycle and its significance. Synthesis and catabolism of alanine, serine and cysteine.

REFERENCES

1. Principles of Biochemistry, Donald Voet, Judith G Voet, Charlotte W. Pratt, 4th Edition, John Wiley and Sons Inc, 2012
2. Lehninger- Principles of Biochemistry; DL Nelson and MM Cox [Eds), 6th Edn. Macmillan Publications 2012
3. Biochemistry- the chemical reactions of living cells, David E Metzler, 2nd Edition, Elsevier Academic Press,
4. Fundamentals of Biochemistry, Jain, J.L, S.Chand publication 6th Edition, 2005.
5. Biochemistry, Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, Freeman and company, 7th Edition, 2010.
6. Harper's Illustrated Biochemistry, Victor W Rodwell, et.al,31st edition, McGraw Hill Education Lange ® 2018.

PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
CLASS TEST (2 CLASS TEST)	**20**
SEMINARS/CLASS WORK	**10**
ASSIGNMENT/ OPEN DISCUSSION	**10**
TOTAL	**40**

SEMESTER VI

DSC BIO – C 14: PRACTICAL

COURSE TITLE	BIOENERGETICS AND METABOLISM
COURSE CREDITS	02
CONTACT HOURS	4 HOURS/WEEK
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25

Course Outcome:

- The practical course will enable the students to learn the estimation of blood substances which tell how well the organs/kidneys are functioning, and glucose, which indicates whether there is a normal amount of sugar in the blood. Blood urea nitrogen is a measure of how well the kidneys are working.
- Learning the structural levels of Nucleic acids.

I : Experiments

1. Estimation of Blood glucose
2. Assay of Digestive enzyme (Salivary amylase)
3. Estimation of Urea
4. Estimation of Uric acid
5. Estimation of DNA and RNA
6. Estimation of creatinine
7. Estimation of cholesterol

II : Report:

Visit to scientific/research institute – Tour report.

OR

Submission of assignment on recent trends in biochemistry

REFERENCES:

1. Practical Biochemistry, Geetha Damodaran, Jaypee, 2011
2. Biochemical methods, S. Sadasivam , A. Manickam, 3rd Edition, New Age International Pvt Ltd, 2007
3. An Introduction to Practical Biochemistry, David Plummer , 3rd edition 2017
4. Laboratory manual in Biochemistry , J. Jayaraman 2011

PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
RECORD / VIVA VOCE	**10**
CONTINUOUS EVALUATION AND CLASS TEST	**15**
TOTAL	**25**

SEMESTER VI

DSC BIO – C15

COURSE TITLE	**MOLECULAR BIOLOGY AND IMMUNOLOGY**
COURSE CREDITS	**04**
TOTAL CONTACT HOURS	**56**
DURATION OF ESA	**03**
FORMATIVE ASSESSMENT MARKS	**40**
SUMMATIVE ASSESSMENT MARKS	**60**

Course outcome:

Will be able to explain:

- Defines the concept of immunology, concepts of antigen and antibody
- Explain immune system cells , Discuss active immunity and passive immunity
- Explain the cellular immune mechanism

Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12
Aptitude		x		x								
Critical thinking		x				x						
Subject clarity	x	x				x	x		x	x	x	x
Analytical Skill	x				x	x				x		

UNIT I: Introduction and DNA Replication **14 hours**

History: Identification of DNA as genetic material- Experiments of Griffith, Hershey and Chase: Overview of structure of DNA.

Introduction to Molecular Biology: Chromosomal organization in prokaryotes and Eukaryotes; Gene and gene concept: cistron, muton, and recon. Central dogma of molecular biology and its modification,

Replication: Types of replication -Conservative, semi conservative and dispersive: Evidence for semi conservative replication- Messelson and Stahl experiment: Mechanism of semi conservative replication- Steps involved in replication, Enzymes and proteins involved in replication, outline of DNA replication in eukaryotes.

DNA damage-Mutation: Concept of mutation, Mutagens – chemical and physical, Molecular basis of mutation: spontaneous and induced mutations, effect of HNO_2, alkylating agents, intercalating agents and UV-radiation. Point mutations: Concept of missense, nonsense and frame shiftmutations.

UNIT II: Transcription and Translation Regulation of gene expression 14 hours

Transcription: Types of RNA, RNA polymerases, promoters, enhancers, silencers, role of sigma factor, Structure of mRNA in prokaryotes, Mechanism- initiation, elongation and termination (Rho- dependent and independent), Overview of eukaryotic transcription, post transcriptional processing: capping, splicing and poly adenylation.

Genetic code: characteristics of genetic code, wobble hypothesis.

Translation: Mechanism of translation - amino acid activation, charging of tRNA, initiation, elongation, and termination; Post-translational modification; Inhibition of protein synthesis by antibiotics. Outline of translation in eukaryotes.

Regulation of Gene expression:

General aspects of regulation, transcriptional regulation - inducible and repressible system, Operon concepts - lactose , tryptophan operons, Regulation of translation. Brief account of Eukaryotic gene expression.

UNIT III: Over view and Nature of Antigen and Antibody 14 hours

Organs of the immune system: Anatomy and functions of lymphoid tissues, Cellular components of the immune system - Hematopoiesis, stem cells, granulocytes- Neutrophil, eosinophil, basophil and Mast cell, Mononuclear cells- Lymphocytes, Monocytes, Macrophages, NK cells and Dendritic cells.

Antigen: Concept of antigenic determinants and immunogens, factors that influence immunogenicity, Classes of antigen, Epitopes, Haptens.

Antibody: Molecular Structure - general features, light and heavychains, Hyper-variable and constant regions, Different isotypes and subtypes of immunoglobulins, Allotypes and idiotypes.

UNIT IV: Innate immunity 14 hours

Anatomical and physiological barriers, Soluble factors, Inflammation-characteristics, initiation of the inflammatory response, Chemotaxis, Phagocytosis, Acute inflammatory response, Role of innate immunity. Cytokines, Complement system.

Adaptive immunity

MHC molecules: genes, different classes, structure and function, Antigen processing and presentation: Endogenous and exogenous pathways.

Humoral Immunity – B cell receptors (BCR), B-Cell maturation, Activation, Differentiation, generation of plasma cells and memory B cells.

Cell-mediated immunity: Structural organization of T cell-receptors, T-cell maturation, Activation, Differentiation, Proliferation, B cell – T cell interaction, the germinal center reactions.

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4. Delves, Peter J., Seamus J. Martin, Dennis R. Burton, and Ivan M. Roitt. & Roitt's essential immunology. Vol. 20. John Wiley & Sons, 2011.
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PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
CLASS TEST (2 CLASS TEST)	**20**
SEMINARS/CLASS WORK	**10**
ASSIGNMENT/ OPEN DISCUSSION	**10**
TOTAL	**40**

SEMESTER VI

DSC BIO – C 20: PRACTICAL

COURSE TITLE	MOLECLAR BIOLOGY AND IMMUNOLOGY
COURSE CREDITS	02
CONTACT HOURS	4 HOURS/WEEK
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25

Course Outcome:

The practical course will enable the students to learn the principles of reactions pertaining to nucleic acids. They will be able to isolate and quantitate DNA and RNA from different sources and characterization.

The practical course will enable the students to learn

- Identifying blood groups and types
- Competently perform serological diagnosis
- Analyze components of human sera byperforming electrophoresis experiments.

Course Outcomes	1	2	3	4	5	6	7	8	9	10	11	12
Aptitude		x		x								
Critical thinking		x				x						
Subject clarity	x	x				x	x		x	x	x	x
Analytical Skill	x				x	x				x		

EXPERIMENTS: MOLECULAR BIOLOGY

1. Isolation of DNA from banana/endosperm of coconut/ bacteria / any other source
2. Isolation of RNA from spinach leaves/any other source
3. Determination of DNA
4. Determination of RNA
5. Purity check by UV spectrophotometer (DNA and RNA ratio)
6. Isolation of plasmid from E. *coli*
7. Agarose gel electrophoresis of nucleic acids
8. DNA analysis by Restriction endonucleases
9. Western blotting

I. EXPERIMENTS: IMMUNOLOGY

1. Counting and seeding of cells
2. Blood grouping
3. Hemagglutation inhibition test
4. WIDAL test
5. ELISA test/assay
6. Isolation of antibodies
7. Total leucocyte count
8. Differential leucocyte count
9. Radial immune diffusion test
10. Agglutination reactions
11. Serum electrophoresis

REFERENCES :

1. Molecular Biology: A Laboratory Manual by by Ashwani Kumar S.K. Gakhar, Monika Miglani, 2019
2. Wilson And Walkers Principles And Techniques of Biochemistry And Molecular Biology 8th ed (Sae) by Hofmann, 1983
3. Laboratory Manual of Microbiology, Biochemistry and Molecular Biology by J. Saxena, M. Baunthiyal, I. Ravi , 2015
4. Biochemical methods, S. Sadasivam , A. Manickam, 3rd Edition, New Age International Pvt Ltd, 2007
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6. Laboratory manual in Biochemistry , J. Jayaraman 2011
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PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING /ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	**WEIGHTAGE IN MARKS**
RECORD / VIVA VOCE	**10**
CONTINUOUS EVALUATION AND CLASS TEST	**15**
TOTAL	**25**

DSC BIO - C 17 PROJECT

COURSE TITLE	PROJECT
COURSE CREDITS	02
CONTACT HOURS	4 HOURS/WEEK
DURATION OF ESA	03
FORMATIVE ASSESSMENT MARKS	25
SUMMATIVE ASSESSMENT MARKS	25

Course Outcome:

The practical course will enable the students to learn the principles of reactions pertaining to different macromolecules. They will be able to qualitatively and quantitatively identify the presence of specific biological macromolecules or amino acids or enzymes or nucleic acids from the sample chosen. This course also enables the students to gain hands on experience.

PEDAGOGY: MOOC/DESK WORK/BOOK CHAPTER/PROBLEM SOLVING/ASSIGNMENT

Formative Assessment	
ASSESSMENT OCCASION	WEIGHTAGE IN MARKS
RECORD / VIVA VOCE	10
CONTINUOUS EVALUATION AND CLASS TEST	15
TOTAL	25

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B.Sc. Biotechnology 5th Semester

Program Name	**B.Sc. Biotechnology**	Semester	**5th Semester**
Course Title	**Genetic Engineering (Theory + Practical)**		
Course Code:	**DSC –A9 (T)**	No. of Theory Credits	**04**
Contact hours	**60 hrs**	Duration of ESA/Exam	**03 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Objectives

1. Understand the fundamental principles and techniques of genetic engineering.
2. Explore the applications of genetic engineering in agriculture, medicine, biotechnology,and environmental science.
3. Develop practical skills in genetic engineering techniques and laboratory procedures.
4. Gain knowledge of gene expression regulation and genetic modification methods.
5. Enhance critical thinking and problem-solving skills through discussions and case studies.
6. Stay updated on emerging trends and advancements in genetic engineering.

Course Outcomes:

1. Demonstrate a thorough understanding of the fundamental principles and techniques of genetic engineering.
2. Apply the knowledge of genetic engineering to diverse applications in agriculture, medicine, biotechnology, and environmental science.
3. Perform laboratory procedures and develop practical skills in genetic engineering techniques.
4. Explain gene expression regulation mechanisms and apply genetic modification methods effectively.
5. Evaluate genetic engineering's ethical, social, and legal implications and propose responsible solutions.
6. Stay updated with recent advancements in genetic engineering, critically evaluate emerging trends, and assess their potential impact on various fields.

Genetic Engineering - Content of Theory	60 hrs
Unit I- Fundamentals of Genetic Engineering	**15**
Definition, scope, and historical overview of genetic engineering. Importance and applications in various fields. **DNA Structure and Manipulation** - Techniques for DNA isolation and purification. Methods for quantification and characterization of DNA samples. **RNA Analysis and Gene Expression**- Methods for RNA isolation and purification. Analysis of gene expression. **Recombinant DNA technology** – Introduction to molecular cloning. Overview of cloning vectors. Plasmids, phage, cosmid, BAC, and YAC. Features and applications of cloning vectors in genetic engineering. Enzymes used in recombinant DNA technology: Restriction endonucleases, DNA modifying enzymes, other nucleases, Polymerases, Ligase, kinases, and phosphatases. Techniques for molecular cloning of DNA or RNA fragments in bacterial and eukaryotic systems.	
Unit II- Practices in Genetic Engineering	**15**
Recombinant Protein Expression and Purification, affinity tags. Techniques for expressing recombinant proteins using bacterial, animal, and plant expression systems. Strategies for protein purification and characterization. Hybridization techniques, Southern, Northern, Western, FISH, Polymerase Chain Reaction (PCR) and its types, molecular probes, DNA sequencing- Sanger's, Next Generation Sequencing **Gene Manipulation Techniques** - Methods of gene delivery. Physical, chemical, and biological methods. Transformation, transfection, electroporation and micro-injection. Gene knockout techniques in bacterial and eukaryotic organisms. **Genome Editing** - Introduction to genome editing techniques- Principles and applications of genome editing techniques. CRISPR-Cas9, site-directed mutagenesis, and other genome editing methods.	
Unit III- Applications of Genetic Engineering	**15**
Introduction to Applications. Overview of the diverse applications of genetic engineering. Gene therapy and its potential in treating genetic disorders. Strategies for gene delivery in therapeutic applications. Diagnostic Applications. DNA fingerprinting and its applications in forensics. Molecular diagnostic techniques and their role in disease diagnosis. Use of genetic engineering in the development of therapeutics and vaccines. Production of biopharmaceuticals using recombinant DNA technology.	
Unit IV- Advances in Genetic Engineering and Ethics	**15**
Industrial Applications. Industrial applications of genetic engineering, such as enzyme production, biofuel production, and bioremediation. Scale-up techniques and process optimization in industrial settings. Introduction to synthetic biology and its integration with genetic engineering. Design and construction of artificial biological systems **Ethical and Regulatory Considerations** - Discussion of ethical implications associated with genetic engineering. Introduction to regulatory guidelines and safety considerations for genetic engineering research and applications	

Pedagogy: Lectures, Seminars, Industry Visits, Debates, Quiz and Assignments

Summative Assessment = 60 Marks	
Formative Assessment / type	**Weightage in Marks**
Attendance	10
Seminar	10
Debates and Quiz	10
Test	10
Total FA	**40**
Total (FA + SA)	**100 marks**

Course Title	**Genetic Engineering**	Practical Credits	**02**
Course No./ **Course Code:**	**DSC–A10 (P)**	Contact hours	**60 hrs**

Practical Content

1. **Introduction to Laboratory Techniques -** Safety guidelines and laboratory protocols Aseptic techniques and proper handling of materials. Basic equipment and instrument operationPreparation of reagents and media
2. **Nucleic Acid Extraction and Quantification-** DNA extraction from different sources (e.g., bacteria, plant, animal). RNA extraction and purification methods. Quality assessment and quantification of nucleic acids (spectrophotometry, gel electrophoresis).
3. **Polymerase Chain Reaction (PCR)**
   Primer design and optimization PCR setup and cycling conditions
   Agarose gel electrophoresis for PCR product analysis
4. **Cloning and Plasmid Manipulation**
   Restriction enzyme digestion
   Ligation reactions
   Transformation of bacterial cells with recombinant plasmids
   Colony selection and screening for successful cloning
5. **Gel Electrophoresis and DNA Analysis**
   Agarose gel electrophoresis for DNA fragment separation and analysisDNA size determination using molecular weight markers
   DNA band visualization techniques (e.g., ethidium bromide staining, DNA intercalating dyes)

Practical Assessment

Formative Assessment		**Summative Assessment**	**Total Marks**
Assessment Occasion/ type	**Weightage in Marks**	**Practical Exams**	
Record	05	25	**50**
Test	10		
Attendance	05		
Performance	05		
Total	**25**	**25**	

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2. Gene Cloning and DNA Analysis: An Introduction (2019) 7th ed., Brown, TA, Wiley Blackwell, ISBN: 978-1119072560.
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19. Genetic Engineering: Principles and Methods (2019) 3rd ed., Fowler, MR, CABI, ISBN: 978-1789240605.

B.Sc. Biotechnology 5th Semester

Program	**B.Sc. Biotechnology**		Semester	**5th Semester**
Course Title	**Plant and Animal Biotechnology (Theory + Practical)**			
Course Code:	**DSC-A11 (T)**		No. of Theory Credits	**04**
Contact hours	**60 hrs**		Duration of ESA/Exam	**3 Hours**
Formative Assessment Marks		**40**	Summative Assessment Marks	**60**

Course Objectives

1. To understand the fundamental aspects of plant and animal biotechnology.
2. Learn about biotechnological tools and techniques used in plant and animal research.
3. Explore methods of introducing foreign genes into plants and animals through transformation techniques.
4. Gain practical skills in plant tissue culture and animal cell culture for improvement.
5. Design strategies for plant genetic manipulation against biotic and abiotic stressors.
6. Hypothesize strategies to increase plant yield and fruit/seed quality.
7. Apply knowledge to real-world challenges in agriculture, veterinary medicine, conservation, and biomedical research
8. Understand the need for animal biotechnology for human welfare.

Course Outcomes:

After completing this course, the student is expected to learn the following:

1. Demonstrate a comprehensive understanding of plant biology, physiology, genetics, andmolecular biology.
2. Apply biotechnological tools and techniques used in plant research and agriculture, such asplant tissue culture, genetic engineering and transgenics.
3. Execute plant tissue culture techniques for callus induction, somatic embryogenesis, andmicropropagation, and apply them in plant breeding and propagation.
4. Perform plant transformation methods and demonstrate the ability to introduce foreign genesinto plants using different techniques.
5. Apply knowledge about ethical considerations and regulatory frameworks associated with plant biotechnology and genetically modified crops.
6. Understand the biology and characterization of cultured cells, including their adhesion, proliferation, differentiation, morphology, and identification.
7. Gain practical skills in basic mammalian cell culture techniques, measuring growth parameters, assessing cell viability, and understanding cytotoxicity.
8. Learn about germplasm conservation techniques and the establishment of gene banks, along with large-scale culture methods for cell lines.
9. Explore organ and histotypic culture techniques, biotransformation, 3D cultures, whole embryo culture, somatic cell cloning, and the ethical considerations surrounding stem cellsand their applications.

Plant and Animal Biotechnology - Content of Theory	60 hrs
Unit–I – Plant Tissue culture methods	**15**
Introduction, history, definition, hypothesis, and concept of totipotency. Principles of plant tissue culture, media and laboratory organization, types of culture, morphogenesis, differentiation, callus, direct, indirect organogenesis, and somatic embryogenesis, synthetic seeds. *In vitro* propagation and micropropagation, Seed culture, embryo culture, Meristem culture, bud culture, limitations and applications. Secondary metabolites, *In vitro*secondary metabolite production, Suspension cultures, cell cultures, growth vs secondary metabolite production, bioreactors and scaling up of secondary metabolite production, limitations, and applications.	
Unit -II Transgenic Plants and biosafety	**15**
Overview of transgenic plants and their significance in agriculture. - Techniques for introducing foreign genes into plants: Agrobacterium-mediated transformation, biolistics, and other methods. Selection and screening of transformed plants. Applications of Transgenic Plants - Improved crop traits through genetic engineering: pest resistance, herbicide tolerance, disease resistance, and abiotic stress tolerance. Biosafety assessment of transgenic plants: potential risks and benefits. International regulatory frameworks for releasing and commercializing genetically modified organisms (GMOs). Ethical and socio-economic impacts of transgenic crops. Intellectual property rights and access to transgenic technologies.	
Unit–III Animal Cell culture methods	**15**
History and laboratory organisation, Media. Cell types and culture characters. Pluripotency, Multipotency, Differentiation, Trans differentiation Reprogramming, Biology and characterization of cultured cells- cell adhesion, proliferation, differentiation,morphology of cells, and identification. The basic technique of mammalian cell culture in vitro, Measuring parameters of growth in cultured cells, cell viability, and cytotoxicity. Large-scale culture of cell lines- monolayer, suspension, and immobilized cultures. Organ and histotypic culture**:** Technique, advantages, limitations, applications. Stem cells: types (embryonic, adult, induced pluripotent), isolation, identification, expansion, differentiation and uses, stem cell engineering,ethical issues.	
Unit -IV Gene transfer in animals and applications	**15**
Gene constructs promoter/ enhancer sequences for transgene expression in animals. Selectable markers for animal cells- thymidine kinase. Transfection of animal cells- calcium phosphate coprecipitation, electroporation, lipofection, peptides, direct DNA transfer, viral vectors, Retrovirus, microinjection. Transgene identification methods. Transgenic and genome-edited animals. Ethical issues in transgenesis. Recent advances and applications in the field. Manipulation of animal reproduction and characterization of animal genes, Embryo transfer in cattle and applications. Somatic cell cloning - cloning of Dolly. Ethical issues. Production of recombinant vaccines.	

Pedagogy: Lectures, Seminars, Industry Visits, Debates, Quiz, and Assignments. Case studies highlight successful applications and challenges in transgenic crop development.

Summative Assessment = 60 Marks	
Formative Assessment /type	**Weightage in Marks**
Attendance	10
Seminar	10
Debates and Quiz	10

Test	10
Total	**60 marks + 40 marks = 100 marks**

Course Title	**Plant and Animal Biotechnology**	Practical Credits	**2**
Course Code	DSC-A-12 (P)	Contact hours	**60 hrs**

Content of Practical

1. Laboratory organization of basic and commercial plant tissue culture
2. Media preparation (MS, B5), solid media preparation, and Liquid media preparation
3. Explant preparation – Leaf, bud, rhizome, and meristem
4. Synthetic seed production
5. Callus culture- Initiation and establishment of different types of callus cultures
6. Micropropagation with a suitable example – Stage 0. 1, 2, 3, and 4
7. Staining, cell viability, and cell count of cell cultures
8. Preparation of cell culture media: Preparation of basic cell culture media, such as Dulbecco's Modified Eagle Medium (DMEM), supplemented with fetal bovine serum (FBS), antibiotics, and other required additives.
9. Aseptic techniques and sterile handling: Practicing aseptic techniques, including properly handling tools and equipment, working in a laminar flow hood, and maintaining sterility throughout the cell culture process.
10. Filter sterilization: Practice filter sterilization for sensitive media ingredients.
11. Cell counting and viability assessment: Count cells using a hemocytometer or automated cell counter, and perform viability assays (e.g., trypan blue exclusion) to determine the percentage of viable cells.
12. Cell staining and microscopy: Staining the cultured cells using dyes such as hematoxylin and eosin (H&E), and observe them under a light microscope to study cell morphology and structure.
13. Contamination identification and troubleshooting: Learn to identify and troubleshoot common issues in cell culture, such as contamination by bacteria, fungi, or mycoplasma, and implementappropriate corrective measures.
14. Experimental design and data analysis: Students can design and execute simple experiments, record and analyze data, and interpret the results based on their observations and measurements.

Practical Assessment			
Formative Assessment		**Summative Assessment**	**Total Marks**
Assessment Occasion/ type	**Weightage in Marks**	**Practical Exams**	
Record	05	25	**50**
Test	10		
Attendance	05		
Performance	05		
Total	**25**	**25**	

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B.Sc. Biotechnology Sixth Semester

Program Name	**B.Sc. Biotechnology**		Semester	**6th Semester**
Course Title	**Immunology (Theory + Practical)**			
Course Code:	**DSC-A13(T)**		No. of Theory Credits	**04**
Contact hours	**60 hrs**		Duration of ESA/Exam	**3 Hours**
Formative Assessment Marks		**40**	Summative Assessment Marks	**60**

Course Objectives:

1. To understand the various aspects of immunity, elicitation of immune responses, factors determining the outcome of immune responses and major players of immunity, relevancebetween nutritional support and immunity, and immunological techniques.
2. To provide knowledge on essential features of antigens and antibodies and their types and different theories of Antibody formation.
3. To acquire knowledge on types of immunity, phagocytosis, interferons, and the complement system.
4. To explain the concept of hypersensitivity, autoimmunity, and transplantation.
5. To provide knowledge on immune deficiencies and several immunological techniques

Course Outcomes:

At the end of the course, the student should be able to:

1. Demonstrate comprehension of the underlying structure and function of the immunesystem and related disorders.
2. Demonstrate an understanding of the role of cells and molecules in immune reactions andresponses
3. Demonstrate technical skills in immunological tools and techniques
4. Apply the domain-specific knowledge and skills acquired in immunology for innovativetherapies and Immunotechnologies
5. Understand the fundamental concepts of immunity, and the contributions of the organs and cellsin immune responses.
6. Realize how the MHC molecule's function and host encounters an immune insult.
7. Understand the antibodies and complement system
8. Understand the mechanisms involved in the initiation of specific immune responses
9. Differentiate the humoral and cell-mediated immune mechanisms
10. Comprehend the overreaction by our immune system leading to hypersensitive conditions and its consequences
11. Understand unique properties of cancer cells, immune recognition of tumors, immune evasionof cancers

Immunology - Content of Theory	60 Hrs
Unit–I Cells and Organs of the Immune System	**15**
Introduction to the Immune System: History of Immunology, Types of Immunity: first and second line of defense, innate and acquired/adaptive immunity, specificity, diversity. Cells of the immune system: Antigen-presenting cells (APCs), Role of B and T-lymphocytes in Humoral immunity and cell-mediated immunity, primary and secondary immune response, Immunization, memory. Organs of the Immune system: Thymus, bone marrow, spleen, Lymph Node, peripheral lymphoid organs	
Unit -II Molecules of the Immune System	**15**
Antigens and haptens: Properties (foreignness, molecular size, heterogeneity). Adjuvants. Antigenicityand Immunogenicity. Affinity and Avidity. B and T cell epitopes, superantigens Immunoglobulins: Classification, structure, and function. Antibody diversity, Monoclonal and polyclonal antibodies. Major histocompatibility complexes: Classification, structure, and function. Antigen processing pathways – Cytosolic and Endocytic, Complement Pathways, Cytokines: Classification and function, Hypersensitivity: Reactions – Types I, II, and III. Delayed Type Hypersensitive Response.	
Unit -III Immunotechniques and vaccines	**15**
Structure and properties of antigens- iso- and allo-antigens, antigen specificity, Cross-reactivity, Precipitation, Immunodiffusion reactions: Radial immunodiffusion, Ouchterlony double diffusion, Immunoelectrophoresis. Agglutination: Agglutination reactions. ELISA, RIA. Immunocytochemistry, Fluorescent Techniques. Vaccines: Conventional, peptide vaccines, subunit, DNA vaccines. Toxoids, antisera, edible vaccines, plantibodies, and Cancer vaccines.	
Unit - IV	**15**
Transplantation immunology: Phases in graft rejection and immuno-suppressors. Autoimmune Disorders: Systemic and Organ-specific Autoimmune disorders with examples Immunodeficiencies: Primary and secondary immunodeficiencies; acquired immunodeficiency syndrome Cancer and the immune system – immune surveillance, immunological escape, cancer antigens, cancerimmunotherapy Microbial diseases in humans**:** Mode of infection, symptoms, epidemiology and control measures of diseases caused by Viruses (Hepatits-B), Bacteria (Typhoid), Fungi (Aspergillosis), Protozoa (Malaria).	

Pedagogy: Lectures, Seminars, Industry Visits, Debates, Quiz and Assignments

Summative Assessment = 60 Marks	
Formative Assessment Occasion/ type	**Weightage in Marks**
Attendance	10
Seminar	10
Debates and Quiz	10
Test	10
Total	**60 marks + 40 marks = 100 marks**

Course Title	**Immunology (Practical)**	Practical Credits	**02**
Course No.	**DSC-A14 (P)**	Contact hours	**60 hrs**

Content of Practical

1. Hemagglutination of ABO Blood groups
2. Determination of Rh factor
3. Whole Count of WBC using Hemocytometer
4. Cells of the Immune System
5. Radial immunodiffusion
6. Ouchterlony double diffusion
7. ELISA – Demonstrate
8. Serum Immunoelectrophoresis
9. Western Blotting

Practical Assessment

Formative Assessment		**Summative Assessment**	**Total Marks**
Assessment Occasion/ type	**Weightage in Marks**	**Practical Exams**	
Record	05	25	**50**
Test	10		
Attendance	05		
Performance	05		
Total	**25**	**25**	

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B.Sc. Biotechnology Sixth Semester

Program Name	**B.Sc. Biotechnology**	Semester	**6th Semester**
Course Title	**Bioprocess and Environmental Biotechnology (Theory)**		
Course Code:	**DSC-A15 (T)**	No. of Theory Credits	**04**
Contact hours	**60 hrs**	Duration of ESA/Exam	**03 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Objectives:

1. Perform simulations of microbial growth and metabolism
2. Design bioreactors for the production of various products.
3. Present knowledge about major metabolic pathways and those related to biofuel production from microbes.
4. Understand the fundamental concepts and principles of environmental biotechnology and Explore the interrelationship between biotechnology and the environment.
5. Gain knowledge of the variousapplications of biotechnology in environmental conservation, pollution control, and sustainability.
6. Learn about microbial processes and their role in environmental biotechnology.
7. Understand the principles of bioremediation and its application in the clean-up of environmental pollutants.
8. Explore the potential of bioenergy production and waste management through biotechnological approaches.
9. Identify and characterize the most important contaminants in the Bioprocess and other industrial wastes.
10. Reuse/recycle the biological waste to clean technology such as energy, biofuel, bio fertilizer through bioremediation

Course out comes:

1. Exploitation of microorganisms for industrial use and their improvement, and formulation of media for efficient growth and production of microbial or cell-based products.
2. The design, operation, and specific applications of various bioreactors.
3. Demonstrate a comprehensive understanding of the fundamental concepts and principlesof environmental biotechnology.
4. Apply knowledge of biotechnological techniques to address environmental challenges,such as pollution control and waste management.
5. Analyze and evaluate environmental biotechnology case studies, research findings, andreal-world applications.
6. Design and implement biotechnological approaches for environmental remediation,utilizing microbial processes and biodegradation principles.
7. Evaluate the ethical and sustainable aspects of environmental biotechnology practices andmake informed decisions regarding their application in environmental conservation.
8. Communicate scientific concepts and research findings related to environmentalbiotechnology effectively, both in written and oral forms, to diverse audiences.

Bioprocess and Environmental Biotechnology – Content of Theory	60 hrs.
UNIT- I – Introduction to bioprocess technology	**15**
Basic principle components of fermentation technology. Strain improvement of industrially important microorganisms. Types of microbial culture and its growth kinetics– Batch, Fed-batch, and Continuous culture. Principles of upstream processing – Media preparation, Inocula development, and sterilization.	
UNIT- II-Bioreactors and downstream processing	**15**
Bioreactors- Significance of Impeller, Baffles, Sparger; Specializedbioreactors- design and their functions: airlift bioreactor, tubular bioreactors, membranebioreactors, tower bioreactors, fluidized bed reactor, packed bed reactors Downstream processing- cell disruption, precipitation methods, solid-liquid separation, liquid-liquid extraction, filtration, centrifugation, chromatography, drying devices (Lyophilization and spray dry technology), crystallization, biosensors-construction and applications, Microbial production of ethanol, amylase and Single Cell Proteins.	
Unit III- Fundamentals of Environmental Biotechnology	**15**
Introduction to Environmental Biotechnology- Principles of Environmental Science. Role of Biotechnology in Environmental Conservation. Microbial Processes in Environmental Biotechnology. Pollution and Biotechnology – Major issues in environmental pollution and the role of biotechnology in addressing them. Biotechnological Methods of Pollution Detection-General bioassay methods for pollution detection. Cell biological methods for assessing pollution levels. Use of biosensors in pollution monitoring. Biotechnological Methods in Pollution Abatement-Reduction of CO2 emission using biotechnologicalapproaches. Addressing eutrophication through biotechnological interventions. Application of cell immobilization techniques in pollution abatement.	
Unit IV- Bioremediation and Waste Management	**15**
Importance of bioremediation in environmental cleanup. Types of contaminants suitable for bioremediation. Microorganisms used in bioremediation. *In-situ* Bioremediation Methods. – Bioaugmentation. Biostimulation. Bioventing.Phytoremediation. *Ex-situ* Bioremediation Methods – Composting, Land farming, Biopile and bioslurry systems. Xenobiotics. Bio metallurgy and bio-mining. Waste water Management. Waste water Characterization and Composition. Biological Processes in Waste water Treatment. Activated Sludge Process and Biological Nutrient Removal, Anaerobic Digestion and Biogas Production. Solid Waste Management.	

Pedagogy: Lectures, Seminars, Industry Visits, Debates, Quiz and Assignments

Summative Assessment = 60 Marks	
Formative Assessment Occasion/ type	**Weightage in Marks**
Attendance	10
Seminar	10
Debates and Quiz	10
Test	10
Total	**60 marks + 40 marks = 100 marks**

Course Title	**Bioprocess and Environmental Biotechnology (Practical)**	Practical Credits	**02**
Course No.	**DSC-A16 (P)**	Contact hours	**60 hrs**

Content of Practical

1. Bacterial growth curve.
2. Calculation of the thermal death point (TDP) of a microbial sample.
3. Study of fermentor- Demonstration.
4. Production of wine
5. Estimation of the percentage of alcohol, total acidity & volatile acidity in wine.
6. Production and analysis of ethanol.
7. Production and analysis of amylase.
8. Production and analysis of lactic acid.
9. Isolation of industrially important microorganisms from natural resources.

Practical Assessment

Formative Assessment		**Summative Assessment**	**Total Marks**
Assessment Occasion/ type	**Weightage in Marks**	**Practical Exams**	
Record	05	25	**50**
Test	10		
Attendance	05		
Performance	05		
Total	**25**	**25**	

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4. Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.
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21. Chatterji, A. K. (2002). Introduction to environmental biotechnology. Prentice-Hall of India Pvt. Ltd.
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MANGALORE UNIVERSITY

Curriculumof BA

in Economics

5th & 6th Semester

MANGALORE UNIVERSITY

Composition Board of Studies

SN	Name & Organization	Designation
1	Dr. Viswanatha Professor, Mangalore University, Konaje	Chairman
2	Sri. Hareesha Acharya P. Associate Professor Govinda Dasa College Suratkal, Mangalore	Member
3	Dr. Prakasha Rao A. Associate Professor Poorna Prajna College Udupi- 576101	Member
4	Dr. Sreenivasaiah K., Assistant Professor Government Women's First Grade College, Balmatta Mangalore	Member
5	Dr. E. Thippeswamy Associate Professor Field marshal K.M. Cariappa College, Madikeri-571201	Member
6	Sri. Ashok Jogi Assistant Professor E.C.R. Institute of Management Studies Brahmavar, Udupi-576225	Member

Pedagogy

Formative Assessment	
Assessment Occasion/type	**Weightage in Marks**
Internal Test	50%
Assignment	20%
Presentation/Project	30%
Total	100
Formative Assessment as per University guidelines are compulsory	

Note: Strictly follow the Practicum

Pedagogy; Evaluation process IA MARKS

FORMATIVE ASSESSMENT			
	C1	C2	Total
Assessment Occasion/type			
Internal Test	10	10	20
Assignment/seminar	5	-	05
Quiz/GD	5	-	05
Presentation/Project etc	-	10	10
Total	20	20	40
Semester End Exam Theory			60

BA – Arts: Curriculum and Credit Framework for U G (V and VI Sem) Programme

Sem	Discipline Specific Core	Minor Multidisciplinary/ OE Courses	Ability Enhancement Courses	Skills Enhancement Courses		Total Credits
V	DSC- ECO- C 09(4), ECO- C 10(4), ECO- C 11(4) **OR** ECO- C 12 (4)	-	-	SEC-4 Employability Skill/ Cyber Security(3)		27
VI	DSC- ECO- C 13(4), ECO- C 14(4), ECO- C 15(4) **OR** ECO- C 16 (4)	-	-	Internship(2)		26

MANGALORE UNIVERSITY

SYLLABUS

Program Name	**BA in Economics**	Semester	**Fifth Semester**
Course Title	**Public Economics**		
Course Code:	**ECO C 09 (Compulsory Paper)**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Understand introductory Public Finance concepts.

CO2. Study the causes of market failure and corrective actions

CO3. Understand the impact, incidence and shifting of tax

CO4. Study the Economic Effects of tax on production, distribution and other effects

CO5. Enable the students to know the Principles and Effects of Public Expenditure

CO6. Understand the Economic and functional classification of the budget; Balanced and Unbalanced budget

CO7. Understand the Burden of Public debt and know the Classical/ Ricardian views, Keynesian and post-Keynesian views

CO8. To acquaint with the advantages and disadvantages of Deficit Financing,

MODULES	DESCRIPTION	60 Hours
Module I	**Introduction to Public Economics**	**15**
	Public Economics: Meaning, definitions, Scope and Significance, Public Finance and Private Finance: Meaning, and Distinction; Public good and private good: Meaning, Characteristics, and Distinction, Principle of Maximum Social Advantage, Market Failures: Meaning, causes-role of externalities; Market failure and role of government.	
Practicum	Group Discussions on Public Finance and private finance; public good and private good Assignment on Market failure and government intervention	
Module II	**Public Revenue and Public Expenditure**	**18**

	Meaning and sources of revenue; Taxation –Cannons of taxation, Characteristics of a sound tax system, Impact, Incidence- Division of Tax burden, Shifting of tax, Economic Effects of tax on production, distribution and other effects, Progressive and Regressive, Proportional Tax, Direct and Indirect Taxes –Merits and Demerits, Taxable Capacity: Meaning and determinants. Public Expenditure; Meaning, classification, principles, Types & Cannons, Reasons for the growth of public expenditure, Wagner's	
	law of increasing state activities, Effects of public expenditure: Production, Distribution &Other effects	
Practicum	Mini-project/study to ascertain the impact of GST on retailers/wholesalers in your vicinity A case study on the taxable capacity of the different sections of society in the vicinity Assignment on Effects of public expenditure: Production, Distribution & Other Effects	
Module III	**Public Debt**	**12**
	Public Debt: Meaning, Purpose, Types & Effects**;** Sources of Public Borrowing; Burden of Public Debt -Classical/ Ricardian views, Keynesian and post-Keynesian views; Causes of the Rise in Public Debt**;** Methods of debt redemption; Debt management.	
Practicum	Studying the burden of public debt through a project/ case study Assignment on Debt Management	
Module IV	**Public Budget, Fiscal Policy and Fiscal Deficit**	**15**
	Budget: Meaning, process & Types of budget, Economic and functional classification of the budget; Balanced and unbalanced budget, Types of Budget Deficits; Fiscal Policy: Meaning, objectives & Tools; Fiscal deficit, Deficit Financing: Meaning, Advantages and Disadvantages	
Practicum:	Calculation of various types of budget deficit using the budget data Group discussion on the advantages and disadvantages of deficit financing	

References	
1	Lekhi R.K., Joginder Singh (2018) Public Finance, Kalyani publication, New Delhi
2	Tyagi B.P. (2014) Public Finance published by Jaya Prakash Nath and CO, Meerut
3	Hindriks J. and G. Myles (2006): Intermediate Public Economics, MIT Press.
4	Bhatia H L (2018): Public Finance. Vikas Publishing House.
5	Musgrave, R.A. (1989), The Theory of Public Finance, McGraw Hill
6	Musgrave R.A. and P.B. Musgrave (1989), Public Finance in Theory and Practice, McGraw Hill,

MANGALORE UNIVERSITY

SYLLABUS

Program Name	**BA in Economics**	Semester	**Fifth Semester**
Course Title	**Development Economics**		
Course Code:	**ECO C10 (Compulsory Paper)**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. Understand the basic concepts and measurements of Development.
- CO2. Learn some classical and partial theories of Development economics and identify the difference.
- CO3. Identify the difference between Developed and Developing Countries.
- CO4. Analyse and tackle the Development issues effectively.

MODULES	**DESCRIPTION**	**60 Hrs**
Module 1	**Introduction to Economic Development**	**14**
	Concept - Definitions - Distinction between Economic Growth and Development - Indicators of Growth and Development, Measures of Economic Development: Gross National Product (GNP) - Physical Quality of Life Index (PQLI), Human Development Index (HDI), Happiness Index, Inequality and Poverty: Meaning, causes, indicators – Human Poverty Index (HPI).	
Practicum:	Assignment on various indicators of growth and development Group discussions about the characteristic features of different countries and their development levels	
Module 2	**General Theories of Economic Growth and Development**	**16**
	Adam Smith's Theory, David Ricardo's Theory, T.R. Malthus' Theory, Karl Marx's Theory, Schumpeter's Theory and Rostow's Growth Theory.	
Practicum:	Assignment on different theories and their relevance to developing Countries, Debate on present stage of India's growth and estimated stage it may reach by 2047	
Module 3	**Partial Theories of Economic Development**	**16**
	Lewis Labour Surplus Model - Rodan's Big Push Theory - Lieberstein's Critical Minimum Effort Approach - Balanced Vs. Unbalanced Growth, Factors in the Development Process Capital Accumulation - Capital-Output Ratio - Technology and Economic Development.	

Practicum:	Group Discussion on Balanced and unbalanced growth strategies in Developed and developing countries Assignment on the Factors in the Development Process Capital Accumulation	
Module 4	**Sustainable Development**	**14**
	Inclusive Development - Millennium Development Goals - Sustainable Development Goals, Targets and Achievements with reference to India.	
Practicum	Seminar on MDGs and SDGs and the challenges	

References	
1	Higgins Benjamin & W.W. Norton Economic Development New York & Company. Inc.
2	Mishra S.K and Puri V.K, Economic Development and Planning, Himalaya Pub., House, Mumbai.
3	Taneja M.L. and Meier G. M, Economics of Development and Planning, S. Chand and Co, New Delhi.
4	Thirlwall A.P. Growth and Development: With Special Reference to Developing Economies, Palgrave Macmillan, New York.
5	Todoaro. M.P & Orient Longman Economic Development in the Third World, United Kingdom
6	Sustainable Development Reports

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SYLLABUS

Program Name	**BA in Economics**	Semester	**Fifth Semester**
Course Title	**Economics of Human Resource Management**		
Course Code:	**ECO C11**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. Understand the meaning, nature, scope and value of the contemporary approach to human resource management with reference to Economics.
- CO2. To describe an organisation of a human resource management functionary in an establishment, and to identify attributes of a successful personnel manager.
- CO3. To impart knowledge and techniques in human resource planning, Job-Analysis, and Job-Design.
- CO4. To explain various methods of recruitment, selection, induction and placement.
- CO5. To develop the importance and methods adopted for training and development of employees in two days environment in the workplace.

MODULES	DESCRIPTION	60 Hours
Module I	**Introduction to Human Resource Management**	**15 hrs**
	Human Resource Management: Concept, Nature, scope, objectives, importance, functions of Human Resource Management with reference to Economics; Organization of personnel department, Qualities of Personnel Manager, role of Personnel Manager, Status of Personnel Manager; Characteristics of a Human Resource Manager, HRD - Responsibility of managers.	
Practicum	Group Discussions on Human Resource Management as a Profession. Assignment on Qualities of Personnel Manager	
Module II	**Procurement of Human Resources**	**15 hrs**
	Human Resource Planning – Concept and objectives, importance, process, problems and guidelines; Job Design and Analysis: Concept, process, job description and job specification; Recruitment and Selection Meaning and process of recruitment, recruitment policy and organization, sources and techniques of recruitment, meaning and process of selection.	
Practicum	Assignment on recruitment and selection Group discussion on Techniques of Recruitment	
Module III	**Training and Job Evaluation**	**15 hrs**

	Training: Concept, objectives, importance; identifying training needs. Designing training programmes, methods of training, evaluating training effectiveness, retraining Concept, process and objectives of job evaluation, advantages and limitations, essentials of successful job evaluation, methods of job evaluation, Wage and Salary Administration. Objectives and principles, essentials of sound wage structure, factors affecting wages, methods of wage payment, and wage policy in India, executive compensation.	
Practicum	Project on training and job evaluation	
Module IV	**Performance Appraisal**	**15 hrs**
	Performance appraisal: Concept, objectives, uses, process, problems, essentials, methods and techniques, appraisal, interview, Transfers, promotions and separations. Purpose of job changes, concept and objectives of transfers. Types of transfer, transfer policy, concept and basis of promotion, promotion policy, demotion, types of separations.	
Practicum	Seminar on transfers and promotions Group discussion on Performance appraisal	

References	
1	Koontz, Weirich & Aryasri, (2004) **Principles of Management**, Tata McGraw-Hill, New Delhi,
2	Tripathi & Reddy, (2008) **Principles of Management**, Tata McGraw-Hill, New Delhi, Laurie
3	Meenakshi Gupta, (2009) **Principles of Management**, PHI Learning, New Delhi,
4	Gupta (2016), **Human resource Management**. S Chand Publisher. New Delhi
5	Aswathappa K. (2020) **Human resource Management**, Tata Mc Graw Hill Publishing Co. Ltd.
6	Prasad L. M, (2017) **Organisational Behaviour**, S. Chand Publishers, New Delhi.

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SYLLABUS

Program Name	**BA in Economics**	Semester	**Fifth Semester**
Course Title	**Indian Banking and Finance**		
Course Code:	**ECO C12**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. Understand the structure of Indian banking and the role of banks in monetary policy.
- CO2. Analyze the functioning of banks and different types of accounts and other services offered by banks.
- CO3. Evaluate recent developments in the Indian banking sector, including digital banking, payment banks, and non-performing assets.
- CO4. Describe the overview of the Indian financial system, including financial markets, financial instruments, and financial regulation.
- CO5. Analyze the challenges faced by Indian banks and the implications of banking reforms for the Indian economy.
- CO6. Develop critical thinking and analytical skills in evaluating various financial products and services banks and capital markets offer.

MODULES	DESCRIPTION	60 Hours
Module I	**Introduction to banking: India**	**15**
	Indian Banks: Evolution, structure, functions, types and features- Public sector, private sector, foreign, Cooperative, RRB, Credit creation and financial intermediation; Central Bank and banking regulation; Regulatory and supervisory powers; Monetary policy and banking channel of credit control; Policy rates and banking; repo, reverse repo, MCLR, Bank rate, CRR, SLR, MSF; Issues in banking sector; NPA crisis.	
Practicum	Compare and contrast the different types of banks, highlighting their strengths and weaknesses- Presentation. Conduct a class discussion and compare and contrast the different scenarios on various loans, highlighting the risks involved and the measures taken by banks to manage these risks.	
Module II	**Banking services**	**15**

	Banking services: Bank deposits; Types and features of bank accounts; account opening and importance of KYC; Bank loans; types, features, documents required; eligibility, interest rates, maturity, loan default and consequences; Other services: Locker facility, payment and remittance services and channels; currency exchange; debit cards, credit cards, pre-paid cards; ATMs; internet and mobile banking; Modern banking products: Insurance on deposits and loans, Investment services in capital market-stocks, bonds and mutual funds; advisory services; retirement products.	
Practicum	Group discussion on bank accounts and loan products and making recommendation to different classes Comparison of banking services by visiting bank branches	
Module III	**Modern Banking**	**15**
	Modern banking facilities; Digital banking; Digital Wallets; Digital account opening; Biometrics; contact less payment system; instant payments; personal finance management tools; Use of artificial intelligence and machine learning in banks; Cyber security in banking; Credit scoring; Direct lending; Corporate banking; Investment Banking	
Practicum:	Survey bank customers to understand their usage and satisfaction levels with digital banking services. Analyze the adoption rates of digital banking services across different age groups and demographic segments	
Module IV	**Financial Market**	**15**
	Introduction to Indian financial markets; Equity markets and stock exchanges; Debt markets and bond markets; Currency markets and forex trading; Commodity markets and trading; Derivatives markets; Mutual funds; Insurance products Investing in capital market products- access, channels; risk in capital market investments; Role & functions of SEBI	
Practicum	Debate: Investing in capital market products. Assignment on Indian financial markets	

References	
1	Khan, M. Y. (2019). Indian Financial System (11th ed.). McGraw Hill Education (India) Private Limited.
2	RBI (2022) report on the trend and Progress of Banking in India
3	Pathak, B. V. (2018). Indian financial system. Pearson Education
4	Principles and Practices of Banking (2023), Indian Institute of Banking & Finance (IIBF), MacMillian
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6	Taxman's Digital Banking, Indian Institute of Banking & Finance (IIBF), Bharati Law House
7	Reserve Bank of India. (2017). Basic Financial Literacy Guide.

	https://www.rbi.org.in/Scripts/BS_FlgGuidelines.aspx
8	Securities and Exchange Board of India. (2021). Handbook of Statistics on Indian Securities Market. https://www.sebi.gov.in/reports-and-statistics/publications/dec-2022/handbook-of-statistics-2021_66158.html
9	Financial Education Handbook (2021) National Centre for Financial Education (NCFE) https://www.ncfe.org.in/resources/downloads
10	Investor Education material by National Stock Exchange (https://www.nseindia.com/invest/how-to-invest-in-capital-market)

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SYLLABUS

Program Name	**BA in Economics**	Semester	**Sixth Semester**
Course Title	**International Economics**		
Course Code:	**ECO C13 (Compulsory Paper)**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. Understand the international trade theories and their application in international trade
- CO2. Explain the concept of terms of trade and demonstrate the effect of trade barriers; and display the ability to analyse the stages of economic integration
- CO3. Understand the concept of BoP and assess the BoP position and examine the changes in forex rate
- CO4. Analyse the role of International trade and financial institutions
- CO5. Demonstrate good inter-personal and communication skills through class participation and contributing to critical discussion on trade issues

MODULES	DESCRIPTION	60 Hours
Module I	**International Trade Theories**	**15**
	Meaning and Importance of International trade; Differences between Internal and International Trade; Trade Theories: Absolute cost and comparative cost advantage theories- Diamond Theory; Hecksher-Ohlin theory; Leontief's paradox	
Practicum	Assignment on Ricardo's Comparative cost advantage and Leontief's paradox	
Module II	**Terms of Trade and Commercial Policy**	**17**
	Terms of trade- Concept and Types, Factors determining Terms of Trade; Commercial Policy: Free trade v/s Protection; Tariffs: Types and effects; Quotas; Economic Integration: Meaning and stages.	
Practicum	Debate: Free trade v/s Protection Mini project: Trace the evolution of India towards Economic Integration	
Module III	**Balance of Payment and Capital Flow**	**13**
	Balance of Payment: Concept, Components; Disequilibrium in Balance of Payment: Causes and Measures to correct disequilibrium; Foreign Exchange rate: Meaning and types; determination of Foreign exchange rate: Demand for and Supply of Forex; Purchasing Power Parity (PPP) theory; Forms of FDI; Advantages and disadvantages of FDI.	
Practicum	Prepare India's Balance of Payment statement using recent Economic Survey Assignment on Forms of FDI	

Module IV	International Finance and Trade Institutions	15
	Bretton Woods Institutions: IMF and IBRD -IDA and IFC: Organization, Objectives, Functions and their role in developing countries; Evolution of WTO: Organization, Objectives, Functions, Agreements and current issues; WTO and developing countries;	
Practicum:	Group Discussion: Effectiveness of IMF and IBRD in developing countries Seminar: Agreements of WTO or current issues of WTO	

References

1	Sodersten. B. (1993): International Economics, MacMillan, 3 Edition, London,
2	Salvatore, D. (2016): International Economies, 12 Edition, Wiley Publication
3	Vaish, M. C. and Sudama Singh (1980): International Economics, 3 Edition, Oxford and IBH Publication, New Delhi.
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5	Dana, M. S. (2000): International Economics: Study Guide and work Book, 5. Edition, Routledge Publishers, London.
6	Kenen, P. B. (1994). The International Economy, Cambridge University Press, London.
7	Krugman, P.R. and M. Obstfeld (1994): International Economics: Theory and Policy Addison-Wesley Publications.
8	Jackson, JD. (1998) The World Trading System, Cambridge University Press, Mass. Cherunilam, International Economics, TMH, New Delhi.
9	D M Mithani, International Economics, Himalaya, Mumbai.
10	Jhingan M.L.(2016): International Economics, Vrinda Publications Pvt Ltd-Delhi
11	Dwivedi D.N. (2013): International Economics Theory & Policy, Vikas Publishing House Pv.t Ltd.
12	K.C. Rana & K.N. Verma (2017): International Economics; Vishal Publishing Co.
13	Krishnamurthy H.R (2013) : Antararashtreeya Arthashastra ; (Kannada version), Sapna, Bengaluru

MANGALORE UNIVERSITY

SYLLABUS

Program Name	**BA in Economics**	Semester	**Sixth Semester**
Course Title	**Indian Public Finance**		
Course Code:	**ECO C14 (Compulsory Paper)**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. Understand the structure of Indian Public Finance
- CO2. Enable the students to know the Source and nature of public revenue and expenditure
- CO3. Understand the Budget and different concept of deficits
- CO4. Know the Public debt and its management
- CO5. Understand the fiscal and monetary policy and their tools and importance
- CO7. To enable the students to know the Indian federal financing system and Financial Commissions.

MODULES	DESCRIPTION	60 Hours
Module I	**Public Revenue**	**18**
	Direct Tax Revenue - Sources of Revenue-Tax and Non-Tax Revenue; Trends and Patterns of Tax Revenue in India; Direct and Indirect Taxes in India; Personal Income Tax Rates and Slabs**;** Corporate Tax- Tax Rate and Slabs; **Indirect Tax Revenue -** Indirect Taxes –Goods and Services Tax (GST)- Objectives and Classification of GST, Tax Rates of GST; Trends and Patterns of GST; Impact of GST on Indian Economy**;** Tax Reform Commissions.	
Practicum	Collection and analysis of data on Direct tax Collection and analysis of GST from businesses	
Module II	**Public Expenditure**	**15**
	Revenue Expenditure - Classification of Public Expenditure in India**;** Revenue Account Expenditure- Trends and Patterns**;** Capital Account Expenditure-Trends and Patterns**;** Fiscal Responsibility and Budget Management (FRBM) Act**;** Impact of Public Expenditure on Indian Economy**; Union Budget and Its Analysis -** Meaning and Classification of Budgets; Zero- Based Budget; Composition of Union Budget; Union Budget Analysis (current one); Different Concept of Deficits- Revenue, Fiscal, Primary Deficits	
Practicum	Analysis of Union Budget (Current one) Group Discussion on Budget Deficits	

Module III	**Public Debt and Its Management**	**14**
	Public Borrowings and Debt - Meaning and Nature of Public Debt; Sources of Public Borrowings; Classification of Public Debt; Trends and Patterns of Central Government Debt; Main Characteristics of Indian Public Debt; Crowding out of Private Investment; Causes of Public Debt in India; **Burden of Public Debt and Management in India -** Meaning of Burden of Public Debt; Importance of Public Management; Principles of Public Debt Management; Repayment of Public Debt in India; Recent Finance Commission in India	
Practicum	Assignment to write on Indian Public Dent and sources of repayment Group Discussion on Burden of Public Debt	
Module IV	**Fiscal and Monetary Policies and Federal Finance in India**	**13**
	Fiscal and Monetary Policy India - Meaning and Objectives of Fiscal Policy; Importance of Fiscal Policy; Tools of Fiscal Policy; Meaning and Objectives of Monetary Policy; Importance of Monetary Policy; Tools of Monetary Policy**; Indian Federal Finance -** Meaning and Importance- Stages of Growth; Allocation of Resources- Division of Functions and Resources; Principles of Federal Finance.	
Practicum	Group Discussion about the Role of Fiscal and Monetary Policies in controlling inflation Assignment to write the State List, Union List and Concurrent list	

References	
1	Bhatia H L (2021): Public Finance, S. Chand and Co., New Delhi.
2	Lekhi R.K (2020): *Public Finance*, Kalyani Publishers, New Delhi.
3	Musgrave R.A and Musgrave P.A (2017): *Public Finance in Theory and Practice*, Mcgraw- Hill Kogakusha, Tokyo.
4	Om Prakash (2021): *Public Economics: Theory a practice*, Vishal Publishing Co. Ludhiana.
5	S.K. Singh (2019): *Public Economics: Theory and Practice* S. Chand and Co., New Delhi.
6	Tyagi, B.P (2018)*: Public Finance*, Jai Prakash Nath and Company, Meerut, India.

MANGALORE UNIVERSITY

SYLLABUS

Program Name	**BA in Economics**	Semester	**Sixth Semester**
Course Title	**Economic Thoughts of Dr. B.R Ambedkar**		
Course Code:	**ECO C15**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. derive inspiration from the life and works of B R Ambedkar
- CO2. Appreciate the socio-economic scenario during Ambedkar' period and compare it with present day
- CO3. Comprehend the contributions of Ambedkar on various economic aspects
- CO4. Assess the economic views of Ambedkar in the light of present-day socio-economic problems
- CO5. develop the traits of critical thinking and critiquing

MODULES	DESCRIPTION	60 Hours
Module 1	**Ambedkar's views on Economy, Society and Equity**	**15 Hrs**
	Socio- Economic-Political Context of India during Ambedkar's period; Brief outline of Ambedkar's life and career; Ambedkar's views on: a) economy and society; b) role of state c) Socialism and State Socialism; d) Women Empowerment , e) Objectives of economy: growth & equity; Socio-economic inequality: Economics of Caste, discrimination and deprivation; reforms suggested there in by Dr Ambedkar: Constitutional Provisions; Hindu code Bill	
Practicum	Assignment: Socio-economic inequality and status of affirmative actions in India	
Module 2	**Thoughts of Ambedkar on Agriculture**	**15Hrs**
	Ambedkar's views on: Agrarian Economy; Consolidation of land holdings and land revenue; Comparison with Ricardian view; Collective farming; views on land-ownership and land lessness; Nationalization of land and ceiling on land holdings; Surplus labour utilisation in agriculture and capital formation;	
Practicum	Mini Project: Using the Agriculture census data (https://agcensus.dacnet.nic.in/), chart the average size of operational holdings (by group) for different social classes in your tehsils and district (for2001-2 and 2015-16); compare with the corresponding figures of state and nation.	
Module 3	**Ambedkar on Industrialisation and Planning**	**15 Hrs**

	Ideas on Industrialisation; views on types of industries Labour: views on labour exploitation and labour reforms; Social security Planning: Measures to develop Irrigation and Power sector: River linking;	
Practicum	Debate 1): Small & cottage industries of rural areas v/s large scale industries in	
	urban areas Debate 2) Industrialize or perish v/s Industrialize and perish	
Module 4	**Ambedkar's contribution to Fiscal and Monetary Economics**	**15 Hrs**
	Fiscal Economics: study of sources of revenue; canons of expenditure Monetary Economics: Price stability and exchange rate stability; Currency reform	
Practicum	Seminar: Ambedkar's views on 'The Problem of Rupee'	

References (In order of importance of usage)	
1	Heggade O D (1998) - Economic Thoughts of B R Ambedkar
2	Heggade O D – ಅಂಬೇಡ್ಕರ್ ರ ಆರ್ಥಿಕ ವಿಚಾರಧಾರೆ, Arjun Pub. House, Mysuru
3	Speeches and writing of Dr. B R Ambedkar, W R Mujawar (4 Volumes)
4	ಡಾ.ಬಾಬಾಸಾಹೆಬ ಅಂಬೇಡ್ಕರ ರರ ಬರಹಗಳು ಮತ್ತ ಭಾಷಣಗಳ – Vol 1, Vol.2 Part 1& 2, Vol 3, Vol 6 Part 1& 2, Vol 10 Part 1, 2, & 3, Vol 12 part 2, Pub by Govt of Karnataka
5	Nagar and Nagar (2010), Economic Thoughts and Policy of Dr. B. R. Ambedkar
6	Permaiah, P.K and Sateesh Reddy (1994) – Dr Ambedkar's Economic Philosophy, Delta Pub, New Delhi
7	Dongre M K – Economic Thought of Dr B R Ambedkar
8	Ramaiah Reddy (ed) (1987)- Dr B R Amdedkar's Economic Philosophy
9	Sukhadeo Thorat(1998), Ambedkar's Role in Economic Planning and Water Policy, Shipra Publications, New Delhi.
10	Ambedkar B. R. (1936) Annihilation of Caste, Government of Maharashtra, Writings and Speeches of Dr B R Ambedkar, Volume 1, Mumbai. Also see https://www.brambedkar.in/annihilation-of-caste/
11	Ambedkar B. R. (1923) THE PROBLEM OF THE RUPEE: ITS ORIGIN AND ITS SOLUTION (HISTORY OF INDIAN CURRENCY & BANKING) http://drambedkar.co.in/wp-content/uploads/books/category1/13the-problem-of-the-rupee.pdf
12	Vasant Moon (Compiled) (1989) DR. BABASAHEB AMBEDKAR WRITINGS AND SPEECHES VOL. 1Part V of https://www.mea.gov.in/Images/attach/amb/Volume_01.pdf

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SYLLABUS

Program Name	**BA in Economics**	Semester	**Sixth Semester**
Course Title	**Environmental Economics**		
Course Code:	**ECO C16**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1. Understand how economic methods can be applied to environmental issues facing society
- CO2. Examine the linkages between Environmental Degradation and Economic Development
- CO3. Develop an informed view regarding the potential of economics to help societies achieve their environmental goals
- CO4. Demonstrate good inter-personal and communication skills through writing an essay and contributing to critical discussion
- CO5. Analyze environmental problems and to assess environmental policies.

MODULES	DESCRIPTION	60 Hours
Module I	**Environment and Ecology**	**15**
	Meaning, Nature and Scope of Economics of Environment; Linkages between Environment and the Economy; Environmental Stress; Population and Environment; Poverty and Environment; Meaning and elements of ecology; Biotic and Abioticcomponents; Food, Hydrological and Carbon Cycles; Meaning and strategies to achieve Sustainable Development; Rio Summit; Green Accounting Introduction to SDGs.	
Practicum:	Making charts relating to SDGs or Assignments on environment-economy linkages at the local level.	
Module II	**Natural Resources Scarcity and Conservation**	**15**
	Meaning and Characteristics of Renewable and Non-renewable resources; Non-Renewable Resources and the problem of depletion and problem of overuse ; Resource Scarcity and Economic Growth (Limits to Growth Model); Energy and Economic Development; Energy resources and their Pricing; Alternative energy sources; Conservation of Natural Resources- 3Rs – Reduce, Reuse and Recycling Measures	

Practicum:	Identifying local resources; Project on resource conservation (esp. water) at the College level; Discussion on Limits to Growth	
Module III	**Environmental Issues**	**15**
	Solid Waste Management, Pollution- Types Air, Water and Noise- Causes and Effects, Bio diversity, Global Warming, Climate Change, Problem of Potable water.	
Practicum:	visiting the Pollution Control Board office and observing its functions	
Module IV	**Environmental Pollution and Regulation**	**15**
	Environmental regulatory system in India; Pollution Control Boards and their Functions; Provisions of the Environmental Protection Act, 1986; Environmental Movements in India (Chipko); Role of NGOs in Environmental Protection.	
Practicum:	Assignments on types of pollution in local areas; Seminars on climate change and its consequences; visiting the Pollution Control Board office and observing its functions	

References	
1	Bhattacharya, R.N (Ed) (2001), *Environmental Economics: An Indian Perspective*, Oxford University Press.
2	Karpagam M. (1993), *Environmental Economics*, Sterling Publishers, New Delhi.
3	Shankar, U, (2001), *Environmental Economics*, Oxford University Press, New Delhi.
4	Singh, Katar and Anil Shisodia (2007): *Environmental Economics: Theory and Applications*, Sage Publications, New Delhi
5	Mahajan V.S (2003): *Environmental Protection – Challenges & Issues*, Deep & Deep Publishers New Delhi
6	Sengupta, R.P. (Ed.) (2001), *Ecology and economics: An Approach to Sustainable Development*, Oxford University Press, New Delhi.
7	Nick Hanley, Jason F, Shogren and Ben White (2005): *Environmental Economics in Theory and Practice*, Macmillan India Ltd.

MANGALORE UNIVERSITY

SYLLABUS

Program Name	**BA in Economics Internship**	Semester	**Sixth Semester**
Course Title	**Internship**		
Course Code:	**Skill Enhancement Course**	No. of Credits	**2**
Contact hours		Duration of SEA/Exam	**Practical**
Formative Assessment Marks	**50**	Summative Assessment Marks	**NA**

INTRODUCTION:

Internship [Organizational work] is an integral part of the curriculum. Its objective is to equip students with job skills and communication abilities, enabling them to bridge the gap between theoretical knowledge and practical application. The internship program incorporates various interventions that offer students exposure to real-life job experiences and expectations, empowering them with insights into the workings of different industries.

The internship is strategically positioned during the 6th semester of the Bachelors of Arts in Economics program. This timing provides students with a strong foundation in economics, enabling them to apply their knowledge in real-world settings. Additionally, the program caters to the critical need for teaching skills in economics and administration, enhancing the academic qualifications of students. Overall, the internship program aims to prepare students for the job market, thereby bridging the gap between academia and the professional world.

OBJECTIVES:

The objectives of conducting program are:

1. To boost students' employability by imparting soft skills that are essential in everyday life.
2. To enable students discover their professional strengths and weaknesses and align them with the changing economic environment.
3. To provide an opportunity for students to apply theoretical concepts and knowledge in real life situations at the work place.
4. To prepare students to understand organization culture and familiarize them with the organization needs.

5. To enable students to manage resources, meet deadlines, identify and undertake specific goal-oriented tasks.

6. To sharpen domain knowledge and provide core competency skills.

Internship Requirements & General Guidelines:

A. Nature of internship project work:

1. Every Student is required to work in an organization (a firm, self- help groups/cooperatives/farms or any rural economy components) for at least two months as part of Internship.

2. The student shall identify an internship work place.

3. Maximum five students of the same department from a College/University shall work for Internship in the same organization.

4. Internship work may be to carry out Professional work.

5. The internship shall be paid or unpaid.

6. While, working from the organizational premises is encouraged, in certain cases, virtual internship shall be considered.

B. Duration of Internship:

1. The Internship works shall be for a period of TWO months [Sixty Days].

2. The internship commence from the first day of the sixth semester.

3. Student is expected to carry out his/her Internship works during the first FIVE days of the week, and shall report to the department on a weekly basis.

4. The duration of the work shall be specified by the organization at the beginning of the program and the number of hours spent shall be in line with the prevailing rules.

C. Guide and Mentor:

1. An internal mentor shall be assigned by the University/College for the smooth conduct and supervision of the internship program.

2. The internal mentor shall provide guidance students in securing internship and to monitor the progress.

D. Protocol of the Internship work:

1. The head of the institution shall issue an internship work authorization letter during the 5th semester to the College or Organization where student is expected to join the internship work.

2. Student is expected to take up the preliminary work such as identifying the organization and engaging in securing in an offer from an organization

3. During the 5th semester, students who secured an offer must get consent offer signed by the principal/head to carry out internship.

4. Student must submit the joining report with the date of joining for internship to the department head through internal mentor.

5. In case of professional work, the student is expected to be regular in performing his/her duties/tasks assigned to him/her by the Organization.

E. Evaluation:

1. All the students should obtain a certificate of internship from the workplace. This certificate shall mention the name of the candidate, the organizations name and duration of work. A letter describing the work of the candidate is desirable. The certificate shall be submitted to the department head.

2. The performance of a candidate shall be assessed for maximum of 100 marks.

3. The assessment methods shall be decided by the Universities based on the existing conventions.

4. The assessment method shall consist of an internship report submitted by the students based on the work experience and a viva-voce/presentation.

5. **Viva-voce/Presentation:** There shall be a viva-voce examination will be conducted for by the department where each student is expected to give a presentation and submit necessary documents.

F. Marks allocation for Internship Work:

Statement of Marks Secured		
Item	**Maximum Marks**	**Marks Obtained**
Candidate Attendance for teaching/work		
Candidate Punctuality for teaching/work		
Course Work Preparation/ Work Commitment		
Students Feedback/Employer Feedback		
Behavioural Attitudes		

Overall Observation		
Total		
Total Marks Secured by student in Words:		

Viva-voce by Chairman and an Expert Drawn from Other University for 30 Marks			
Sl. No	Aspects	**Maximum Marks**	**Marks Obtained**
1	Presentation Skills		
2	Communication Skills		
3	Subject Knowledge		
Total			

Note: Assessment needs to be done as per the regulation.

Question Paper Pattern for UG Semester
DSC

Paper Code:		**Paper Title:**			
Duration of Exam	**2 Hours**			Max Marks	**60 Marks**
Instruction:	**Answer all the sections**				

Section-A

1. Answer **ALL** the following sub-questions, each sub-question carries **ONE** mark	(10X1=10)
A. **B.** **C.** **D.** **.** **J.** ***Note for Section-A:*** **Three sub-questions from each unit and remaining one sub-question (J) from unit I to III.**	

Section-B

Answer any **FOUR** of the following questions, each question carries **FIVE** marks	(4X5=20)
2. **3.** **4.** **5.** **6.** **7.** ***Note for Section-B:*** **Minimum Two question from each unit (Q No 2 to 6)**	

Section-C

Answer any **THREE** of the following questions, each question carries **TEN** marks	(3X10=30)
8. **9.** **10.** **11.** **12.** ***Note for Section-C:*** **Minimum Two question from each unit (Q No 8 to 12) Sub-questions such as 'a' and 'b' may be given for a question in section-C only.**	

Sri. Hareesha Acharya P
Member

Dr. Sreenivasaiah K.
Member

Dr. Prakasha Rao A.
Member

Dr. E. Thippeswamy
Member

Prof. Vishwanatha
Chairman

Mangalore University

Mangalagangothri -574 199

SYLLABUS

V and VI Semester
B.A./B.Sc. (Hons) Mathematics,

(ACCORDING TO NATIONAL EDUCATION POLICY 2020)

2023

Name of the Degree Program : **B.A./B.Sc.**
Discipline Course : **Mathematics**
Starting Year of Implementation : **2021-22 (I & II Semesters)**
2022-23 (III & IV Semesters)
2023-24 (V & VI Semesters)

Assessment

Weightage for the Assessments (in percentage)

Type of Course	Formative Assessment/ I.A.	Summative Assessment (S.A.)
Theory	40%	60 %
Practical	50%	50 %
Projects	40 %	60 %
Experiential Learning (Internship etc.)	--	--

Courses Offered

Semester	Course No.	Theory/ Practical	Credits	Paper Title	Marks in percentage	
					S. A.	I.A.
V	MATDSCT5.1	Theory	4	Real Analysis-II and Complex Analysis	60	40
	MATDSCP5.1	Practical	2	Theory based Practicals on Real Analysis-II and Complex Analysis	25	25
	MATDSCT5.2	Theory	4	Algebra and Graph Theory	60	40
	MATDSCP5.2	Practical	2	Theory based Practicals on Algebra and Graph Theory	25	25
VI	MATDSCT6.1	Theory	4	Linear Algebra	60	40
	MATDSCP6.1	Practical	2	Theory based Practicals on Linear Algebra	25	25
	MATDSCT6.2	Theory	4	Numerical Analysis	60	40
	MATDSCP6.2	Practical	2	Theory based Practicals on Numerical Analysis	25	25

Syllabus for B.A./B.Sc. with Mathematics

SEMESTER – V

MATDSCT 5.1: Real Analysis-II and Complex Analysis	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 60 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes:

The overall expectation from this course is that the student builds a basic understanding on Riemann integration and elementary complex analysis. The broader course outcomes are listed as follows. At the end of this course, the student will be able to:

1. Carry out computations of upper and lower Riemann sums as well definite integrals.
2. Describe various criteria for Integrability of functions.
3. Evaluate some improper integrals and Evaluate double integrals by using Beta, Gamma functions.
4. Exhibit certain properties of mathematical objects such as integrable functions, analytic functions, harmonic functions and so on.
5. Prove some statements related to Riemann integration as well as in complex analysis.
6. Carry out the existing algorithms to construct mathematical structures such as analytic functions.
7. Evaluate complex line integrals using definition and some well known theorems.
8. Apply the gained knowledge to solve various other problems.

Real Analysis-II

Unit – I: Riemann Integration

Definition and Existence of the Integral, Riemann Darboux Sums - Upper and lower (Darboux) sums - definition, properties and problems. Riemann Integral - Upper and Lower integrals (definition & problems), Inequalities for Integrals, Refinement of Partitions, Darboux's theorem, Conditions of Integrability, Integrability of Sum, Difference, Product, Quotient and Modulus of integrable functions. Integral as a limit of sum (Riemann sums), Some Applications, Some Integrable Functions – Integrability of continuous functions, monotonic functions, bounded function with finite number of discontinuity.

15 Hour

Unit –II: Improper Integrals

Improper integrals of the first, second and third kind with examples. Improper integral as the limit of the proper integral. Comparison test, Abel's test and Dirichlet's test for the convergence of the integral of a product of two functions. Beta, Gamma functions - Definitions, properties and examples, Relations between Beta and Gamma functions, Applications to evaluation of definite integrals, Duplication formula and applications.

15 Hours

Complex Analysis

Unit – III: Complex numbers and functions of complex variables:

Complex numbers: Sums and Products, Basic Algebraic Properties, Further Properties, Vectors and Moduli, Complex Conjugates, Exponential Form, Products and Powers in Exponential Form, Arguments of Products and Quotients, Roots of Complex Numbers, and examples, Regions in the complex plane.

Analytic Functions: Functions of a Complex Variable, Mappings, Mappings by the Exponential Function, Limits, Theorems on Limits, Limits Involving the Point at Infinity, Continuity, Derivatives, Differentiation Formulas, Cauchy–Riemann Equations, Sufficient Conditions for Differentiability, Polar Coordinates, Analytic Functions and examples, Harmonic Functions.

15 Hours

Unit –IV: Complex Integration

Derivatives and Definite Integrals of Complex valued Functions of Real Variable, Contours, and Contour Integrals with Examples, Examples with Branch Cuts, Upper Bounds for Moduli of Contour Integrals, Antiderivatives, Cauchy–Goursat Theorem, Simply Connected Domains, Multiply Connected Domains, Cauchy Integral Formula, An Extension of Cauchy Integral Formula, Some Consequences of the Extension.

15 Hours

Reference Books:

[1] S.C. Malik and Savita Arora, *Mathematical Analysis*, 2nd ed. New Delhi, India: New Age international (P) Ltd.

[2] Maurice D. Weir, George B. Thomas, Jr., Joel Hassand Frank R. Giordano, Thomas' Calculus, 11th Ed., Pearson, 2008.

[3] R.V. Churchil & J.W. Brown, *Complex Variables and Applications*, 5th ed, McGraw Hill Companies.

[4] S.C Malik, *Real Analysis,* New Age International (India) Pvt. Ltd.

[5] Richard R Goldberg, *Methods of Real Analysis*, Oxford and IBH Publishing.

[6] Ajit Kumar and S. Kumaresan - *A Basic Course in Real Analysis*, Taylor and Francis Group.

[7] L. V. Ahlfors, *Complex Analysis*, 3rd Edition, McGraw Hill Education.

[8] Bruce P. Palka *, Introduction to the Theory of Function of a Complex Variable*, Springer

[9] Serge Lang, *Complex Analysis*, Springer.

[10] Shanthinarayan, *Theory of Functions of a Complex Variable,* S. Chand Publishers.

[11] S. Ponnuswamy, *Foundations of Complex Analysis*, 2nd Edition, Alpha Science International Limited.

[12] Grewal, B. S., & Grewal, J. S. (1996). Higher engineering mathematics. 42nd Ed., Khanna Publishers, New Delhi.

[13] Shanthi Narayan, P. K. Mittal (2004), Theory of Functions of a Complex Variable, Revised Ed. S. Chand and Company Ltd. New Delhi.

MATDSCP 5.1: Practicals on Real Analysis-II and Complex Analysis	
Practical Hours : 4 Hours/Week	**Credits: 2**
Total Practical Hours: 60 Hours	**Max. Marks: 50 (S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software* (FOSS) tools for computer programming
2. Solve problem on Real Analysis and Complex Analysis studied in MATDSCT 5.1 by using FOSS softwares.
3. Acquire knowledge of applications of Real Analysis and Complex Analysis through FOSS.

Practical/Lab Work to be performed in Computer Lab

Suggested Software: Maxima/Scilab/Python/R.
Suggested Programs:

1. Program to find upper and lower Riemann sums with respect to given partition
2. Program to test Riemann Integrability.
3. Program to evaluate Riemann integral as a limit of sum.
4. Program to check the convergence of the given improper integral using Abel's test.
5. Program to check the convergence of the given improper integral using Dirichlet's test.
6. Programs to evaluate improper integrals using Beta/Gamma Functions.
7. Program to illustrate applications of duplication formula for Beta/Gamma functions.
8. Program to find the nth roots of a given complex number.
9. Program on verification of Cauchy – Riemann equations (Cartesian form) or test for analyticity.
10. Program on verification of Cauchy – Riemann equations (Polar form) or test for analyticity.
11. Program to check whether a function is harmonic or not.
12. Program to construct analytic functions (through Milne–Thompson method).
13. Program to evaluate Definite Integrals of Complex valued Functions of Real Variable.
14. Program to illustrate evaluation of integrals using Cauchy's integral theorem.

MATDSCT5.2: Algebra and Graph Theory	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 60 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes: The overall expectation from this course is that the student builds a basic understanding on the theory of groups and some elementary concepts of graph theory. This course will enable the students to:

1. Know the significance of normal subgroups and quotient groups.
2. Understand structure preserving mapping between two algebraic structures of the same type.
3. Know the algebraic structures having the same structure with different elements.
4. Identify and analyze the algebraic structures such as ring, field and integral domain
5. Know the basic terminologies used in the theory of graphs.
6. Study the graphs which are used to model pair wise relations between the objects which will help in understanding the networking, optimization, matching and operation.
7. Understand the importance of cutsets, connectivity, planarity and colorability in the theory of graphs.
8. Apply graph theoretic tools to solve real life problems.

Algebra

Unit I: More on Groups

Congruence relation in subgroups, Cosets, Theorem on cosets, Lagrange's theorem and applications, Index of a subgroup, Normal Subgroups, Quotient groups. Homomorphism, Kernel of a homomorphism, Isomorphism, First Isomorphism theorem, Automorphisms. Permutation groups, Cycles, Transpositions, Type of permutations, Length of a cycle, Index of S_n, Alternating group, Order of a permutation.

15 hours

Unit II: Rings, Integral Domains, Fields

Rings : Definition and examples, Commutative Rings, Subrings, Integral Domain, Division Ring, Fields, Properties of Rings, Characteristic of an Integral Domain, Homomorphism, Kernel, Isomorphism, Ideals, First Isomorphism theorem in Rings, Prime and Maximal Ideals, Quotient Rings.

15 hours

Graph Theory

Unit III: Basics of Graph Theory

Graphs, Finite and infinite graphs, Incidence and degree, Isolated vertex, Pendent vertex, Null graph, Isomorphism, Sub graph, Walks, Paths, Circuits, Connected and Disconnected graphs, components, Euler graphs, Operation on graphs, Hamiltonian paths, Circuits, Tees and some properties of trees, Rooted and Binary trees, Spanning tree and Fundamental circuit.

15 hours

Unit IV: Connectivity, Planar Graphs and Coloring

Cutsets, Properties, Fundamental cut sets, Connectivity, and Separability. Planar graphs, Kuratowski's graphs, Different representation of planar graphs, Geometric duel. Graph Coloring: Chromatic number and Chromatic polynomials.

15 hours

Reference Books

[1] I N Herstein (1990), Topics in Algebra, 2nd Edition, Wiley Eastern Ltd., New Delhi.

[2] Vijay K Khanna and S K Bhambri (1998), A Course in Abstract Algebra, Vikas Publications.

[3] Michael Artin (2015), Algebra, 2nd ed., Pearson.

[4] Joseph A, Gallian (2021), Contemporary Abstract Algebra, 10th ed., Taylor and Francis Group.

[5] C. L. Liu (2000), Elements of Discrete Mathematics, Tata McGraw-Hill.

[6] Hari Kishan and Shiv Raj Pundir (2015), Discrete Mathematics, Pragathi Prakashan, 10th ed.

[7] W D Wallis (2017), A Beginner's Guide to Discrete Mathematics for Computer Science, Wiley Publishers.

[8] Kenneth H. Rossen, Discrete Mathematics and its Applications, Mc-Graw Hill, 8th ed., 2021.

[9] Frank Harary (1969), Graph Theory, Addison-Wesley Pub. Company.

[10] N. Deo (1990), Graph Theory: Prentice Hall of India Pvt. Ltd. New Delhi.

[11] D B West (2001), Introduction to graph theory 2nd Ed., Pearson.

MATDSCP5.2: Practicals Algebra and Graph Theory	
Teaching Hours : 4 Hours/Week	**Credits: 2**
Total Teaching Hours: 60 Hours	**Max. Marks: 50** **(S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software (FOSS)* tools for computer programming
2. Solve problems related to Algebra and Graph Theory using FOSS software.

Practical/Lab Work to be performed in Computer Lab (FOSS) Suggested Software: Maxima/Scilab /Python/R.

Suggested Programs:

1. Verification of Lagrange's theorem
2. Examples to find left and right cosets and finding index of a group
3. Finding all Normal Subgroups of a group.
4. Finding whether a given Permutation is even and odd and its order.
5. Checking whether a given set is a ring with respect to given binary operations.
6. Checking whether a given set is an integral domain or field with respect to given binary operations.
7. Finding zero divisors and units in finite rings.
8. Verification of the given mapping for ring homomorphism.
9. Drawing some standard graphs like Dodecahedron, wheel graph, Peterson graph.
10. Checking planarity, finding number of edges, vertex and edge connectivity, center, radius, and diameter.
11. Checking for Hamiltonian path/circuit in a graph.
12. Checking for Eulerian path/cycle in a graph.
13. Finding shortest path between two vertices.
14. Finding vertex coloring and redrawing the graph with colouring for vertices and finding chromatic number.

SEMESTER – VI

MATDSCT 6.1: Linear Algebra	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 60 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes:

The overall expectation from this course is that the student will build a basic understanding in few areas of linear algebra such as vector spaces, linear transformations and inner product spaces. Some broader course outcomes are listed as follows. At the end of this course, the student will be able to

1. Understand the concepts of Vector spaces, subspaces, bases dimension and their properties.
2. Find a basis and compute the dimension of a given finite dimensional vector space.
3. Use matrix representation of linear transformations in various computations.
4. Become familiar with the concepts Eigen values and Eigen vectors, minimal polynomials, linear transformations etc.
5. Learn properties of inner product spaces and determine orthogonality in inner product spaces.
6. Prove various statements in the context of vectors spaces.
7. Realize importance of adjoint of a linear transformation and its canonical form.
8. Apply the techniques of diagonalization in solving various problems related to matrices.

Unit – I: Vector spaces

Vector spaces - Definition, Examples and properties, Subspaces - Examples, Criterion for a sub- set to be a subspace and some properties. Linear Combination - Linear span, Linear dependence and Linear independence, Basic properties of linear dependence and independence, Techniques of determining linear dependence and independence in various vector spaces and related problems. Basis and dimension - Co-ordinates, Ordered basis, Some basic properties of basis and dimension and subspace spanned by given set of vectors, Quotient space, Dimension of quotient space (derivation in finite case). Sum and Direct sum of subspaces - Dimensions of sum and direct sum spaces (derivation in finite case).

15 Hours

Unit – II: Linear Transformations

Linear transformation - Definition, Examples, Equivalent criteria, Some basic properties, Matrix representation, Change of basis and effect on associated matrix, Similar matrices; Rank - Nullity theorem - Null space, Range space, Proof of rank nullity theorem and related problems.

15 Hours

Unit – III: Isomorphism, Eigenvalues and Diagonalization

Homomorphism, Isomorphism and automorphism - Examples, Order of automorphism and Fundamental theorem of homomorphism; Eigenvalues and Eigen vectors - Computation of eigen values, Algebraic multiplicity and some basic properties of eigen values, Determination of eigenvectors and eigen space and geometric multiplicity. Diagonalizability of linear transformation - Meaning, Condition based on algebraic and geometric multiplicity and related problems.

15 Hours

Unit – IV: Invertible Transformation and Inner product spaces

Invertible transformation - Some basic properties of invertible, singular and non-singular transformations, Conditions for existence of inverses, Minimal polynomial of a transformation**,** Relation between characteristic and minimal polynomials and related problems.

Inner product and normed linear spaces - Definitions, Examples, Cauchy-Schwartz inequality and related problems; Gram-Schmidt orthogonalization - Orthogonal vectors, orthonormal basis, Gram-Schmidt orthogonalization process.

15 Hours

Reference Books:

[1] I. N. Herstein, *Topics in Algebra*, 2nd Edition, Wiley.

[2] Stephen H. Friedberg, Arnold J. Insel & Lawrence E. Spence (2003), Linear Algebra(4^{th} Edition), Printice-Hall of India Pvt. Ltd.

[3] F. M. Stewart, *Introduction to Linear Algebra*, Dover Publications.

[4] S. Kumaresan, *Linear Algebra*, Prentice Hall India Learning Private Limited.

[5] Kenneth Hoffman & Ray Kunze (2015), Linear Algebra, (2^{nd} Edition), PrenticeHall India Leaning Private Limited.

[6] Gilbert Strang (2015), Linear Algebra and its applications, (2^{nd} Edition), Elsevier.

[7] Vivek Sahai & Vikas Bist (2013), Linear Algebra (2^{nd} Edition) Narosa Publishing.

[8] Serge Lang (2005), Introduction to Linear Algebra (2^{nd} Edition), Springer India.

[9] T. K. Manicavasagam Pillai and K S Narayanan, Modern Algebra Volume 2.

MATDSCP 6.1: Practicals on Linear Algebra	
Practical Hours : 4 Hours/Week	**Credits: 2**
Total Practical Hours: 60 Hours	**Max. Marks: 50 (S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software (FOSS)* tools for computer programming
2. Solve problem on Linear Algebra studied in MATDSCT 6.1 by using FOSS softwares.
3. Acquire knowledge of applications of Linear Algebra through FOSS.

Practical/Lab Work to be performed in Computer Lab (FOSS) Suggested Softwares: Maxima/Scilab /Python/R.

Suggested Programs:

1. Program to verify linear dependence and independence.
2. Program to find basis and dimension of the subspaces.
3. Program to verify if a function is linear transformation or not.
4. Program to find the matrix of linear transformation.
5. Program to illustrate the effect of change of basis on the matrix of linear transformation.
6. Program to check invertibility of the given linear transformation and finding the inverse if exists.
7. Program to find the Eigen values and Eigen vectors of a given linear transformation.
8. Program on Rank – nullity theorem.
9. Program to find the characteristic polynomial of given transformation.
10. Program to find the minimal polynomial of given transformation.
11. Program to find the algebraic multiplicity of the Eigen values of the given linear transformation.
12. Program on diagonalization.
13. Program to verify that the given basis is orthogonal or not.
14. Program to illustrate Gram-Schmidt orthogonalization process.

MATDSCT 6.2: Numerical Analysis	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 60 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes:

The overall expectation from this course is that the student will get equipped with certain numerical techniques for various computations such as finding roots, finding the integrals and derivatives, and finding solutions to differential equations. Some broader course outcomes are listed as follows. At the end of this course, the student will be able to

1. Compute approximate roots of algebraic and transcendental equations using iterations.
2. Describe various operators arising in numerical analysis such as difference operators, shift operators and so on.
3. Articulate the rationale behind various techniques of numerical analysis such as in finding roots, integrals and derivatives.
4. Reproduce the existing algorithms for various tasks as mentioned previously in numerical analysis.
5. Apply the rules of calculus and other areas of mathematics in justifying the techniques of numerical analysis.
6. Solve problems using suitable numerical technique.
7. Obtain approximate solutions to initial value problems using various numerical techniques.
8. Appreciate the profound applicability of techniques of numerical analysis in solving real life problems and also appreciate the way the techniques are modifiedto improve the accuracy.

Unit – I: Algebraic and Transcendental Equations

Solutions to algebraic and transcendental equations -Bisection method, Regula-Falsi method, Iterative methods, Newton-Raphson method and Secant method (Plain discussion of the rationale behind techniques and problems on their applications).

System of Linear Algebraic Equations: Direct Methods – Gauss elimination method, Gauss-Jordan elimination method and Tringularization method; Iterative methods – Jacobi method, Gauss-Jacobi method, Gauss- Seidal method.

15 Hours

Unit – II: Polynomial Interpolations

Finite differences - Forward, Backward differences and shift operators: definitions, properties and problems; Polynomial interpolation - Newton-Gregory forward and backward interpolation formulas, Gauss's Forward and backward interpolation formulas, Lagrange interpolation polynomial, Newton's divided differences and Newton's general interpolation formula (Discussion on setting up the polynomials and problems on their applications).

15 Hours

Unit-III: Numerical Differentiation and Integration

Formula for derivatives (till second order) based on Newton-Gregory forward and backward interpolations (Derivations and problems based on them). Numerical Integration - General quadrature formula, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule (derivations for only general quadrature formula, trapezoidal rule and Simpson's $1/3^{rd}$ rule and problems on the applications of all formulas).

15 Hours

UNIT-IV: Numerical Solution of Ordinary Differential Equations

Introduction, Solution by Taylor's series method, Picard's method, Euler's method, Modified Euler's method, Runge-Kutta Methods, Predictor-Corrector Methods- Milne's method, Adam's Bashforth Method, Adam Moulton Method.

15 Hours

Reference Books :

1. S. S. Sastry, *Introductory methods of Numerical Analysis*, 5th Edition, PHI Learning Private Limited.
2. E. Isaacson and H. B. Keller, *Analysis of Numerical methods*, Dover Publications.
3. E Kreyszig, *Advanced Engineering Mathematics*, Wiley India Pvt. Limited.
4. B. S. Grewal, *Numerical Methods for Scientists and Engineers*, Khanna Publishers.
5. M. K. Jain, S. R. K. Iyengar and R. K. Jain, *Numerical Methods for Scientific and Engineering computation*, 4th Edition, New Age International
6. H. C. Saxena, *Finite Difference and Numerical Analysis,* S. Chand Publishers
7. B. D. Gupta, *Numerical Analysis*, Konark Publishers Pvt. Ltd.

MATDSCP 6.2: Practicals on Numerical Analysis	
Practical Hours : 4 Hours/Week	**Credits: 2**
Total Practical Hours: 60 Hours	**Max. Marks: 50 (S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

1. Learn *Free and Open Source Software (FOSS)* tools for computer programming
2. Solve problem on numerical Analysis studied in **MATDSCT 6.2 by** using FOSS softwares.
3. Acquire knowledge of applications of Numerical Analysis through FOSS.

Practical/Lab Work to be performed in Computer Lab (FOSS)

Suggested Softwares: Maxima/Scilab /Python/R.

Suggested Programs:

1. Program to find root of an equation using Bisection, Regula-Falsi and Secant methods.
2. Program to find root of an equation using Newton-Raphson method.
3. Program to solve system of algebraic equations using Gauss-elimination method.
4. Program to solve system of algebraic equations using Gauss-Jordan method.
5. Program to solve system of algebraic equation using Gauss-Jacobi method.
6. Program to solve system of algebraic equation using Gauss-Seidel method.
7. Program to evaluate integral using Simpson's 1/3 and 3/8 rules.
8. Program to evaluate integral using Trapezoidal and Weddle rules
9. Program to find the sums of powers of successive natural numbers using Newton – Gregory technique.
10. Program to find differentiation at specified point using Newton-Gregory interpolation method.
11. Program to find the missing value of table using Lagrange method.
12. Program to find the solution of given initial value problem using Picard's method.
13. Program to find the solution of given initial value problem using Euler's method and Modified Euler's method.
14. Program to find the solution of given initial value problem using Runge-Kutta methods.

References

1. The Hundred-Page Machine Learning Book, Andriy Burkov, January 13, 2019.
2. Introduction to Machine Learning with Python: A Guide for Data Scientists 1st Edition by Andreas Müller, Sarah Guido, O'Reilly Media, November 15, 2016

List of Activities:

1. Introduction to Scikit, Numpy, Scipy and Tensor Flow
2. Linear Regression – Single Variable Linear Regression
3. Linear Regression – Multi Variable Linear Regression
4. Classification – Logistic Regression
5. Classification – Support Vector Machines (SVM)
6. Classification using Neural Networks
7. Unsupervised Learning – Principal Component Analysis (PCA)
8. Unsupervised Learning – K-Means Clustering

ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

MANGALORE UNIVERSITY

ಕ್ರಮಾಂಕ/No. :MU/ACC/CR.28/2021-22/A8

ಕುಲಸಚಿವರಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ – 574 199
Office of the Registrar
Mangalagangothri – 574 199

ದಿನಾಂಕ/Date: 24.12.2021

NOTIFICATION

Sub: Modified Syllabus of Computer Applications, a vocational course for B.Com (Basic/Hons) Degree Programmes under NEP 2020–reg

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Pursuant to the above, the modified syllabus of Computer Applications, a vocational course for B.Com (Basic/Hons) Degree Programmes under NEP 2020 is hereby notified for implementation with effect from the academic year 2021-22 subject to the ratification of Academic Council meeting .

Copy of the Syllabus shall be downloaded from the Mangalore University Website. www.mangaloreuniversity.ac.in

REGISTRAR.

To:

1. The Principals of all the Colleges affiliated to Mangalore University.
2. The Registrar (Evaluation), Mangalore University.
3. Prof. Manjaiah D.H, Chairman, UG Combined BOS in Compter Applications & Compuer Science & Department of Computer Science, Mangalore University, Mangalagangothri.
4. The Assistant Registrar/The Superintendent, Academic Section, O/o the Registrar, Mangalore University.
5. The Director, DUIMS, Mangalore University – with a request to publish in the Website.
6. Guard File.

B.Com (Computer Applications) (Basic/Hons) (Vocational)

Programme Objectives (PO):

PO1: Impart advanced learning to students in the discipline of Commerce, specifically with the application of software technology for professional requirements, merging the academic domains of Commerce and Computer Applications

PO2: To impart central knowledge and skills to the students in emerging areas of commerce like accounting, auditing, finance, marketing, HR, company laws, taxation etc with computing skills for effective domain enrichment

PO3: To groom students with desired competence in commerce education and research with computing leverage.

PO4: To strengthen theoretical and applied aspects of commerce for preparing the students for higher education and research.

PO5: To equip the students with necessary skill sets pertaining to computing principles, software technologies and business practices in software solutions essential for gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

PO6: To impart demonstratable knowledge, skills and values in order to support students' eventual progression to higher learning and gainful career with resilient value system.

Programme Outcomes (PO)

The Commerce graduates should be able to:

PO1: Apply the knowledge of commerce and computers to obtain constructive solutions to complex business & management problems.

PO2: Understand the concepts of key areas in computer science and apply latest technologies to solve problems in the areas of computer applications in business and commerce

PO3: Design solutions for Socio-economic, commerce and business problems and plan case study, processes to meet the specifications with consideration for sustainable development.

PO4: Use modern computing models and tools to conduct investigations of complex economic, business and management problems including analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Understand digital ethics - what can be made possible by digital technology and what is ethically desirable, in order to be successful leaders in the business world

PO6: Use digital edge in order to function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings, communicate effectively with the business community & IT professionals and with society atlarge.

PO7: Demonstrate knowledge and understanding of Commerce, Management & Software engineering principles and apply these to one's own work, as a member and leader in a team.

PO8: Recognize the need for and have the preparation and ability to engage in independent and life – long learning in the broadest context of technological change.

Program Structure

Proposed Scheme of Teaching & Evaluation for B.Com (Computer Applications)(Basic/Hons) with Commerce as Core subject

Semester I							
Sl. No.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**
1	Lang.1.1	Language-I	3	3+1+0	60	40	100
2	Lang.1.2	Language-II	3	3+1+0	60	40	100
3	B.Com.1.1	Financial Accounting	4	3+0+2	60	40	100
4	B.Com.1.2	Information Technology	3	3+0+0	60	40	100
5	B.Com.1.3	Problem solving with C	3	3+0+0	60	40	100
6	B.Com.1.4	IT & C Lab	2	0+0+4	25	25	50
7	B.Com.1.5	Digital Fluency	2	1+0+2	30	20	50
8	B.com. 1.6	Yoga	1	0+0+2	-	25	25
9	B.com. 1.7	Health and Wellness	1	0+0+2	-	25	25
10	B.Com.1.8	Accounting for Everyone/Financial Literacy/Managerial Economics	3	3+0+0	60	40	100
Sub–Total (A)			**25**		**415**	**335**	**750**

Semester II							
Sl. No.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**
11	Lang.2.1	Language-I	3	3+1+0	60	40	100
12	Lang.2.2	Language-II	3	3+1+0	60	40	100
13	B.Com.2.1	Advanced Financial Accounting	4	3+0+2	60	40	100
14	B.Com.2.2	Operating System	3	3+0+0	60	40	100
15	B.Com.2.3	Desktop Publishing	3	3+0+0	60	40	100
16	B.Com.2.4	Linux & DTP Lab	2	0+0+4	25	25	50
17	B.Com.2.5	Sports	1	0+0+2	-	25	25
18	B.Com.2.6	NCC/NSS/R&R(S&G)/Cultural	1	0+0+2	-	25	25
19	B.Com.2.7	Environmental Studies	2	2+0+0	30	20	50
20	B.Com.2.8	Financial Environment/Investing in Stock Markets/ Public Finance	3	3+0+0	60	40	100
Sub–Total(B)			**25**		**415**	**335**	**750**

EXIT OPTION WITH CERTIFICATION-with ability to solve well defined problems

Semester III							
Sl. No.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours perWeek (L + T + P)**	**SEE**	**CIE**	**Total Marks**
21	Lang.1.1	Language-I	3	3+1+0	60	40	100
22	Lang.1.2	Language-II	3	3+1+0	60	40	100
23	B.Com.3.1	Corporate Accounting	4	3+0+2	60	40	100
24	B.Com.3.2	Java Programming	3	3+0+0	60	40	100
25	B.Com.3.3	DBMS	3	3+0+0	60	40	100
26	B.Com.3.4	Java & DBMS lab	2	0+0+4	25	25	50
27	B.Com.3.5	Artificial Intelligence	2	1+0+2	30	20	50
28	B.Com.3.6	Sports	1	0+0+2	-	25	25
29	B.Com.3.7	NCC/NSS/R&R(S&G)/Cultural	1	0+0+2	-	25	25
30	B.Com.3.8	Advertising Skills/Entrepreneurial Skills/ Modern Bank Management	3	3+0+0	60	40	100
Sub–Total(C)			**25**		**415**	**335**	**750**

Semester IV							
Sl. No.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**
31	Lang.1.1	Language-I	3	3+1+0	60	40	100
32	Lang.1.2	Language–II	3	3+1+0	60	40	100
33	B.Com.4.1	Advanced Corporate Accounting	4	3+0+2	60	40	100
34	B.Com.4.2	Web Application Development	3	3+0+0	60	40	100
35	B.Com.4.3	Computerized Accounting	3	3+0+0	60	40	100
36	B.Com.4.4	Web & Tally Lab	2	0+0+2	25	25	50
37	B.Com.4.5	Constitution of India	2	2+0+0	30	20	50
38	B.Com.4.6	Sports	1	0+0+2	-	25	25
39	B.Com.4.7	NCC/NSS/R&R(S&G)/ Cultural	1	0+0+2	-	25	25
40	B.Com.4.8	Business Ethics/ Corporate Governance/ International Trade	3	3+0+0	60	40	100
Sub–Total(D)			**25**		**415**	**335**	**750**

EXIT OPTION WITH DIPLOMA –Ability to solve broadly defined problems.

Semester V							
Sl. No.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**
41	B.Com.5.1	Financial Management	4	3+0+2	60	40	100
42	B.Com.5.2	VB. NET Programming	3	3+0+0	60	40	100
43	B.Com.5.3	Computer Graphics and Animations	3	3+0+0	60	40	100
44	B.Com.5.4	VB.Net & CG lab	2	0+0+4	50	50	100
45	B.Com.5.4 Elective	One Course from the Selected Elective Group	3	3+1+0	60	40	100
46	B.Com.5.6 Elective	GST- Law & Practice	3	2+0+2	60	40	100
47	B.Com.5.6 Elective	Internship	2	0+0+4	-	50	50
48	B.Com.5.7	Sports	1	0+0+2	-	25	25
49	B.Com.5.8	NCC/NSS/R&R(S&G)/ Cultural	1	0+0+2	-	25	25
50	B.Com.5.7	Cyber Security/Ethics & Self Awareness	2	1+0+2	30	20	50
Sub–Total(E)			**24**		**380**	**370**	**750**

Semester VI							
Sl. No.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**
51	B.Com.6.1	Software Engineering	3	3+0+0	60	40	100
52	B.Com.6.2	Information securities & Cyber Laws	3	3+0+0	60	40	100
53	B.Com.6.3	Project	2	0+0+4	50	50	100
54	B.Com.6.3	Financial Derivatives	4	3+0+2	60	40	100
55	B.Com.6.4 Elective	One courses from the Selected Elective Group	3	3+1+0	60	40	100
56	B.Com.6.5	Basics of Spread Sheet Modeling OR Report on Study of Startups and Innovative Business Ideas	3	2+0+2	60	40	100
57	B.Com.6.6 Elective	Internship	2	0+0+4	-	50	50
58	B.Com.6.7	Sports	1	0+0+2	-	25	25
59	B.Com.6.8	NCC/NSS/R&R(S&G)/ cultural	1	0+0+2	-	25	25
60	B.Com.6.9	Professional Communication	2	2+0+0	30	20	50
Sub–Total(F)			**24**		**380**	**370**	**750**
Grand Total - Degree			**148**		**2420**	**2080**	**4500**

EXIT OPTION WITH BACHELOR DEGREE-Ability to solve complex problems that are ill-structured requiring multi-disciplinary skills to solve them.

Semester VII							
Sl. N o.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**
61	B.Com.7.1	International Business	4	4+1+0	60	40	100
62	B.Com.7.2	Advanced Business Statistics	4	4+1+0	60	40	100
63	B.Com.7.3	Advanced Financial Management	4	4+1+0	60	40	100
64	B.Com.7.4	One Course from the Selected Elective Group	3	3+1+0	60	40	100
65	B.Com.7.5	ERP Applications	3	2+0+2	60	40	100
66	B.Com.7.6	Research Methodology	3	2+0+2	60	40	100
Sub–Total(G)			**21**		**360**	**240**	**600**

Semester VIII							
Sl. No.	**Course Code**	**Title of the Course**	**Credits**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**
67	B.Com.8.1	Financial Reporting-IND.AS	4	3+0+2	60	40	100
68	B.Com.8.2	Strategic Financial Management	4	4+0+0	60	40	100
69	B.Com.8.3	Business Analytics OR Data Analysis & Decision Sciences	4	3+0+2	60	40	100
70	B.Com.8.4	One Course from the Selected Elective Group	3	3+1+0	60	40	100
71	B.Com.8.5	Managing Digital Platforms	3	2+0+2	60	40	100
72	B.Com.8.6	Research Projects/Internship with Viva – voce	6	0+0+12	120	80	200
		OR	3*	3+1+0	60*	40*	100*
		Two Courses from the Selected Elective Group 8.5 (A) & 8.5 (B)	3*	3+1+0	60*	40*	100*
Sub–Total (H)			**21/ 21***		**420/ 420***	**280/ 280***	**700/ 700***
Grand Total - Honors			**190**		**3200/ 3200***	**2600/ 2600***	**5800/ 5800***

*** Students who do not opt Research Project / Internship shall take two elective courses such as 8.5 (A) & 8.5 (B).**

Sub Total (H) and Grand Totals Honors vary accordingly.

BACHELOR DEGREE WITH HONORS – Experience of work place problem solving in the form of internship or research experience preparing for higher education or entrepreneurship experience.

Notes:

- **One Hour of Lecture is equal to 1 Credit.**
- **One Hour of Tutorial is equal to 1 Credit (Except Languages).**
- **Two Hours of Practical is equal to 1 Credit**

Acronyms Expanded

- **AECC : Ability Enhancement Compulsory Course**
- **DSC © : Discipline Specific Core (Course)**
- **SEC-SB/VB : Skill Enhancement Course-Skill Based/Value Based**
- **OEC : Open Elective Course**
- **DSE : Discipline Specific Elective**
- **SEE : Semester End Examination**
- **CIE : Continuous Internal Evaluation**
- **L+T+P : Lecture+Tutorial+Practical(s)**

Note: Practical Classes may be conducted in the Business Lab or in Computer Lab or in Class room depending on the requirement. One batch of students should not exceed half (i.e., 50 or less than 50 students) of the number of students in each class/section. 2 Hours of Practical Class is equal to 1 Hour of Teaching, however, whenever it is conducted for the entire class (i.e., more than 50 students) 2 Hours of Practical Class is equal to 2 Hours of Teaching.

ELECTIVE GROUPS AND COURSES:

Discipline Specific Electives - V Semester						
Sl. No	**Accounting**	**Finance**	**Banking & Insurance**	**Marketing**	**Human Resources**	**IT**
1	Ind. AS andIFRS	Financial Markets & Intermediaries	Indian Banking System	Retail Management	Human Resources Development	Financial Analytics

Discipline Specific Electives - VI Semester						
1	e-Business & Accounting	Investment Management	Banking Innovations & Technology	Customer Relationship Marketing	Cultural Diversity atWork Place	HR Analytics
2	Accounting forServices Sector	Global Financial System & Practices	Principles &Practice of Insurance	Digital Marketing	New Age Leadership Skills	Marketing Analytics
3	Accounting for Government and Local Bodies	Risk Management	Insurance Lawand Regulations	Consumer Behavior & Marketing Research	Labour Laws & Practice	ICT Application in Business

Discipline Specific Electives - VII Semester						
1	Forensic Accounting	Corporate Structuring	Banking Products & Services	Logistics & Supply Chain Management	Strategic HRM	DBMS & SQL

Discipline Specific Electives - VIII Semester						
1	Innovations in Accounting	Corporate Valuation	e-Banking	E - Commerce	International HRM	Web & Social Intelligence
2	Accounting Information System	Analysis of Financial Statements	Insurance Planning & Management	Services Marketing	Employee Welfare & Social Security	Artificial Intelligence & Machine Learning in Business

NOTE: Student shall continue with the same elective group in V and VI semesters, however, he/she may change the elective group in VII semester, but shall continue in the same group in VIII semester.

Scheme of Assessment for Theory Examination

Duration: 3 Hrs **Max Marks: 60**

<table>
<tr><th colspan="2">Question Pattern</th><th>Marks</th></tr>
<tr><td colspan="3">Part – A</td></tr>
<tr><td colspan="2">1. Answer any SIX sub-questions (6×2=12)</td><td rowspan="5">12</td></tr>
<tr><td>Sub-question</td><td>Unit</td></tr>
<tr><td>a, b</td><td>1</td></tr>
<tr><td>c, d</td><td>2</td></tr>
<tr><td>e, f</td><td>3</td></tr>
<tr><td>g, h</td><td>4</td></tr>
<tr><td colspan="3">Part – B
(Answer any ONE full question from each unit – 12 marks each)
(Combinations of sub-questions of 3 to 6 marks)</td></tr>
<tr><td colspan="2">Unit-1</td><td rowspan="3">12</td></tr>
<tr><td colspan="2">2.</td></tr>
<tr><td colspan="2">3.</td></tr>
<tr><td colspan="2">Unit-2</td><td rowspan="3">12</td></tr>
<tr><td colspan="2">4.</td></tr>
<tr><td colspan="2">5.</td></tr>
<tr><td colspan="2">Unit-3</td><td rowspan="3">12</td></tr>
<tr><td colspan="2">6.</td></tr>
<tr><td colspan="2">7.</td></tr>
<tr><td colspan="2">Unit-4</td><td rowspan="3">12</td></tr>
<tr><td colspan="2">8.</td></tr>
<tr><td colspan="2">9.</td></tr>
<tr><td colspan="2">Total</td><td>60</td></tr>
</table>

SEMESTER - 1

Name of the Program: Bachelor of Commerce (B.Com.- Computer Applications)
Course Code:B.Com.1.2
Name of the Course: Information Technology.

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy:
Classrooms lecture, Case studies, Group discussion, Seminar & Computer lab.

Course Outcomes: On successful completion of the course, the Students will be able to

a) Be able to apply knowledge of computing analyze a problem, and identify anddefine the computing requirements appropriate to its solution
b) Be able to design, implement, and evaluate a computer-based system, process,component, or program to meet desired needs
c) Be able to effectively integrate IT based solutions into the user environment

Syllabus:	Hours
Unit- 1	**12**

Introduction to Computers: Introduction, Characteristics computers, Evolution computers, Generation of Computers, Classification of computers, the computer system, Application of computers.

Number system: Introduction, Number system, Conversion between Decimal to Binary and vice versa

Computer Architecture: Introduction, Central processing unit, main memory unit, interconnection of units, cache, communication between various units of a computer system.

Primary memory: Introduction, memory representation, memory hierarchy, Random access memory: Types of RAM, Read-only memory, Types of ROM.

Unit- 2	**10**

Secondary Storage: Introduction, classification, magnetic tape, magnetic disk, Optical disk Storage organization and the types (CD ,DVD , Blue-ray), Memory stick, Universal serial bus, Mass storage devices.

Input devices: Introduction, Types of input devices - keyboard, mouse, joystick, Touch screen, scanner, Optical character recognition, Optical Mark Recognition, Magnetic ink character recognition, Bar code reader

Output devices: Introduction, Types of output, Classification of output devices- printer, plotter, Monitor, Terminals

Unit- 3	**10**

Computer Program: Introduction, algorithm, flowchart.

Computer languages: Introduction, Evolution of programming languages, classification of programming languages, generation of programming languages, Features of a good programming language, selection of a programming language.

Computer software: Introduction, software definition, relationship between software and hardware, software categories, terminology software

Network basics: Computer networks, Network topologies, Network devices.

Unit- 4	10
Internet basics: Introduction, Evolution, Basic internet terms, getting connected to internet, internet Applications. **Working with Application Software, Productivity software:** Word processing software, **Spreadsheet** software (excel) **Presentation software**: Introduction, , PowerPoint environment, creating a new presentation, working with different views, using masters, adding animation, adding transition, running slides.	
Skill Development Activities: 1. Design, implement, and evaluate a computer-based system, process, component, orprogram to meet desired needs. 2. Integrate IT based solutions into the user environment. 3. Working with database, RDBMS. 4. Any other activities, which are relevant to the course.	
Text Books: 1. ITL Education Solutions Limited, **Introduction to InformationTechnology**, Pearson Education India; 2nd edition, 2012. 2. Peter Norton, **Introduction to Computers**, 7th Edition, Tata McGraw HillPublication, 2017 (Unit - IV).	

Name of the Program: Bachelor of Commerce (B.Com.- Computer Applications)

Course Code:B.Com.1.3

Name of the Course: Problem Solving with C

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy:

Classrooms lecture, Case studies, Group discussion, Seminar & computer lab.

Course Outcomes: On successful completion of the course, the Students will be able to

a) To apply programming knowledge to create solutions to challenging problems, including specifying, designing, implementing and validating solutions for new problems.

Syllabus:	Hours
Unit - 1	**12**

Overview of C : History of C , Importance of C Program, Basic structure of a C-program, Execution of C Program.

C Programming Basic Concepts: Character set, C token, Keywords and identifiers, Constants, Variables, data types, Declaration of variables, assigning values to variables, defining symbolic constants.

Input and output with C: Formatted I/O functions - printf and scanf, control stings and escape sequences, output specifications with printf functions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and puts functions.

Unit - 2	**10**

Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associatively; Evaluation of arithmetic expressions; Type conversion.

Control Structures: Decision Making and Branching -Decision making with if statement, simple if statement, the if else statement, nesting of if … else statements, the else if ladder, the switch statement, the ?: operator, the go to statement.

Decision making and looping - The while statement, the do statement, for statement, nested loops, exit, break, jumps in loops.

Unit - 3	**10**

Derived data types in C: Arrays - declaration, initialization and access of one-dimensional and two dimensional arrays. Programs using one- and two-dimensional arrays, sorting and searching arrays.

Handling of Strings: Declaring and initializing string variables, reading strings from terminal, writing strings to screen, Arithmetic operations on characters, String handling functions - strlen, strcmp, strcpy, strstr and strcat; Character handling functions - toascii, toupper, tolower, isalpha, isnumeric etc

Unit - 4	**10**

User-defined functions: Need for user-defined functions, Declaring, defining and calling C functions, return values and their types, Categories of functions: With/without arguments, with/without return values. Nesting of functions.

Recursion: Definition, example programs.

Structures and unions: Structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, Structure and functions, structures within structures. Unions

Skill Development Activities:

1. Functional, logic and also learn skills of problem solving and implementation of solution
2. Specifying, designing, implementing and validating solutions for new problems.
3. Any other activities, which are relevant to the course.

Reference Materials:

1. E. Balagurusamy, **Programming in ANSI C**, McGraw Hill Education India Private Limited; Seventh edition, (2017
2. .M. T. Somashekara, D. S. Guru, K. S. Manjunatha, **Problem Solving with C**,PHI Learning Pvt. Ltd.; Second edition, 2018
3. Hanly, **Problem Solving and Program Design in C**, Pearson Education India;7 edition, 2013
4. Satish Jain, **Programming & Problem Solving Through C Language**, BPB Publications, 2012

Note: Latest edition of text books may be used.

Course Code: B.Com.1.4	Course Title: IT & C Lab
Course Credits:2	Hours/Week:04
Total Contact Hours:52	Formative Assessment Marks:25
Exam Marks:25	Exam Duration:3 hrs

PRACTICAL EXERCISES

PART-A

WORD

1. Prepare a word document that includes the following features inserting picture, bulleting and numbering, formatting (size, bold, underline, italic, superscript, subscript, color etc), border and shading, paragraph and line alignment.
2. Prepare a word document with a table to insert Roll No, name, class, and marks in three subjects. Find total and average.
3. Prepare a interview call letters for five candidates. The letter shall contain information about company, job profile and instructions about the interview. Using mail merge features.

POWER POINT

Prepare a Power point presentation with at least four slides (in each exercise) including picture, chart and other contents. Apply various transition and animations.

Exercise No. 1: About your college.

Exercise No. 2: Indian Banking System

PART-B

EXCEL

1. Create an EMPLOYEE data having employees name, designation and basic pay of 5 employees. Calculate DA, HRA, Gross Pay, Income tax, Net pay, Provident fund as per the following rule

   DA=10% of basic pay

   HRA= if basic pay is< 2500, 10% of basic pay else 25% of basic pay

   Gross=DA+HRA+Basic pay

   Provident fund=12% of Basic pay

   Professional tax=Rs 100 if gross is<10000 else 200

   Net Pay=Gross- Professional tax - Provident Fund
2. Prepare a STUDENT table. Insert following information such as RollNo, Name, Class and Marks in three subjects. The insert details of 5 students. Calculate total marks, percentage, result (pass or fail), and Grade (distinction, first class, second class, pass class) as per usual rules. Draw a column chart showing the RollNo versus Percentage scored.

3. Create a table containing Zones and percentage of commission to be given to a sales man

Zone	Percentage
South	10%
North	12.5%
East	14%
West	13%

Create another table in the same worksheet to store salesman names, zone names, places, names of items sold, rate per unit, quantity sold. Calculate total sales amount for each salesman. For the above table write the formula to compute the commission to be given.

- Show the records of various zones separately.
- Show the records of only East and West zones.
- Display the details of the items which are sold more than 50 no.s in South or North zones.

PART-C

C PROGRAMS

1. Write a program to read radius of a circle and find area and circumference of the circle.
2. Write a program to read three numbers and find the largest of three numbers using nested if statement.
3. Write a program to generate n Fibonacci numbers.
4. Write a program to read a multi-digit number find the sum of the digits, reverse the number and check it for palindrome
5. Program to read marks scored by n students and find the average of marks (Demonstration of single dimensional array).
6. Write a program to add two matrices (Demonstration of two dimensional arrays).
7. Write a program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
8. Write a program to find the ${}^{n}C_{r}$ of a given number using factorial function.
9. Write a program using structure, read N students RollNo, Name and Marks in three subjects. Calculate Total, Percentage and Grade for N students.

Assessment Criteria		Marks
Activity-1 from Part A	**Word/ PowerPoint**	**06**
Activity-2 from Part B	**Excel**	**07**
Activity-3 from Part C	**C Program**	**07**
Practical Record		**05**
Total		**25**

SEMESTER - II

Name of the Program: Bachelor of Commerce (B.Com.- Computer Applications)

Course Code: B.Com. 2.2

Name of the Course: Operating System

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy:

Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & computer lab.

Course Outcomes: On successful completion of the course, the Students will be able to

a) Analyze the structure of OS and basic architectural components involved in design
b) Analyze the various resource management techniques
c) Interpret the mechanisms adopted for file sharing
d) conceptualize the components involved in designing a contemporary OS
e) To be familiar with various types of operating systems

Syllabus:	Hours
UNIT I	**12**

Introduction: Operating system, Mainframe systems (Batch systems, Multiprogrammed systems, Time sharing systems)
Operating System Structures: System Components, Operating System Services
Process Management: Process concept, Process Scheduling, Operations on process, Cooperative Process
Threads: Overview, Multithreading Models.

UNIT II	10

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms.
Process Synchronization: Background, the critical section Problems, Synchronization, Semaphore, Classic problems synchronization
Deadlocks: System model, deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection

UNIT III	10

Memory Management: Background, Swapping, contiguous Memory allocations, Paging, segmentation
Virtual Memory: Background, demand paging, process creation, page replacement, allocation of frames and thrashing.
File Management: File concept, Access methods, Directory structure, Protection.

UNIT IV	10

Linux: An introduction, reason for its popularity, Linux file system, login and logout.

Linux commands:

Command format, Wild card characters

Directory oriented commands – ls, mkdir, rmdir, cd, pwd

Fileoriented commands – cat, cp,rm, mv, wc

File Access Permissions , chmod command

Communication oriented commands – write, mail, wall

General purpose commands – date, who, who am i, man, cal, expr

Pipe and Filters related commands - Redirection, pipe, sort, grep

vi editor, Shell programming

Skill Developments Activities:

1. Study structure of OS and basic architectural components involved in designing operatingsystem of a company.
2. Visit any information technology company in your area and collect the informationabout File system Mounting, File sharing, Protection etc.
2. Any other activities, which are relevant to the course.

Text Books:

1. Silberschartz, Galvin and Gagne, **Operating Systems Concepts**, 8th Edition, JohnWiley & sons, Pvt. Ltd.2008
2. 2. B Mohamed Ibrahim, **Linux: A Practical Approach**, Laxmi Publications; First edition, ,2016

Reference Books:

1. Pramod Chandra P. Bhatt, **An Introduction to Operating Systems: Concepts and Practice(GNU/Linux),**
   Prentice Hall India Learning Private Limited; Fourth edition, 2013
2. Richard Blum, Christine Bresnahan, **Linux Command Line and Shell Scripting Bible**, Thirdedition, Wiley, 2015.
3. Sobell, **Practical Guide to Linux Commands Editor**, Pearson Education India; 3 edition, 2013.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.- Computer Applications)

Course Code:B.Com.2.3

Name of the Course: Desktop Publishing

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	4 Hrs	48 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

a) Gain basic understanding of the field of desktop publishing
b) Acquire skills of preparing projects for publication which include layout and design
c) Learn both the technical and aesthetic aspects of text, image manipulation and integration
d) Learn using design as a means of communication, along with using tools to implementeffective design strategies

Syllabus:	Hours
UNIT - I	**12**

Introducing InDesign CS4: Getting started with InDesign CS4, Exploring the InDesign CS4 workspace, working with custom workspace, creating a new document, saving a document, closing the document and quitting the application.

Working with Documents: Opening an existing document, Introducing master page, working with text, working with the type on a path tool, performing basic formatting tasks, performing advance formatting tasks, working with paragraph styles.

Working with drawing tools and objects: Using shape tools, using pencil tool, using pen tool, transforming objects.

Publishing the document : Creating a table of contents, creating and applying styles in TOC, importing styles, printing a document, exploring the types of print options, saving the document as a PDF file

UNIT - II	**10**

Introduction to Corel DRAW graphics suit x4: New and enhanced features in Coreldraw graphics suit X4. Getting started with Coreldraw X4, Exploring the workspace of Coreldraw X4, drawing basic geometric figures, saving the drawing, opening an existing document, previewing with the drawing, working with page layout, closing the drawing and quitting Coreldraw.

Working with lines: About lines in Coreldraw: Drawing a curve, drawing calligraphic lines, About outline tool: defining lines and outlines setting, creating a calligraphic outline, adding an arrowhead.

Working with objects: Selecting and deselecting objects, deleting objects, sizing objects, rotating objects, combining objects, grouping in Coreldraw: grouping object, ungrouping objects. Selecting color for an object, filling objects.

Working with text: Types of text: preparing a layout for using the text, creating artistic text, creating paragraph text, converting text from one type to another, changing the appearances of text, changing a font, changing the font size and color of the text, changing the alignment, applying effects to the text, wrapping paragraph text around objects, fitting text to an object using curve command.

Working with bitmaps: About vector and bitmap image, change vector images into bitmap images, importing a bitmap into a drawing, cropping, resampling and resizing a bitmap.	
UNIT - III	**10**
Getting Familiar with CS4: Introducing and launching Photoshop CS4, Exploring the new interface. Move tool, eyedropper tool, zoom tool, type tool. The layer palette, the channels palette, the color palette, the history palette, the brush palette, clone source palette, the actions palette. Opening an existing file or Photoshop document, creating a new document, saving files, reverting files, closing files. **Working with images and selections:** Changing the resolution of an image, changing the size of a document Editing images: rotating an image, cropping an image, trim command. Working with selections tool: Marquee tool, working with selections. Lasso tools(3 types of tools only meaning) Magic wand tool(only meaning exclude different options) **Drawing painting and retouching tools:** Setting the current foreground and background colors, Exploring color picker dialog box (only meaning exclude different components), using eyedropper tool. Using retouching tool, healing brush tool, patch tool, clone stamp tool, eraser tool, background eraser tool, magic eraser tool. **Master layers in Photoshop:** Working with layers, creating a new layer, hiding and showing layers, deleting layers, Applying blend modes.	
UNIT - IV	**10**
Getting Started with Flash Professional CS6: Starting Flash Professional CS6, Creating new flash File, Exploring the Flash Professional Cs6 workshop (The application Bar, Stage, panels, using tool panels, properties inspector). Transform Panel, swatches panel, color panel, scene panel. Understanding Timeline and layers, Motion Editor, Creating or choosing a new workspace, Saving Flash Files. **Working with Graphics:** Bitmap and vector graphics, Merge Drawing mode, Object drawing mode, Primitive drawing mode, Creating graphics in flash professional CS6,Selecting Objects(Using selection tool, Subselection tool, lasso tool, selection using lasso tool, Lasso tool with polygon modifier, line tool), Drawing rectangles and ovals, Rectangles and shapes, ovals and circles, polygon and stars, pencil tool, pen tool. Draw straight line with the pen tool, creating a curved path using pen tool, Adding anchor points on paths, deleting corner and curve points, painting with the brush tool, spray brush tool, Drawing patterns with the deco tool. Paint bucket tool, In bottle tool, eyedropper tool, using eraser tool, Transforming objects, Distorting objects, rotating and skewing objects. Using gradient and bitmap fills(All) **Working with symbols and instances:** Using symbols, creating symbols, duplicate symbols, create instances, editing instance properties, break apart a symbol instance, editing symbols **Timeline with timeline:** Working with timeline, about layer, create a layer, rename layer, outline layer, viewing layer, guide layer. Creating animation, types of animation, Classification of animation in the timeline. Understanding motion tweens, Easing tween animation, orienting objects to the path, swapping targets, motion presets.	

Skill Development Activities:

a) Identify the tasks and use appropriate software and documentation to create specific projects in desktop publishing house in the local area.

b) Create and present publication project using and describing the principles and skills necessary for its creation.

c) Evaluate projects according to criteria defined in technology application standards for desktop publishing

c) Any other activities, which are relevant to the course.

Text Books:

1. Ramesh Bangia, **Learning Desk Top Publishing (DTP)**, Khanna Book Publishing Co. (P)Ltd.; 1 edition, 2016.
2. Satish Jain, **BPB DTP Course**, BPB, 2014
3. Satish Jain, Adobe Flash Professional CS6 Training Guide Paperback, First edition, BPBPublications, 2016

Reference Books:

1. Kogent Learning Solutions Inc., **InDesign CS6 in Simple Steps**, Dreamtech Press,2012
2. Kogent Learning Solutions Inc., **Photoshop CS6 in Simple Steps**, Dreamtech Press, 2012
3. Kogent Learning **Solutions Inc., "Flash CS6 in Simple Steps", First Edition, Dreamtech Press, 2013.**
4. Kogent Learning Solutions Inc., **CorelDRAW X7 in Simple Steps**, Dreamtech Press, 2014.

Note: Latest edition of text books may be used.

Course Code: B.Com.2.4	Course Title: Linux & DTP lab
Course Credits:2	Hours/Week:04
Total Contact Hours:52	Formative Assessment Marks:25
Exam Marks:25	Exam Duration:3 hrs

PRACTICAL EXERCISES

PART-A

Linux

1. Write a shell script to accept 'n' integers and count +ves, -ves and zeros separately. Also find the sum of +ves, and -ves.
2. Write a shell script to accept student name and marks in 3 subjects. Find the total marks and grade (depending on the total marks).
3. Write a shell script program to copy the content of one file1 to file2 and display the content of both the files.
4. Write a menu driven shell script for the following.
    a) To list files and directories.
    b) Renaming a file (check for the existence of the source file).
    c) To display the current working directory
    d) To list the users logged in
    e) Exit

PART-B

Adobe InDesign

1. Design College day invitation by using InDesign tools.
2. Design a Newspaper cutting.

Adobe Coreldraw X4

1. Create any banner in Corel Draw using different tools.
2. Create Business card (visiting card) in CorelDraw using different tools.

PART-C

Adobe Photoshop

1. Create image in Photoshop painting tools or use existing images copy the portions of one image to another image. Use Toolbox options. Marquee Tool (Rectangular Marquee, elliptical Marquee), Move, Lasso Tool, Magic wand and Crop Tools.
2. Create images of artistic architectures using Photoshop painting tools (brush, pencil, color, paint bucket tools), Drawing tools and retouching tools.
3. Create image or use existing images to create a new layer, delete layer, show and hide layers and apply different blend modes.

Adobe Flash

1. Create a moving butterfly using simple motion tween animation in Adobe Flash.
2. Using Adobe Flash, design a building in background using different tools and simple motion tween animation for moving the bus.

Assessment Criteria		Marks
Activity-1 from Part A	**Linux**	**06**
Activity-2 from Part B	**Adobe InDesign/ Adobe Coreldraw X4**	**07**
Activity-3 from Part C	**Adobe Photoshop/ Adobe Flash**	**07**
Practical Record		**05**
Total		**25**

Karnataka State Higher Education Council

Scheme of Teaching & Evaluation and Curriculum for the 5th and 6th Semester B.Com (Tax Procedure) for the Academic Year 2023-24

A. Scheme of Teaching & Evaluation for B.Com.

Semester V								
Sl. No.	**Course Code**	**Title of the Course**	**Category of Courses**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**	**Credits**
36	COM 5.1	Financial Management	DSC-13	3+0+2	60	40	100	4
37	COM 5.2	Advanced Income Tax Law and practice	DSC-14	3+0+2	60	40	100	4
38	COM 5.3	Principles and Practice of Auditing	DSC-15	4+0+0	60	40	100	4
39	COM 5.4	Elective 1	DSE-1	3+0+0	60	40	100	3
40	COM 5.5	Elective 2	DSE-2	3+0+0	60	40	100	3
41	COM 5.6	Cost Accounting – I	Vocational- 1	2+0+2	50	50	100	3
42	COM 5.7	Cyber Security	SEC - SB	2+0+2	50	50	100	3
Sub -Total (D)					**400**	**300**	**700**	**24**

Elective Groups and Courses:

Discipline Specific Electives – V Semester (5.4 / 5.5)										
Sl. No	**Course Code**	**Accounting**	**Course Code**	**Finance**	**Course Code**	**Marketing**	**Course Code**	**Human Resources**	**Course Code**	Information Systems
1	A1	Indian Accounting Standards- I	F1	Financial Institutions and Markets	M1	Retail Management	H1	Human Resources Development	I1	Basics of Business Analytics

Note:

1. Under DSE, Dual Specialization to be offered, students should choose two elective groups from the above elective groups. Same elective groups should be continued in the 6th Semester also.

Semester VI								
Sl. No.	**Course Code**	**Title of the Course**	**Category of Courses**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**	**Credits**
43	COM 6.1	Advanced Financial Management	DSC-16	3+0+2	60	40	100	4
44	COM 6.2	Customs Duty	DSC-17	3+0+2	60	40	100	4
45	COM 6.3	Management Accounting	DSC-18	3+0+2	60	40	100	4
46	COM 6.4	Elective 1	DSE-3	3+0+0	60	40	100	3
47	COM 6.5	Elective 2	DSE 4-	3+0+0	60	40	100	3
48	COM 6.6	Cost Accounting - II	Vocational -2	2+0+2	50	50	100	3
49	COM 6.7	Internship	I-1	4 to 5 weeks		100	100	3
Sub -Total (D)					**350**	**350**	**700**	**24**

Elective Groups and Courses:

Discipline Specific Electives – VI Semester (6.4/6.5)										
Sl. No.	**Course Code**	**Accounting**	**Course Code**	**Finance**	**Course Code**	**Marketing**	**Course Code**	**Human Resources**	**Course Code**	**Information Systems**
1	A2	Indian Accounting Standards-2	F2	Investment Management	M2	Customer Relationship Management	H2	Cultural Diversity at Work Place	I2	HR Analytics

Note:

1. Under DSE, Dual Specialization to be offered, students should choose two elective groups from the above elective groups. Same elective groups should be continued in the 6th Semester also.
2. The students shall undergo 4 to 5 weeks of internship programme in any business organization immediately after completion of 5th Semester Examination but before the commencement of 6th Semester classes.

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Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM 5.2

Name of the Course: Advance Income Tax Law and Practice – I

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**5 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students will be able to

a) Compute the income of charitable trusts
b) Compute the income of Association of persons and co-operative society.
c) It will give the knowledge of special provisions of tax avoidance
d) It will give the knowledge of penalties under income tax act.

Syllabus:	**Hours**
Module No. 1: Assessment of Charitable Institutions	**15**

Basic Introduction to Taxation of Charitable Institution under Income Tax Act 1961,
Definition of Charitable purpose
-Sections Governing the Exemption for Income of the Charitable Trusts covering Application of Income for the purpose of the Trust, Accumulations, Investments, Income from Capital Gain and other aspects.
- Conditions for applicability of Exemptions for Trust
- Procedure for registration
- Procedure for fresh registration
- Non-Applicability of Sec 11in certain cases
- Tax on Anonymous donations
- Applicability of Audit, Basics about Return of Income of Accounts of Charitable Institutions
Computation of Income and Tax thereon for Charitable Institutions.

Module No. 2: Assessment of Association of Persons	**15**

Assessment of Association of Persons (AOP) under the Income Tax Act.
Disallowance under Sec 40(ba). Identifying the Rate of Tax Applicable to AOPs. Computation of the Taxable Income of the Members of AOP, Computation of Tax thereon on share of member of Association of Persons along with the relief;

Module No. 3: Assessment of Co-operative Society	**10**

Deductions in respect of Co-operative Societies,
- Computation of Taxable Income and tax liability of Cooperative Society.

Module No. 4: Special Provisions in the Income tax law to curb avoidance of tax	**10**

Mode of taking certain loans, deposits and specified sum.
- Mode of undertaking transactions.
- Mode of repayment of loans or deposits.
- Obligation to furnish statement of financial transaction or reportable account.
- Furnishing of statement of financial transaction under.

Module No. 5: Penalties under the Income-tax Act.	**10**

Penalty for Failure to comply with notices,
- Penalty for Failure to Maintain Books of Accounts,
- Penalty for **Failure to get accounts audited.**
- Penalty for concealment of incomes including under reporting or miss-reporting of income.
- Immunity from imposition of penalty.

Skill Developments Activities:

1. Prepare a slab rates chart for different Individual assesses.
2. Visit any Chartered Accountants office, Collect and record the procedure involved in filing the Income tax returns of an Individual.
3. List out any 10 Incomes exempt from tax under section 10 of an Individual.
4. Prepare the chart of perquisites received by an employee in an organization.
5. Identify and collect various enclosures pertaining to Income tax returns of an individual.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. Mehrotra H.C and T.S.Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
2. Vinod K. Singhania, Direct Taxes, Taxman Publication Private Ltd, New Delhi.
3. Gaur and Narang, Law and practice of Income Tax, Kalyani Publications, Ludhiana.
4. Bhagawathi Prasad, Direct Taxes.
5. B.Mariyappa, Income tax Law and Practice-I, Himalaya Publishing House. New Delhi.s
6. Dr. Saha, Law and Practice of Income Tax, Himalaya Publishing House.
7. Study material CA final ICAI

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 5.6
Name of the Course: Cost Accounting - I

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**(2+0+2) 4 Hrs**	**42 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Students will acquire the knowledge of basic concepts used in cost accounting and management accounting having a bearing on managerial decision-making.

b) students should be able to identify, use and interpret the results of costing techniques appropriate to different activities and decisions.

Syllabus:	**Hours**
Module No. 1: INTRODUCTION TO COST ACCOUNTING	**8**
Objectives and Scope of Cost Accounting; Cost Terms and Concepts; various elements of costs; Methods of Costing; Techniques of Costing. Classification of Costs on Functions and behavior.	
Module No. 2: MATERIAL COSTS	**10**
Procurement procedures; Valuation of material receipts; Inventory control – determination of optimum order quantity and economic order quantity; Techniques of Inventory Control – ABC analysis, JIT, use of control ratios; Inventory Accounting.	
Module No. 3: EMPLOYEE COSTS	**8**
Time Keeping, Time booking and payroll; Labour turnover, overtime and idle time; Principles and Methods of remuneration and incentive schemes (including Halsey Plan and Rowan Plan);	
Module No. 4: OVERHEADS	10
Collection, Classification and apportionment and allocation of overheads; Absorption and treatment of over and under-absorption of overheads; Reporting of overhead costs.	
Module No. 5: RECONCILIATION OF COST AND FINANCIAL ACCOUNTS	**6**
Need for reconciliation, Procedure for reconciliation, Reasons for disagreement in profits. Problems on reconciliation statement.	

Books for Reference:

1. . Khan M.Y. and Jain P.K. Management Accounting. 5th Ed. McGraw Hill Education.
2. Pillai R.S.N. and Bagavathi. Management Accounting. 4th Ed. S.ChandPublications.
b. Recommended Reading
1. Ruchi Bhatia. Accounting for Managers. 1st Ed. Himalaya Publishing House.
2. Khan M.Y. and Jain P.K. (2009). Management Accounting. 5th Ed. McGrawHill Education.
3. Arora M (2012). A Textbook of Cost and Management Accounting. 10th Ed.Vikas Publishing House.
4. Guruswamy M.S. (2009). Management Accounting. 2nd Ed. McGraw HillEducation.
5. Pandey I.M. (2008). Management Accounting. 3rd Edition, Vikas PublishingHouse

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 6.2
Name of the Course: Custtoms Duty

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

1. The students will get the knowledge of customs law and provisions.
2. The students will get the knowledge of Export and Import procedure.
3. The students are able to do the Valuation under customs.

Syllabus:	**Hours**
Module No. 1: Basics of Customs Duty and Types of Duty	**10**
Evaluation & development of customs law Scope & coverage, regulatory framework, Key Definitions, Nature of customs duty, types of customs duties	
Module No. 2: Prohibition, Exemptions and Relief under Customs duty and HSN	**10**
Classification of goods under Customs Tariff Act. Prohibition on importation and exportation of goods, Relief from payment of custom duty, exemption from custom duty.	
Module No. 3: Valuation Under Customs	**20**
Valuation for custom duty, methods of valuation for customs, customs value – Inclusion and exclusion.	
Module No. 4: Import and Export Procedure	**10**
Import procedure under customs, Export procedure under customs, provisions for baggage, import and export through port and carrier.	
Module No. 5: Duty Drawback and Export Promotion Schemes	**10**
Duty drawback on goods used in manufacture of export products, duty drawback on re-export. Export provision schemes, SEZ, EOU, EHTP, STP , BTP.	

Skill Development activities:

1. Visit any chartered accountant office and identify the procedure involved in the computation of income from profession.
2. List out the different types of capital assets and identify the procedure involved in the computation of tax for the same.
3. List out the steps involved in the computation of income tax from other sources and critically examine the same.
4. Identify the Due date for filing the returns and rate of taxes applicable for individuals.
5. Draw an organization chart of Income Tax department in your locality.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. Mehrotra H.C and T.S.Goyal, , Sahithya Bhavan Publication, Agra.
2. Vinod K. Singhania, Indirect Tax Law, Taxman Publication Private Ltd, New Delhi
3. Gaur and Narang, Law and practice of Income Tax, Kalyani Publications Ludhiana.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 6.6
Name of the Course: Cost Accounting II

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	(2+0+2) 4 Hrs	42 Hrs

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

This course aims to emphasize on different types of costing and the key factors leading to variance and its elimination. Further they are made familiar with the various statements, budgets, and inventory control techniques in relevance to cost volume profit analysis in a business environment.

Syllabus:	Hours
Module No. 1: METHODS OF COSTING 1	**10**

Job and contract costing :- Prerequisites, features and applications of job costing.
Job costing procedure, advantages and disadvantages of job costing.
Contract costing :- Meaning and features of contact costing. Applications of contract costing
Similarities and dis-similarities between job costing and contract costing.

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Module No. 2: METHODS OF COSTING 2	**10**
Process costing :- Meaning, features and applications of process costing. Comparison between job costing and process costing. Treatment of process losses and gains in cost accounts. 1. Preparation of process accounts 2. Operating cost statement of transport companies. Topics to be excluded -Inter process profit and cost statement of other service sectors.	
Module No. 3: Marginal costing.	**10**
Meaning and definition of marginal cost, marginal costing. Features of marginal costing. Terms used in marginal costing -P/V ratio, BEP, margin of safety, angle of incidence. Break even analysis and uses. Break even chart. Problems on CVP analysis. Calculation of P /V ratio, margin of safety, break-even point etc.	
Module No. 4: Budgetary control and standard costing.:	**12**
meaning and definition of budget and budgetary control. Objectives of budgetary control, essential requirement of budgetary control. Advantages and disadvantages of budgetary control. Types of budgets - Cash budget, Purchase budget, Sales budget, Production budget,. Fixed and flexible budgets. Standard costing – setting up of standard , types of standard , Uses and limitations of standard costing. Material variance, Labor variance and overhead variance.	

Books for Referrence:

1. Khan M.Y. and Jain P.K. Management Accounting. 5th Ed. McGraw Hill Education.
2. Pillai R.S.N. and Bagavathi. Management Accounting. 4th Ed. S.ChandPublications.

b. Recommended Reading

1. Ruchi Bhatia. Accounting for Managers. 1st Ed. Himalaya Publishing House.
2. Khan M.Y. and Jain P.K. (2009). Management Accounting. 5th Ed. McGrawHill Education.
3. Arora M (2012). A Textbook of Cost and Management Accounting. 10th Ed.Vikas Publishing House.
4. Guruswamy M.S. (2009). Management Accounting. 2nd Ed. McGraw HillEducation.
5. Pandey I.M. (2008). Management Accounting. 3rd Edition, Vikas PublishingHouse

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Karnataka State Higher Education Council

Scheme of Teaching & Evaluation and Curriculum for the 5th and 6th Semester B.Com for the Academic Year 2023-24

A. Scheme of Teaching & Evaluation for B.Com.

Semester V								
Sl. No.	**Course Code**	**Title of the Course**	**Category of Courses**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**	**Credits**
36	COM 5.1	Financial Management	DSC-13	3+0+2	60	40	100	4
37	COM 5.2	Income Tax Law and Practice-I	DSC-14	3+0+2	60	40	100	4
38	COM 5.3	Principles and Practice of Auditing	DSC-15	4+0+0	60	40	100	4
39	COM 5.4	Elective 1	DSE-1	3+0+0	60	40	100	3
40	COM 5.5	Elective 2	DSE-2	3+0+0	60	40	100	3
41	COM 5.6	A. GST- Law & Practice B. Digital Marketing	Vocational-1 Anyone to be chosen	2+0+2	50	50	100	3
42	COM 5.7	Cyber Security	SEC - SB	2+0+2	50	50	100	3
Sub -Total (D)					**400**	**300**	**700**	**24**

Elective Groups and Courses:

Discipline Specific Electives – V Semester (5.4 / 5.5)										
Sl. No	**Course Code**	**Accounting**	**Course Code**	**Finance**	**Course Code**	**Marketing**	**Course Code**	**Human Resources**	**Course Code**	Information Systems
1	A1	Indian Accounting Standards- I	F1	Financial Institutions and Markets	M1	Retail Management	H1	Human Resources Development	I1	Basics of Business Analytics

Note:

1. Under DSE, Dual Specialization to be offered, students should choose two elective groups from the above elective groups. Same elective groups should be continued in the 6th Semester also.

Semester VI								
Sl. No.	**Course Code**	**Title of the Course**	**Category of Courses**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**	**Credits**
43	COM 6.1	Advanced Financial Management	DSC-16	3+0+2	60	40	100	4
44	COM 6.2	Income Tax Law and Practice-II	DSC-17	3+0+2	60	40	100	4
45	COM 6.3	Management Accounting	DSC-18	3+0+2	60	40	100	4
46	COM 6.4	Elective 1	DSE-3	3+0+0	60	40	100	3
47	COM 6.5	Elective 2	DSE 4-	3+0+0	60	40	100	3
48	COM 6.6	A. Assessment of persons other than-Individuals & Filing of ITRs B. E- Commerce	Vocational -2 Anyone to be chosen	2+0+2	50	50	100	3
49	COM 6.7	Internship	I-1	4 to 5 weeks		100	100	3
Sub -Total (D)					**350**	**350**	**700**	**24**

Elective Groups and Courses:

Discipline Specific Electives – VI Semester (6.4/6.5)										
Sl. No.	**Course Code**	**Accounting**	**Course Code**	**Finance**	**Course Code**	**Marketing**	**Course Code**	**Human Resources**	**Course Code**	**Information Systems**
1	A2	Indian Accounting Standards-2	F2	Investment Management	M2	Customer Relationship Management	H2	Cultural Diversity at Work Place	I2	HR Analytics

Note:

1. Under DSE, Dual Specialization to be offered, students should choose two elective groups from the above elective groups. Same elective groups should be continued in the 6th Semester also.
2. The students shall undergo 4 to 5 weeks of internship programme in any business organization immediately after completion of 5th Semester Examination but before the commencement of 6th Semester classes.

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Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM .5.1

Name of the Course: Financial Management

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the role of financial managers effectively in an organization.
b) Apply the compounding & discounting techniques for time value of money.
c) Take investment decision with appropriate capital budgeting techniques for investment proposals.
d) Understand the factors influencing the capital structure of an organization.
e) Estimate the working capital requirement for the smooth running of the business

Syllabus:	**Hours**
Module No. 1: Introduction to Financial Management	**12**

Introduction –Meaning of Finance, Finance Function, Objectives of Finance function, Organization of Finance function -Meaning and definition of Financial Management; Goals of Financial Management, Scope of Financial Management, Functions of Financial Management, Role of Finance Manager in India. Financial planning-- Meaning –Need – Importance -Steps in financial Planning – Principles of a sound financial plan and Factors affecting financial plan.

Module No. 2: Time Value of Money	**10**

Introduction – Meaning of time value of money-time preference of money- Techniques of time value of money: Compounding Technique-Future value of Single flow, Multiple flow and Annuity -Discounting Technique-Present value of Single flow, Multiple flow – and Annuity. Doubling Period- Rule 69 and 72.

Module No. 3: Financing Decision	**14**

Introduction-Meaning and Definition of Capital Structure, Factors determining the Capital Structure, Concept of Optimum Capital Structure, EBIT-EPS Analysis- Problems. Leverages: Meaning and Definition, Types of Leverages- Operating Leverage, Financial Leverage and Combined Leverages. Problems.

Module No. 4: Investment Decision	**12**

Introduction-Meaning and Definition of Capital Budgeting, Features, Significance – Steps in Capital Budgeting Process. Techniques of Capital budgeting: Traditional Methods – Pay Back Period, and Accounting Rate of Return – DCF Methods: Net Present Value Internal Rate of Return and Profitability Index- Problems.

Module 5: Working Capital Management	**12**

Introduction- Meaning and Definition, types of working capital, Operating cycle, Determinants of working capital needs – Estimation of working capital requirements. dangers of excess and inadequate working capital, Merits of adequate working capital, Sources of working capital. Cash Management, Receivable Management, and Inventory Management (Concepts only).

Skill Development Activities:

1. Visit the Finance Department of any organization and collect and record the Functions and Responsibilities of Finance Manager.
2. As a finance manager of a company advice the management in designing an appropriate Capital Structure.
3. Evaluate a capital investment proposal by using NPV method with imaginary figures.
4. Illustrate with imaginary figures the compounding and discounting techniques of time value of money.
5. Estimate working capital requirements of an organization with imaginary figures.
6. Any other activities, which are relevant to the course.

Books for reference:

1. I M Pandey, Financial management, Vikas publications, New Delhi.
2. Abrish Guptha, Financial management, Pearson.
3. Khan & Jain, Basic Financial Management, TMH, New Delhi.
4. S N Maheshwari, Principles of Financial Management, Sulthan Chand & Sons, New Delhi.
5. Chandra & Chandra D Bose, Fundamentals of Financial Management, PHI, New Delhi.
6. B.Mariyappa, Financial Management, Himalaya Publishing House, New Delhi.
7. Ravi M Kishore, Financial Management, Taxman Publications
8. Prasanna Chandra, Financial Management, Theory and Practice, Tata McGraw Hill.

Note: Latest edition of books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM 5.2

Name of the Course: Income Tax Law and Practice – I

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students will be able to

a) Comprehend the procedure for computation of Total Income and tax liability of an individual.
b) Understand the provisions for determining the residential status of an Individual.
c) Comprehend the meaning of Salary, Perquisites, Profit in lieu of salary, allowances and various retirement benefits.
d) Compute the income house property for different categories of house property.
e) Comprehend TDS & advances tax Ruling and identify the various deductions under section 80.

Syllabus:	**Hours**
Module No. 1: Basic Concepts of Income Tax	**12**

Introduction –Meaning of tax-, types of taxes, cannons of taxation. Brief history of Indian Income Tax, legal framework of taxation, Important definitions, assessment, assessment year, previous year including exceptions, assesses, person, income, casual income, Gross total income, Total income, Agricultural income, scheme of taxation, – Exempted incomes of individuals under section 10 of the Income Tax Act, 1961.

Module No. 2: Residential Status and Incidence of Tax	**10**

Introduction – Residential status of an individual. Determination of residential status of an individual. Incidence of tax or Scope of Total income. Problems on computation of Gross total Income of an individual.

Module No. 3: Income from Salary	**18**

Introduction - Meaning of Salary -Basis of charge Definitions–Salary, Perquisites and profits in lieu of salary - Provident Fund –Transferred balance. - Retirement Benefits – Gratuity, pension and Leave salary. Deductions and Problems on Computation of Taxable Salary.

Module No. 4: Income from House Property	**10**

Introduction - Basis for charge - Deemed owners -House property incomes exempt from tax, composite rent and unrealized rent. Annual Value –Determination of Annual Value
- Deductions from Annual Value - Problems on Computation of Income from House Property.

Module No. 5: Tax Deduction at Sources & Advance Tax Ruling	**10**

Introduction - Meaning of TDS - Provisions regarding TDS - TDS to be made from Salaries
- Filing of Quarterly statement – Theory and Problems; Advance Tax: Meaning of advance tax - Computation of advance tax - Instalment of advance tax and due dates. **Deductions** under Sections 80C, 80CCC, 80CCD, 80CCG, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80TTA and 80U as applicable to Individuals.

Skill Developments Activities:

1. Prepare a slab rates chart for different Individual assesses.
2. Visit any Chartered Accountants office, Collect and record the procedure involved in filing the Income tax returns of an Individual.
3. List out any 10 Incomes exempt from tax under section 10 of an Individual.
4. Prepare the chart of perquisites received by an employee in an organization.
5. Identify and collect various enclosures pertaining to Income tax returns of an individual.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. Mehrotra H.C and T.S.Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
2. Vinod K. Singhania, Direct Taxes, Taxman Publication Private Ltd, New Delhi.
3. Gaur and Narang, Law and practice of Income Tax, Kalyani Publications, Ludhiana.
4. Bhagawathi Prasad, Direct Taxes.
5. B.Mariyappa, Income tax Law and Practice-I, Himalaya Publishing House. New Delhi.s
6. Dr. Saha, Law and Practice of Income Tax, Himalaya Publishing House.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM 5.3

Name of the Course: Principles and Practice of Auditing

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the conceptual framework of auditing.
b) Examine the risk assessment and internal control in auditing
c) Comprehend the relevance of IT in audit and audit sampling for testing.
d) Examine the company audit and the procedure involved in the audit of different entities.
e) Gain knowledge on different aspect of audit reporting and conceptual framework applicable on professional accountants.

Syllabus:	**Hours**
Module No. 1: Introduction to Auditing	**10**
Introduction – Meaning and Definition – Objectives– Types of Audit– Merits and Demerits of Auditing – Relationship of audit with other disciplines. Preparation before commencement of new audit - Working Papers -Audit Note Book, Audit Programme Qualities of an Auditor – Audit planning – Audit strategy —Audit Engagement -Audit Documentation - Audit Evidence – Written Representation.	
Module No. 2: Risk Assessment and Internal Control	**12**
Introduction – Audit risk – Assessment of risk – Internal Control-Meaning and objectives– Internal check- Meaning, objectives and fundamental Principles. Internal check with regards to wage payment, cash sales, and cash purchases.	
Module No. 3: Verification and Valuation of Assets and Liabilities	**12**
Meaning and objectives of verification and valuation – Position of an auditor as regards the valuation of assets- Verification and Valuation of different items of Assets- Land and Building, Plant and Machinery, Goodwill, Investments, Stock in Trade. Liabilities-Bills payable, Sundry Creditors and Contingent liabilities.	
Module No. 4: Company Audit and Audit of other Entities	**13**
Company Auditor: appointment, Qualification, powers, duties and liabilities, professional ethics of an auditor. Other Entities: Audit Procedure of NGOs - Charitable institutions - Educational institutions – Government – Local Bodies – Cooperative societies – hotels – hospitals – clubs & Banks.	
Module 5: Audit Report & **Professional Ethics**	**13**
Introduction – Meaning – Elements of audit report –Types of audit report - Independent Auditor's report and their illustration; Professional Ethics: Code of Ethics - Professional Accountants in Public practices and business – Fundamental Principles of Professional Ethics.	

Skill Development Activities:

1. Design and develop an audit plan program for a joint stock company
2. List the various documents necessary to be verified in the audit process
3. Draft an audit report (qualified or clean) with imaginary data.
4. Visit an audit firm, write about the procedure followed by them in auditing the books of accounts of a firm.
5. Record the verification procedure with respect to any one fixed asset.
6. Draft an audit program.
7. Any other activities, which are relevant to the course.

Books for Reference:

1. ICAI Study Materials on Auditing and Assurance
2. B.N. Tandon, Principles of Auditing, S. Chand and Company, New Delhi.
3. T.R. Sharma, Auditing Principles and Problems, Sahitya Bhawan, Agra.
4. J.M. Manjunatha and others, Auditing and Assurance, HPH.
5. Gupta Karnal, Contemporary Auditing, Tata Mc. Graw-Hill, New Delhi.
6. R.G. Saxena, Principles of Auditing.

Note: Latest edition of books may be used.

Name of the Programme: Bachelor of Commerce (B.Com)
Course Code: COM A1
Name of the Course: Indian Accounting Standards-1

Course Credits	No. of Hours per Week	Total No of Teaching Hours
3 Credits	3 Hrs	45 Hrs

Pedagogy: Lectures in the Classroom, Reading and analysis of annual reports of listed companies; writing assignment, seminar presentation, group discussion.

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the need and benefits of accounting standards.
b) Prepare the financial statements as Indian Accounting standards.
c) Comprehend the requirements of Indian Accounting Standards for recognition, measurement and disclosures of certain items appear in financial statements
d) Understand the Accounting Standards for Items that do not Appear in Financial Statements

Syllabus	Hours
Module No. – 1 Introduction to Indian Accounting Standards.	**10**

Introduction- Meaning and Definition of Accounting Standards – Objectives of Accounting Standards – Benefits and Limitations of Accounting Standards – Process of Formulation of Accounting Standards in India – List of Indian Accounting Standards (Ind AS) – Need for Convergence Towards Global Standards– International Financial Reporting Standards - Features and Merits and Demerits of IFRS – Benefits of Convergence with IFRS – Applicability of Ind AS in India.

Module No. 2 Preparation of Financial Statements (Ind AS 1)	**12**

Frame work for preparation of Financial Statements, presentation of Financial Statement as per Ind AS 1. Statement of Profit and Loss, Balance Sheet, Statement of changes in Equity, statement of Cash flow and Notes to accounts. Problems on preparation of Statement of Profit and Loss and Balance Sheet as per Schedule III of Companies Act, 2013.

Module No. – 3 Provision under Accounting Standard for Items Appear in Financial Statements.	**10**

Property, Plant and Equipment (Ind AS-16) - Intangible assets (Ind AS-38) - Impairment of assets (Ind AS-36) – Inventories (Ind AS 2) - Borrowing costs (Ind AS- 23) – Investment Property (Ind AS-40) –objectives, Scope, definitions, Recognition Measurement and disclosures of the above-mentioned Standards. Simple problems on the above standards.

Module No.- 4 Provisions under Accounting Standards for Items that do not Appear in Financial Statements.	**08**

Segment Reporting (Ind AS 108), Related Party Discloser (Ind AS 24), Events Occurring after Balance Sheet Date (Ind AS 10), Interim Financial Reporting (Ind AS 34).

Module No. - 5 Liability Based Indian Accounting Standards.	**05**

Provisions, Contingent liabilities and contingent assets (Ind AS 37) – Scope, provision, liability, obligating event, legal obligation, constructive obligation, contingent liability, contingent asset, relationship between provisions and

contingent liability, recognition of provisions, Contingent asset and contingent liability, Measurement and Disclosure of Information in the Financial Statements.

Skill Development Activities:

1. Explain the structure and functions of Indian Accounting Standards Board
2. Set out the procedure for issue of an Accounting Standard by the Accounting Standards Board.
3. List out the financial statements in accordance with Ind AS 1 and show the formats of the same with imaginary figures.
4. Explain the main provisions of Ind AS 2, Ind AS 16 and Ind AS 18
5. State and explain the provisions pertaining to Segment Reporting and Related Party Disclosure under Ind AS.

Books for Reference:

1. Study material of the Institute of Chartered Accountants of India

2. Anil Kumar, Rajesh Kumar and Mariyappa, Indian Accounting Standards, HPH

3. Miriyala, Ravikanth, Indian Accounting Standards Made Easy, Commercial Law Publishers

4. Dr.A.L.Saini IFRS for India, , Snow white publications.

5. CA Shibarama Tripathy Roadmap to IFRS and Indian Accounting Standards

6. Ghosh T P, IFRS for Finance Executives Taxman Allied Services Private Limited.

Note: Latest edition of books may be used

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM F1

Name of the Course: Financial Institutions and Markets

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	45 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the structure of Indian financial system and its constituents.
b) Outline the role of capital and money market in economic development.
c) Comprehend primary and secondary market and its relevance in capital formation.
d) Appraise the role played by banking and development financial institutions in economic development so far.
e) Understand the different types of NBFCs and their contribution.

Syllabus:	Hours
Module No. 1: Financial System in India	**08**
Introduction – Meaning of Financial System– Financial concepts - Constituents of Financial System – Structure of Financial System – Role of Financial system- Functions of Financial System – Development of Financial System in India. Financial Sector Reforms - Financial System and Economic Development – Weakness of Indian financial system.	
Module No. 2: Capital Market & Money Market	**08**
Capital Market: Meaning –Structure, Importance – Functions – Players in the Capital Market – Instruments of Capital Market – Components of Capital Market – Recent trends in Capital Market. **Money Market:** Meaning-Structure, functions Importance – Functions – Instrument of Money Market – Recent trends in Money Market.	
Module No. 3: Primary Market & Secondary Market	**10**
Primary Market: Meaning, features, players of primary market, Instruments in primary market, Merits and Demerits of primary markets–- Methods of floating new issues: Public issue–Offer for sale – Right Issue – Private placement – Problems of Indian Primary Markets; **Secondary Market**: Meaning, structure, functions, players in Stock Market, Merits and Demerits of stock markets. Methods in Stock Markets - Recognition of stock exchanges – Function of stock exchanges of BSE- NSE – OTCI – Listing of securities – Trading and Settlement Procedure in the Stock Market - Problems of Indian Stock Market; SEBI: Objectives - functions –Role and Reforms in Secondary Market.	
Module No. 4 Banking & Development Financial Institutions	**12**
Banking: Introduction – Meaning – Role and functions – Types of Banks; Development Financial Institutions: History – Management - Role & Functions of EXIM Bank –NABARD SIDBI – MUDRA – NHB – LIC & GIC - UTI – SFCs.	
Module No. 5: Non-Banking Financial Companies (NBFCs) & Forex Market	**07**
Introduction – Meaning- Role – Importance – Types of NBFCs – Insurance Companies - Loan Companies - Investment Companies — Leasing & Hire Purchase - Housing Finance,— Chit Funds - Mutual funds -Venture Capital Funds - Factors & Forfeiting - Credit Rating - Depository and Custodial Services; Forex market- Concept- Meaning- Importance-Merits of forex market- Fluctuations in foreign exchange rates- Causes and Effects.	

Skill Developments Activities:

1. List out any five recent Financial Sectors Reforms and analyse them.
2. Collect Share Application Forms of any five different companies who have offered IPO in the last or present financial year.
3. Collect data on last financial year price rigging and insider trading cases reported as per SEBI.
4. Visit website of Development Financial Institutions (DFIs) and prepare report on the history/milestone and functions of the DFIs
5. Identify the Different types of Venture capital firms operating in Karnataka and their investment.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. Livingston, Miles; Financial Intermediaries; Blackwell
2. Sudhindra Bhat, Financial Institutes and Markets, Excel Books.
3. Niti Bhasin; Banking and Financial Markets in India 1947 To 2007; New Century.
4. Khan M.Y, Indian Financial Systems, Tata McGraw Hill, New Delhi.
5. E Gordon, K.Natarajan (2010). Financial Markets and Services. Himalaya Publishing House, New Delhi
6. Shashi k Guptha, Nisha Aggarwal & Neeti Guptha (2008), Financial Markets. Kalyani Publishers, New Delhi
7. Vasanth Desai (2009). Financial Markets and Services. Himalaya Publishing House.

Note: Latest edition of books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM H1
Name of the Course: Human Resources Development

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**3 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the need of HRD.
b) Comprehend the framework of HRD.
c) Know the models for evaluating the HRD programs.
d) Comprehend the need for employee counselling.
e) Apprehend the HR performance.

Syllabus:	**Hours**
Module No. 1: Conceptual Analysis of HRD	**08**
Introduction – Meaning and Definition of HRD, Need for HRD-Multiple Goals of HRD, HRD Department and its Task, HRD for Organizational Effectiveness, HRD in the Indian Context, HRD Mechanisms, Employee Empowerment, HRD as a Motivational Factor, Concerns of Trade Unions.	
Module No. 2: Frame Work of Human Resource Development	**10**
Frame work of Human Resource Development - HRD Processes - Assessing HRD Needs - HRD Model - Designing Effective HRD Program - HRD Interventions- Creating HRD Programs - Implementing HRD programs - Training Methods - Self Paced/Computer Based/ Company Sponsored Training - On-the-Job and Off-the-Job - Brain Storming - Case Studies - Role Plays - Simulations – T-Groups - Transactional Analysis.	
Module No. 3**: Evaluating HRD Programs**	**08**
Introduction- - Models and Frame Work of Evaluation - Assessing the Impact of HRD Programs - Human Resource Development Applications - Fundamental Concepts of Socialization - Realistic Job Review - Career Management and Development.	
Module No. 4: Management Development	**09**
Introduction - Employee counselling and wellness services – Counselling as an HRD Activity-Counselling Programs - Issues in Employee Counselling - Employee Wellness and Health Promotion Programs - Organizational Strategies Based on Human Resources.	
Module No. 5: HR Performance	**10**
Introduction -Work Force Reduction, Realignment and Retention - HR Performance and Bench Marking - Impact of Globalization on HRD- Diversity of Work Force - HRD programs for diverse employees - Expatriate & Repatriate support and development.	

Skill Development Activities:

1. Discuss with HR manager on HRD and report on the same.
2. Visit any Organisation in your locality, collect information and report on employee welfare facilities provided by the company.
3. Meet HR trainer, discuss their role and responsibilities.
4. Visit any Organisation, discuss with employees about effectiveness of training.
5. Any other activities, which are relevant to the course.

Books for Reference:

1. Werner & Desimone, Human Resource Development, Cengage Learning.
2. William E. Blank, Handbook for Developing Competency Based Training Programmes, Prentice -Hall, New Jerse
3. Uday Kumar Haldar, Human Resource Development, Oxford University Press.
4. Srinivas Kandula, Strategic Human Resource Development, PHI Learning.
5. Nadler, Leonard: Corporate Human Resource Development, Van Nostrand Reinhold, ASTD, New York.
6. Rao, T.V and Pareek, Udai: Designing and Managing Human Resource Systems, Oxford IBH Pub. Pvt. Ltd., New Delhi, 2005.
7. Rao, T.V: Readings in HRD, Oxford IBH Pub. Pvt. Ltd., New Delhi, 2004.
8. Viramani, B.R and Seth, Parmila: Evaluating Management Development, Vision Books, New Delhi.
9. Rao, T.V. (et.al): HRD in the New Economic Environment, Tata McGraw-Hill Pub.Pvt, Ltd., New Delhi, 2003.
10. Rao, T.V: HRD Audit, Sage Publications, New Delhi.
11. ILO, Teaching and Training Methods for Management Development Hand Book, McGraw-Hill, New York.
12. Rao, T.V: Human Resource Development, Sage Publications, New Delhi.
13. Kapur, Sashi: Human Resource Development and Training in Practice, Beacon Books, New Delhi.

Note: Latest Edition of books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM I1

Name of the Course: Basics of Business Analytics

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**3 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand analytical applications in practice.
b) Validate sources of data, use statistical resources and apply tools and techniques learnt to solve real time problems.
c) Formulate and manipulate business models, using quantitative methods including spreadsheets and graphical methods, in order to find solutions to real time problems.
d) Be aware about the emerging trends in the world of analytics.

Syllabus:	**Hours**
Module No. 1: Introduction to Business Analytics	**07**
Data, Types of Data- Forms of Data-Evolution of Big Data- Business Analytics -Need for Analytics- Types of Analytics-Importance of Business Analytics in Decision Making-Analytics Process Model-SMART model-Spreadsheet analysis-Internet of Things.	
Module No. 2: Technology of Big Data	**06**
Overview of DBMS, Data Warehousing: Concepts, Need, Objectives– Relevance of Data Warehousing in Business Analytics-Data Mining-Application of Data Mining- Data Mining Technique- Data Classification- Hadoop Distributed File System-Features of HDFS-MapReduce-Features of MapReduce.	
Module No. 3: **Data Scientists and Data Visualization**	**10**
Data Scientists-New Era of Data Scientists -Data Scientist model- Sources of Data scientists-Horizontal Versus Vertical Data Scientists- Retention of Data Scientists- Data Visualization-Types of Data Visualization -Issues in Data Visualization-Tools in data visualization- Data Collection, Sampling and Pre-processing- Types of Data Sources- Sampling-Types of Data Elements-Visual Data Exploration and Exploratory Statistical Analysis-Missing Values-Missing Values-Standardizing Data-Categorization-Weights of Evidence Coding-Variable Selection-Segmentation	
Module No. 4: Practices of Analytics	**12**
Predictive Analytics- Target Definition-Linear Regression -Logistic Regression -Decision Trees -Neural Networks -Support Vector Machines-Ensemble Methods -Multiclass Classification Techniques -Evaluating Predictive Models-Descriptive Analytics- Association Rules -Sequence Rules –Segmentation-Survival Analysis- Survival Analysis Measurements-Kaplan Meier Analysis-Parametric Survival Analysis-Proportional Hazards Regression-Extensions of Survival Analysis Models-Evaluating Survival Analysis Models-Social Network Analytics-Social Network Definitions-Social Network Metrics-Social Network Learning-Relational Neighbor Classifier-Probabilistic Relational Neighbor Classifier -Relational Logistic Regression-Collective Inferencing –Egonets- Mobile Analytics- Practices of analytics in - Google-General Electric-Microsoft-Kaggle-Facebook-Amazon.	

Module No. 5: Big Data and Emerging trends	**10**
Data for Big Data-Enterprise orientation for Big data –leadership –Targets-Analysts- Other Factors to Consider in Big Data Success-Emerging Technologies in Health Information Systems: Transforming Health in Information Era-Omics Revolution and Personalized Medicine-Genomic Data Integration into Medical Records-Socio- demographic Data for Health Records-Family Health History-Genomics Driven Wellness Tracking and Management System (GO-WELL)-Emerging trends of analytics in Education, Government, Finance & Supply Chain Management.	
Skill Development Activities: **Course teacher can identify and give the skill development activities.**	
Books for Reference: 1. Big Data Black Book, DT Editorial Services, Dreamtech Press, 2015. 2. Big Data at Work, Thomas H. Davenport, Harvard Business Review Press, Boston, Massachusetts, 2014. 3. Analytics in a Big Data World, John Wiley & Sons, Inc., Hoboken, New Jersey,2014. 4. Big Data and Internet of Things: A Roadmap for smart Environments, Nik Bessis Ciprian Dobre Editors, Springer International Publishing Switzerland 2014 **Note: Latest edition of books may be used.**	

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM M1

Name of the Course: Retail Management

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	45 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the contemporary of retail management, issues, strategies and trends in Retailing.
b) Utilize the theories and strategies of retail planning.
c) Perceive the role and responsibilities of store manager and examine the visual merchandising and its techniques in the present context.
d) Prioritize the factors to be considered while fixing the price in retailing.
e) Comprehend the emerging trends in Retail Industry.

Syllabus:	**Hours**
Module No. 1: Introduction to Retailing	**08**
Introduction – Meaning and Definition – Characteristics of Retailing -Functions of Retailing- Types of Retailing- Forms of Retailing based on ownership. Retail Theories- Wheel of Retailing- Retail Life cycle- Retail Business in India. Influencing factor- Present Indian retail scenario. International Perspective in Retail Business.	
Module No. 2: Consumer Behaviour in Retail Business	**10**
Buying Decision Process and its Implication on Retailing – Influence of Group and Individual Factors, Customer Shopping Behaviour, Customer Service and Customer Satisfaction. Retail Planning Process: Factors to Consider in Preparing a Business Plan – Implementation – Risk Analysis.	
Module No. 3: Retail Operations	**10**
Factors Influencing location of Store - Market Area Analysis – Trade Area Analysis – Rating Plan method - Site Evaluation. Retail Operations: Stores Layout and Visual Merchandising, Stores designing, Space Planning, Inventory Management, Merchandise Management, Category Management.	
Module No. 4: Retail Marketing Mix	**07**
Product: Decisions Related to Selection of Goods (Merchandise Management Revisited) Decisions Related to Delivery of Service. **Pricing**: Influencing Factors – Approaches to Pricing – Price Sensitivity - Value Pricing – Markdown Pricing. **Place:** Supply Channel-SCM Principles – Retail Logistics – Computerized Replenishment System- Corporate Replenishment Policies. **Promotion**: Setting objectives – Communication Effects - Promotional Mix. Human Resource Management in Retailing – Manpower Planning – Recruitment and Training – Compensation – Performance Appraisal Methods.	
Module No. 5: Impact of Information Technology in Retailing	**10**
Non-Store Retailing (E-Retailing) - The Impact of Information Technology in Retailing - Integrated Systems and Networking – EDI – Bar Coding – Electronic Article Surveillance Electronic Shelf Labels – Customer Database Management System. Legal Aspects in Retailing, Social Issues in Retailing, Ethical Issues in Retailing. Artificial Intelligence in Retailing.	

Skill Developments Activities:

1) Identify any 10 Retail Business Stores at you Conveniences
2) Visit any Established Retail Mall and Draw a Chart of Product Segmentation
3) Make a list of factor influence on choice of retail stores
4) Conduct a survey after sale service of any retail outlet
5) Contact any retailer, collect the information on factors influencing on retail pricing.
6) Any other activities, which are relevant to the course.

Books for Reference:

1. Barry Bermans and Joel Evans: "Retail Management – A Strategic Approach", PHI New Delhi,

2. A.J.Lamba, "The Art of Retailing", Tata McGrawHill, New Delhi,

3. Swapna Pradhan: Retailing Management, , TMH

4. James R. Ogden & Denise T: Integrated Retail Management

5. Levy & Weitz: Retail Management -TMH

6. Rosemary Varley, Mohammed Rafiq-: Retail Management

7. Chetan Bajaj: Retail Management -Oxford Publication.

8. Uniyal & Sinha: Retail Management - Oxford Publications.

9. Suja Nair: Retail Management

10. R.S Tiwari: Retail Management, HPH, New Delhi

Note: Latest edition of books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 5.6
Name of the Course: GST-Law & Practice

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**(2+0+2) 4 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Comprehend the concepts of Goods and Services tax.
b) Understand the fundamentals of GST.
c) Analyse the GST Procedures in the Business.
d) Know the GST Assessment and its computation.

Syllabus:	**Hours**
Module No. 1: Introduction to GST	**08**
Introduction-Meaning and Definition of GST, Objectives, Features, Advantages and Disadvantages of GST, Taxes subsumed under GST, Structure of GST (Dual Model) - CGST, SGST and IGST. GST Council, Composition, Powers and Functions. CGST Act,2017-Feature and Important definitions.	
Module No. 2: GST Registration and Taxable Event	**10**
Registration under GST provision and process. Amendment and cancellation of registration, Taxable event -Supply of goods and services-Meaning, Scope and types- composite supply, Mixed supply. Determination of time and place of supply of goods and services. Levy and collection of tax. List of exempted goods and services- Problems.	
Module No. 3: Input Tax Credit	**08**
Input Tax Credit - Eligible and Ineligible Input Tax Credit; Apportionments of Credit and Blocked Credits; Tax Credit in respect of Capital Goods; Recovery of Excess Tax Credit; Availability of Tax Credit in special circumstances; Transfer of Input tax, Reverse Charge Mechanism, tax invoice, Problems on input tax credit.	
Module No. 4: GST Assessment	10
Tax Invoice, Credit and Debit Notes, Returns, Audit in GST, Assessment: Self- Assessment, Summary and Scrutiny. Special Provisions. Taxability of E-Commerce, Anti- Profiteering, Avoidance of dual control- issues in filing of returns, monthly collection targets, GST Council meetings.	
Module No. 5: Valuations of Goods and Services Under GST	**09**
Introduction to Valuation under GST, Meaning and Types of Consideration: a) Consideration received through money b) Consideration not received in money c) Consideration received fully in money, valuation rules for supply of goods and services: 1) General Valuation Rules; 2) Special Valuation Rules; Other cases for valuation of supply, imported services, imported goods, valuation for discount. Transaction Value: Meaning and conditions for transaction value, inclusive transaction value, and exclusive discount excluded from transaction value. Problems on GST.	

Skill Development Activities:

1. Prepare a tax invoice under the GST Act.
2. Write the procedure for registration under GST.
3. Prepare a chart showing rates of GST.
4. Compute taxable value and tax liability with imaginary figures under CGST, SGST and IGST.
5. List out the exempted Goods and Services under GST.
6. Analyse the custom duties rates of last five years.
7. Any other activities, which are relevant to the course.

Books for Reference:

1. V.S.Datey, Goods and Services Taxes, Taxman.
2. Sathpal Puliana, M. A. Maniyar, Glimpse of Goods and Service Tax, Karnataka Law Journal Publications, Bangalore.
3. Pullani and Maniyar, Goods and Service Tax, Published by Law Journal, Bangalore.
4. H.C. Mehrotra and V.P. Agarwal, Goods and Services Tax.
5. H.C. Mehotra and S.P. Goyal, Goods and Services Tax.
6. Ghousia Khatoon, C.M. Naveen Kumar and S.N. Venkatesh, Goods and Services Tax, Himalaya Publishing House, Bangalore.
7. R.G. Saha, S.K. Podder and Shruthi Prabhakar, Fundamentals of GST and Customs Act, Himalaya Publishing House.
8. G. B. Baligar, Goods and Services Tax, Ashok Prakashan, Hubli.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 5.6 (B)
Name of the Course: Digital Marketing

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**(2+0+2) 4 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

e) Gain knowledge on Digital Marketing , Email marketing and Content marketing.
f) Understand Search Engine Optimization tools and techniques
g) Gain skills on creation of Google AdWords & Google AdSense
h) Gain knowledge on Social Media Marketing and Web Analytics.
i) Gain knowledge on YouTube Advertising & Conversions.

Syllabus:	**Hours**
Module No. 1: Introduction to Digital Marketing	**08**

Introduction - Meaning of Digital Marketing, Need for Digital Marketing, Digital Marketing Platforms. Digital Marketing students, professional and Business Email Marketing :Importance of e-mail marketing, e-mail Marketing platforms, Creating e-mailers, Creating a Contact Management and Segmentation Strategy, Understanding e-mail Deliverability & Tracking e-mails, How to create Effective & Unique e-mail Content, Outlining the Design of Your Marketing e-mails, Open rates and CTR of e-mail, Drive leads from e-mail, What are opt-in lists , Develop Relationships with Lead Nurturing & Automation Content Marketing: Understanding Content Marketing, Generating Content Ideas, Planning a Long-Term Content Strategy, Building a Content Creation Framework, Becoming an Effective Writer , Extending the Value of Your Content through Repurposing, How to Effectively Promote Content, Measuring and Analyzing Your Content.

Module No. 2: Search Engine Optimization (SEO)	**10**

Search Engine Optimization (SEO):Meaning of SEO, Importance and Its Growth in recent years, Ecosystem of a search Engine, kinds of traffic, Keyword Research & Analysis (Free and Paid tool & Extension), Recent Google Updates & How Google Algorithms works On Page Optimization (OPO), Off-Page Optimization Misc SEO Tools: Google Webmaster Tools, Site Map Creators, Browser-based analysis tools, Page Rank tools, Pinging & indexing tools, Dead links identification tools, Open site explorer, Domain information/who is tools, Quick sprout, Google My Business.

Module No. 3: Google AdWords & Google AdSense	**08**

Google AdWords: Google Ad-Words Fundamentals, Google AdWords Account Structure, Key terminologies in Google AdWords, How to Create an AdWords account, Different Types of AdWords and its Campaign & Ads creation process, Ad approval process, Keyword Match types , Keyword targeting & selection (Keyword planner), Display Planner, Different types of extensions , Creating location extensions, Creating call extensions, Create Review extensions, Bidding techniques – Manual / Auto , Demographic Targeting / Bidding, CPC-based, CPAbased & CPM-based accounts., Google Analytics Individual Qualification (GAIQ), Google AdSense : Understanding ad networks and AdSense's limitations, Learning which situations are best for using AdSense, Setting up an AdSense account, Creating new ad units, Displaying ads on a website, Configuring channels and ad styles, Allowing and blocking ads , Reviewing the AdSense dashboard, Running AdSense reports and custom reports, Exporting data, Reviewing payee and account settings.

Module No. 4: Social Media Marketing (SMM) & Web Analytics	**10**

Social Media Marketing (SMM) Facebook Marketing, Twitter Marketing, Linkedin Marketing, Google plus Marketing, YouTube Marketing, Pinterest Marketing, Snapchat Marketing, Instagram Marketing, Social Media Automation Tools, Social Media Ad Specs The ROI in Social Media Marketing, Tools and Dashboards, Reputation management Web Analytics: The need & importance of Web Analytics, Introducing Google Analytics, The Google Analytics layout , Basic Reporting, Basic Campaign and Conversion Tracking, GoogleTag Manager, Social Media Analytics, Social CRM & Analytics, Other Web analytics tools, Making better decisions, Common mistakes analysts make.

Module No. 5: Youtube Advertising (Video Ads) & Conversions	**09**

Youtube Advertising (Video Ads): Youtube advertising? ,Why should one advertise on youtube? , Creating youtube campaigns, Choose the audience for video ads, Instream ads, Invideo ads, In-search ads, In-display ads, Measuring your YouTube ad performance, Drive leads and sales from YouTube ads Conversions: Understanding Conversion Tracking, Types of Conversions, Setting up Conversion Tracking, Optimizing Conversions, Track offline conversions, Analyzing conversion data, Conversion optimizer.

Skill Development Activities:

1. Explain the key digital marketing activities needed for competitive success.
2. Examine the concept of Digital Media and benefits to be derived.
3. Recognise the core features of CRM and retention programmes
4. Identify the metrics used in digital marketing.
5. Organise how we can limit the marketing materials we get through e-mail.

Books for Reference:

1. Understanding DIGITAL Marketing, Marketing strategies for engaging the digital generation Damian Ryan & Calvin Jones
2. The Art of Digital Marketing: The Definitive Guide to Creating Strategic By Ian Dodson
3.. Internet Marketing: a practical approach By Alan Charlesworth
4. Social Media Marketing: A Strategic Approach By Melissa Barker, Donald I. Barker, Nicholas F. Bormann, Krista E Neher

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 6.1
Name of the Course: Advanced Financial Management

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand and determine the overall cost of capital.
b) Comprehend the different advanced capital budgeting techniques.
c) Understand the importance of dividend decisions.
d) Evaluate mergers and acquisition.
e) Enable the ethical and governance issues in financial management.

Syllabus:	**Hours**
Module No. 1: Cost of Capital and Capital Structure Theories	**14**

Cost of Capital: Meaning and Definition – Significance of Cost of Capital – Types of Capital – Computation of Cost of Capital – Specific Cost – Cost of Debt – Cost of Preference Share Capital – Cost of Equity Share Capital – Weighted Average Cost of Capital – Problems.
Theories of capital structures: The Net Income Approach, The Net Operating Income Approach, Traditional Approach and MM Hypothesis – Problems.

Module No. 2: Risk Analysis in Capital Budgeting	**14**

Risk Analysis – Types of Risks – Risk and Uncertainty – Techniques of Measuring Risks – Risk adjusted Discount Rate Approach – Certainty Equivalent Approach – Sensitivity Analysis - Probability Approach - Standard Deviation and Co-efficient of Variation – Decision Tree Analysis – Problems. .

Module No. 3: Dividend Decision and Theories	**14**

Introduction - Dividend Decisions: Meaning - Types of Dividends – Types of Dividends Polices – Significance of Stable Dividend Policy - Determinants of Dividend Policy; Dividend Theories: Theories of Relevance – Walter's Model and Gordon's Model and Theory of Irrelevance – The Miller-Modigliani (MM) Hypothesis - Problems.

Module No. 4: Mergers and Acquisitions	**10**

Meaning - Reasons – Types of Combinations - Types of Merger – Motives and Benefits of Merger – Financial Evaluation of a Merger - Merger Negotiations – Leverage buyout, Management Buyout Meaning and Significance of P/E Ratio. Problems on Exchange Ratios based on Assets Approach, Earnings Approach and Market Value Approach and Impact of Merger on EPS ,Market Price and Market capitalization.

Module No. 5: Ethical and Governance Issues	**08**

Introduction to Ethical and Governance Issues: Fundamental Principles, Ethical Issues in Financial Management, Agency Relationship, Transaction Cost Theory, Governance Structures and Policies, Social and Environmental Issues, Purpose and Content of an Integrated Report.

Skill Development Activities:

1. Visit an organization in your town and collect data about the financial objectives.
2. Compute the specific cost and Weighted average cost of capital of an Organization, you have visited.
3. Case analysis of some live merger reported in business magazines.
4. Meet the financial manager of any company, discuss ethical issues in financial management.
5. Collect the data relating to dividend policies practices by any two companies.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. I M Pandey, Financial management, Vikas publications, New Delhi.
2. Abrish Guptha, Financial management, Pearson.
3. Khan & Jain, Basic Financial Management, TMH, New Delhi.
4. S N Maheshwari, Principles of Financial Management, Sulthan Chand & Sons, New Delhi.
5. Chandra & Chandra D Bose, Fundamentals of Financial Management, PHI, New Delhi.
6. B.Mariyappa, Advanced Financial Management, Himalaya Publishing House, New Delhi.
7. Ravi M Kishore, Financial Management, Taxman Publications
8. Prasanna Chandra, Financial Management, Theory and Practice, Tata McGraw Hill.

Note: Latest edition of text books may be used

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 6.2
Name of the Course: Income Tax Law & Practice – II

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the procedure for computation of income from business and other Profession.
b) the provisions for determining the capital gains.
c) Compute the income from other sources.
d) Demonstrate the computation of total income of an Individual.
e) Comprehend the assessment procedure and to know the power of income tax authorities.

Syllabus:	**Hours**
Module No. 1: Profits and Gains of Business and Profession	**20**
Introduction-Meaning and definition of Business, Profession and Vocation. - Expenses Expressly allowed - Expenses Expressly Disallowed - Allowable losses - Expressly disallowed expenses and losses, Expenses allowed on payment basis. Problems on computation of income from business of a sole trading concern - Problems on computation of income from profession: Medical Practitioner - Advocate and Chartered Accountants.	
Module No. 2: Capital Gains	**10**
Introduction - Basis for charge - Capital Assets - Types of capital assets – Transfer - Computation of capital gains – Short term capital gain and Long term capital gain - Exemptions under section 54, 54B, 54EC, 54D, 54F, and 54G. Problems covering the above sections.	
Module No. 3: Income from other Sources	**10**
Introduction - Incomes taxable under Head income other sources – Securities - Types of Securities - Rules for Grossing up. Ex-interest and cum-interest securities. Bond Washing Transactions - Computation of Income from other Sources.	
Module No. 4: Set Off and Carry Forward of Losses & Assessment of individuals.	**10**
Introduction – Provisions of Set off and Carry Forward of Losses (Theory only) - Computation of Total Income and tax liability of an Individual.	
Module No. 5: Assessment Procedure and Income Tax Authorities:	**10**
Introduction - Due date of filing returns, Filing of returns by different assesses, E- filing of returns, Types of Assessment, Permanent Account Number -Meaning, Procedure for obtaining PAN and transactions were quoting of PAN is compulsor**y.** Income Tax Authorities their Powers and duties.	

Skill Development activities:

1. Visit any chartered accountant office and identify the procedure involved in the computation of income from profession.
2. List out the different types of capital assets and identify the procedure involved in the computation of tax for the same.
3. List out the steps involved in the computation of income tax from other sources and critically examine the same.
4. Identify the Due date for filing the returns and rate of taxes applicable for individuals.
5. Draw an organization chart of Income Tax department in your locality.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. Mehrotra H.C and T.S.Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
2. Vinod K. Singhania, Direct Taxes, Taxman Publication Private Ltd, New Delhi
3. Gaur and Narang, Law and practice of Income Tax, Kalyani Publicat Ludhiana.
4. Bhagawathi Prasad, Direct Taxes.
5. B.Mariyappa, Income tax Law and Practice-II, Himalaya Publishing House. Delhi.s
6. Dr. Saha, Law and Practice of Income Tax, Himalaya Publishing House.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM 6.3

Name of the Course: Management Accounting

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs**	**60 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Demonstrate the significance of management accounting in decision making.
b) Analyse and interpret the corporate financial statements by using various techniques.
c) Compare the financial performance of corporates through ratio analysis.
d) Understand the latest provisions in preparing cash flow statement.
e) Comprehend the significance of management audit and examine the corporate reports of Management Review and Governance.

Syllabus:	**Hours**
Module No. 1: Introduction to Management Accounting	**12**
Introduction – Concept – Meaning and Definition - Significance - Scope - Objectives and Functions - Difference between Financial Accounting, Cost Accounting and Management Accounting - Advantages and Limitations of Management Accounting - Management Accountant: Role and Functions of Management Accountant.	
Module No. 2: Financial Statements Analysis and Interpretation	**14**
Introduction – Meaning and Nature of financial statements - Limitations of financial statements - Essentials of a good financial statement. Analysis and interpretations- Meaning and definition of Financial of analysis, types of analysis, Techniques of Financial Analysis- Comparative Statements, Common Size Statements and Trend Analysis - Problems.	
Module No. 3: Ratio Analysis	**14**
Introduction - Meaning and Definition of Ratio Analysis, Uses & Limitations of Ratio Analysis – Classification of ratios: Liquidity ratios: Current ratio, Liquid ratio and Absolute liquid ratio; Solvency ratios: Debt equity ratio, Proprietary ratio and Capital gearing ratio - Earning per share and return on capital employed; Profitability ratios: Gross profit ratio - Net profit ratio – Operating ratio, and Operating profit ratio. Turnover ratios: Inventory turnover ratio - Debtors turnover ratio Debt collection period - Creditors turnover ratio -Debt payment period, Assets turnover ratio, Earnings per share and Price Earnings Ratio. Problems on Ratio Analysis - Preparation of financial statements with the help of Accounting Ratios.	
Module No. 4: Cashflow Analysis	**12**
Introduction- Meaning and Definition, Merits and Demerits, differences between Fund flow and cash flow statements. Provisions of Ind AS 7. Procedure of cash flow statement Concept of cash and cash equivalent. Classification of Cash flows, Preparation of cashflow statement as per Ind AS 7 (Indirect method only). Problems.	
Module No. 5: Management Audit & Reports on Management	**08**
Introduction – Meaning –Nature – Scope - Importance – Need - Objectives of management audit - Differences between Financial Audit and Management Audit - Steps involved in Management Audit. Reports on Management Review and Governance: Introduction - Report of Board of Directors - Management discussion analysis- Annual Report on CSR –	

Business Responsibility Report – Corporate Governance Report – Secretarial Audit Report.

Skill Development Activities:

1. Meet Management accountant and discuss his role in decision making in an Enterprise.
2. Collect financial statements of any one corporate entity for two year and prepare a comparative statement and analyse the financial position.
3. Collect financial statements of any one corporate entity, analyse the same by using ratio analysis.
4. Prepare a cash flow statement
5. Meet the management accountant, discuss the steps involved in management audit.
6. Collect reports of any two corporates, analyse the management review and governance of the same.
7. Any other activities, which are relevant to the course.

Books for Reference:

1. Study Materials of ICAI on Management Accounting (Updated)
2. Study Materials of ICMAI on Management Accounting
3. Charles T. Horngren, Gary L. Sundem, Dave Burgstahler, Jeff O. Schatzberg, Introduction to Management Accounting, Pearson Education.
4. B Mariyappa Management Accounting Himalaya Publishing House New Delhi
5. Khan, M.Y. and Jain, P.K. Management Accounting. McGraw Hill Education.
6. Arora, M.N. Management Accounting, Vikas Publishing House, New Delhi
7. Maheshwari, S.N. and S.N. Mittal, Management Accounting. Shree Mahavir Book Depot, New Delhi.

Note: Latest edition of text books may be used.

Name of the Programme: Bachelor of Commerce (B.Com)
Course Code: COM A2
Name of the Course: Indian Accounting Standards-2

Course Credits	No. of Hours per Week	Total No of Teaching Hours
3 Credits	**3 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the preparation of consolidated financial statements as per Ind AS
b) Learn the disclosures in the financial statements
c) Understand the latest provisions of measurement-based accounting policies.
d) Comprehend the Accounting and Reporting of Financial Instruments
e) Analyse the Revenue based accounting standard.

Syllabus	Hours
Module-1 Consolidated Financial Statement (Ind AS 110)	**9**
Meaning and Definition- Holding Company and Subsidiary Company, Steps in Preparation of consolidated Financial Statements, Capital profit, Revenue profit, Non-controlling Interest and Goodwill or Capital Reserve and Unreleased profit, and mutual indebtedness. Problems on Preparation of Consolidated Balance Sheet.	
Module No. 2 Disclosures in the Financial Statements	**9**
Employee benefits (Ind AS 19) Earnings per Share (Ind AS 33) Lease (Ind AS 116), Interim Financial Reporting (Ind AS 34) Share-based Payment (Ind AS 102).	
Module No. 3 Measurement Based on Accounting Policies	**9**
Accounting Policies, Changes in Accounting Estimates and Errors (Ind AS 8), First time adoption of Ind AS (Ind As 101), Accounting for Government Grants and Disclosure of Government Assistance ((Ind AS 20)) and Share Based Payment (Ind AS 102)	
Module No. 4 Accounting and Reporting of Financial Instruments	**9**
Presentation of Financial Instruments (Ind AS 32) – Meaning, Financial Assets, Financial Liabilities - Presentation Recognition and Measurement of financial Instruments (Ind AS 39) – Initial and Subsequent Recognition and measurement of Financial Assets and Financial Liabilities, Derecognition of Financial Assets and Financial Liabilities- Disclosures of Financial Instruments (Ind AS 107)	
Module No. 5 Revenue based accounting standard.	**9**
Revenue from Contracts with Customers (Ind AS 115), Fair Value Measurement (Ind AS 113) Contract, Practical Provisions and problems on the above standards.	

Skill Development Activities:

1. Prepare consolidated Balance sheet with imaginary figures.
2. Make a list of Indian Accounting Standards
3. Make disclosures of any five Indian Accounting Standards.
4. Study the compliance with the requirements of Indian Accounting standards as disclosed in the Notes to Accounts in Annual Reports.

Books for Reference:

1. Study material of the Institute of Chartered Accountants of India
2. Anil Kumar, Rajesh Kumar and Mariyappa, Indian Accounting Standards, HPH
3. Miriyala, Ravikanth, Indian Accounting Standards Made Easy, Commercial Law Publishers
4. Dr.A.L.Saini IFRS for India, , Snow white publications.
5. CA Shibarama Tripathy Roadmap to IFRS and Indian Accounting Standards
6. Ghosh T P, IFRS for Finance Executives Taxman Allied Services Private Limited.

Note: Latest edition of text books may be used

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM F2

Name of the Course: Investment Management

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	3 Hrs	45 Hrs

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the concept of investments, its features and various instruments.
b) Comprehend the functioning of secondary market in India.
c) Underline the concept of risk and return and their relevance in purchasing and selling of securities.
d) Illustrate the valuation of securities and finding out the values for purchase and sale of securities.
e) Demonstrate the fundamental analysis to analyse the company for purchase and sale of securities and technical analysis for trading in the share market.

Syllabus:	Hours
Module No. 1: Concept of Investment	**07**
Introduction - Investment: Attributes, Economic vs. Financial Investment, Investment and speculation, Features of a good investment, Investment Process. Financial Instruments: Money Market Instruments, Capital Market Instruments. Derivatives.	
Module No. 2: Fundamental Analysis	**12**
Fundamental analysis-EIC Frame Work, Global Economy, Domestic Economy, Business Cycles, Industry Analysis and Company Analysis. Valuation of securities: Valuation of Bonds and debentures and preference shares, equity shares- no growth rate, normal growth rate and super normal growth rate.	
Module No. 3:Risk & Return	**10**
Risk and Return Concepts: Concept of Risk, Types of Risk- Systematic risk, Unsystematic risk, Calculation of Risk and returns. Portfolio Risk and Return: Expected returns of a portfolio, Calculation of Portfolio Risk and Return.	
Module No. 4 Technical Analysis	**08**
Technical Analysis – Concept, Theories- Dow Theory, Eliot wave theory. Charts-Types, Trend and Trend Reversal Patterns. Mathematical Indicators – Moving averages, ROC, RSI, and Market Indicators - Market Efficiency and Behavioural Finance: Random walk and Efficient Market Hypothesis, Forms of Market Efficiency, Empirical test for different forms of market efficiency	
Module No. 5: Portfolio Management	**8**
Portfolio Management: Meaning, Need, Objectives, process of Portfolio management, Selection of securities and Portfolio analysis. Construction of optimal portfolio using Sharpe's Single Index Model. Portfolio Performance evaluation (Theory only).	

Skill Developments Activities:

1. Collect and compare the data on financial instruments selected for investment from any five investors.
2. Open Demat account, learn how to trade in stock market and submit the report on prospectus and challenges of stock trading.
3. Discuss with investors on systematic and unsystematic risk analysis, submit report on the same.
4. Calculate the intrinsic value of any five bonds listed on BSE / NSE, making necessary assumptions.

5. Summarise the parameters of 'Economy Analysis' of any five countries and give your inference.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. Bodie ZVI, Kane Alex, Marcus J Alan and Mohanty Pitabas., Investments, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. Sharpe F. William, Alexander J Gordon and Bailey V Jeffery, Investments, Prentice Hall of India Private Limited, New Delhi.
3. Fischer E Donald and Jordan J Ronald., Security Analysis and Portfolio Management, Prentice Hall of India Private Limited, New Delhi.
4. Kevin S., Portfolio Management, PHI, New Delhi.
5. Punithavathy Pandian, Security Analysis and Portfolio Management, Vikas Publishing House Private Limited, New Delhi.
6. Prasanna Chandra, Investment Analysis and Portfolio Management, Tata McGraw Hill Publishing Company Limited, New Delhi.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM H2

Name of the Course: Cultural Diversity at Work Place

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**3 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand, interpret question reflect upon and engage with the notion of "diversity".
b) Recall the cultural diversity at work place in an organization.
c) Support the business case for workforce diversity and inclusion.
d) Identify diversity and work respecting cross cultural environment.
e) Assess contemporary organizational strategies for managing workforce diversity and inclusion.

Syllabus:	**Hours**
Module No. 1: Introduction to Diversity	**10**
Introduction to cultural diversity in organizations, Evolution of Diversity Management, Over View of Diversity, Advantages of Diversity, Identifying characteristics of diversity, Scope-Challenges and issues in diversity management, Understanding the nature of Diversity – Cultural Diversity – Global Organizations- Global Diversity.	
Module No. 2: Exploring Differences	**08**
Introduction -Exploring our and others' differences, including sources of our identity. Difference and power: Concepts of prejudice, discrimination, dehumanization and oppression.	
Module No. 3: Visions of Diversity and Cross Cultural Management	**10**
Models and visions of diversity in society and organizations: Justice, fairness, and group and individual differences. Cross-Cultural Management: Meaning and Concepts, Frameworks in Cross-Cultural Management: Kluckhohn and Strodtbeck framework, Hofstede's Cultural Dimensions, Trompenaar's Dimensions, Schwartz Value Survey, GLOBE study.	
Module No. 4: Skills and Competencies	**08**
Skills and competencies for multicultural teams and workplaces/ Organizational assessment and change for diversity and inclusion, Diversity Strategies. Creating Multicultural Organisations.	
Module 5: Recent Trends in Diversity Management	**09**
Emerging workforce trends–Dual-career couples–Cultural issues in international working on work-life balance–Managing multi-cultural teams: Issues and challenges, Global demographic trends: Impact on diversity management, Social psychological perspective on workforce diversity, Diversity Management in IT organizations Contemporary Issues in Workplace Diversity.	

Skill Development Activities:

1. Visit any MNCs, identify and report on the cultural diversity in an organization.
2. Interact and List out the ways in which dehumanization done in public/ private sector organization.

3. Interact with HR Manager of any MNCs, explore and report on cross cultural management.
4. Explore the benefits of multi-cultural organizations.
5. Examine and report on diversity management in select IT organizations.
6. Any other activities, which are relevant to the course.

Books for Reference:

1. Bell, M.P. (2012). Diversity in organizations (2nd Ed.). Mason, OH: Cengage.
2. Harvey, C.P. & Allard, M.J. (2015). Understanding and managing diversity: Readings, cases, and exercises (6th Ed.). Upper Saddle River, NJ: Pearson.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM I2
Name of the Course: Human Resource Analytics

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**3 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

a) Course Outcomes: On successful completion of the course, the students' will be able to

b) Understand the role of Analytics in Human Resource.
c) Identify a list of HR metrics relevant to an organization's mission or goals.
d) Apply best practices for using HR analytics to support making data-driven decisions.
e) Demonstrate the use of Analytical techniques to analyse and interpret HR data

Syllabus:	**Hours**
Module No. 1: HR Decision-making and HR Analytics	**10**
Introduction – HR decision making – importance and significance of HR analytics – benefits of HR analytics – Steps to implement HR analytics – HR analytics and changing role of HR managers – aligning human resources to business through HR analytics – HR analytics framework and models – LAMP Framework.	
Module No. 2: HR Business Process and HR Analytics	**08**
Statistics and statistical modelling for HR research and HR decision-making – HR research tools and techniques – data analysis for human resources – parametric and non- parametric tests- HRIS for HR decision-making – HR metrics – recruitment metrics – metrics for training and development function – HR scorecard – HR dashboard	
Module No. 3: Forecasting and Measuring HR value propositions with HR analytics	**07**
Value proposition and HR decisions – Sustainability in HR decisions – HR optimization through analytics – Predictive HR analytics	
Module No. 4: HR analytics and Data	**12**
HR data and data quality – data collection – big data for human resources – transforming HR data into HR information – HR reporting – HR report visualization – performing root cause analysis – datafication of human resources, Excel exercises: Preparing to Build Your Balanced Scorecard, Developing Executive and Operational Dashboards, Pivotal Talent Pools with High Rates of Voluntary Turnover: Voluntary Turnover, Involuntary Turnover, For-Cause Dismissals, and Layoffs	
Module 5: HR Analytics and Predictive Modelling	**08**
Different phases of HR analytics and predictive modelling – data and information for HR predictive analysis – software solutions – predictive analytics tools and techniques – understanding future human resources.	

Skill Development Activities:
Course teacher can identify and give the skill development activities.

Books for Reference:

1. Dipak Kumar Bhattacharya, HR Analytics: Understanding Theories and Applications, SAGE publications, 2017
2. Ron Person, Balanced Scorecards & Operational Dashboards with Microsoft Excel, Wiley Publications.

3. Jac Fitz-enz, The New HR Analytics- Predicting the Economic Value of Your Company's Human Capital Investments, AMACOM.
4. Jac Fitz-enz ,John R. Mattox II, Predictive Analytics for Human Resources, Wiley & SAS Business Series.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM .M2

Name of the Course: Customer Relationship Management

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**3 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the s'tudents will be able to

a) To be aware of the nuances of customer relationship.
b) To analyze the CRM link with the other aspects of marketing.
c) To impart the basic knowledge of the Role of CRM in increasing the sales of the company.
d) To make the students aware of the different CRM models in service industry.
e) To make the students aware and analyze the different issues in CRM

Syllabus:	**Hours**
Module No. 1: Evolution of Customer Relationship	**10**
Introduction - CRM- Definition, Emergence of CRM Practice, Factors responsible for CRM growth, CRM process, framework of CRM, Benefits of CRM, Types of CRM, Scope of CRM, Customer Profitability, Features Trends in CRM , CRM and Cost-Benefit Analysis, CRM and Relationship Marketing.	
Module No. 2: CRM Concepts	**10**
Introduction - Customer Value, Customer Expectation, Customer Satisfaction, Customer Centricity, Customer Acquisition, Customer Retention, Customer Loyalty, Customer Lifetime Value. Customer Experience Management, Customer Profitability, Enterprise Marketing Management, Customer Satisfaction Measurements, Web based Customer Support.	
Module No. 3: **Planning for CRM**	**08**
Introduction -Steps in Planning-Building Customer Centricity, Setting CRM Objectives, Defining Data Requirements, Planning Desired Outputs, Relevant issues while planning the Outputs, Elements of CRM plan, CRM Strategy: The Strategy Development Process, Customer Strategy Grid.	
Module No. 4: CRM and Marketing Strategy	**07**
Introduction **-** CRM Marketing Initiatives, Sales Force Automation, Campaign Management, Call Centres. Practice of CRM: CRM in Consumer Markets, CRM in Services Sector, CRM in Mass Markets, CRM in Manufacturing Sector.	
Module 5: CRM Planning and Implementation	**10**
Introduction - Issues and Problems in implementing CRM, Information Technology tools in CRM, Challenges of CRM Implementation. CRM Implementation Roadmap, Road Map (RM) Performance: Measuring CRM performance, CRM Metrics.	

Skill Development Activities:

1. Visit any bank, identify and note customer relationship management by banker.
2. Conduct online survey on customer satisfaction of insurance products of any company.
3. Visit any telecommunication retail service outlet, discuss CRM related aspects with CRM manager.
4. Discuss from any five call centre employees on how their work helps to maintain customer relationship.

6. Prepare report how technology impacts on CRM.
7. Any other activities, which are relevant to the course.

Books for Reference:

1. Francis Buttle, Stan Maklan, Customer Relationship Management: Concepts and Technologies, 3rd edition, Routledge Publishers, 2015
2. Kumar, V., Reinartz, Werner Customer Relationship Management Concept, Strategy and Tools, 1st edition, Springer Texts, 2014.
3. Jagdish N.Sheth, Atul Parvatiyar & G.Shainesh, "Customer Relationship Management", Emerging Concepts, Tools and Application", 2010, TMH
4. Dilip Soman & Sara N-Marandi," Managing Customer Value" 1st edition, 2014, Cambridge.
5. Alok Kumar Rai, "Customer Relationship Management: Concepts and Cases", 2008, PHI.
6. Ken Burnett, the Handbook of Key "Customer Relationship Management", 2010, PearsonEducation.
7. Mukesh Chaturvedi, Abinav Chaturvedi, "Customer Relationship Management- An Indian Perspective", 2010 Excel Books, 2nd edition

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)

Course Code: COM 6.6

Name of the Course: Assessment of Persons other than Individuals and Filing of ITRs

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	**(2+0+2) 4 Hrs**	**45 Hrs**

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand the calculation of Depreciation and allowance
b) Comprehend the assessment of partnership Firms and determine the tax liability.
c) Comprehend the assessment of corporate entities and determine the tax liability.
d) Equip with understanding of intensive knowledge on analysis of all forms of ITR Forms along with the Overview ITR Forms and e-filing.

Syllabus:	**Hours**
Module No. 1: Depreciation and Investment Allowance	**08**
Introduction-Meaning of Depreciation, Important points regarding depreciation, Conditions for allowance of Depreciation, Assets eligible for depreciation, important terms for computation of depreciation allowance. Problems.	
Module No. 2: Assessment of Partnership firms	**10**
Definition of Partnership, Firm and Partners – Assessment of Firms (Section 184) – Computation of Firm's Business Income – Treatment of Interest, Commission, Remuneration received by partners (Sec 40b). Presumptive taxation (44AD) Problems on Computation of total income and tax liability of firms (Use of available software package for computation of tax liability, Related Forms and Challans)	
sModule No. 3: Assessment of Companies.	**10**
Introduction-Meaning and Definition of Company-Types of Companies under Income tax Act -– Problems on computation of total income of companies- Including Minimum Alternate Tax (115JB) Applicable Deductions u/s 80IA, 80IB, 80IC, 80G - Problems on Computation of Tax Liability (Use of Software Package-Quick Books/ Electro com)	
Module No. 4: Tax Under E-Environment	**12**
Filing of Income tax returns (ITR) – Types income tax return forms- benefit of filing ITR- different sections of ITR returns- document required to filing ITR –form 26AS significance returns-Advance Tax Sections-Tax Deducted at Source (TDS)- online payment of tax- problems on Advance Tax and TDS.] E-filing of return on Income Tax Portal , Verification of ITR..	
Module No. 5: Case laws and Amendments	**05**
Introduction - Recent Amendments in Filing of Returns as per Finance Bill; Recent Case Laws for guidance. Depute the students at least two weeks to any Audit Firm to learn practically the filing of Returns of various kinds of assesses. Like individuals, Firms and Companies.	

Skill Development Activities:

1) Prepare a chart showing rates of depreciation for different assets.
2) Calculate the Eligible Remuneration to working partners as per Income tax rules with imaginary figures.
3) Narrate the procedure for calculation of Book Profit.

4) Students should able to e-file and understand ITR forms.
5) Any other activities, which are relevant to the course

Books for Reference:

1. Vinod K Singhania – "Direct Taxes - Law and Practice", Taxmann Publications
2. H C Mehrotra and Goyal, "Direct Taxes", Sahitya Bhavan Publications
3. Gaur and Narang ; Direct Taxes, Kalyani Publishers
4. Rajiva S. Mishra –Direct & Indirect Tax 5. Santhil & Santhil : Business taxation.
5. B.Mariyappa Business Tax Himalaya Publication House. New Delhi.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Commerce (B.Com.)
Course Code: COM 6.6 (B)
Name of the Course: E-Commerce

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	(2+0+2) 4 Hrs	45 Hrs

Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

j) Comprehend the concepts of E-commerce
k) Understand the e-retailing benefits and key success factors
l) Analyse the benefits of EDI
m) To understand Cyber security
n) Know the Issues in E-commerce.

Syllabus:	Hours
Module No. 1: E-commerce and its Technological Aspects	**08**

Overview of developments in Information Technology and Defining E-Commerce: The scope of E-commerce, Electronic Market, Electronic Data Interchange, Internet Commerce, Benefits and limitations of E-Commerce, Produce a generic framework for E-Commerce, Architectural framework of Electronic Commerce, Web based E-Commerce Architecture.
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Module No. 2: Consumer Oriented E Commerce	**10**

E-Retailing, Traditional retailing and e-retailing, Benefits of e-retailing, Key success factors, Models of e-retailing, Features of e-retailing. e-services: Categories of e-services, Web-enabled services, matchmaking services, Information-selling on the web, e-entertainment, Auctions and other specialized services. Business to Business Electronic Commerce.

Module No. 3: Electronic Data Interchange:	**10**

Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used, Electronic Fund Transfer and secure electronic transaction protocol for credit card payment. Digital economy: Identify the methods of payments on the net – Electronic Cash,cheque and credit cards on the Internet.

Module No. 4: Security in E Commerce Threats in Computer Systems:	**08**

Virus, Cyber Crime Network Security: Encryption, Protecting Web server with a Firewall, Firewall and the Security Policy, Network Firewalls and Application Firewalls, Proxy Server.	
Module No. 5: Issues in E-Commerce	**09**
Understanding Ethical, Social and Political issues in E-Commerce: A model for Organizing the issues, Basic Ethical Concepts, Analyzing Ethical Dilemmas, Candidate Ethical Principles Privacy and Information Rights: Information collected at E-Commerce Websites, The Concept of Privacy, Legal protections Intellectual Property Rights: Types of Intellectual Property Protection, Governance.	

1	Dr. M. Ramachandra Gowda (9448008278) Vice Chancellor, Rani Channamma University, Belagavi.	Chairman
2	Dr. H. Rajashekar (9448754039) Professor, University of Mysore, Mysuru	Member
3	Dr. R.L. Hyderabad (9448935151) Professor, Karnatak University, Dharwad.	Member
4	Dr. Vijay Boothpur Professor, Gulbarga University, Kalaburgi	Member
5	Dr. P. Eshwar Professor, Mangalore University, Konaje	Member
6	Dr. Sudarshan Reddy, (9449520923), Professor, Tumkur University, Tumakuru.	Member
7	Dr. S.B. Kamashetty (9448892024) Professor, KSAW University, Vijayapura	Member
8	Dr. H. Y. Kamble (9448107161) Professor, Rani Channamma University, Vijayapura	Member
9	Dr. Anitha H.S. (9845559557) Professor, Davanagere University, Davanagere.	Member
10	Dr. B.G. Bhaskar Principal, Vivekananda Degree College, Bengaluru	Member
11	Dr. M. Jayappa Rtd.Principal, RBAMS College, Bangalore.	Member
12	Dr. R. Parvathi (9844232545) Principal, VET FGC, Bengaluru	Member
13	Dr. Sumangala Naik (9740571664) Assoc. Professor, GFGC, Honnavara.	Member
14	Shri Amberappa M. (8792658857) Assoc. Professor, GFGC, Bidar	Member
15	Dr. C. Nagaraju, Principal, Shanthi Arts, Science & Commerce College, Malavalli,	Member
16	Dr. K.V. Suresh Principal, JSS Women's College, Mysuru	Member
17	Dr. Lakshmish (9480467605) Principal, LB & SBS College, Sagara, Shimoga Dist.	Member
18	Dr. M. Jayappa, Special Officer, KSHEC,	Convenor

Program Name	**B.Sc.**		**SEMESTER**	**V**
Course Title	**NON-CHORDATES AND ECONOMIC ZOOLOGY (Theory)**			
Course Code:	**ZOO C11-T**		No. of Credits	**4**
Contact hours	**60 Hrs.**		Duration of SEA/Exam	**2 Hrs.**
Formative assessment marks		**40**	Summative assessment marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Group the animals on the basis of their morphological characteristics/ structures.
- Demonstrate comprehensive identification abilities of Non-Chordate diversity.
- Explain structural and functional diversity of Non-Chordates.
- Develop understanding on the diversity of life with regard to protists, nonchordates and chordates.
- Examine the diversity and evolutionary history of a taxon through the construction of a basic phylogenetic/ cladistics tree.

UNIT – I: **15 Hrs.**

An overview of Invertebrate classifications up to the order; Protozoa**:** *Paramecium* -Morphology and Reproduction: Asexual- binary fission, Sexual-conjugation (endomixis, autogamy, cytogamy); Porifera: *Sycon* – Morphology and *Canal* System; Coelenterata : *Obelia* - Morphology and Reproduction (Polymorphism). Ctenophora : Salient features with an example ; Platyhelminthes : *Taenia solium* - Morphology and Life cycle ; Nemathelminthes : *Ascaris lumbricoides* - Morphology and life cycle .

UNIT – II: **15 Hrs.**

Ctenophora : Salient features with an example ; Platyhelminthes : *Taenia solium* - Morphology and Life cycle ; Nemathelminthes : *Ascaris lumbricoides* - Morphology and life cycle; Annelida: Characteristics and classification: *Hirudinaria* (Leech) - Morphology and Reproduction;

UNIT – III:

15 Hrs.

Arthropoda : Characteristics and classification : *Palaemon* (Prawn) - Morphology, Appendages, Nervous System and Reproduction; Mollusca: Characteristics and classification: *Pila* - Morphology, Shell , Respiratory system , Nervous System and Reproduction; Echinodermata **:** Characteristics and classification **:** *Asterias* - Morphology and Water vascular system.

UNIT – IV: **15 Hrs.**

Economic Zoology**:** Life cycle and control of pests - Gundhi bug, Sugarcane leafhopper, Termites, Rodents ; Mosquito life cycle and control; Bio-culture **:** Lac-culture - techniques and applications; Vermi-culture - techniques and its applications; Apiculture -Types and applications; Aquaculture – techniques and applications; Poultry- housing management and applications; Dairy farming- cattle breeds, diary management.

References	
1	Barnes, R.S.K.; Calow,P.; Olive, P.J.W.; Golding, D.W.; Spicer, J.I.(2002) The Invertebrates: Synthesis, Blackwell Publishing.
2	Hickman,C.; Roberts,L.S.; Keen,S.L.; Larson, A. and Eisenhour, D. (2018) Animal Diversity, McGraw-Hill.
3	Holland, P. (2011) The Animal Kingdom: A Very Short Introduction, Oxford University Press.
4	Kardong, K.V. (2006) Vertebrates: Comparative Anatomy, Function, Evolution (4^{th} edition), McGraw-Hill.
5	Barrington, E.J.W. (1979) Invertebrate Structure and Functions. II Edition. E.L.B.S. and Nelson.
6	Boradale, L.A. and Potts, E.A. (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7	Bushbaum, R. (1964) Animals without Backbones. University of Chicago Press.

SCHEME OF THEORY EXAMINATION
B.Sc. Zoology V Semester

Course Title/Code: ZOO C11- T : NON-CHORDATES AND ECONOMIC ZOOLOGY

Duration: 2 Hours **Max. Marks: 60**

PART - A

Q-I. Answer any **SIX** questions out of **EIGHT** questions (**2 questions from each Unit**) (**6 x2) = 12**

PART - B

Q-II. Answer any **TWO** questions out of **THREE** questions (**From Unit-I)** (**2 x 3) = 06**
Q-III. Answer any **ONE** question out of **TWO** questions (**From Unit-I**) **(1 x 6) = 06**

Q-IV. Answer any **TWO** questions out of **THREE** questions (**From Unit-II)** (**2 x 3) = 06**
Q-V. Answer any **ONE** question out of **TWO** questions (**From Unit-II**) **(1 x 6) = 06**

Q-VI. Answer any **TWO** questions out of **THREE** questions (**From Unit-III)** (**2 x 3) = 06**
Q-VII. Answer any **ONE** question out of **TWO** questions (**From Unit-III**) **(1 x 6) = 06**

Q-VIII. Answer any **TWO** questions out of **THREE** questions (**From Unit-IV)** (**2 x 3) = 06**
Q-IX. Answer any **ONE** question out of **TWO** questions (**From Unit-IV**) **(1 x 6) = 06**

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
House Examination/Test	20
Written Assessment/ Presentation/Project/Term papers/Seminars	15
Class room Performance/Participation	05
TOTAL	**40**
Formative Assessment as per NEP guidelines are compulsory	

Course Title	**NON-CHORDATES AND ECONOMIC ZOOLOGY (Practical)**		
Course Code:	**ZOO C12-P**	Practical Credits	**2**
Contact hours	**4 Hours/Week**	Duration of Practical Exam.	**3 Hrs.**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

Course Outcomes (COs): At the end of the course the student should be able to:

- Understand the basics of classification of non-chordates.
- Learn the diversity of habit and habitat of these species.
- Develop the skills to identify different classes and species of animals.
- Know uniqueness of a particular animal and its importance.
- Enhancement of basic laboratory skill like keen observation and drawing.

PRACTICALS **15x4=60 (4Hrs/week)**

1. Preparation and observation of protozoan culture.
2. Protozoa: Systematics of *Amoeba*, *Euglena*, *Noctiluca*, *Paramecium* and *Vorticella* (Permanent slides).
3. Porifera**:** Systematics of *Sycon, Euplectella, Hyalonema, Spongilla* and *Euspongia* (Specimens). Study of permanent slides of T.S of *Sycon*, spicules and gemmules.
4. Cnidaria: Systematics of *Aurelia* and *Metridium* (Specimens). Slides of *Hydra*, *Obelia*-polyp and medusa, and *Ephyra* larva, T.S. of *Metridium* passing through mesenteries.
5. Study of Corals- *Astraea, Fungia, Meandrina, Corallium, Gorgonia, Millepora* and *Pennatula.*
6. Helminthes**:** Systematics of *Planaria*, *Fasciola hepatica* and *Taenia solium*, *Ascaris*- Male and female (Specimens). Slides of T.S. of *Planaria*, T.S of male and female *Ascaris*.
7. Annelida: Systematics of *Nereis, Heteronereis, Sabella, Aphrodite* (Specimens). Slide of T.S. of Earth worm through typhlosole.
8. Arthropoda: Systematics of *Penaeus, Palaemon, Astracus,* Scorpion, Spider, *Limulus, Peripatus, Millipede, Centipede,* Praying mantis, Termite Queen, Moth, Butterfly, Dung beetle/Rhinocerous beetle (Any six specimens). Slide of Larvae- Nauplius, Zoea, Mysis.
9. Mollusca**:** Systematics of *Chiton, Mytilus, Aplysia, Pila, Octopus, Sepia* (Specimens) and Glochidium larva (Slide).Shell Pattern- *Unio, Ostrea, Cypria, Murex, Nautilus, Patella, Dentalium,* Cuttle bone.
10. Echinodermata: Systematics of Sea star, Brittle star, Sea Urchin, Sea cucumber, Sea lilly (Specimens). Slides of Bipinnaria larva, Echinopluteus larva and Pedicellaria.

11. Harmful Non chordates**:** Soil Nematodes. Agricultural, veterinary and human pests / vectors o f Arachnida and Arthropoda – Mosquito, Lice , Mites .

12. Beneficial Non chordates**:** *Bombyx mori*,: Life cycle - Cocoon, Raw silk. Uzi fly; Study on - any two species of honey bee and bee wax; Pearl Oyster and Natural Pearls.

13. Indian Poultry breeds and Cattle breeds (Any three).

14. Virtual Dissection/Cultured specimens**:** Earthworm – Nervous system, Leech- Digestive system.

15. Virtual Dissection/Cultured specimens: Prawn **-** Nervous system; Cockroach- Salivary apparatus and Digestive system

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SCHEME OF PRACTICAL EXAMINATION
B.Sc. Zoology: V Semester
Course Title/Code: ZOO C12 P: NON-CHORDATES AND ECONOMIC ZOOLOGY

Duration: 3 hours **Max. Marks: 25**

Q I. Dissect and display the organ system of available cultured specimens provided and comment. **(4+2) = 06**

OR

Virtual dissection (Two specimens) - Identify, draw labelled diagram and comment on the flagged systems (Identification of the system - ½ mark; Identification of the flagged part - ½ mark; Labelled diagram of the entire system - 1 marks; Description of flagged part -1 mark) **(3+3) = 06**

Q II. Identify with systematics, draw labelled diagram and comment (**A- C**). (1 slide, 2 specimens). (Identification -½ mark; Systematics -½ mark; Labelled diagram -1 mark; Comments -1 mark) (**3x3) = 09**

Q III. Identify and comment on the economic importance (**D and E**). (D- Harmful Non chordates; E-Beneficial non chordates/ Breeds) (Identification-1, Economic importance-1.5 marks) (**2.5x2)= 05**

Q IV. Record and Viva voce **05**

Pedagogy: Lectures, Presentations, Videos, Assignments and Weekly Formative Assessment Tests

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
House Examination/Test	10
Project/Model submission	05
Class room Performance/Participation	05
Record writing & timely submission	05
Total	**25**
Formative Assessment as per NEP guidelines are compulsory	

Program Name	**B.Sc.**	**SEMESTER**	**V**
Course Title	**CHORDATES AND COMPARATIVE ANATOMY (Theory)**		
Course Code	**ZOO C13-T**	No. of Credits	**4**
Contact hours	**60 Hrs.**	Duration of SEA/Exam	**2 Hrs.**
Formative assessment marks	**40**	Summative assessment marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Demonstrate comprehensive identification abilities of chordate diversity
- Explain structural and functional diversity of chordate diversity
- Understand evolutionary relationship amongst chordates
- Take up research in biological sciences.
- Realize that very similar physiological mechanisms are used in very diverse organisms.
- Get a flavour of research by working on project besides improving their writing skills. It will further enable the students to think and interpret individually.

UNIT – I: **15 Hrs.**

Hemichordata: *Balanoglossus* –Habitat and Habit ; morphology; Coelom; Tornaria larva and its affinities; Affinities and systematic position of Hemichordata; Chordata: Origin of Chordates; Basic characters of chordates and classification up to classes; Urochordata : *Herdmania*- Habitat and Habit ; Morphology; Ascidian tadpole- structure and retrogressive metamorphosis. Cephalochordata: *Branchiostoma* (*Amphioxus*)- Habitat and Habit; Morphology; Digestive system; Feeding mechanism; Excretory and Circulatory system; Agnatha : General characters of *Agnatha* and classification up to classes; Salient features of *Cyclostomata* and *Ostracodermi* with examples. *Ammocoete* larva and its significance.

UNIT – II: **15 Hrs.**

Vertebrates**:** General characters and Classification of different classes of Vertebrates (*Pisces*-up to classes, *Amphibia*-up to orders, *Reptilia* up to orders, *Aves*-up to super orders, *Mammalia* up to subclass) citing examples (living orders only); General characters and comparison of *Chondrichthyes* and *Osteichthyes*; Interesting features and evolutionary significance of *Dipnoi*; Salient features of *Placodermi* with examples; Interesting features of *Sphenodon*, crocodile and *Archaeopteryx* ; Salient features of *Ratitae* and *Carinatae* with examples.Interesting features of mammalian orders (*Insectivora, Carnivora, Chiroptera, Cetacea, Proboscidia, Ungulata – Perissodactyla* and *Artiodactyla* and *Primates –Platyrhini* and *Catarhini*) with examples.

UNIT – III: **15 Hrs.**

General account of Chordates: Types of caudal fins, scales and swim bladder in fishes; Origin of Amphibia; Neoteny and Paedogenesis in Amphibians; Parental care in Pisces and Amphibians; Adaptive radiation in extinct reptiles with suitable examples; Temporal fossae in reptiles; Distinguishing poisonous from non-poisonous snakes; Poison apparatus and biting mechanism in snakes; Flight adaptations in birds; Dentition in mammals; Evolution of molar tooth; Migration in fishes -catadromous and anadromous with suitable example; Bird migration-types with example; Echolocation in mammal .

UNIT – IV: **15 Hrs.**

Integumentary System: Structure of skin and its derivatives; **Skeletal System :** Comparative account of Axial Skeletal system in vertebrates- Skull- Amphibian (Frog), Reptiles (Lizard), Aves (Pigeon) and Mammals (Man); Comparative account of Appendicular skeletal system in vertebrates-Pectoral and Pelvic girdles of Amphibian (Frog), Reptiles (Lizard), Aves (Pigeon) and Mammals (Man); **Respiratory system ;** Comparative account of respiratory system in vertebrates: Pisces (Scolidon), Amphibian (Frog), Reptiles (Lizard), Aves (Pigeon) and Mammals (Man). **Circulatory System : C**omparative account of heart and aortic arches in vertebrates: Pisces (Scoliodon), Amphibian (Frog), Reptiles (Lizard), Aves (Pigeon) and Mammals (Man); **Excretory System:** Succession of kidney in vertebrates; **Nervous system :** Comparative account of brain in vertebrates: Pisces (Scoliodon), Amphibian (Frog), Reptiles (Lizard), Aves (Pigeon) and Mammals (Man).

REFERENCES

1	Colbert *et al*: Colbert's Evolution of the Vertebrates: A history of the back boned animals through time. (5th edition 2002, Wiley-Liss).
2	Hildebrand: Analysis of vertebrate Structure (4th ed 1995, John Wiley)
3	Kenneth V. Kardong (20015) vertebrates: Comparative Anatomy, Function, Evolution McGraw Hill
4	McFarland *et al.,*: Vertebrate Life (1979, Macmillan publishing)
5	Parker and Haswell: Text Book of Zoology, Vol. II (1978, ELBS)
6	Romer and Parsons: The Vertebrate Body (6th ed 1986, CBS Publishing Japan)
7	Young: The Life of vertebrates (3rded 2006, ELBS/Oxford)
8	Weichert C.K. and William Presch (1970). Elements of Chordate Anatomy, Tata McGraw Hills

SCHEME OF THEORY EXAMINATION
B.Sc. Zoology V Semester

Course Title/Code: ZOO C13- T: CHORDATES AND COMPARATIVE ANATOMY

Duration: 2 Hours **Max. Marks: 60**

PART - A

Q-I. Answer any **SIX** questions out of **EIGHT** questions (**2 questions from each Unit**) (**6 x2) = 12**

PART - B

Q-II. Answer any **TWO** questions out of **THREE** questions (**From Unit-I)** (**2 x 3) = 06**
Q-III. Answer any **ONE** question out of **TWO** questions (**From Unit-I**) **(1 x 6) = 06**

Q-IV. Answer any **TWO** questions out of **THREE** questions (**From Unit-II)** (**2 x 3) = 06**
Q-V. Answer any **ONE** question out of **TWO** questions (**From Unit-II**) **(1 x 6) = 06**

Q-VI. Answer any **TWO** questions out of **THREE** questions (**From Unit-III)** (**2 x 3) = 06**
Q-VII. Answer any **ONE** question out of **TWO** questions (**From Unit-III**) **(1 x 6) = 06**

Q-VIII. Answer any **TWO** questions out of **THREE** questions (**From Unit-IV)** (**2 x 3) = 06**
Q-IX. Answer any **ONE** question out of **TWO** questions (**From Unit-IV**) **(1 x 6) = 06**

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
House Examination/Test	20
Written Assessment/ Presentation/Project/Term papers/Seminars	15
Class room Performance/Participation	05
TOTAL	**40**
Formative Assessment as per NEP guidelines are compulsory	

Course Title	**CHORDATES AND COMPARATIVE ANATOMY (Practical)**		
Course Code:	**ZOO C14 P**	Practical Credits	**2**
Contact hours	**4 Hours/Week**	Duration of Practical Exam.	**3 Hrs.**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PRACTICALS **(15x4) = 60 (4Hrs/ Week)**

1. Protochordata: *Balanoglossus* and its T. S through proboscis; Ascidian/*Herdmania* and *Amphioxus*; T.S. of *Amphioxus* through pharynx and intestine.

2. Cyclostomata: *Petromyzon*; Ammocoete larva and *Myxine.*

3. Pisces: Cartilaginous Fishes – *Narcine, Trygon, Pristis, Myolobaties* ; Bony Fishes –*Zebra fish*, *Hippocampus*, *Muraena, Ostracion, Tetradon, Pleuronectus, Diodon, Echeneis*. (Any six). Ornamental fishes: *Siamese, Koi, Oscar, Betta* sp., *Neon tetra*, *Guppies, Gold fish, Angle fish*, *Rainbow fish, Mollies* (Any four).

4. Accessory respiratory organs : *Saccobranchus, Clarias* and *Anabas.*
5. Amphibia: *Haplobatrachus* , *Bufo, Ambystoma, Axolotl larva, Necturus* and *Ichthyophis.*
6. Reptilia: *Turtle*, *Tortoise*, *Mabuya, Calotes, Chameleon*, *Varanus*. snakes –*Dryophis*, *Rat snake*, *Brahmini*, *Cobra*, *Krait*, *Russell's viper* and *Hydrophis*.

7. Aves: Beak and feet modifications in the following examples: *Duck, Crow, Sparrow, Parrot, King fisher, Eagle* or *Hawk.*.

8. Mammalia: *Mongoose, Squirrel, Pangolin, Hedge Hog, Rat, Loris* and *Bats* .

9. Virtual Dissection/Cultured specimens: Shark/Bony fish: Afferent and efferent branchial systems; glossopharyngeal and vagus nerves.
10. Virtual Dissection/Cultured specimens: Rat: Dissection (only demonstration) – Circulatory system (arterial and venous); Urinogenital system.

11. Skeletal System in man: Skull, vertebrae, girdles and limb bones (Except hands and feet).
12. Comparative account of skin in *shark, frog, calotes, pigeon* and *Man*.
13. Comparative account of heart in *shark, frog, calotes, pigeon* and *Man.*
14. Comparative account of brain in *shark, frog, calotes, pigeon* and *Man.*

SCHEME OF PRACTICAL EXAMINATION
B.Sc. Zoology: V Semester

Course Title/Code: ZOO C14-P: CHORDATES AND COMPARATIVE ANATOMY

Duration: 3 hours **Max. Marks: 25**

Q I. Dissect and display the organ system of cultured specimens provided and comment. **(4+2) = 06**

OR

Virtual Dissection (Two Specimen) - Identify, draw labelled diagram and comment on the flagged Systems (Identification of the system - ½ mark; Identification of the flagged part - ½ mark; Labelled diagram of the entire system - 1 marks; Description of flagged part -1mark) **(3+3)= 06**

Q II. Identify with systematics, draw labelled diagram and comment (**A&B**). (1 slide/ 1 specimen). (Identification - ½ mark; Systematics -½ mark; Labelled diagram -1 mark; Comments -1 mark) **(3x2)= 06**

Q III. Identify the human endoskeleton ' **C** ' with neat labelled diagram and comment. **03**
(Identification -1 mark, diagram -1 mark, comment-1 marks)

Q IV. Identify and give the comparative account of skin / heart / brain of two vertebrates (**D**) **05**
(Identification -1 mark, diagram -2 mark, comment-2 marks)

Q IV. Record and Viva voce **05**

Pedagogy: Lectures, Presentations, Videos, Assignments and Weekly Formative Assessment Tests

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
House Examination/Test	10
Project/Model submission	05
Class room Performance/Participation	05
Record writing & timely submission	05
Total	**25**
Formative Assessment as per NEP guidelines are compulsory	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark -X in the intersection cell if a course outcome addresses a particular program outcome.

Course Outcomes (COs) / Program Outcomes (POs)	**ZOO C11 T**	**ZOO C12P**	**ZOO C13T**	**ZOO C14P**
Core competency				
Critical thinking				
Analytical reasoning				
Research skills				
Team work				

Program Name	**B.Sc.**		**SEMESTER**	**VI**
Course Title	**EVOLUTIONARY & DEVELOPMENTAL BIOLOGY (Theory)**			
Course Code	**ZOO C15- T**		No. of Credits	**4**
Contact hours	**60 Hours**		Duration of SEA/Exam	**2 hours**
Formative assessment marks		**40**	Summative assessment marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Understand that by biological evolution we mean that many of the organisms that inhabit the earth today are different from those that inhabited it in the past.
- Understand that natural selection is one of several processes that can bring about evolution although it can also promote stability rather than change.
- Understand how the single cell formed at fertilization forms an embryo and then a full adult organism.
- Integrate genetics, molecular biology, biochemistry, cell biology, anatomy and physiology during embryonic development.
- Understand a variety of interacting processes, which generate an organism's heterogeneous shapes, size, and structural features.
- Understand how a cell behaves in response to an autonomous determinant or an external signal, and the scientific reasoning exhibited in experimental Life sciences.

UNIT – I: **15 Hrs.**

Theories of Evolution**:** Origin of Life; Historical review of evolutionary concept- Lamarckism, Darwinism (Natural, Sexual and Artificial selection); Modern synthetic theory of evolution; Adaptive radiations- Patterns of evolution (Divergence, Convergence, Parallel, Co-evolution). Population Genetics**:** Microevolution and Macroevolution; allele frequencies; genotype frequencies; Hardy- Weinberg equilibrium and conditions for its maintenance; Forces of evolution- mutation, selection, migration, genetic drift.

UNIT – II: **15 Hrs.**

Direct evidences of evolution**:** Types of fossils; Incompleteness of fossil record; Dating of fossils; Evolution of horse- *Eohippus, Mesohippus, Merychippus* and *Equus.* ; Species concept - Biological species concept; Advantages and Limitations; Modes of speciation –Allopatric and Sympatric; Species extinction: Mass extinction - Causes and names of five major extinctions.

UNIT – III: **15 Hrs.**

Gamete Fertilization and Early Development**:** Gametogenesis; Fertilization; Cleavage pattern; Gastrulation; fate maps and Morphogenesis. Developmental Genes**:** General concepts of organogenesis; Introduction to the genetic basis of embryonic development and Developmental control genes in *Drosophila* (*Homeo box* genes).

UNIT – IV: **15 Hrs.**

Vertebrate Development: Early developmental process: Metamorphosis in amphibians; Placentation in mammals; Environmental regulation of development. Late Developmental Processes**:** Development of eye, kidney, limb in amphibian. Mammalian female reproductive cycles - estrous and menstrual cycle; Regeneration in mammals; Aging- Biology of senescence.

REFERENCES:

1	Ridley, M (2004) Evolution (3rd edition) Blackwell Publishing
2	Hall, B.K. and Hallgrimson, B (2008) Evolution (4th edition) Jones and Barlett Publishers
3	Barton, N. H., Briggs, D. E. G., Eisen, J. A., Goldstein, D. B. and Patel, N. H. (2007). Evolution. Cold Spring, Harbour Laboratory Press.
4	Campbell, N. A. and Reece J. B. (2011). Biology. IX Edition, Pearson, Benjamin, Cummings.
5	Douglas, J. Futuyma (1997). Evolutionary Biology. Sinauer Associates.
6	Developmental Biology: T. Subramaniam, (Reprint), Narosa Publishing House Pvt. Ltd., New Delhi
7	Developmental biology: Werner, A. Müller, Springer Science & Amp; Business Media. (2012).
8	Human Embryology and Developmental Biology E-Book: Bruce M. Carlson, Elsevier Health Sciences.
9	Developmental Biology: Michael J. F. Barresi, Scott F. Gilbert, Oxford University Press. (2019).

SCHEME OF THEORY EXAMINATION
B.Sc. Zoology VI Semester

Course Title/Code: ZOO C15- T: EVOLUTIONARY & DEVELOPMENTAL BIOLOGY

Duration: 2 Hours **Max. Marks: 60**

PART - A

Q-I. Answer any **SIX** questions out of **EIGHT** questions (**2 questions from each Unit**) (**6 x2) = 12**

PART - B

Q-II. Answer any **TWO** questions out of **THREE** questions (**From Unit-I)** (**2 x 3) = 06**
Q-III. Answer any **ONE** question out of **TWO** questions (**From Unit-I**) **(1 x 6) = 06**

Q-IV. Answer any **TWO** questions out of **THREE** questions (**From Unit-II)** (**2 x 3) = 06**
Q-V. Answer any **ONE** question out of **TWO** questions (**From Unit-II**) **(1 x 6) = 06**

Q-VI. Answer any **TWO** questions out of **THREE** questions (**From Unit-III)** (**2 x 3) = 06**
Q-VII. Answer any **ONE** question out of **TWO** questions (**From Unit-III**) **(1 x 6) = 06**

Q-VIII. Answer any **TWO** questions out of **THREE** questions (**From Unit-IV)** (**2 x 3) = 06**
Q-IX. Answer any **ONE** question out of **TWO** questions (**From Unit-IV**) **(1 x 6) = 06**

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
House Examination/Test	20
Written Assessment/ Presentation/Project/Term papers/Seminars	15
Class room Performance/Participation	05
TOTAL	**40**
Formative Assessment as per NEP guidelines are compulsory	

Course Title	**EVOLUTIONARY & DEVELOPMENTAL BIOLOGY (Practical)**		
Course Code:	**ZOO C16-P**	Practical Credits	**2**
Contact hours	**4 Hours/Week**	Duration of Practical Exam.	**3 Hrs.**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

PRACTICALS **15x4=60 (4Hrs/week)**

1. Study of fossils from models/pictures. - *Archaeopteryx*, *Dinosaurs*, *Horse* and *Human.*
2. Study of homology and analogy from suitable specimens- Forelimbs of vertebrates; wings in animals; Prawn appendages - serial homology.
3. Study and verification of Hardy-Weinberg equilibrium by chi – square analysis.
4. Graphical representation and interpretation of data of height/ weight of sample of 100 humans in relation to their age and sex.
5. Study the types of eggs based on quantity and distribution of yolk: *Sea urchin, insect, frog* and *Chick.*
6. Study the early developmental stages in frog - cleavage, blastula, gastrula, neurula.
7. Study the metamorphosis in frog (tadpole to adult).
8. Study the development of chick embryo using the incubated chick eggs (up to 96h).
9. Study of adaptive radiations in feet of birds and mouth parts of insects.
10. Study the placental structure and classification.

SCHEME OF PRACTICAL EXAMINATION
B.Sc. Zoology VI Semester

Course Title/Code: ZOO C16-P: EVOLUTIONARY & DEVELOPMENTAL BIOLOGY

Duration: 3 hours **Max. Marks: 25**

Q I. Identify and comment on the given model **A** and comment (**Expt.- 1**) **03**
(Identification - 1 mark; comments - 2 marks)

Q II. Identify and comment on the spotter **B** (**Expt.- 2**) **03**
(Identification- 1 mark; comments- 2 marks)

Q III. Problem / Graphical representation of data (**Expt.-3/4**) **04**

Q IV. Identify and comment on the given chart / specimen with a labeled diagram- **C (Expt.-5/6)** **03**
(Identification-1 mark; diagram –1 mark; comments-1 mark)

Q V. Identify and comment on the given specimen/slide with a labeled diagram - **D** (**Expt.-7/8**) **03**
(Identification-1 mark; diagram – 1 mark; comments-1 mark)

Q VI. Identify and comment on the given spotter- **E** (**Expt.-9/10)** **04**
(Identification- 1 mark; diagram- 1 mark; comments - 2 marks)

Q VII. Record and Viva-voce **05**

Pedagogy: Lectures, Presentations, Videos, Assignments and Weekly Formative Assessment Tests

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
House Examination/Test	10
Project/Model submission	05
Class room Performance/Participation	05
Record writing & timely submission	05
Total	**25**
Formative Assessment as per NEP guidelines are compulsory	

Program Name	**B.Sc.**		**SEMESTER**	**VI**
Course Title	**ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT & CONSERVATIONS (Theory)**			
Course Code:	**ZOO C17-T**		No. of Credits	**4**
Contact hours	**60 Hrs.**		Duration of Exam.	**2 Hrs.**
Formative assessment marks		**40**	Summative assessment marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Develop an understanding of how animals interact with each other and their naturalenvironment.
- Develop the ability to use the fundamental principles of wildlife ecology to solve local, regional and national conservation and management issues.
- Develop the ability to work collaborative team-based projects.
- Gain an appreciation for the modern scope of scientific inquiry in the field of Wildlife conservation and management
- Develop an ability to analyze, present and interpret wildlife conservation management in formation

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UNIT – I **15 Hrs.**

Ecology**:** Introduction to ecology; food chain and food web, trophic levels-ecological pyramids, Ecological succession –Ecotone and edge effect; Ecosystem: types of ecosystem- terrestrial; aquatic; desert; grassland; cave; mangrove; Man-made ecosystems- cropland; garden ; aquarium. Ecological factors- weather, climate, ozone layer. Adaptive features of plants and animals to different environmental conditions (Light, Temperature) .

UNIT – II **15 Hrs.**

Pollution**:** Types of pollutions - air, soil, water and thermal pollution ; Causes, effect and control measures; ozone layer depletion; bio-accumulation, bio-magnifications, and bio-remediation; Effects of pollution on plants and animals; Pollution monitoring ; Waste management – Types and sources of wastes ; Degradable and non-degradable wastes management .

UNIT – III **15 Hrs.**

Wildlife Management: Taxonomy in biodiversity assessment; Biodiversity – levels of biodiversity- Ecosystem, Genetic and Species (Alpha, Beta, Gamma); Zoological realms; Unique Indian animals- Endemic species; Niche, Home range and Territory; Biodiversity hot spots –Western Ghats biodiversity ; Biodiversity assessment - monitoring biodiversity –WCMC, IGCMC, Animal census ; Remote sensing and GIS techniques in Wildlife studies ; Threats to wildlife ; IUCN Red list categories with examples in Indian context.

UNIT – IV **15 Hrs.**

Wildlife Conservation: *In-situ* conservation: Wildlife National Parks, sanctuaries & biosphere reserves; *ex-situ* conservation: Zoological gardens and Captive breeding program; Legal aspects- Wildlife (Protection) Act, 1972; Biodiversity Act (2002); Ramsar convention ; Special projects : Project Tiger; Project Elephant; Project Lion; Crocodile breeding project ; Project Rhino. Organizations working on wildlife conservation.

References	
1	Colinvaux, P.A. (1993) Ecology (2nd edition) Wiley, John and Sons , Inc.
2	Krebs, C.J. (2001) Ecology (6th edition) Benjamin Cummings.
3	Odum, E.P., (2008) Fundamentals of Ecology. Indian Edition. Brooks/Cole. (3rd Edition)Blackwell Sci.
4	Kendeigh, F C. (1984) Ecology with Special Reference to Animal and Man. Prentice Hall Inc.
5	Caughley, G., and Sinclair, A.R.E. (1994) Wildlife Ecology and Management. Blackwell Science.
6	Woodroffe, R., Thirgood, S. and Rabinowitz, A. (2005) People and Wildlife, Conflict or Co-existence? Cambridge University.
7	Bookhout, T.A. (1996) Research and Management Techniques for Wildlife and Habitats (5th edition) The Wild life Society, Allen Press.
8	Sutherland, W.J. (2000) The Conservation Handbook: Research, Management and Policy. Blackwell Sciences
9	Hunter M.L., Gibbs, J .B .and Sterling, E.J.(2008) Problem solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing.

SCHEME OF THEORY EXAMINATION
B.Sc. Zoology VI Semester

Course Title/Code: ZOO C17-T : ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT & CONSERVATIONS

Duration: 2 Hours **Max. Marks: 60**

PART - A

Q-I. Answer any **SIX** questions out of **EIGHT** questions (**2 questions from each Unit**) (**6 x2) = 12**

PART - B

Q-II. Answer any **TWO** questions out of **THREE** questions (**From Unit-I)** (**2 x 3) = 06**

Q-III. Answer any **ONE** question out of **TWO** questions (**From Unit-I**) **(1 x 6) = 06**

Q-IV. Answer any **TWO** questions out of **THREE** questions (**From Unit-II)** (**2 x 3) = 06**

Q-V. Answer any **ONE** question out of **TWO** questions (**From Unit-II**) **(1 x 6) = 06**

Q-VI. Answer any **TWO** questions out of **THREE** questions (**From Unit-III)** (**2 x 3) = 06**

Q-VII. Answer any **ONE** question out of **TWO** questions (**From Unit-III**) **(1 x 6) = 06**

Q-VIII. Answer any **TWO** questions out of **THREE** questions (**From Unit-IV)** (**2 x 3) = 06**

Q-IX. Answer any **ONE** question out of **TWO** questions (**From Unit-IV**) **(1 x 6) = 06**

Pedagogy: Written Assignment/Presentation/Project/Term Papers/Seminar

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
House Examination/Test	20
Written Assessment/ Presentation/Project/Term papers/Seminars	15
Class room Performance/Participation	05
TOTAL	**40**
Formative Assessment as per NEP guidelines are compulsory	

Course Title	**ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT & CONSERVATION (Practical)**		
Course Code:	**ZOO C18-P**	Practical Credits	**2**
Contact hours	**4 Hours/Week**	Duration of Practical Exam.	**3 Hrs.**
Formative assessment marks	**25**	Summative assessment marks	**25**

PRACTICALS **15x4=60 (4Hrs/ Week)**

1. Water quality parameters assessment:
   - Estimation of Dissolved Oxygen (O_2);
   - Estimation of Carbon dioxide (CO_2);
   - Estimation of Biological Oxygen Demand (BOD);
   - Estimation of Chemical Oxygen Demand (COD);
   - Estimation of Chlorides, hardness and salinity of water.

2. Analysis of physico-chemical parameters of soil: pH, moisture, temperature, organic matter.

3. Analysis of air pollution: Air monitoring for particulate matter.

4. Collection, preservation and estimation of zooplanktons (Ponds & Lakes).

5. Identification of wild animals**:** Pugmarks & hoof marks; scats & pellet counts; nest; antlers. Feathers.

6. Studies on field equipments and their applications in wildlife census- Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System(GPS), Photography & Videography.

7. Demonstration of field techniques for assessment of animals (Line transect, quadrate methods)

8. Demonstration of waste management techniques: Vermitechnology / Hermitechnology

9. Collection, identification and recordings of fauna of selected ecosystems & submission of report.

10. Visit to protected areas/ ex-situ conservation facilities/ industries and submission of report.

SCHEME OF PRACTICAL EXAMINATION
B.Sc. Zoology VI Semester

Course Title/Code: ZOO C18-P ENVIRONMENTAL BIOLOGY, WILDLIFE MANAGEMENT & CONSERVATION

Duration: 3 hours **Max. Marks: 25**

Q I. Analyses of the quality of the given water sample (O_2/ CO_2/Chloride/ Hardness/Salinity**).** **05**
(Procedure- 2 marks; readings- 2 marks; results – 1 mark)

Q II. Analysis of physico-chemical parameters of soil sample (pH,Temp, Moisture,Organic matter). **04**
(Procedure- 2 marks; results- 2 marks)

Q III. Identify and comment on the given spotters- **A** and **B** (**Expt.-5 & 6)** (**2x3)= 06**
(Identification- 1 mark; comments - 2 marks)

Q IV. Submission of report (**Expt.-9 / 10**) **05**

Q V. Record and Viva-voce **05**

Pedagogy: Lectures, Presentations, Videos, Assignments and Weekly Formative Assessment Tests

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
House Examination/Test	10
Project/Model submission	05
Class room Performance/Participation	05
Record writing & timely submission	05
Total	**25**
Formative Assessment as per NEP guidelines are compulsory	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark -X in the intersection cell if a course outcome addresses a particular program outcome.

Course Outcomes (COs) / Program Outcomes (POs)	**ZOO C15 T**	**ZOO C16P**	**ZOO C17T**	**ZOO C18P**
Core competency				
Critical thinking				
Analytical reasoning				
Research skills				
Team work				

Semester V

BASSOCN 501 Social Entrepreneurship

Course Objectives: this course will help the students to

1. Understand the scope and need for social entrepreneurship
2. Plan and implement socially innovative ideas
3. Equipped to start their own social enterprise or non for profit organization

Course Outcome:

CO1. To provide knowledge about social entrepreneurship p
CO2. To help to develop social entrepreneurship imagination
CO3. To help them to start their own social enterprise or not for profit startup as well as act innovative in the already working organization

Course Content:

Unit – 1 Fundamentals of Social Entrepreneurship 15 Hrs

a. Social entrepreneurship: Meaning, Features and Relevance;
b. Social Business: Meaning; Relationship and Difference between Social Entrepreneurship and Social Business;
c. Typology of Entrepreneurship Ventures; Identifying social business opportunities.

Unit – 2 Establishment of Non-Profit Organisations 15 Hrs

a. Concept, meaning, Objectives and establishment of Non-Profit organizations (NPOs/NGOs)
b. Legal Procedure for establishment of NPOs: Societies Registration Act, Indian Companies Act, Charitable Endowments Act, Foreign Contribution (Regulation) Act (FCRA); Available Tax Reliefs
c. Social Values of NPOs: Mission and Vision; Memorandum of Association (MoA) and Bye-Laws

Unit – 3 Management and Financing 15 Hrs

a. Human Resource Management: Staffing Plan, Social Security of Workers: provisions and Benefits of Gratuity Act; Rules and Regulations of EPF Scheme
b. Project Management: Meaning; Identification of Project; Proposal Development: Basic Factors, Project Proposal Guide; Budget, Rationale for sending Project Proposal to the Donor; Proposal Writing; Do's and Don'ts of a Project Proposal
c. Financing: Sources of Finance: Government, Donors, International Agencies; Documents Used in Fund Raising; Due Diligence; Campaigns; Internal Income Generation

Unit - 4 Case Studies 15 Hrs

a. Women Empowerment: Ela Bhatt, Sumita Ghose
b. Sanitation: Bindeshwar Pathak
c. Study the functioning of a local NPO/NGO; present the findings in a seminar and submit a report (For example areas of Sanitation, Rural Development, Women Empowerment)

BASSOCN 502 Tribal Society

Course Objectives: this course will help the students

1 To provide basic knowledge about social organization among tribal, with specific focuson Karnataka

2 Critically understand the implications of changes occurring

3 Undertake micro research work and communicate effectively

Course Outcome:

CO1. To provide basic knowledgeabout social organization among tribal

CO2. Critically understand theimplications ofchanges occurring

CO3. Undertake micro researchwork and communicate effectively

Course Content:

Unit – 1 Concepts and Categories 15 Hrs

a. Tribes and Indigenous People; Scheduled Tribes, Primitive Tribes, De-Notified or ex-criminal Tribes in India. Geographical Distribution of Tribesin India

b. Hadis, Rules of Marriage, Clan, Lineage, Consanguinity and Affinity; Male-Female relations

c. Tribal Organization: Social System, Legal System, Political System, Economic System, Religion and Magic

Unit – 2 Changes and Development Issues 15Hrs

a. Social Mobility: Types, Tribes and Caste, Tribe-Caste-Peasant Continuum, Sanskritisation

b. Tribalisation, Detribalisation, Retribalisation

c. Tribal Development and welfare: Approaches - Isolationist; Assimilationist and Integrationist; Problems of Exploitation, Land Alienation, Unemployment, Cultural Transformation, Scheduled Areas, Tribal Justice and Modern Law

Unit – 3 Studying Tribes 15 Hrs

a. Fieldwork: History and Significance; Ethics of Fieldwork; Eticand Epic Perspectives

b. Sources of Data: Primary and Secondary

c. Participatory Method, Case Studies, Genealogies

Unit-4 Field Work 15 Hrs

a. Take up field work in any nearby tribal settlement;

b. Present the findings and

c. Submit a report

BASSOCN 503 Statistics in Social Research

Course Objectives: this course will help the students

1 Introduction to sociological research and methods

2 To familiarize the students with the process of research

3 General introduction to statistical techniques for analyzing social science data

Course Outcome:

CO1. General introduction to statistical techniques for analyzing socialscience data

CO2. To compute these basic statistics as appropriate for the data at hand

CO3. Learn techniques for summarizing data, examining relationships among variables, generalizing from samples to populations, andtesting statistical hypotheses

Course Content:

Unit – 1 Social Research **15 Hrs**

a. Social Research, Types of social Research – qualitative quantitative; inductive deductive.

b. Steps in social Research; Problems in social research

c. Concept, Assumption, Formulation of Hypothesis; Research designs

Unit - 2 Methods of data collection in Social Research **15 Hrs**

a. Sources of primary data - Observation, Interview and Questionnaire

b. Sources of secondary data: published, unpublished, other sources.

c. Survey and Sampling; types of sampling

Unit 3: Social Statistics **15 Hrs**

a. Social Statistics meaning and its importance in social research;

b. Types of social Statistics: Descriptive and Inferential; use of computers in social statistics

c. Construction of Frequency Tables; Diagrammatic and Graphical Representation of Data: Pie Charts, Bar Charts, historigram, histograms, frequency polygon.

Unit - 4 Methods of Statistical Measures **15 Hrs**

a. Measures of Central Tendency: mean median and mode; Merits and Demerits

b. Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation,

c. Correlation: Pearson’s Correlation, Rank order Correlation

BASSOCN 601 Sociological Perspectives

Course Objectives: this course will help the students

1 To introduce major Sociological theoretical approaches

2 To introduce and use fundamental categories of theory

3 Compare and contrast the ways different theorists use the same or similar concepts tobuild or present their ideas

Course Outcome:

CO1. To introducemajor Sociological theoretical approaches

CO2. To introduceand use fundamental categories of theory

CO3. Compare and contrast the ways different theorists use the same or similar concepts to build or present their ideas

Course Content:

Unit – 1 Basics of Theory **15Hrs**

a. Theory: Meaning and Features. Meaning of Social Theory. Types of Theory: Macro, Meso, Micro;
b. The elements of sociological theory; Levels of theorisation
c. Types and functions of sociological theory

Unit – 2 Structural Functionalism **15Hrs**

a. Origin of Structuralism and Functionalism; Meaning of: Social Structure, Social System, Function, Integration, Social Equilibrium, Social Order, Dysfunction

b. Postulates of Functional Analysis

c. Neo-functionalism

Unit – 3 Conflict Perspective **15Hrs**

a. Origin of Conflict Perspective; Meaning of: Conflict, Social Inequality, Power, Dominance, Authority, Class Struggle, Hegemony

b. Process of Social Conflict and Social Change;

c. Functions of Social Conflict

Unit-4 Symbolic Interactionism **15Hrs**

a. Origin of Symbolic Interaction Perspective; Social Construction of Reality, Self, Identity, Reflexivity, Negotiation

b. Importance of Meaning; Definition of Situation

c. Dramaturgy and Everyday Life

BASSOCN 602 Sociology of Health

Course Objectives: this course will help the students

1 Understand the concept of health, illness and social conditions

2 Analyze the relationship between social factors and health status

3 Understand the role of medical doctors, paramedics, pharmaceutical industry and socialinstitutions in maintaining and promoting health

Course Outcome:

CO1. Understandthe concept ofhealth, illnessand social conditions

CO2. Analyze the relationship between socialfactors and health status

CO3. Understand the role of medical doctors,paramedics, pharmaceutical industry and social institutions in maintaining andpromoting health

Course Content:

Unit – 1 Introduction 15Hrs

a. Sociology of Health: Meaning, Nature and Need; Scope: Sociology in Medicine and Sociology of Medicine

b. Emergence and Development of Sociology of Health in World and India

c. Actors: Doctors-Nurses and Paramedical Staff-Patients and their relationship

Unit – 2 Determinants of Health 15Hrs

a. Social Determinants: Class, Caste, Power, Gender, Social Cohesion

b. Cultural Determinants: Beliefs, Nutrition, Environment

c. Economic Determinants: Poverty, Homelessness, Living Conditions, Neighbourhood

Unit – 3 Models of Health 15Hrs

a. Systems of Medicine; (Biomedicine and AYUSH) Biomedical Model and its Dominance

b. Sick Role and Experiencing Illness

c. Hospital as Social Organization

Unit-4 Health Care Reform 15 Hrs

a. Medicalisation and Pharamceuticalisation of Health

b. Learning from the Field: Report on Health Services in your area

c. Functioning of Health Organizations or Selected Health Programmes at State Level

BASSOCN 602 Society in Karnataka

Course Objectives: this course will help the students

1 Enhance Sociological knowledge about the Local and Regional context of Karnataka
2 Acquaint students with the changing trends in Karnataka with special reference to Developmentprocesses and politics
3 Learn about the unique cultures in Karnataka

Course Outcome:

CO1. Enhance Sociological knowledge about the Local and Regional context of Karnataka
CO2. Acquaintstudents with the changing trends in Karnataka with special reference to Development processes and politics
CO3. Learn about the unique culturesin Karnataka

Course Content:

Unit – 1 Features of Karnataka 15 Hrs

a. Overview of Karnataka's History: Antiquity of Land and Language Social Composition: Religion, Language, Caste, Tribe, Class as per latest Census/Sample Surveys; HDI and Regional Disparities

b. Geography and Politics: Spatial Features: Plains, Coastal and Malnad; Old Mysuru, Hyderabad Karnataka, Bombay Karnataka and present day administrative division (Mysuru, Bengaluru, Kalyana Karnataka and Kittur Karnataka); Political Landscape since Independence

c. Economic Profile: Developments in Agriculture, Industry and Service Sectors

Unit - 2 Social Organisation 15Hrs

a. Religions, Languages, Castes, Tribes and Classes as per latest Census/Sample Surveys
b. Education: Growth of STEM Courses, Status of Social Sciences and Humanities; Urbanisation: Trends and Issues
c. HDI and Regional Disparities

Unit – 3 Social Movements of Karnataka 15Hrs

a. Unification of Karnataka, Save Kannada and Gokak Movements
b. Environment Movements: Chipko and Appiko, Sahyadri Mining Protest, Seabird Naval Base, Movement Against Social Forestry
c. Socio-Religious Movements: Veerashaiva, Non-Brahmin, Dalit Movements

Unit-4 Studies on Karnataka Society 15 Hrs

a. Contributions of M N Srinivas, S. Parvathamma, Hiremallur Ishwaran

b. Fieldwork on Changing Social Institutions in Karnataka

c. Presentation and report submission

Karnataka State Higher Education Council

Curriculum Framework for Undergraduate Program

Bachelor of Business Administration (BBA)

For 5th & 6th Semester from the Academic Year

2023-24

SEMESTER – V

SLNo.	Course Code	Title of the Course	Categoryof Course	Teaching Hours per Week (L+T+P)	SEE	CIE	Total Marks	Credits
31	BBA5.1	Production and Operations Management	DSC -13	4+0+0	60	40	100	4
32	BBA5.2	Income Tax-I	DSC-14	3+0+2	60	40	100	4
33	BBA5.3	Banking Law and Practice	DSC-15	4+0+0	60	40	100	4
34	BBA5.4	Elective -1 (FN1\MK1\HRM1\DA1\RM1\LSCM1)	DSE-1	3+0+0	60	40	100	3
35	BBA5.5	Elective-2 (FN1\MK1\HRM1\DA1\RM1\LSCM1)	DSE-2	3+0+0	60	40	100	3
36	BBA5.6	Information Technology for Business (Excel &DBMS)	**Vocational-1**	3+0+2	60	40	100	4
37	BBA5.7	Cyber Security	SEC – VB	1+0+2	30	20	50	2
SUB TOTAL (E)					390	260	650	24

ELECTIVE GROUPS AND COURSES:

Sl. No.	Finance	Marketing	Human Resource Management	Data Analytics	Retail Management	Logistics And SupplyChain Management
COURSE CODE	**FN1**	**MK1**	**HRM1**	**DA1**	**RM1**	**LSCM1**
Paper-1	**Advanced Corporate Financial Management**	**Consumer Behavior**	**Compensation and Performance Management**	**Financial Analytics**	**Fundamentals of Retail Management**	**Freight Transport Management**

Note: Students have to choose Two Electives in V Semester and Continue with the same Elective combinations in VI Semester.

SEMESTER – VI

SLNo.	Course Code	Title of the Course	Category of Course	Teaching Hours per Week (L+T+P)	SEE	CIE	Total Marks	Credits
38	BBA 6.1	Business Law	DSC	4+0+0	60	40	100	4
39	BBA6.2	Income Tax-II	DSC	3+0+2	60	40	100	4
40	BBA6.3	International Business	DSC	4+0+0	60	40	100	4
41	BBA6.4	Elective -1 (FN2\MK2\HRM2\DA2\ RM2\LSCM2)	DSE	3+0+0	60	40	100	3
42	BBA6.5	Elective-2 (FN2\MK2\HRM2\DA2\ RM2\LSCM2)	DSE	3+0+0	60	40	100	3
43	BBA6.6	Goods and Services Tax	Vocational	2+0+2	60	40	100	4
44	BBA6.7	Internship	I-1	4 weeks	-	50	50	2
SUB TOTAL (F)					**360**	**290**	**650**	**24**

A. INTERNSHIP WITH BUSINESS ORGANIZATIONS

Objectives:

- To enhance the classroom learning
- To provide training and experiential learning opportunities for students
- To provide an opportunity to apply knowledge and skills acquired by the students in the classroom to a professional context.

Guidelines to the institution:

1. Each student will have to work in a Business Organization for at least 4 weeks after their Fifth Semester Examination.
2. The entire batch of students is to be divided equally among the department faculty members. The faculty members should be the mentors and guide the students in the internship process.
3. The students must submit the Certificate for completion of internship by the organization to the college along with a brief report of not less than 25 pages. The report contains details of the organization, nature of business, and a write up on the learning outcome from the internship carried out by them.

Marks Allocation:

- 30 Marks for the Internship Report and 20 Marks for Presentation and Viva-Voce examination.
- Viva-Voce shall be conducted at the end of the semester, by the external faculty, from among the panel of examiners and identified by the College.
- The Institution should send the marks to the University along with IA Marks scored by them in the VI Semester.

ELECTIVE GROUPS AND COURSES:

Discipline Specific Electives –VI Semester						
Sl. No.	**Finance**	**Marketing**	**Human Resource Management**	**Data Analytics**	**Retail Management**	**Logistics and Supply Chain Management**
COURSE CODE	**FN2**	**MK2**	**HRM2**	**DA2**	**RM2**	**LSCM2**
Paper-2	**Security Analysis and Portfolio Management**	**Advertising and Media Management.**	**Cultural Diversity at Workplace**	**Marketing Analytics**	**Retail Operations Management**	**Sourcing for Logistics and Supply Chain Management**

Name of the Program: Bachelor of Business Administration (BBA)
Course Code: BBA5.1
Name of the Course: Production and Operations Management

Course Credits	No. of hoursper week	Total No. of Teaching hours
4 Credits	4 hours	56 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion of the course, the students' will be able to

a) Understand ever growing importance of Production and Operations Management in uncertain business environment.
b) Gain an in-depth understanding of Plant Location and Layout
c) Appreciate the unique challenges faced by firms in Inventory Management.
d) Understand the subject as to Production Planning and Control.
e) Develop skills to operate competitively in the current business scenario.

Syllabus:	**Hours**
Module No.1: Introduction to Production and Operations Management	**12**
Introduction -Meaning of Production and Operations, differences between Production and Operations Management, Scope of Production Management, Production System. Types of Production, Benefits of Production Management, Responsibility of a Production Manager, Decisions of Production Management. Operations management: Concept and Functions	
Module No. 2: Plant Location and layout	**10**
Meaning and definition –Factors affecting location, Theory and practices, cost Factor in location – Plant layout Principles – Space requirement – Different types of facilities – Organization of physical facilities – Building, Sanitation, Lighting, Air Conditioning and Safety.	
Module No.3: **Production Planning and Control**	**12**
Meaning and Definition-Characteristics of Production Planning and Control, Objectives of Production Planning and Control, Stages of Production Planning and Control, Scope of Production Planning & Control, Factors Affecting Production Planning and Control, Production Planning System, Process Planning Manufacturing, Planning and Control System, Role of Production Planning and Control in Manufacturing Industry.	
Module No. 4: Inventory Management	**12**
Inventory Management – Concepts, Classification: Objectives: Factors Affecting Inventory Control Policy. Inventory costs: Basic EOQ Model: Re-order Level: ABC Analysis. Quality Management - Quality Concepts, Difference between Inspections, Quality Control, Quality Assurances, Total Quality Management: Control Charts: acceptance sampling.	
Module 5: Maintenance and Waste Management	**10**
Introduction – Meaning – Objectives – Types of maintenance, Breakdown, Spares planning and control, Preventive routine, Relative Advantages, Maintenance Scheduling, Equipment reliability and Modern Scientific Maintenance Methods - Waste Management–Scrap and surplus disposal, Salvage and recovery.	

Skill Development Activities:

1. Visit any industry and list out the stages of its automation and artificial intelligence with as many details as possible.
2. List out the factors which are important while selecting a plant layout and draw a chart on Plant layout
3. Describe the Functions of Quality Circles in an industry
4. List out the Functions of Inventory Management in an organization.

Books for Reference:

1. Ashwathappa. K & Sridhar Bhatt: Production & Operations Management, HPH.
2. Gondhalekar & Salunkhe: Productivity Techniques, HPH.
3. SN Chary, Production & Operations Management, McGraw Hill.
4 U. Kachru, Production & Operations Management, Excel Books.
5. Alan Muhlemann, John Oaclank and Keith Lockyn, Production & Operations Management, PHI.
6 K KAhuja, Production Management, CBS Publishers.
7.S.A. Chunawalla & Patel: Production & Operations Management, HPH.
8.Everett E Adam Jr., and Ronald J Ebert, Production & Operations Management, Sage Publishing
9.Dr. L. N.Agarwal and Dr. K.C. Jain, Production Management
10.Thomas E. Morton, Production Operations Management, South Western College.

Note: Latest edition of books may be used.

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Name of The Program: Bachelor of Business Administration (BBA)
Course Code: BBA5.2
Name of the Course: Income Tax – I

Course Credits	No. of hoursper week	Total No. of Teaching hours
4 Credits	4 hours	56 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc..

Course Outcomes: On successful completion of the course, the students will be able to:

a) Comprehend the procedure for computation of Total Income and tax liability of an individual.
b) Understand the provisions for determining the residential status of an Individual.
c) Comprehend the meaning of Salary, Perquisites, Profit in lieu of salary, allowances and various retirement benefits.
d) Compute the income house property for different categories of house property.
e) Comprehend TDS & advances tax Ruling and identify the various deductions under section 80.

Syllabus:	**Hours**
Module-1: Basic Concepts of Income Tax	**12**
Introduction –Meaning of tax-, types of taxes, cannons of taxation. Brief history of Indian Income Tax, legal framework of taxation, Important definitions, assessment, assessment year, previous year including exceptions, assesses, person, income, casual income, Gross total income, Total income, Agricultural income, scheme of taxation, – Exempted incomes of an individual under section 10.	
Module -2: Residential Status and Incidence of Tax	**10**
Introduction – Residential status of an individual. Determination of residential status of an individual. Incidence of tax or Scope of Total income. Problems on computation of Gross total Income of an individual.	
Module- 3: Income from Salary	**16**
Introduction - Meaning of Salary -Basis of charge Definitions–Salary, Perquisites and profits in lieu of salary - Provident Fund –Transferred balance. - Retirement Benefits – Gratuity, pension and Leave salary. Deductions and Problems on Computation of Taxable Salary.	
Module -4: Income from House Property	**10**
Introduction - Basis for charge - Deemed owners -House property incomes exempt from tax, composite rent and unrealized rent. Annual Value –Determination of Annual Value - Deductions from Annual Value - Problems on Computation of Income from House Property.	

Module No.-5: Tax Deduction at Sources & Advance Tax Ruling	**08**

Introduction - Meaning of TDS - Provisions regarding TDS - TDS to be made from Salaries - Filing of Quarterly statement – Theory and Problems; Advance Tax: Meaning of advance tax - Computation of advance tax - Instalment of advance tax and due dates.

Deductions under Section 80C, 80CCC, 80CCD, 80CCG, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80TTA and 80U as applicable to individuals under old regime. (Individuals only).

Skill Development Activities:

1. Prepare a slab rates chart for different Individual assesses.
2. Visit any Chartered Accountant office Collect and record the procedure involved in filing the Income tax returns of an Individual.
3. List out any 10 Incomes exempt from tax of an Individual.
4. Prepare the list of perquisites received by an employee in an organization.
5. Identify and collect various enclosures pertaining to Income tax returns of an individual.
6. Any other activities, which are relevant to the course.

Books for References:

1. Mehrotra H.C and T.S.Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
2. Vinod K. Singhania, Direct Taxes, Taxman Publication Private Ltd, New Delhi.
3. Gaur and Narang, Law and practice of Income Tax, Kalyani Publications, Ludhiana.
4. Bhagawathi Prasad, Direct Taxes.
5. B.Mariyappa, Income tax Law and Practice-I, Himalaya Publishing House. New Delhi.s
6. Dr. Saha, Law and Practice of Income Tax, Himalaya Publishing House.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Business Administration (BBA)
Course Code: BBA 5.3
Name of the Course: Banking Law and Practice

Course Credits	No. of hoursper week	Total No. of Teaching hours
4 Credits	4 hours	56 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

Course Outcomes: On successful completion of the course, the students will beable to:

a) Understand the legal aspects of banker and customer relationship.
b) Open the different types of accounts.
c) Describe the various operations of banks.
d) Understand the different types of crossing of cheques and endorsement.
e) Understanding of different types of E-payments.

Syllabus:	**Hours**
Module No. 1: Banker and Customer	**16**

A) Banker and Customer Relationship: Introduction – Meaning of Banker& Customer; General and Special relationships between Banker & Customer, (Rights and Obligations of Banker & Customer).

B) Customers and Account Holders: Types of Customer and Account Holders – Procedure and Practice in opening and operating the accounts of different types of customers – Minor, Joint Account Holders, Partnership Firms, Joint Stock Companies, Clubs, Non-Resident Account – NRI & NRE Accounts.

Module No. 2: Banking Operations.	**08**

Meaning – Duties and Responsibilities of Collecting Banker, Holder for Value, Holder in Due Course; Statutory Protection to Collecting Banker.

Module No. 3: Paying Banker	**12**

Meaning – Precautions – Statutory Protection to the Paying Banker; Cheques – Crossing of Cheques – Types of Crossing; Endorsements - Meaning, Essentials and Kinds of Endorsement; Dishonor of Cheque - Grounds for Dishonor of cheque.

Module No. 4: Lending Operations	**12**

Principles of Bank Lending, Kinds of lending - Loans, Cash Credit, Overdraft, Bills Discounting, Letters of Credit. Types of securities and Methods of creation of charge, Secured and Unsecured Advances; Procedure - Housing, Education and Vehicle loan's; Non-Performing Asset (NPA): Meaning, circumstances & impact; Government Regulations on Priority lending for commercial banks.

Module No. 5: Banking Innovations	**8**
New technology in Banking – E-services – plastic cards . Internet Banking, ATM based services, ECS, MICR, RTGS, NEFT, DEMAT, IMPS UPI , AADHAR enabled payment system, USSD, E-Valet and application based payment systems, Role of artificial intelligence in banks, Block Chain – Meaning and features.	

Skill Development Activities:

1. Collect and paste pay in slip for SB A/c and Current a/c.
2. Draw a specimen of a crossed cheque.
3. List out different types of customers and collect KYC documents required for loan
4. List out various fee-based services offered by a bank in your locality
5. List out application-based payment systems provided by a commercial bank.

Books for References:

1. Gordon & Natarajan: Banking Theory Law and Practice, HPH.
2. Maheshwari. S.N.: Banking Law and Practice, Vikas Publication.
3. Kothari N. M: Law and Practice of Banking.
4. Tannan M.L: Banking Law and Practice in India, Indian Law House
5. S. P Srivastava: Banking Theory & Practice, Anmol Publications.
6. Sheldon H.P: Practice and Law of Banking.
7. Neelam C Gulati: Principles of Banking Management.
8. Dr. Alice Mani: Banking Law and Operation, SB.

Note: Latest edition of Reference Books may be used

Name of the Program: Bachelor of Business Administration **(BBA)**

Finance Elective

Course Code: FN1

Name of the Course: Advanced Corporate Financial Management

Course Credits	No. of hours per week	Total No. of Teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion of the course, the students will beable to:

a) Understand and determine the overall cost of capital.
b) Comprehend the different advanced capital budgeting techniques.
c) Understand the importance of dividend decisions and dividend thories.
d) Evaluate mergers and acquisition.
e) Enable the ethical and governance issues in financial management.

Syllabus:	**Hours**
Module No. 1: Cost of Capital and Capital Structure Theories	**12**
Cost of Capital: Meaning and Definition – Significance of Cost of Capital – Types of Capital – Computation of Cost of Capital – Specific Cost – Cost of Debt – Cost of Preference Share Capital – Cost of Equity Share Capital – Weighted Average Cost of Capital – Problems. **Theories of capital structures**: The Net Income Approach, The Net Operating Income Approach, Traditional Approach and MM Hypothesis – Problems.	
Module No. 2: Risk Analysis in Capital Budgeting	**12**
Risk Analysis – Types of Risks – Risk and Uncertainty – Techniques of Measuring Risks – Risk adjusted Discount Rate Approach – Certainty Equivalent Approach – Sensitivity Analysis - Probability Approach - Standard Deviation and Co-efficient of Variation – Decision Tree Analysis – Problems. .	
Module No. 3: Dividend Decision & Theories of Dividend.	**14**
Introduction - Dividend Decisions: Meaning - Types of Dividends – Types of Dividends Polices – Significance of Stable Dividend Policy - Determinants of Dividend Policy; Dividend Theories: Theories of Relevance – Walter's Model and Gordon's Model and Theory of Irrelevance – The Miller-Modigliani (MM) Hypothesis - Problems.	
Module No. 4: Mergers and Acquisitions	**10**
Meaning - Reasons – Types of Combinations - Types of Merger – Motives and Benefits of Merger – Financial Evaluation of a Merger - Merger Negotiations – Leverage buyout, Management Buyout Meaning and Significance of P/E Ratio. Problems on Exchange Ratios based on Assets Approach, Earnings Approach and Market Value Approach and Impact of Merger on EPS, Market Price and Market capitalization.	
Module No. 5: Ethical and Governance Issues	**08**
Introduction to Ethical and Governance Issues: Fundamental Principles, Ethical Issues in Financial Management, Agency Relationship, Transaction Cost Theory, Governance Structures and Policies, Social and Environmental Issues, Purpose and Content of an Integrated Report.	

Skill Development Activities:

1. Visit an organisation in your town and collect data about the financial objectives.
2. Compute the specific cost and Weighted average cost of capital of an Organisation, you have visited.
3. Case analysis of some live merger reported in business magazines.
4. Meet the financial manager of any company, discuss ethical issues in financial management.
5. Collect the data relating to dividend policies practices by any two companies.
6. Any other activities, which are relevant to the course.

Books for References:

1. I M Pandey, Financial management, Vikas publications, New Delhi.
2. Abrish Guptha, Financial management, Pearson.
3. Khan & Jain, Basic Financial Management, TMH, New Delhi.
4. S N Maheshwari, Principles of Financial Management, Sulthan Chand & Sons, New Delhi.
5. Chandra & Chandra D Bose, Fundamentals of Financial Management, PHI, New Delhi.
6. B.Mariyappa, Advanced Financial Management, Himalaya Publishing House, New Delhi.
7. Ravi M Kishore, Financial Management, Taxman Publications
8. Prasanna Chandra, Financial Management, Theory and Practice, Tata McGraw Hill.

Note: Latest edition of Reference Books may be used

Name of the Program: Bachelor of Business Administration (BBA)

Marketing Elective

Course Code: MK 1

Name of the Course: Consumer Behaviour

Course Credits	No. of hoursper week	Total No. of Teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion of the course, the students will be able to:

a) Understanding of Consumer Behaviour towards products, brands and services.
b) Distinguish between different consumer behaviour influences and their relationships.
c) Establish the relevance of consumer behaviour theories and concepts to marketing decisions.
d) Implement appropriate combinations of theories and concepts.
e) Recognise social and ethical implications of marketing actions on consumer behaviour.

Syllabus:	**Hours**
Module -1: Introduction to Consumer Behaviour	**10**
Meaning and Definition, Need for Consumer Behaviour, consumer and customer. Buyers and users. Need to study consumer behaviour. Applications in Marketing, Consumer research process –Understanding consumer through Research process. Factors influencing Consumer Behaviour. External factors – Culture, Sub Culture, Social Class, Reference Groups, Family, Internal factors– Needs & Motivations, Perception, Personality, Lifestyle, Values, Learning, Memory, Beliefs & Attitudes.	
Module -2: Individual Determinants of Consumer Behaviour	**08**
Consumer Needs & Motivation; Personality and Self-Concept; Consumer Perception; Learning & Memory; Nature of Consumer Attitudes – Psychological: Motivation, Perceptions, Learning, Belief and Attitudes. Consumer Attitude, Formation and Change.	
Module-3: Environmental Determinants of Consumer Behaviour	**12**
Family Influences; Influence of Culture; Subculture & Cross-Cultural Influences; Group Dynamics and Consumer Reference Groups; Social Class: Family role. Person's Age, Life cycle stage, Occupational and economic circumstances.	
Module - 4: Consumer's Decision-Making Process	**09**
Opinion leadership, dynamics of opinion leadership process, The Motivation behind opinion leadership- The Diffusion Process-The adoption process- levels of consumer decision making- Models of consumer decision making.	

Module -5: Consumer Satisfaction & Consumerism	**06**
Concept of Consumer Satisfaction; Working towards enhancing Consumer Satisfaction; Sources of Consumer Dissatisfaction; Dealing with Consumer Complaint. Concept of Consumerism; Consumerism in India; Reasons for Growth of Consumerism in India.	

Skill Development Activities:

1. Collect information on behaviour of consumers at an unorganized retail Outlets.
2. prepare a questionnaire to conduct consumer survey to assets the important factor motivates their purchase like mobile, shoes, bags,etc
3. Collect and record feedback on customer satisfaction online shoeing
4. Write a report on the marketing problem faced by an organization of your choice.
5. Visit any three local restaurants and assess how each attracts clients in different stages of the family life cycle.

Books for References:

1. Leon. G. Schiffman & Leslve Lazer Kanuk; Consumer behaviour; 6th Edition; PHI, New Delhi, 2000.
2. Suja.R.Nair, Consumer behaviour in Indian perspective, First Edition, Himalaya Publishing House, Mumbai, 2003.
3. Batra/Kazmi; Consumer Behaviour.
4. David. L. Loudon & Albert J. Bitta; Consumer Behaviour; 4th Edition, Mcgraw Hill, Inc; New Delhi,1993.
5. K. Venkatramana, Consumer Behaviour, SHBP.
6. Assael Henry; Consumer behaviour and marketing action; Asian Books(P) Ltd, Thomson learning, 6th Edition; 2001.
7. Jay D. Lindquist & M. Joseph Sirgy, Shopper, Buyer and Consumer Behaviour, 2003.
8. Blackwell; Consumer Behaviour, 2nd Edition.
9. S.A.Chunawalla : Commentary on Consumer Behaviour, HPH.
10. Sontakki; Consumer Behaviour, HPH.
11. Schiffman; Consumer Behaviour, Pearson Education.

Name of the Program: Bachelor of Business Administration (BBA)

Human Resource Elective

Course Code: HRM1

Name of the Course: COMPENSATION AND PERFORMANCE MANAGEMENT

COURSE CREDITS	NO. OF HOURS PER WEEK	TOTAL NO. OF TEACHING HOURS
3 CREDITS	3 HOURS	45 HOURS

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

Course Outcomes: On successful completion of the course, the students will beable to:

a) Understand the concepts of Compensation management.
b) Describe job evaluation and its methods.
c) Evaluate the different methods of wages.
d) Describe performance management and methods of performance management.
e) Preparation of Payroll.

SYLLABUS:	**HOURS**
Module No. 1: Introduction to Compensation Management	**12**

Compensation - Definition - Classification - Types - Wages, Salary, Benefits, DA, Consolidated Pay; Equity based programs, Commission, Reward, Remuneration, Bonus, Short term and Long term Incentives, Social Security, Retirement Plan, Pension Plans, Profit Sharing Plan, Stock Bonus Plan, ESOP ,Employer Benefits and Employer Costs for ESOP, Individual Retirement Account, Savings Incentive Match Plan for Employees.

Compensation Management- Compensation and Non-compensation Dimensions, 3-P Concept in Compensation Management, Compensation as Retention Strategy, Compensation Issues, Compensation Management in Multi-National organizations Compensation Strategy: Organizational and External Factors Affecting Compensation Strategies, Compensation Strategies as an Integral Part of HRM, Compensation Policies.

Module No. 2: Job Evaluation	**06**

Definition of Job Evaluation, Major Decisions in Job Evaluation, Job Evaluation Methods, Point Factor Method of Job Evaluation: Combining Point factor and Factor Comparison Methods, Job Evaluation Committee, Factor Evaluation System (FES), Using FES to determine Job Worth, Position Evaluation Statements.

Module No. 3: Wage and Salary Administration	**12**

Theories of Wages - Wage Structure - Wage Fixation - Wage Payment - Salary Administration. Difference between Salary and Wages - Basis for Compensation Fixation- Components of Wages - Basic Wages - Overtime Wages - Dearness Allowance - Basis for calculation - Time Rate Wages and Efficiency Based Wages - Incentive Schemes - Individual Bonus Schemes, Group Bonus Schemes - Effect of various Labour Laws on Wages-Preparation of Pay Roll

Module No. 4: Performance Management	14

Evolution of Performance Management, Definitions of Performance Management, Importance of Performance Management, Aims and Purpose of Performance Management, Employee Engagement and Performance Management, Principles and Dimensions of Performance Management Performance Appraisal Methods: Traditional Methods, Modern Methods, Performance Appraisal Feedback: Role, Types and Principles, Levels of Performance Feedback, 360-Degree Appraisal, Ethics in Performance Appraisal.

Module No. 5: Issues In Performance Management	08

Team Performance Management, Performance Management and Learning Organizations, Performance Management and Virtual Teams, Role of Line Managers in Performance Management, Performance Management and Reward, Linking Performance to Pay –A Simple System Using Pay Band, Linking Performance to Total Reward, Challenges of Linking Performance and Reward.

Skill Development Activities:

1. List the various components of total compensation in Multinational Companies.
2. Construct a questionnaire for a salary survey on nurses.
3. Design a performance appraisal plan using any Modern Performance Appraisal Tool for an IT company.
4. Study any one contemporary practice of Performance Management System (Balance scorecard, Lean Management, BPRE, Six Sigma and so on)

Books for References:

1. Joseph J. Martocchio, Strategic Compensation, 3rd Edition, Pearson Education
2. Michael Armstrong & Helen Murlis: Hand Book of Reward Management – Crust Publishing House.
3. Milkovich & Newman, Compensation, Tata McGraw Hill
4. Richard I. Anderson , Compensation Management in Knowledge based world, 10th edition, Pearson Education
5. Thomas. P. Plannery, David. A. Hofrichter & Paul. E. Platten: People, Performance & Pay – Free Press.
6. Aguinis Herman, Performance Management, 2nd Edition, 2009 Pearson Education, New Delhi.
7. Aziz A, Performance Appraisal: Accounting and Quantitative Approaches, 1993, Pointer.
8. Bhatia S.K, Performance Management: Concepts, Practices and Strategies for Organisation Success, 2007, Deep & Deep, New Delhi.
9. BD Singh, Compensation & Reward Management, Excel Books
10. Cardy R.L, Performance Management: Concepts, Skills and Exercises, 1st Edition, 2008, PHI, New Delhi.
11. Goel Dewkar, Performance Appraisal and Compensation Management: A Modern Approach, 2 nd Edition, 2008, PHI, New Delhi.
12. Sarma A.M, Performance Management System, 1st Edition, 2008, Himalaya Pub, Mumbai.

Name of the Program: Bachelor of Business Administration (BBA)

DATA ANALYTICS

Course Code: DA 1

Name of the Course: Financial Analytics

Course Credits	No. of hoursper week	Total No. of Teaching hours
3 credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.

Course Outcomes: On successful completion student will demonstrate:

a) Analyze and model financial data.
b) Access the different open-source domains.
c) Evaluate and build model on time series data.
d) Execute the statistical analysis using python.

Syllabus:	**Hours**
Module No. 1: Introduction to Financial Analytics	**08**
Introduction: Meaning-Importance of Financial Analytics uses-Features-Documents used in Financial Analytics: Time value of money – Discounted and Non-discounted (computation using Excel).	
Module No. 2: Access to Financial Data Using Latest Technology	**07**
Public domain data base (RBI, BSE, NSE, Google finance), Prowess, downloading data from NSE and Yahoo finance. IMF and World Bank data base, Kaggle, Bloomberg, FINTECH companies (ROBO, ALGO trade).	
Module No. 3: Introduction to Time Series Modeling	**10**
Meaning of Data- types of data- time series, panel, cross sectional-components of Time series data. Simple time series concepts – moving average, exponential moving, WMA (Theory and Practices), data - differencing, logarithm, lagging, stationary v/s non stationary data (detailed explanation with examples) computing return series data (simple returns and logarithm returns) (using Excel).	
Module No. 4: Introduction to Python	**10**
Installation of Python, types of data and structures, basic analysis using NUMPY and PANDAs (financial examples), data preparation for time series data.	

Module No. 5: Python for Finance	**10**

Descriptive statistics, Time series graphs in Python, understanding between correlation and covariance, basics of regression and its assumptions, Stationary and non-stationary data, basics of Time series using Python. Credit default using binary logistic regression.

Skill Development Activities:

a) Explain the Different types of trends in time series data.
b) Explain the assumptions of regressions.
c) List out public domain data base.
d) List out recent FINTECH companies.

Books for References:

1. Python for finance: Yves hil pisces
2. Hands on Data analysis with Pandas: Stefanie molin.
3. Hands on Python for finance, Krish Naik, Packt
4. Python For Finance, Yuxing Yan, Packt
5. Mastering Python for Finance, James Ma Weiming ,Pack Publishing
6. Financial Reporting and Financial Statement Analysis,M Hanif , A Mukherjee, McGraw Hill
7. Haskell Financial Data Modelling and Predictive Analytics,Pavel Ryzhov,PACKT

Name of the Program: Bachelor of Business Administration (BBA)

Retail Management

Course Code: RM 1

Name of the Course: Fundamentals of Retail Management

Course Credits	No. of hoursper week	Total No. of teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, Case studies, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion student will demonstrate:

a) Understand the Retail Business.
b) Understand the business operations in Retailing.
c) Formulate the retail strategies of Retail Business.
d) Apply the Retailing principles and theories.
e) Explore the career opportunities in the Retail sector.

Syllabus:	**Hours**
Module -1: Introduction to Retail Business	**10**

Definition, functions and types of retail ownership-Independent Retailer, Chain Stores, Franchising, Leased departmental stores, Vertical Marketing system, Consumer co-operatives; forms of retail business ownership. Indian Retail Scenario- Factors influencing retail business in India; Ethical Issues in Retailing; International perspective in retail business- FDI in Indian Organized Retail Sector.

Module -2: Consumer Behaviour in Retail Business	**08**

Buying decision process and its implication on retailing –Customer shopping Behavior, Customer service and customer satisfaction. Retail planning process: Factors to consider in preparing a business plan – implementation – risk analysis.

Module-. 3: Retail Organization and Functional Management	**08**

Business Models in Retailing, Classification of Retailing Formats, Operational Stages in Retailing, Factors influencing Location of stores, Stores Designing, Space planning, Inventory Management, Merchandising Management, Selection and optimization of Workforce. Retail Accounting and Cash Management.

Module -4: Retail Marketing Mix	**12**

Introduction -Product: Decisions related to selection of goods (Merchandise Management) Product Assortment and display, new product launch, PLC in Retailing; Pricing- Influencing factors – approaches to pricing – price sensitivity - Value pricing – Markdown pricing. Place: Supply channel, Retail logistics, computerized replenishment system, corporate replenishment Policies. Promotion : Setting objectives, communication effects , promotional mix.; Retail distribution- In Store and Online Store, Factors influencing retail distribution; Human Resource Management in Retailing- Selection and Optimization of work force.

Module- 5: Impact of Information Technology in Retailing	**07**
Non store retailing (e-retailing) - The impact of Information Technology in retailing - Integrated systems and networking – EDI – Bar coding – Electronic article surveillance – Electronic shelf labels – customer database management system. Legal aspects in retailing, Social issues in retailing, Ethical issues in retailing.	

Skill Development Activities:

a) Draw a retail life cycle chart and list the stages.

b) Draw a chart showing store operations.

c) List out the major functions of a store manager diagrammatically.

d) List out the current trends in e-retailing

e) List out the Factors Influencing in the location of a New Retail outlet.

Books for References:

1. Suja Nair; Retail Management,HPH
2. Karthic – Retail Management, HPH
3. S.K. Poddar& others – Retail Management, HPH.
4. R.S.Tiwari ; Retail Management, HPH 18
5. Barry Bermans and Joel Evans: "Retail Management – A Strategic Approach", 8th edition, PHI/02
6. A.J.Lamba, "The Art of Retailing", 1st edition, Tata McGrawHill, Newdelhi, 2003.
7. Swapna Pradhan :Retailing Management, 2/e, 2007 & 2008, TMH
8. James R. Ogden & Denise T.: Integrated Retail Management
9. A Sivakumar : Retail Marketing , Excel Books
10. Ogden : Biztantra, 2007
11. Levy & Weitz : Retail Management -TMH 5th Edition 2002
12. Rosemary Varley, Mohammed Rafiq-: Retail Management
13. Chetan Bajaj: Retail Management -Oxford Publication.
14. Uniyal &Sinha : Retail Management - Oxford Publications.
15. Araif Sakh ; Retail Management

Name of the Program: Bachelor of Business Administration (BBA)

Logistic and Supply Chain Management

Course Code: LSCM 1

NAME OF THE COURSE: Freight Transport Management

Course Credits	No. of hoursper week	Total No. of teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.

Course Outcomes: On successful completion of the course, the students will be able to:

a) Understand the different functions of Commercial transport.
b) Analyse pricing and pricing strategy.
c) Understand transport administration.
d) Understand of transport and export documentations.

Syllabus:	**Hours**
Module 1: Transport Function	**10**
Transport functionality - Transport structure and classification - Principles and participants - Transport service-Traditional carriers, package service, ground package service, Air package service- Intermodal Transportation - Piggyback/TOFC/COFC, Containerships, Non-operating intermediaries; **Modes of Transport** – Rail, Water, Pipeline, Air, Motor Carriers.	
Module 2: Transport Economics	**09**
The structure of Transport Costs and Location of Economic Activities. Demand for transport. Models of Freight and Passenger Demand. Model Choice; Cost Functions in the Transport Sector. Special Problems of Individuals Modes of Transport; Inter-modal condition in the Indian Situation.	
Module 3: Transport Administration	**08**
Operations management, Consolidation, Negotiation, Control, Auditing and Claim administration, Logistical Integration.	
Module 4: Transport Documentation	**10**
Transport documents: Delivery order, Dock receipt, Bill of Lading, Freight Bill, Sea way Bill (SWB/e-SWB), Airway Bill (AWB/e-AWB), shipping guarantee, packing note or list, consignment note - Shipping Manifest. **Export documents**: BOL, certificate of origin, commercial invoice, consular documents, destination control statement, Dock receipt, EEI, Export license, Export packing list, Free trade documents, inspection certificate, insurance certificate, shipper's letter of instruction.	
Module 5: Pricing	**08**
Pricing fundamentals – Fundamentals of Pricing, Principle of Pricing, F.O.B Pricing, Delivered pricing - Pricing issues- potential discrimination, quantity discounts, pick up allowances, promotional pricing, menu pricing- platform service pricing, value added service cost, efficiency incentives.	

Skill Development Activities:

1. Identify any two products suitable for transportation via Rail, Water, Pipeline, Air, Motor Carriers
2. Identify the best modes of transport for textiles and spices from India to USA
3. Draft a BOL for shipment of goods
4. List out and explain the different kinds of Pricing.

Books for References:

1. Donald. J. Bowersox & Donald. J. Closs, Logistical Management-The integrated Supply Chain Process, TATA Mc-Graw Hill
2. Sunil Chopra & Peter Meindl, Supply Chain Management, PHI
3. Donald J Bowersox, David J Closs, M Bixby Cooper, Supply Chain Logistics Management- McGraw Hill Education, 3rd Indian Edition.
4. Rahul V Altekar, "Supply Chain Management- Concepts and Cases", Prentice Hall of India Pvt. Ltd.

Name of the Program: Bachelor of Business Administration (BBA)

Course Code: **BBA 5.6 Vocational**

Name of the Course: INFORMATION TECHNOLOGY FOR BUSINESS

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs.**	**56 Hrs.**

Pedagogy: Classroom's lecture, tutorials, Group discussion, Seminar, Case studies.

Course Outcomes: On successful completion Student will demonstrate ;

a) Understand the fundamentals of information technology
b) Understand usage of information technology in business.
c) Learn core concepts of computing and modern systems
d) Applications of Excel and SQL.
e) Awareness about latest information.

Syllabus	Hours
Module No. 1: Information Technology and Information System	**10**
Introduction to IT, Introduction to IS, Difference be IS and IT, Need for Information System, Information Systems in the Enterprise, Impact of Information Technology on Business (Business Data Processing, Intra and Inter Organizational communication using network technology, Business process and Knowledge process outsourcing), Managers and Activities in IS, Importance of Information systems in decision making and strategy building, Information systems and subsystems.	
Module No. 2: Subsystems of Information System	**12**
Transaction Processing Systems (TPS), Management Information System (MIS), Decision Support Systems (DSS), Group Decision Support System (GDSS), Executive Information System (EIS), Expert System (ES), Features, Process, advantages and Disadvantages, Role of these systems in Decision making process.	
Module No. 3: Database Management System	**14**
Introduction to Data and Information, Database, Types of Database models, Introduction to DBMS, Difference between file management systems and DBMS, Advantages and Disadvantages of DBMS, Data warehousing, Data mining, Application of DBMS, Introduction to MS Access, Create Database, Create Table, Adding Data, Forms in MS Access, Reports in MS Access.	
Module No. 4: Microsoft Excel in Business	**14**
Introduction to MS Excel, features of MS Excel, Cell reference, Format cells, Data Validation, Protecting Sheets, Data Analysis in Excel: Sort, Filter, Conditional Formatting, Preparing Charts, Pivot Table, What if Analysis(Goal Seek, Scenario manager), Financial Functions: NPV, PMT, PV,FV, Rate, IRR, DB,SLN,SYD. **Logical Functions**: IF, AND, OR, Lookup Functions: V Lookup, H Lookup, Mathematical Functions, and Text Functions.	
Module No. 5: Recent Trends in IT	05
Virtualization, Cloud computing, Grid Computing, Internet of Things, Green Marketing, Artificial Intelligence, Machine Learning.	

Skill Developments Activities:

1. Creating Database Tables in MS Access and Entering Data
2. Creating Forms in MS Access
3. Creating Reports in MS Access
4. Creating charts in Excel
5. What if analysis in Excel
6. Summarizing data using Pivot Table

7. VLookup and HLookup Functions
8. Rate of Interest Calculation using Financial Function
9. EMI calculation using Financial Function
10. Data Validation in Excel
11. Sort and Filter
12. Conditional Formatting in Excel.

Books for Reference:

1. Lauaon Kenneth & Landon Jane, "Management Information Systems: Managing the Digital firm", Eighth edition, PHI, 2004.
2. Uma G. Gupta, "Management Information Systems – A Management Prespective", Galgotia publications Pvt., Ltd., 1998.
3. Louis Rosenfel and Peter Morville, "Information Architecture for the World wide Web", O'Reilly Associates, 2002.
4. C.S.V.Murthy: Management Information Systems, HPH
5. Steven Alter, "Information Systems – A Management Perspective", Pearson Education, 2001.
6. Uma Gupta, "Information Systems – Success in 21st Century", Prentice Hall of India, 2000.
7. Robert G. Murdick, Joel E. Ross and James R. Claggett, "Information Systems for Modern Management", PHI, 1994.
8. Introduction to Database Systems, CJ Date, Pearson
9. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGraw Hill 3rd Edition.
10. The Database Systems – The Complete Book, H G Molina, J D Ullman, J Widom Pearson
11. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
12. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
13. Introduction to Database Systems, C.J.Date Pearson Education
14. Microsoft Access 2013 Step by Step by Cox, Joyce, Lambert, Joan.
15. Excel 2019 All-In-One: Master the new features of Excel 2019 / Office 365 (English Edition) by Lokesh Lalwani
16. Microsoft Excel 2016 - Data Analysis and Business Modeling by Wayne L. Winston (Author)

Name of the Program: Bachelor of Business Administration (BBA.)
Course Code: BBA. 6.1
Name of the Course: Business Law

Course Credits	No. of hours per week	Total No. of teaching hours
4 Credits	4 Hrs.	56 Hrs.

Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussion, Seminar & field work etc.,

Course Outcomes: On successful completion of the course, the students will be able to

a. Comprehend the laws relating to Contracts and its application in business activities.
b. Comprehend the rules for Sale of Goods and rights and duties of a buyer and a Seller.
c. Understand the importance of Negotiable Instrument Act and its provisions relating to Cheque and other Negotiable Instruments.
d. Understand the significance of Consumer Protection Act and its features
e. Understand the need for Environment Protection.

Syllabus:	**Hours**
Module No. 1: Indian Contract Act, 1872	**16**
Introduction – Definition of Contract, Essentials of Valid Contract, Offer and acceptance, consideration, contractual capacity, free consent. Classification of Contract, Discharge of a contract, Breach of Contract and Remedies to Breach of Contract.	
Module No. 2: The Sale of Goods Act, 1930	**12**
Introduction - Definition of Contract of Sale, Essentials of Contract of Sale, Conditions and Warranties, Transfer of ownership in goods including sale by a non- owner and exceptions. Performance of contract of sale - Unpaid seller, rights of an unpaid seller against the goods and against the buyer.	
Module No. 3: Negotiable Instruments Act 1881	**12**
Introduction – Meaning and Definition of Negotiable Instruments – Characteristics of Negotiable Instruments – Kinds of Negotiable Instruments – Promissory Note, Bills of Exchange and Cheques (Meaning, Characteristics and types) – Parties to Negotiable Instruments –Dishonour of Negotiable Instruments – Notice of dishonour – Noting and Protesting.	
Module No. 4: Consumer Protection Act 1986	**08**
Definitions of the terms – Consumer, Consumer Dispute, Defect, Deficiency, Unfair Trade Practices, and Services, Rights of Consumer under the Act, Consumer Redressal Agencies – District Forum, State Commission and National Commission.	

Module No. 5: Environment Protection Act 1986	08

Introduction - Objectives of the Act, Definitions of Important Terms – Environment, Environment Pollutant, Environment Pollution, Hazardous Substance and Occupier, Types of Pollution, Powers of Central Government to protect Environment in India.

Skill Developments Activities:

1. Discuss the case of "Carlill vs Carbolic Smoke Ball Company" case
2. Discuss the case of "Mohori Bibee v/s Dharmodas Ghose".
3. Briefly narrate any one case law relating to minor.
4. List at least 5 items which can be categorized as 'hazardous substance' according to Environment Protection Act.
5. List out any six cybercrimes.

Csases:

The relevant legal point, facts and the judicial decision relating to the following 10 case laws are to be specifically dealt with –

1. Balfour Vs Balfour
2. Carlill Vs Carbolic Smoke Ball Company
3. Felthouse Vs Bindley
4. Lalman Shukla Vs. Gauridutt
5. Durgaprasad Vs Baldeo
6. Chinnayya Vs Ramayya
7. Mohiribibi Vs. Dharmodas Ghosh
8. Ranganayakamma Vs Alvar Chetty
9. Hadley Vs Baxendale

Books for Reference:

1. M.C. Kuchhal, and Vivek Kuchhal, Business Law, Vikas Publishing House, New Delhi.
2. Avtar Singh, Business Law, Eastern Book Company, Lucknow.
3. Ravinder Kumar, Legal Aspects of Business, Cengage Learning
4. SN Maheshwari and SK Maheshwari, Business Law, National Publishing House, New Delhi.
5. Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi
6. Bhushan Kumar Goyal and Jain Kinneri, Business Laws, InternationalBook House
7. Sushma Arora, Business Laws, Taxmann Publications.
8. Akhileshwar Pathak, Legal Aspects of Business, McGraw Hill Education, 6th Ed.
9. P C Tulsian and Bharat Tulsian, Business Law, McGraw Hill Education
10. Sharma,J.P. and Sunaina Kanojia, Business Laws, Ane Books Pvt. Ltd., New Delhi
11. K. Rama Rao and Ravi S.P., Business Regulatory Framework., HPH
12. N.D. Kapoor, Business Laws, Sultan Chand Publications
13. K. Aswathappa, Business Laws, HPH,
14. Information Technology Act/Rules 2000, Taxmann Publications Pvt. Ltd.
15. Chanda.P.R, Business Laws, Galgotia Publishing Company

Name of the Program: Bachelor of Business Administration (BBA)

Course Code: BBA 6.2

Name of the Course: Income Tax – II

Course Credits	No. of hours per week	Total No. of Teaching hours
4 Credits	4 Hrs.	56 Hrs.

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion of the course, the students will:

a) Understand the procedure for computation of income from business and other Profession.
b) the provisions for determining the capital gains.
c) Compute the income from other sources.
d) Demonstrate the computation of total income of an Individual.
e) Comprehend the assessment procedure and to know the power of income tax authorities.

Syllabus:	Hours
Module No. 1: Profits and Gains of Business and Profession	**18**
Introduction-Meaning and definition of Business, Profession and Vocation. - Expenses Expressly allowed - Expenses Expressly Disallowed - Allowable losses - Expressly disallowed expenses and losses, Expenses allowed on payment basis. Problems on computation of income from business of a sole trading concern - Problems on computation of income from profession: Medical Practitioner - Advocate and Chartered Accountants.	
Module No. 2: Capital Gains	**10**
Introduction - Basis for charge - Capital Assets - Types of capital assets – Transfer - Computation of capital gains – Short term capital gain and Long term capital gain - Exemption under section 54, 54B, 54EC, 54D, 54F, and 54G. Problems covering the above sections.	
Module No. 3: Income from other Sources	**10**
Introduction - Incomes taxable under Head income other sources – Securities - Types of Securities - Rules for Grossing up. Ex-interest and cum-interest securities. Bond Washing Transactions - Computation of Income from other Sources.	
Module No. 4: Set Off and Carry Forward of Losses & Assessment of individuals.	**10**
Introduction – Provisions of Set off and Carry Forward of Losses (Theory only) Computation of Total Income and tax liability of an Individual.	
Module No. 5: Assessment Procedure and Income Tax Authorities	**08**
Introduction - Due date of filing returns, Filing of returns by different assesses, E-filing of returns, Types of Assessment, Permanent Account Number -Meaning, Procedure for obtaining PAN and transactions were quoting of PAN is compulsor**y.** Income Tax Authorities their Powers and duties.	

Skill Developments Activities:

1. Visit any chartered accountant office and identify the procedure involved in the computation of income from profession.
2. List out the different types of capital assets and identify the procedure involved in the computation of tax for the same.
3. List out the steps involved in the computation of income tax from other sources and critically examine the same.
4. Identify the Due date for filing the returns and rate of taxes applicable for individuals.
5. Draw an organization chart of Income Tax department in your locality.
6. Any other activities, which are relevant to the course.

Books for References:

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1. Dr. Vinod K. Singhania: Direct Taxes – Law and Practice, Taxmann publication.
2. B.B. Lal: Direct Taxes, Konark Publisher (P) ltd.
3. Dr. Mehrotra and Dr. Goyal: Direct Taxes – Law and Practice, Sahitya Bhavan Publication.
4. Dinakar Pagare: Law and Practice of Income Tax, Sultan Chand and sons.
5. Gaur & Narang: Income Tax.
6. 7 Lecturers – Income Tax – I, VBH
7. Dr.V.Rajesh Kumar and Dr.R.K.Sreekantha: Income Tax – I, Vittam Publications.
8. Dr. B Mariyappa, Income Tax II – HPH.

Name of the Program: Bachelor of Business Administration (BBA)
Course Code: BBA 6.3
Name of the Course: International Business

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	**4 Hrs.**	**56 Hrs.**

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion of the course, the students will able to:

a) Understand the concept of International Business.
b) Differentiate the Internal and External International Business Environment.
c) Understand the difference MNC and TNC
d) Understand the role of International Organisations in International Business.
e) Understand International Operations Management.

Syllabus:	**Hours**
Module No. 1: Introduction to International Business	**12**

Introduction- Meaning and definition of international business, need and importance of international business, stages of internationalization, tariffs and non-tariff barriers to international business.

Mode of entry into international business - exporting (direct and indirect), licensing and franchising, contract manufacturing, turnkey projects, management contracts, wholly owned manufacturing facility, Assembly operations, Joint Ventures, Third country location, Mergers and Acquisition, Strategic alliance, Counter Trade; Foreign investments.

Module No. 2: International Business Environment	12

Overview, Internal and External environment - Economic environment, Political environment, Demographic environment, Social and Cultural environment, Technological and Natural environment.

Module No.3: Globalization	**12**

Meaning, features, essential conditions favoring globalization, challenges to globalization, MNCs, TNCs - Meaning, features, merits and demerits; Technology transfer - meaning and issues in technology transfer.

Module No.4: Organizations Supporting International Business	**10**

Meaning, Objectives and functions of - IMF, WTO, GATT, GATS, TRIM, TRIP; and Regional Integration- EU, NAFTA, SAARC, BRICS.

Module No.5: International Operations Management	10

Global Supply Chain Management- Global sourcing, Global manufacturing strategies, International Logistics, International HRM - Staffing policy and it's determinants; Expatriation and Repatriation (Meaning only).

Skill Developments Activities:

a) Tabulate the foreign exchange rate of rupee for dollar and euro currencies for 1 month
b) List any two Indian MNC's along with their products or services offered.
c) Prepare a chart showing currencies of different countries
d) Collect and paste any 2 documents used in Import and Export trade.

Books for References:

1. Rakesh Mohan Joshi. (2011). International Business, Oxford University Press, New Delhi.
2. Francis Cherunilam; International Business, Prentice Hall of India
3. P. SubbaRao – International Business – HPH
4. Sumati Varma. (2013). International Business (1st edi), Pearson.
5. Charles Hill. (2011). International Business: Text & Cases, Tata McGraw Hill, New Delhi.
6. International Business by Daniel and Radebaugh –Pearson Education

Name of the Program: Bachelor of Business Administration **(BBA)**

Finance Elective

Course Code: FN2

Name of the Course: Security Analysis and Portfolio Management

Course Credits	No. of hours per week	Total No. of teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussion, Seminar &field work etc.,

Course Outcomes: On successful completion of the course, the students will beable to:

a) Understand the concept of basics of Investment.
b) Evaluate the different types of alternatives.
c) Evaluate the portfolio and portfolio management.
d) Understand the concept of risk and returns
e) Gain the knowledge of fundamental and technical analysis.

Syllabus:	**Hrs.**
Module No. 1: Introduction to Investments	**10**
Introduction- Investment process, Criteria for Investment, types of Investors, Investment, Speculation and Gambling. Elements of Investment, Investment Avenues, Factors influencing selection of investment alternatives. Security Market- Introduction, functions, Secondary Market Operations. Stock Exchanges in India, Security Exchange Board of India, Government Securities Market, Corporate Debt Market and Money Market Instruments.	
Module No. 2: Risk-Return Relationship	**05**
Meaning of risk, types off risk, measuring risk, risk preference of investors. Meaning of return, measures of return, holding period of return, Annualized return, expected return, investors attitude towards risk and return.	
Module No. 3: Fundamental Analysis	**10**
Introduction- Investment Analysis, Fundamental Analysis, Macro Economic Analysis, Industry Analysis, Company Analysis, Trend Analysis, and Ratio Analysis.	
Module No. 4: Technical Analysis	**10**
Meaning of Technical Analysis, Fundamental vs Technical Analysis, Charting techniques, Technical Indicators, Testing Technical Trading Rules and Evaluation of Technical Analysis.	
Module No. 5: Portfolio Management	**10**
Framework-Portfolio Analysis – Selection and Evaluation – Meaning of portfolio – Reasons to hold portfolio – Diversification analysis – Markowitz's Model – Assumptions –Specific model – Risk and return optimization – Efficient frontier – Efficient portfolios –Leveraged portfolios – Corner portfolios – Sharpe's Single Index model – Portfolio-evaluation measures – Sharpe's Performance Index – Treynor's Performance Index – Jensen's Performance Index.	

Skill Development

1. Prepare an imaginary investment portfolio for individual with a salary of 10 lakhs per annum.
2. List of 10 companies approached SEBI for IPO
3. Prepare a technical analysis chart on Blue Chip Companies of BSE.
4. Collect information regarding GDRs, ADRs, IDRs and various Bonds and make a chart.
5. Watch market movement for a day and analyze the trend of Nifty-Fifty Index.

Books for Reference

1. A. Brahmiah & P. Subba Rao, Financial Futures and Options, HPH.
2. Singh Preeti, Investment Management, HPHG
3. Alexander Fundamental of Investments, Pearson Ed.
4. Hangen: Modern Investment theory. Pearson Ed.
5. Kahn: Technical Analysis – Plain and sample Pearson Ed.
6. Ranganthan: Investment Analysis and Port folio Management.
7. Chandra Prasanna: Managing Investment – Tata Mc Gram Hill.
8. Alexander, shampe and Bailey – Fundamentals of Investments Prentice Hall of India
9. Newyork Institute of Finance – How the Bond Market work – PHI.
10. Mayo Investment Thomason hearning

Name of the Program: Bachelor of Business Administration (BBA)

Marketing Elective

Course Code: MK 2

Name of the Course: Advertising and Media Management

Course Credits	No. of hours per week	Total No. of teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion of the course, the students will beable to:

a) Understand the nature, role, and importance of IMC in marketing strategy
b) Understand effective design and implementation of advertising strategies
c) Present a general understanding of content, structure, and appeal of advertisements
d) Understand ethical challenges related to responsible management of advertising and brand strategy.
e) Evaluate the effectiveness of advertising and agencies role

Syllabus:	**Hours**
Module -1: Introduction to Integrated Marketing Communication	10
Integrated marketing communication, AIDA Model, Setting goals and objectives, concept of DAGMAR in setting objectives, elements of IMC; Role of advertising in India's economic development, Ethics in advertising, Social, Economic and Legal aspects of advertising.	
Module -2: Consumer and Media	**10**
How advertising works: perception, cognition, affect, association, persuasion, behaviour, Associating feeling with brands, Use of research in advertising planning; Advertising Media; industry structure, functions, advantages, disadvantages of print, Television, Radio, Internet, Outdoor, Basic concept of media planning, media selection, Media Scheduling strategy, setting media budgets	
Module-3: Advertising Program	**10**
Planning and managing creative strategies; Creative approaches; Building Advertising Program: Message, Theme, advertising appeals; Advertising layout: how to design and produce advertisements; Advertising Budget: nature and methods of advertising appropriation; Art of copywriting; Guidelines for copywriting; Copywriting for print, Audio, TV and outdoor media.	
Module -4: Other Elements of IMC- Sales Promotion, PR, Events and Experiences and Word of Mouth	**10**
Consumer and trade sales promotion, application of sales promotion in different domains**;** Using public relations in image building**;** Planning and executing events, event management**;** Viral marketing, building organic word of mouth communication.	

Module -5: Measuring Effectiveness	**05**
Measuring Advertising Effectiveness: stages of evaluations and various types of testing-Pre and Post testing; Advertising agencies: history, role, importance, organizational structure, functions; Selection of agency, client agency relationship, compensation strategies	

Skill Development Activities:

a) List out ethical issues in Advertisements.
b) List out different modes of Advertisement.
c) Write a note on guidelines for copywriting.
d) List out types of Outdoor Advertisement.
e) State the process in selection of Advertisement Agency.

Books for References:

1. Advertising Principles and Practice, William Wells, John Burnett, Sandra Moriarty, 6th ed., Pearson education, Inc.
2. Advertising and Promotion, G.Belch, Michael Belch, Keyoor Purani, 9th edition, Tata Mcgraw Hill publication, ISBN: 978-1-25-902685-0.

Name of the Program: Bachelor of Business Administration (BBA)

Human Resource Elective

Course Code: HRM 2

Name of the Course: Cultural Diversity at Work Place

Course Credits	No. of hoursper week	Total No. of Teaching hours
3 credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

Course Outcomes: On successful completion of the course, the students will be able to:

f) Understand, interpret question reflect upon and engage with the notion of "diversity".
g) Recall the cultural diversity at work place in an organization.
h) Support the business case for workforce diversity and inclusion.
i) Identify diversity and work respecting cross cultural environment.
j) Assess contemporary organizational strategies for managing workforce diversity and inclusion.

Syllabus:	**Hours**
Module No. 1: Introduction to Diversity	**10**

Introduction to cultural diversity in organizations, Evolution of Diversity Management, Over View of Diversity, Advantages of Diversity, Identifying characteristics of diversity, Scope- Challenges and issues in diversity management, Understanding the nature of Diversity – Cultural Diversity – Global Organizations- Global Diversity.

Module No. 2: Exploring Differences	**08**

Introduction -Exploring our and others' differences, including sources of our identity. Difference and power: Concepts of prejudice, discrimination, dehumanization and oppression.

Module No. 3: Visions of Diversity and Cross Cultural Management	**10**

Models and visions of diversity in society and organizations: Justice, fairness, and group and individual differences. Cross-Cultural Management: Meaning and Concepts, Frameworks in Cross-Cultural Management: Kluckhohn and Strodtbeck framework, Hofstede's Cultural Dimensions, Trompenaar's Dimensions, Schwartz Value Survey, GLOBE study.

Module No. 4: Skills and Competencies	**10**
Skills and competencies for multicultural teams and workplaces/ Organizational assessment and change for diversity and inclusion, Diversity Strategies. Creating Multicultural Organisations.	
Module No. 5: Recent Trends in Diversity Management	**08**
Emerging workforce trends–Dual-career couples–Cultural issues in international working on work-life balance–Managing multi-cultural teams: Issues and challenges, Global demographic trends: Impact on diversity management, Social psychological perspective on workforce diversity, Diversity Management in IT organizations Contemporary Issues in Workplace Diversity.	

Skill Development Activities:

1. Visit any MNCs, identify and report on the cultural diversity in an organization.
2. Interact and List out the ways in which dehumanization done in public/ private sector organization.)
3. Interact with HR Manager of any MNCs, explore and report on cross cultural management.
4. Explore the benefits of multi-cultural organizations.
5. Examine and report on diversity management in select IT organizations.
6. Any other activities, which are relevant to the course.

Books for References:

1. Bell, M.P. (2012). Diversity in organizations (2nd Ed.). Mason, OH: Cengage.
2. Harvey, C.P. & Allard, M.J. (2015). Understanding and managing diversity: Readings, cases, and exercises (6th Ed.). Upper Saddle River, NJ: Pearson.

Note: Latest edition of text books may be used.

Name of the Program: Bachelor of Business Administration (BBA)

DATA ANALYTICS

Course Code: DA 2

Name of the Course: Marketing Analytics

Course Credits	No. of hoursper week	Total no. of teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion student will demonstrate:

a) Understand the importance of marketing analytics for forward looking and systematic allocation of marketing resources
b) Apply marketing analytics to develop predictive marketing dashboard for organization
c) Analyse data and develop insights to address strategic marketing challenges
d) Execute the models on Predictions and Classifications on R Software.
Know the applications of analytics in marketing.

Syllabus:	**Hours**
Module No. 1: Introduction to Marketing Analytics and Data Mining	**06**
Introduction to Marketing Analytics, Need of Marketing Analytics, Benefits of Marketing Analytics, Data mining –Definition, Classes of Data mining methods – Grouping methods, Predictive modeling methods, Linking methods to marketing applications. Process model for Data mining – CRISP DM.	
Module No. 2: Introduction to R	**10**
About R, Data types and Structures, Data coercion, Data preparation: Merging, Sorting, Splitting, Aggregating, Introduction to R Libraries – How to install and invoke, Introduction to R Graph – Basic R charts – Different types of charts.	
Module No. 3: Descriptive Analytics	**08**
Exploratory Data Analysis using summary table and various charts to find the insights, slicing and dicing of the Customer data. Inferential Statistics: T-Test, ANOVA, Chi-Square using marketing data and exploring relationship (Correlation).	
Module No. 4: Prediction and Classification Modelling using R	**10**
Introduction to Prediction and Classification modelling, data splitting for training and testing purpose, Prediction modelling: Predicting the sales using Moving Average Model and Regression Model(Simple and Multiple Regression model), Classification modelling: Customer churn using Binary logistic regression and decision tree.	
Module No. 5: Application of Analytics in Marketing	**11**
Association Rules – Market Basket Analysis for Product Bundling and Promotion, RFM (Recency Frequency Monetary) Analysis, Customer Segmentation using K-Means Cluster Analysis, Key Driver Analysis using Regression Model.	

Skill Development Activities:

a) Explain the Process model for Data Mining.
b) Explain the difference between Binary Logistic Regression and Decision Tree.
c) List out Public domain data base.
d) List out applications of marketing analytics.

Books for References:

1. Marketing Analytics: Data-Driven Techniques with Microsoft® Excel® Published by John Wiley & Sons, Inc
2. Marketing Data Science, Thomas W. Miller Published by Pearson
3. Marketing Metrics, Neil T Bendle, Paul W. Farris, Phillip E. Pfeifer published by Pearson
4. Marketing Analytics, Mike Grigsby published by Kogan Page.

Name of the Program: Bachelor of Business Administration (BBA)

Retail Management

Course Code: RM 2

Name of the Course: Retail Operations Management

Course Credits	No. of hoursper week	Total No. of teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, Case studies, Group discussion, Seminar &field work etc.,

Course Outcomes: On successful completion student will demonstrate:

a) Compare various retail formats and technological advancements for setting up appropriate retail business.
b) Identify the competitive strategies for retail business decisions.
c) Examine the site location and operational efficiency for marketing decisions.
d) Analyse the effectiveness of merchandising and pricing strategies.
e) Assess store layout and planogram for retail business.

Syllabus:	**Hours**
Module -1: Retail and Logistics Management	**07**
Introduction Retailing and economic significance- Functions of a retailer - Types of retailers – Trends in retailing – International Retailing – Retailing as a career –Retail Management Decision Process - Service Retailing.	
Module -2: Retailing Environment Theories	**10**
Theory of Retail Change: Theory of Natural Selection in retailing, Theory of Wheel of retailing, General-Specific-General Cycle or Accordion Theory, Retail Life Cycle Theory- - Multi channel retailing – Retail Aggregators Business Model – Phases of growth of retail markets – Retail Mix.	
Module-. 3: Store Loyalty Management and Retail Location	**10**
Types of customers – Variables influencing store loyalty – Store loyalty models – Influencing customers through visual merchandising – Value added through private labels – Retail location strategy– Importance of location decision – Retail location strategies and techniques – Types of retail locations.	
Module -4: Merchandise Management	**10**
Meaning - Roles and responsibilities of the merchandiser and the buyer – Function of Buying for different types of Organizations – Process of Merchandise Planning – Merchandise Sourcing – Methods of procuring merchandise – Concept of private label - Retail Pricing policies.	
Module- 5: Category Management	**08**
Meaning - Definition of Category Management - Components of Category Management - Category Management Business process - Category Definition - Defining the Category Role-Destination Category, Routine Category, Seasonal Category, Convenience Category - Category Assessment - Category Performance Measures - Category Strategies - Category Tactics - Category Plan implementation - Category Review.	

Skill Development Activities:

a) Write a note on Visual merchandising training programme layout design, and product placement.

b) Write a note Leadership training: Develop skills in coaching, delegation, and motivation.

c) Derive Customer analysis by considering skills in understanding customer behavior and preferences to improve customer satisfaction.

d) Chart out the types of customers in creating customer loyalty programs.

Books for References:

1. Coughlem: Marketing Channels.ϖ Gilbert Pearson: Retail Marketing Education Asia 2001.
2. Micheal Levyϖ & Barton AWeitz: Retailing Management, McGraw
3. Patrick M Dunne: Robert F Lusch: Retail Management Hill Publications.
4. Suja Nair: Retail Management, Himalaya Publishing House.ϖ
5. W. Stern, E L. Ansary, T. Ooughlan: Marketing Channels, 6thEdition PHIϖ New Delhi, 2001.

Name of the Program: Bachelor of Business Administration (BBA)

Logistic and Supply Chain Management

Course Code: LSCM 2

NAME OF THE COURSE: Sourcing for Logistics and Supply Chain Management

Course Credits	No. of hoursper week	Total No. of Teaching hours
3 Credits	3 hours	45 hours

Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

Course Outcomes: On successful completion of the course, the students will beable to:

a) Understand the role of sourcing in logistics and supply chain management, and its impact on overall business performance.
b) Analyze and evaluate sourcing strategies and decisions, including make-or-buy, insourcing vs. outsourcing, and supplier selection criteria.
c) Develop effective supplier relationship management skills, including negotiation, communication, and collaboration.
d) Apply sourcing best practices, including risk management, sustainability, and ethical sourcing.
e) Evaluate the impact of technology and innovation on sourcing, and apply relevant tools and techniques to optimize sourcing processes and outcomes.

Syllabus:	**Hours**
Module No. 1: Sourcing	**08**
Meaning and Definition. Approaches to Sourcing. Sole Sourcing – Single, Dual & Multiple sourcing arrangements, other sourcing/purchasing strategies, Tendering – Open, Restricted and Negotiated approaches. Intra–Company trading and Transfer pricing arrangement, Implications of International Sourcing.	
Module No. 2: External Sourcing	**08**
Criteria for sourcing requirement from external suppliers – Quality Assurance, Environmental and Sustainability, Technical Capabilities, System Capabilities, Labour Standards, Financial Capabilities. Award criteria – Price, Total Life Cycle Costs, Technical Merit, Added Value Solutions, Systems, and Resources.	
Module No.3: Assessment of Financial Stability	**10**
Sources of information on potential suppliers' Financial performance. Financial reports – Profit & Loss Statements, Balance Sheets, and Cash Flow Statements. Ratio Analysis on Liquidity, Profitability, Gearing and Investment. Role of credit rating agencies.	
Module No.4: Assessment of Market Data	**12**
Analysing Suppliers' Market. Secondary Data on Markets & Suppliers. Indices that measure economic data. Process of obtaining tenders and quotations. Decision criteria for tenders and quotations. Criteria to assess tenders and quotations – use of weighted points system.	

ModuleNo.5: Legislative, Regulatory & Organizational Requirements	**07**
Legislative, Regulatory & Organizational Requirements when sourcing from not-for-profit, private and public sector suppliers. Competitive tendering process. Timescales on tendering process. Procedure for award of contract. Regulatory bodies.	

Skill Development Activities:

1. Highlight the stages when Early Supplier Involvement is encouraged by companies to maximise the benefits
2. List out the Regulatory bodies connected to sourcing.
3. Identify the benefits of co-location of suppliers to the company.
4. List out the Credit rating agencies for supplier assessment.

Books for References:

1. Donald Waters, Logistics - An Introduction to Supply Chain Management, Palgrave Macmillan, New York,
2. John Gattorna , Handbook of Logistics and Distribution Management.
3. P. Fawcett, R. McLeish and I Ogden, Logistics Management.
4. D.M. Lambert & J R Stock, Richard D Irwin Inc., Strategic Logistics Management.
5. Martin Christopher, Logistics and Supply Chain Management, Pitman Publishing, 2nd Edition
6. David N, Burt, Donald W. Dobler, Stephen L. Starling, "World Class Supply Management- A Key to Supply Chain Management", Tata McGraw Hill Publishing Company Ltd., New Delhi.

Name of the Program: Bachelor of Business Administration (BBA)
Course Code: BBA 6.6 Vocational
Name of the Course: GOODS AND SERVICES TAX

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.

Pedagogy: Classroom's lecture, tutorials, Group discussion, Seminar, Case studies.

Course Outcomes: On successful completion Student will demonstrate

a) Understand the basics of taxation, including the meaning and types of taxes, and the differences between direct and indirect taxation.
b) Analyze the history of indirect taxation in India and the structure of the Indian taxation system.
c) Understand the framework and definitions of GST, including the constitutional framework, CGST, SGST, IGST, and exemptions from GST.
d) Understand the time, place, and value of supply under GST, and apply this knowledge to calculate the value of supply and determine GST liability.
e) Understand input tax credit under GST, including its meaning and process for availing it, and apply this knowledge to calculate net GST liability.

Syllabus	Hours
Module No. 1: Basics of Taxation	**04**
Tax – Meaning and Types, Differences between Direct and Indirect Taxation, Brief History of Indirect Taxation in India, Structure of Indian Taxation.	
Module No. 2: Goods and Services Tax –Framework and Definitions	**12**
Introduction to Goods and Services Tax, Constitutional Framework, Orientation to CGST, SGST and IGST, Meaning and Scope of Supply, Types of Supply. Exemptions from GST.	
Module No. 3: Time, Place And Value of Supply	**20**
Time of Supply – in case of Goods and in case of Services - Problems on ascertaining Time of Supply; Place of Supply – in case of Goods and in case of Services (both General and Specific Services) – Problems on Identification of Place of Supply; Value of Supply – Meaning, Inclusions and Exclusions. Problems on calculation of 'Value of Supply'.	
Module No. 4: GST Liability and Input Tax Credit	**14**
Rates of GST – Classification of Goods and Services and Rates based on classification, Problems on computation of GST Liability. Input Tax Credit – Meaning, Process for availing Input Tax Credit – Problems on calculation of Input Tax Credit and Net GST Liability.	
Module No. 5: GST Procedures	05
Registration under GST, Tax Invoice, Levy and Collection of GST, Composition Scheme, Due dates for Payment of GST, Accounting record for GST, Features of GST in Tally Package. GST Returns – Types of Returns, Monthly Returns, Annual Return and Final Return – Due dates for filing of returns. Final Assessment. Accounts and Audit under GST.	

Skill Developments Activities:

a) List out the process of GST registration for a business.
b) Chart out 'time of supply' concept relevance in GST.
c) Identify the place of supply for goods and services in different scenarios.
d) Calculate GST liability for a particular transaction using imaginary values.
e) Explain the process of availing input tax credit in GST.

Books for Reference:

1. V Rajesh Kumar and Mahadev, "Indirect Taxes", Mc Graw Hill Education
2. Datey, V S, "Indirect Taxes", Taxmann Publications.
3. Hiregange et al, "Indirect Taxes:, Puliani and Puliani.
4. Haldia, Arpit, "GST Made Easy", Taxmann Publications.
5. Chaudhary, Dalmia, Girdharwal, "GST – A Practical Approach", Taxmann Publications.
6. Garg, Kamal, "Understanding GST", Bharat Publications.
7. Hiregange, Jain and Naik, "Students' Handbook on Goods and Services Tax", Puliani and Puliani.

ತೃತೀಯ ಬಿ.ಎ. ಕನ್ನಡ ಐಚ್ಛಿಕ – ಸಿ–೯

ಕನ್ನಡ ವ್ಯಾಕರಣ ಪರಂಪರೆ : ಶಬ್ದಮಣಿದರ್ಪಣ
(ಅಕ್ಷರ–ಸಂಧಿ–ನಾಮ)

ಸಾಹಿತ್ಯ ಮಂಗಳ–೫

ಪರಿವಿಡಿ

ತೃತೀಯ ಬಿ.ಎ. ಕನ್ನಡ ಐಚ್ಛಿಕ – ಸಿ – ೧೦

ಕನ್ನಡ ಭಾಷಾ ವಿಜ್ಞಾನ

ಸಾಹಿತ್ಯ ಮಂಗಳ–೫

ಪರಿವಿಡಿ

ತೃತೀಯ ಬಿ.ಎ. ಕನ್ನಡ ಐಚ್ಛಿಕ

ಸಾಹಿತ್ಯ ಮಂಗಳ–೫

ಸಿ–೧೧ : ಕನ್ನಡ ಛಂದಸ್ಸು

ಪರಿವಿಡಿ

ತೃತೀಯ ಬಿ.ಎ. ಕನ್ನಡ ಐಚ್ಛಿಕ – (೬ನೇ ಸೆಮಿಸ್ಟರ್) - ಸಿ–೧೨

ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ (ಪೂರ್ವದ ಹಳಗನ್ನಡ–ಹಳಗನ್ನಡ ಸಾಹಿತ್ಯ)

ಕ್ರೆಡಿಟ್–೪, ಬೋಧನಾವಧಿ : ೪ ಗಂಟೆಗಳು,

ಗರಿಷ್ಠ ಮಾರ್ಕ್ಸ್ ೬೦, ಅಂತರಿಕ ಮೌಲ್ಯಮಾಪನ–೪೦

ಸಾಹಿತ್ಯ ಮಂಗಳ–೬

ಪರಿವಿಡಿ

ಬೋಧನಾವಧಿ : ೩೦ ಗಂಟೆಗಳು

ತೃತೀಯ ಬಿ.ಎ. ಕನ್ನಡ ಐಚ್ಛಿಕ – (೬ನೇ ಸೆಮಿಸ್ಟರ್) -ಸಿ–೧೩

ಕನ್ನಡ ವ್ಯಾಕರಣ ಪರಂಪರೆ : ಶಬ್ದಮಣಿ ದರ್ಪಣ (ಸಮಾಸ, ಆಖ್ಯಾತ, ಧಾತು ಮತ್ತು ಅವ್ಯಯ)

ಕ್ರೆಡಿಟ್–೪, ಬೋಧನಾವಧಿ : ೪ ಗಂಟೆಗಳು,

ಗರಿಷ್ಠ ಮಾರ್ಕ್ಸ್ ೬೦, ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ–೪೦

ಸಾಹಿತ್ಯ ಮಂಗಳ–೬

ಬೋಧನಾವಧಿ : ೩೦ ಗಂಟೆಗಳು

ಪರಿವಿಡಿ

ಘಟಕ ೧

೧. ಕನ್ನಡ ವ್ಯಾಕರಣ ಪರಂಪರೆ : ಆಧುನಿಕ ಚಿಂತನೆಗಳು

೧.೦. ವ್ಯಾಕರಣ ನಿರ್ವಚನ., ವ್ಯಾಕರಣ ಪರಂಪರೆ.

೧.೧. ಆಧುನಿಕ ಚಿಂತನೆಗಳು. : ಆಧುನಿಕ ವ್ಯಾಕರಣ ಪರಂಪರೆಯ ಬಗೆಗಳು, ವ್ಯಾಕರಣ ಪರಂಪರೆಯ ಮೇಲೆ ಆಂಗ್ಲ ಭಾಷೆಯ ಪ್ರಭಾವ.

ಘಟಕ ೨

೧. ಸಮಾಸ ಪ್ರಕರಣ .

೧.೦. ಸಮಾಸ ಎಂದರೇನು?

೧.೧. ಹಳಗನ್ನಡ ಸಮಾಸಗಳು (ಕೇಶಿರಾಜನು ಹೇಳುವ ಷಟ್ ಸಮಾಸಗಳು ಸೇರಿದಂತೆ), ಅರಿ ಸಮಾಸ, ವೀಪ್ಸೆ ಶಬ್ದಗಳ ಯುಗಲೋಚ್ಚಾರಣೆ

೧.೨. ಸಮಾಸವನ್ನು ಕುರಿತು ಡಿ.ಎನ್ ಶಂಕರ ಭಟ್ಟರ ವಿಚಾರಗಳು.

ಘಟಕ ೩

೧. ಆಖ್ಯಾತ ಪ್ರಕರಣ

೧.೦. ಆಖ್ಯಾತ ಪ್ರತ್ಯಯಗಳು

೧.೧. ಕಾಲವಾಚಕ ಪ್ರತ್ಯಯಗಳು : ಕನ್ನಡ ಕಾಲವ್ಯವಸ್ಥೆ

೧.೨ ಹೊಸಗನ್ನಡದಲ್ಲಿ ಕಾಲವ್ಯವಸ್ಥೆ

೧.೩ ವಿಧಿಯ ಕೆ.ಕುಂ ಪ್ರತ್ಯಯಗಳು

೧.೪. ಪ್ರತಿಷೇಧ ಕ್ರಿಯಾ ರೂಪ

೧.೫. ಅಪೂರ್ಣ ಕ್ರಿಯಾರೂಪ – ಸತಿ ಸಪ್ತಮಿ.

೧.೬. ಪಕ್ಷಾರ್ಥ 'ಒಡೆ' ಕ್ರಿಯಾ ರೂಪ.

೧.೭. ಕರ್ಮಣಿ ಪ್ರಯೋಗ

ಘಟಕ ೪

೧. ಧಾತು ಮತ್ತು ಅವ್ಯಯ ಪ್ರಕರಣ

೧.೧. ಧಾತು

೧.೧. ಧಾತುಗಳ ಪಟ್ಟಿ (೯೮೫)

೪.೨ ಅವ್ಯಯಗಳು

೧.೦. ಅವ್ಯಯದ ನಿರ್ವಚನ

೧.೨. ಅವ್ಯಯಗಳಲ್ಲಿ ಆಧುನಿಕ ದೃಷ್ಟಿ– ಭಾವ ಸೂಚಕ,
ಕ್ರಿಯಾರ್ಥಕ, ಸಮುಚ್ಚಾಯಕ, ಅನುಸರ್ಗ.

ಅನುಬಂಧ

ಕೇಶಿರಾಜನು ಹೇಳುವ ಕನ್ನಡದ ಅಸಾಧಾರಣ ಲಕ್ಷಣಗಳು :
ಗಮಕ ಸಮಾಸ, ಱಜ, ಕುಳ ಕ್ಷಳ, ಶ್ರುತಿ ಸಹ್ಯ. ,
ಸತಿ ಸಪ್ತಮಿ, ಸಮ ಸಂಸ್ಕೃತ,ವ– ಮ–ಹ – ಪ ಭೇದ,
ವಿರಹಿತ ಅವ್ಯಯ ಸಂಸ್ಕೃತ ಲಿಂಗ,
ಪದೋತ್ತಮ ಶಿಥಿಲತ್ವ, ಯತಿ ವಿಲಂಘನ.

ತೃತೀಯ ಬಿ.ಎ. ಕನ್ನಡ ಐಚ್ಛಿಕ –(ಒನೇ ಸೆಮಿಸ್ಟರ್) - ಸಿ–೧೪

ಸಾಂಸ್ಕೃತಿಕ ಅಧ್ಯಯನಗಳು

ಕ್ರೆಡಿಟ್–೪, ಬೋಧನಾವಧಿ : ೪ ಗಂಟೆಗಳು,

ಗರಿಷ್ಠ ಮಾರ್ಕ್ಸ್ ೬೦, ಅಂತರಿಕ ಮೌಲ್ಯಮಾಪನ–೪೦

ಸಾಹಿತ್ಯ ಮಂಗಳ–೬

ಬೋಧನಾವಧಿ : ೩೦ ಗಂಟೆಗಳು

ಪರಿವಿಡಿ

ಘಟಕ ೧ ನೀಲಮ್ಮನ ವಚನಗಳು

ನೀಲಮ್ಮನ ವಚನಗಳಲ್ಲಿ ಸಾಮಾಜಿಕ ಪ್ರಜ್ಞೆ

ಘಟಕ ೨

ಶರೀಫರ ತತ್ವಪದಗಳು ಮತ್ತು ವಸಾಹತು ಪ್ರಜ್ಞೆ

ಎಲ್ಲರಂಥವನಲ್ಲ ನನ ಗಂಡ
ಬಿದ್ದಿಯಬ್ಬೇ ಮುದುಕಿ
ಮನೆಯ ಮಾಳಿಗಿ
ಗುಡಿಯ ನೋಡಿರಣ್ಣ
ದುಡ್ಡು ಕೆಟ್ಟದ್ದೋ ನೋಡಣ್ಣ
ಕುಂಬಾರಕಿ
ಸಾಲಿಯ ನೋಡಿದಿಯಾ
ಗಿರಣಿ ವಿಸ್ತಾರ ನೋಡಮ್ಮ

ಘಟಕ ೩

ಕೊಡಗಿನ ಗೌರಮ್ಮ ಮತ್ತು ಗಾಂಧಿವಾದ
ಹೋಗಿಯೇ ಬಿಟ್ಟಿದ್ದ!
ಒಂದು ಚಿತ್ರ
ನನ್ನ ಮದುವೆ

ಘಟಕ ೪

ತೇಜಸ್ವಿ ಕೃತಿಗಳಲ್ಲಿ ಪರಿಸರ ಪ್ರಜ್ಞೆ
ಮಾನೀಟರ್
ಕುಕ್ಕುಟ ಪಿಶಾಚ
ಕೆರೆಯ ದಡದಲ್ಲಿ

ರಾಷ್ಟ್ರೀಯ ಶಿಕ್ಷಣ ನೀತಿ (NEP) - 2020ರ ಅನ್ವಯ
ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

ತೃತೀಯ ಬಿ.ಎ. –(ಒನೇ ಸೆಮಿಸ್ಟರ್)- MINI PROJECT

ಪ್ರವಾಸ ಸಾಹಿತ್ಯ

(ಪ್ರವಾಸ ಸಾಹಿತ್ಯದ ಪರಂಪರೆ - ಸ್ವದೇಶಿ ಪ್ರವಾಸ ಕಥನ - ವಿದೇಶಿ ಪ್ರವಾಸ ಕಥನ ಪರಿಕಲ್ಪನೆಗಳನ್ನೊಳಗೊಂಡಂತೆ)
ಒಟ್ಟು ಕ್ರೆಡಿಟ್‌ಗಳು 2, ಬೋಧನಾ ಅವಧಿ 2+0+0,
ಸೆಮಿಸ್ಟರ್‌ನಲ್ಲಿ ಒಟ್ಟು 50 ಅಂಕಗಳು
SEE - ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆ - 30 ಅಂಕಗಳು
CIE - ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ - 20 ಅಂಕಗಳು

(ಸೂಚನೆ:– MINI PROJECT ಗೆ ಸಂಬಂಧಿಸಿ 3 ವಿಷಯಗಳ ಪೈಕಿ ಯಾವುದಾದರೂ ಒಂದನ್ನು ಆಯ್ಕೆ ಮಾಡತಕ್ಕದ್ದು)

ಪರಿವಿಡಿ

ರಾಷ್ಟ್ರೀಯ ಶಿಕ್ಷಣ ನೀತಿ (NEP) - 2020ರ ಅನ್ವಯ
ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

ತೃತೀಯ ಬಿ.ಎ. –(ಒನೇ ಸೆಮಿಸ್ಟರ್)- MINI PROJECT

ಗಣಕ ಸಾಹಿತ್ಯ

(ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ಮತ್ತು ಕನ್ನಡ ಪ್ರಸಾರ-ಗಣಕಗಳಲ್ಲಿ ಕನ್ನಡ ಆಳವಡಿಕೆ, ತಂತ್ರಜ್ಞಾನದ ಬಳಕೆ - ಇಮೇಲ್, ಬ್ಲಾಗ್ ಕೋಶಗಳು ಮತ್ತು ಕನ್ನಡ ಮಾಹಿತಿಜಾಲ ಪರಿಕಲ್ಪನೆಗಳನ್ನೊಳಗೊಂಡಂತೆ)

(ಕ್ರೆಡಿಟ್‌ಗಳು 2, ಪಾಠದ ಅವಧಿ- 2, ಲಿಖಿತ ಪರೀಕ್ಷೆಗೆ 30 ಅಂಕಗಳು
ಹಾಗೂ ಆಂತರಿಕ ಗುಣಾಂಕಗಳು- 20)

ಪರಿವಿಡಿ

ಬೋಧನಾವಧಿ : 20 ಗಂಟೆಗಳು

ಘಟಕ - I

ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ಮತ್ತು ಕನ್ನಡ ಪ್ರಸಾರ

1. ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನದ
   ಅರ್ಥ, ರೂಪ, ಸ್ವರೂಪ, ಬೆಳವಣಿಗೆ/ ಟಿ.ಜಿ. ಶ್ರೀನಿಧಿ
2. ಕನ್ನಡ ತಂತ್ರಜ್ಞಾನ ನೆನ್ನೆ, ಇಂದು, ನಾಳೆ / ಟಿ.ಜಿ. ಶ್ರೀನಿಧಿ
3. ಕನ್ನಡದ ಉಳಿವಿಗೆ ಒಂದೇ ಹಾದಿ :
   ಮುಕ್ತ ಜ್ಞಾನ, ಮುಕ್ತ ತಂತ್ರಜ್ಞಾನ / ಬೇಳೂರು ಸುದರ್ಶನ

ಘಟಕ - II

ಗಣಕಗಳಲ್ಲಿ ಕನ್ನಡ ಆಳವಡಿಕೆ, ತಂತ್ರಜ್ಞಾನದ ಬಳಕೆ

1. ಕನ್ನಡದಲ್ಲಿ ಡೆಸ್ಕ್‌ಟಾಪ್ ಪಬ್ಲಿಶಿಂಗ್(ಡಿಟಿಪಿ):
   ಒಂದು ದಿಕ್ಸೂಚಿ / ಬೇಳೂರು ಸುದರ್ಶನ
2. ಕಣಜ ಅಂತರಜಾಲ ಕನ್ನಡ ಜ್ಞಾನಕೋಶ
3. ಕನ್ನಡ ಭಾಷೆಗೆ ಸಂಬಂಧಿಸಿದ
   ತಂತ್ರಾಂಶ ಸಂಪನ್ಮೂಲಗಳು / ಬೇಳೂರು ಸುದರ್ಶನ

ಘಟಕ - III

ಬ್ಲಾಗ್ ಕೋಶಗಳು ಮತ್ತು ಕನ್ನಡ ಮಾಹಿತಿಜಾಲ

1. ಅಂತರಜಾಲ ಮತ್ತು ಕನ್ನಡ / ಟಿ.ಜಿ. ಶ್ರೀನಿಧಿ
2. ಬ್ಲಾಗಾಯತ : ಸುದ್ದಿ, ಬದುಕು,
   ಭಾವನೆಗೆ ಹೊಸ ಆಕಾರ / ಬೇಳೂರು ಸುದರ್ಶನ

ರಾಷ್ಟ್ರೀಯ ಶಿಕ್ಷಣ ನೀತಿ (NEP) - 2020ರ ಅನ್ವಯ
ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

ತೃತೀಯ ಬಿ.ಎ. –(ಒನೇ ಸೆಮಿಸ್ಟರ್)- MINI PROJECT

ಶಾಸನ ಸಾಹಿತ್ಯ

(ಕ್ರೆಡಿಟ್‌ಗಳು 2, ಪಾಠದ ಅವಧಿ- 2, ಲಿಖಿತ ಪರೀಕ್ಷೆಗೆ 30 ಅಂಕಗಳು ಹಾಗೂ
ಆಂತರಿಕ ಗುಣಾಂಕಗಳು- 20)

ಪರಿವಿಡಿ

ಬೋಧನಾವಧಿ : 20 ಗಂಟೆಗಳು

ಘಟಕ - 1

ಶಾಸನಗಳು

ಅರ್ಥ - ಸ್ವರೂಪ - ಪ್ರಯೋಜನ - ಡಾ. ಪಿ. ಶ್ರೀಕೃಷ್ಣ ಭಟ್

ಘಟಕ - 2

ಶಾಸನ ಪ್ರಕಾರಗಳು

ದಾನ ಶಾಸನಗಳು ಮತ್ತು ವೀರಗಲ್ಲುಗಳು - ಡಾ. ಎಚ್. ತಿಪ್ಪೇರುದ್ರ ಸ್ವಾಮಿ

ಮಾಸ್ತಿಗಲ್ಲುಗಳು - ಡಾ. ಎಂ. ಚಿದಾನಂದಮೂರ್ತಿ

ಪ್ರಶಸ್ತಿ ಶಾಸನಗಳು - ಡಾ. ಹು.ಕಾ. ಜಯದೇವ್

ನಿಶಿಧಿ ಶಾಸನಗಳು - ಡಾ. ಎಂ.ಎಂ. ಕಲಬುರ್ಗಿ

ಘಟಕ - 3

ಸಾಹಿತ್ಯಕ ಪಠ್ಯಗಳು

ತಮಟಿ ಕಲ್ಲು ಶಾಸನ

ಕಪ್ಪೆ ಅರಭಟ್ಟನ ಶಾಸನ

ಘಟಕ - 4

ಸಾಂಸ್ಕೃತಿಕ ಪಠ್ಯಗಳು

ದೇಕಬ್ಬೆಯ ಶಾಸನ

ಬುಕ್ಕರಾಯನ ಶಾಸನ

MANGALORE UNIVERSITY
B A- PROGRAMME

Political Science Syllabus- V and VI Semester

Course Structure

Course Category	Core paper Code	Paper Title	Credit	No. of Teaching Hours/Week	Total Marks/ Assessment
V Semester					
DSC	POL C9	International Relations-Basic Concepts	4	4	**100 (60+40)**
	POL C10	Comparative Government and Politics	4	4	**100 (60+40)**
	POL C11	Karnataka Government and Politics	4	4	**100 (60+40)**
VI Semester					
DSC	POL C13	International Relations-Theoretical Aspects	4	4	**100 (60+40)**
	POL C14	Political Economy of India	4	4	**100 (60+40)**
	POL C16	Modern Indian Political Thinkers	4	4	**100 (60+40)**

Skill Enhancement Course

			3	3	
Total credits: 27					

Semester V

POL C9

Course Title: International Relations-Basic Concepts	
Semester: V	**Course Code: POL C9**
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course objectives:

1. Is to make students understand the importance of studying International Relations.
2. Is to make students realize the significance of relations with neighbouring states
3. Is to expose the students towards changing dimensions of national power
4. Is to make students understand the employment opportunities in Foreign Affairs

Learning outcomes:

At the end of the course the students shall:

1. Be in a position to describe National interest, National power and the significance of sovereignty.
2. The students will get the basic knowledge of the practical political world and operating institutions.
3. The students will be in a position to describe the nuances of balance of power, collective security and diplomacy.
4. Be in a position to understand the sources of employment in and around the foreign affairs of specific countries

Unit	Contents of Course- POL C9	60 Hours
Unit-I	**Chapter-1:** International Relations and International Politics- Meaning, Nature, Scope of International Relations. **Chapter-2:** Evolution of International Relations (From city state to Modern Nation State System). **Chapter-3:** Development of International Relations as an academic discipline.	**15 Hours**
Unit-II	**Chapter-4:**World War I and II: Causes and Consequences and its impact on world politics. **Chapter-5**: Cold War: Origin of Cold War, Causes and Effects of Cold War, End of Cold War and Collapse of Soviet Union. **Chapter-6:** National Interest – Meaning, Elements, Kinds and Instruments for Promotion of National Interests.	**15 Hours**
Unit- III	**Chapter-7:** National Power Meaning, Nature, Forms, Elements, Limitations and Evaluation of National Power. **Chapter-8:** Balance of Power – Meaning, Nature, Techniquesof Maintaining the Balance of Power and Relevance of Balance of Power in Modern Age. **Chapter-9:** Collective security, National Security and Diplomacy (Old and New).	**15 Hours**
Unit- IV	**Chapter-10:** Arms Race, Arms control and Nuclear Disarmament and Deterrence. **Chapter-11:** Peaceful Settlement of Disputes, Conflict Resolution theories. **Chapter-12:** World order – Unipolar, Bi-Polar and Multi-Polar.	**15 Hours**

Exercise:

- Invited lectures by diplomats.
- Mock diplomatic meetings.
- Debates about conflict resolution, peace and disarmament.

Suggested Readings

1. Burchill Scott et al, Theories of International Relations 3rd edition, Basingstoke: Palgrave Macmillan, 2005.

2. Aron, Raymond, Peace and War: A Theory of International Relations, New York, Anchor Books, 1973.

3. Baylis, J. and Smith, S. (eds.), The Globalization of World Politics, Oxford, Oxford University Press, 2001.

4. Ganguly, Sumit , India's Foreign Policy: Retrospect and Prospect, New Delhi, Oxford University Press, 2012.

5. William, P., Goldstein, D. M. and Shafritz, J. M. (eds.) (1999) Classic Readings of International Relations. Belmont: Wadsworth Publishing Co, pp. 30-58; 92-126.

6. Appadorai and Rajan, M. S. (eds.), India's Foreign Policy and Relations. New Delhi, South Asian Publishers, 1985.

7. Vanaik, A. India in a Changing World: Problems, Limits and Successes of Its Foreign Policy. New Delhi: Orient Longman, 1995.

8. Mewmillians, W.C. and Piotrowski, H., The World since 1945: A History of International Relations, Lynne Rienner Publishers.

9. Morganthou Hans J., Revised by Kenneth W. Thompson, "Politics Among Nations", Kalyani Publisher, New Delhi.

10. Kennth Waltz, "The Theory of International Politics", Waveland Press, 2010.

11. Perkins, Palmer, "International Relations", C.B.S. Publishers and Distributors, (Reprinted 2001), New Delhi.

Pedagogy:

The course shall be taught through the Close-Reading Sessions of texts, group discussions and week-end seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

POL C10

Course Title: Comparative Government and Politics (With special reference to UK, USA and China)	
Semester: V	**Course Code: POL C10**
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course objectives:

1. To introduce students to the fundamentals of the study of comparative government and politics.
2. To compare and comprehend structural components of the democratic and non- democratic political systems.
3. To expose students to the functioning of the given political systems.
4. To equip students to acquire knowledge on the different political systems and compare them to make assessment on the right and wrong political decisions.

Learning outcomes:

At the end of the course the students shall –

1. Grasp and understand the working of constitutional systems of these countries.
2. Compare and evaluate the working of the governments concerned.
3. Understand and explain different forms of executive and their functioning
4. Understand and utilize the knowledge for facing the competitive examinations.

Unit	Contents of Course- POL C10	60 Hours
Unit-I	**Chapter-1:** Comparative Government and Politics: Meaning, Nature, Scope and Importance of Comparative Government and Politics. **Chapter-2:** Approaches to the study of Comparative Government and Politics Traditional (Philosophical, Historical, Legal and Institutional) and Modern Approaches (System, Structural Functional, Communication and Decision Making). **Chapter-3:** Types of Government and Politics: Parliamentary, Unitary, Presidential and Federal Government.	**15 Hours**
Unit-II	**Chapter-4:** Method of representation: Direct, Indirect, Proportional, Functional. **Chapter-5**: Constitutionalism- Meaning, Principles (separationof powers, responsibility and accountability, popular sovereignty, Rule of Law, Judicial independence, Individual rights, civilian control over military) Problems and Prospects of Constitutionalism. **Chapter-6:** Political Party and Pressure Groups: Definition and classification based on ideology (Single to Multi party systems, Republican-Democratic, Labour-Conservative, Communist, Pressure Group-Definition, role and Characteristics.	**15 Hours**
Unit- III	**Chapter-7:** Political Process: Political Socialisation, Political Culture and Political Representation. **Chapter-8:** Legislature (USA, UK and China). **Chapter-9:** Executive (USA, UK and China).	**15 Hours**
Unit- IV	**Chapter-10:** Judicial System (USA, UK and China). **Chapter-11:** Party System ((USA, UK and China). **Chapter-12:** Election Process (USA, UK and China).	**15 Hours**

Exercise:

- Students can have a debate on working of the organs of governments.
- Students can evaluate the merits and demerits of these systems.
- Debate on which of the countries functioning of the government is better with reasons.

Suggested Readings

1. A. Appadorai, The Substance of Politics, OUP, New Delhi, 2008 (latest edition).

2. Bara, J & Pennington, M. (eds.). Comparative Politics. New Delhi: Sage, 2009.

3. Caramani, D. (ed.). Comparative Politics. Oxford: Oxford University Press, 2008.

4. Hague, R. and Harrop, M. Comparative Government and Politics: An Introduction. (Eighth Edition). London: Palgrave McMillan, 2010.

5. Ishiyama, J.T. and Breuning, M. (eds.). 21st Century Political Science: A Reference Book. Los Angeles: Sage, 2011.

6. Sudhir Krishnaswamy, Democracy and Constitutionalism in India, OUP, New Delhi,

2009.

7. Pierre, Jon and B. Peters (Eds.), Governance, Politics and the State, London, Macmillian, 2000.

8. Rajeev Bhargav& Ashok Acharya (eds), Political Theory: An Introduction, Longman Pearson, New Delhi, 2008.

9. Newton, K. and Deth, Jan W. V. Foundations of Comparative Politics: Democracies of the Modern World. Cambridge: Cambridge University Press, 2010.

10. O'Neil, P. Essentials of Comparative Politics. (Third Edition). New York: WW. Norton & Company, Inc, 2009.

Pedagogy:

The course shall be taught through the lecture, interactive sessions, assignments, group discussions and week-end seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

POL C11

Course Title: Karnataka Government and Politics	
Semester: V	**Course Code: POL C11**
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course objectives:

1. To make students to understand the significance of the study of state politics and to enlarge the understanding of federal relations in India.
2. To enable students to recognize the major transformations of state politics both in pre and post-independence era.
3. To make students to understand how the social factors influence the politics at the state level.
4. To expose students to the fundamental requirements of competitive examinations.

Learning outcomes:

At the end of the course the students shall –

1. Understand the methodology of understanding the state politics as well as federal relationships in India.
2. Understand the social and political conditions of Mysore under colonial rule.
3. Develop perspectives on the important persons and organizations involved in the process of unification.
4. Analyze the issues related to regionalism, polarization, identity politics, water, language, and border issues.
5. Use the materials for competitive examinations.

Unit	Contents of Course- POL C11	60 Hours
Unit-I	**Chapter-1:** State Politics in India: Nature and Importance. **Chapter-2:** Politics (Political Development of) in Princely Stateof Mysore: Evolution of Legislature, Mysore Representative Assembly. **Chapter-3:** Administration and Governance in the Princely State and Reorganisation of State**.**	**15 Hours**
Unit-II	**Chapter-4:** Unification Movement: Factors Responsible, Role of Vidyavardhaka Sangha and Kannada Sahitya Parishat. **Chapter-5**: Contributions: AlurVenkatarao: Karnatakatva, Gudleppa Hallikere, Siddappa Kambli. **Chapter-6:** 1924 Belgaum Conference, Hardekar Manjappa: Concept of Swadeshi and Nationalism, Huilgol Narayan Rao.	**15 Hours**
Unit- III	**Chapter-7:** Caste and Politics: Dominant Caste, Backward Class Movement and AHINDA, Caste and Identity Politics, Religion and Politics. **Chapter-8:** Regionalism, Dr. Nanjundappa Report, Regional Disparities. **Chapter-9:** Language and Politics, Water and Border Disputes, Peasant Issues, Gender Politics and Karnataka's Relations with Center.	**15 Hours**
Unit- IV	**Chapter-10:**Era of Coalitions in Karnataka (2004 and 2018): its effects on policy making, administration and party politics **Chapter-11:** Politics of Polarisation: Growth of Polarisation in Karnataka politics and its impact. **Chapter-12:**Demands for separate state, Art 371J and Special status	**15 Hours**

Exercise:

- Students can write a note on one of the issues concerning Administration of Deewan's.
- Initiate a group discussion on different stages of unification movement in Karnataka.
- Analyse the electoral results through statistics taking one of the constituencies of their convenience.

Suggested Readings

1. Harish Ramaswamy and S. S. Patagundi(Ed.) (2007). Karnataka- Government and Politics. Delhi: Concept Publishing Company.
2. Raghavendra Rao, K. (2000). Imagining Unimaginable Communities. Hampi: Prasranga, Kannada University.
3. Hayavadana Rao, M. (1946).Mysore gazetteer. Bangalore: The Govt Press.
4. Halappa, G. S. (1963). Studies in State Administration. Dharwad: Karnataka University.
5. Raghavendra Rao, K., (2005), Karnataka Aikeekaranadha Naalwaru Chinthakaru, (In Kannada). Dharvada :Manohara Grantha Mala.
6. Muthanna, M. (1977).Karnataka -History, Administration and Culture. Mysore: Usha Press.
7. James Manor. (1978). Political Change in an Indian State-Mysore. New Delhi: South Asia Books.
8. Prasad, G. K,.Jeevan Kumar and K. C Suri.(1995). The Angry voter. Madras: Shanti Publications.
9. Sandeep Shastri. (1995). Towards explaining the voters' Mandate: An analysis of the Karnataka Assembly Elections-1994. Michigan University press.
10. Bjorn Hettne.(1978). The Political Economy of indirect Rule, Mysore 1881-1947. UK: Curzon Press.
11. Rajan, M. A. S. (1986). Land reforms in Karnataka. New Delhi: South Asia Books.
12. Nadkarni, M.V (1987). Farmers' Movements in India. Hyderabad : Allied Publishers.
13. Atul Kohli. 2006 (1987).The State and Poverty in India. Cambridge: Cambridge University Press.
14. Marc Galanter. (1984). Competing inequalities: Law and Backward Classes in India. New Delhi: Oxford University Press.
15. Kuppuswamy.(1978). Backward Classes Movement in Karnataka, Bangalore: Bangalore University:
16. Georage Mathew (ed). (1984). Shift in Indian Politics, New Delhi: Concept Publishing Company.
17. Chandrashekar, S. (1985), Dimensions of Socio-Political Change in Mysore- 1918 To 1940. New Delhi: Ashish Publishing House.
18. Krishana Rao M. & G.S.Halappa. (1962). History of Freedom Movement in Karnataka. Mysore: Government of Mysore.
19. Ramaiya. P. R. (1961). Mysore's Political Evolution. Bangalore: Jayagowri Publications.
20. Arun P. Bali. (2001). Refashioning the New Economic Order- Karnataka in Transition. Jaipur: Rawat Publications.
21. Diwakar, R.R. (1992). "The Story of Karnataka Unification". (Kannada). Bangalore: Lokashikshana Trust.
22. Karnataka Patrika. (2001). Academy (In Kannada), "Karnataka Parampare". Karnataka Press Academy.
23. Gopal Rao, H.S. (1996). "The History of Karnataka Unification". Bangalore: Navakarnataka Publications.
24. Kumar,Jeevan and Subramanya, Susheela. (2000). "Vision Karnataka 2025, Strategies and Action Plans for Sustainable Development". Southern Economics.

25. Hasan, Zoya. (2004). “Politics of Inclusion: Caste, Minority, and Representation in India”. Oxford University Press.
26. Gubbannavar, Shivananda. (1985). “Karnataka Rajyadalita Krama”. (In Kannada). Bangalore: IBH Prakashan.
27. Bali,Arun. P. (2001). “Refashioning the New Economic order, Karnataka in transition”. New Delhi: Rawat Publishers.
28. AlurVenkatarao. 1941. Nanna Jeevanada Smruthigalu, Daravada: Kalasindhu Mudranalaya.
29. Rani, Midatala. And Jayakumar. H. (1998). Karnataka Government and Politics. Mysore: Chethana Book House.

Pedagogy:

The course shall be taught through the interactive sessions, Open Educational Recourses (OER) as reference materials, assignments and seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Semester VI

POL C13

Course Title: International Relations- Theoretical Aspects	
Semester: VI	**Course Code: POL C13**
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course objectives:

1. Is to introduce students to the larger theoretical positions of International relations.
2. Is to enable students to understand the importance of theories in academic debates
3. Is to make students familiarize the major transformations in theoretical positions.
4. Is to enlarge the learning capacity of students and apply the same for preparing for the competitive examination.

Learning outcomes:

At the end of the course the students shall –

1. Get exposed to theories and identify them with examples.
2. Explain theories by relating them to contemporary events across the globe.
3. Interpret world affairs in the light of theories which will serve as a key intellectual tool.
4. Utilize the knowledge in preparation for competitive examinations.

Unit	Contents of Course- POL C13	60 Hours
Unit-I	**Chapter-1:** Meaning, Nature, Functions and importance of Theories in International Relations. **Chapter-2:** Classical v/s Scientific – Debate. **Chapter-3:** Realism and Neo-Realism Theories.	**13 Hours**
Unit-II	**Chapter-4:** Liberal, Neo-Liberalism, Marxist theory and Neo-Marxist Theory. **Chapter-5**: Game Theory, Bargaining and Decision-Making Theory. **Chapter-6**: Systems Theory-Meaning, Nature and importance and World Systems Theory.	**16 Hours**
Unit- III	**Chapter-7:** Communication Theory and Decision Making Theory. **Chapter-8:** Dependency theory and Self-Reliance theory. **Chapter-9:** Theory of Clash of Civilisations of Samuel P Huntington.	**16 Hours**
Unit- IV	**Chapter-10:** Power Cycle theory and Feminist Theory. **Chapter-11:** Theory building in International Relations, stages of theory building. **Chapter-12:** Future of International Relations Theory and Challenges.	**15 Hours**

Exercise:

- Look at major global developments/issues from theoretical points of view and to comprehend the underlying forces /thinking.
- Take up a nation and apply any suitable theory for its evaluation.
- List out the need for future theories of International relations.

Suggested Readings

1. Cochran Molly, Normative Theory in International Relations: A Pragmatic Approach,: Cambridge University Press, Cambridge, 2004.

2. Devetak, Richard, Post Modernism, Scott Burchill, Andrew Linklater, et al, eds. Theories of International Relations, Palgrave, Hampshire, 2005.

3. Hurd, Ian, Constructivism, Cristian, Christian Reus - Smit and Duncan Snidal, eds. Oxford Handbook of International Relations, Oxford University Press, Oxford, 2008.

4. Kumar Mahendra, Theoretical Aspects of International Politics, Shivalal Agarwal and Company, New Delhi, 2017.

5. Morgenthau, Hans J. Politics Among Nations, Alfred A Knopf, New York, 1948.

6. Robert Keohane, Joseph Nye Jr. Power and Independence, Pearson 4th edition, 2011.

7. Shapcott Richard, Critical Theory, Oxford University Press, Oxford, 2008.

8. Sorensen, Robert Jackson and Georg, Introduction to International Relations: Theories and Approaches, Oxford University Press, 2015.

9. Tickner Ann, Gender in International Relations, Columbia University Press, New York, 1992. 10. Waltz, Kenneth N, Theory of International Politics, New York, 1979

Pedagogy:

The course shall be taught through the lecture, Open Educational Recourses (OER) as reference materials, seminars and group discussions.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

POL C14

Course Title: Political Economy of India	
Semester: VI	**Course Code: POL C14**
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course objectives:

1. To introduce students to the linkages between politics and economy
2. To make students understand the importance of the knowledge as to how economies operate within a given political system.
3. To enable students to understand various agencies shaping and defining the development at large.
4. To make students to realize the importance of this course in preparing for the competitive examinations.

Learning outcomes:

At the end of the course the students shall –

1. Learn about the political dimension of economics and provides them the skills to manage the economy.
2. Be exposed to inter disciplinary thinking and helps them to assess the relationship between policy and its impact on various areas like agriculture.
3. Experience practically the nature and the factors that influence growth in a given system.
4. Be in a position to practically apply the knowledge for employment.

Unit	Contents of Course- POL C14	60 Hours
Unit-I	**Understanding Political Economy** **Chapter-1:** Meaning, definition, and scope of Political Economy. **Chapter-2:**Approaches to Political Economy, Traditional Approach, Pre-reform India: Liberalism Marxism and Gandhian approach. **Chapter-3:**Post reform India: New Liberal Economic Reforms, Liberalisation Privatisation and Globalisation (LPG Model).	**15 Hours**
Unit-II	**State, Economy, and Market** **Chapter-4:**Development Planning and Challenges, Grants and Aids: IMF and World Bank. **Chapter-5**: Market and the Changing Institutions of Governance. **Chapter-6:** NITI *Ayog*, Make in India, Labour Policy and Social security.	**15 Hours**
Unit- III	**Growth and Redistribution** **Chapter-7:**Surplus and Labour, Growth as Redistribution. **Chapter-8:**Fiscal Policy: Taxation and Revenue Generation, Distribution of Revenue between Centre and State (GST) Finance Commission. **Chapter-9:** Indian Agricultural Policy: Politics of Land Reforms, Food Policies in India, Green Revolution.	**15 Hours**
Unit- IV	**Challenges of Indian Political Economy** **Chapter-10:** Gender, Racial and Ethnic Problems. **Chapter-11:** Migration, Displacement. **Chapter-12:** Banking Crisis, Parallel Economy, Black Money.	**15 Hours**

Exercise:

- Arrange for lectures from industrialists / experience sharing.
- Make assessments and analysis of budgets.
- Get hands on experience through internships in banking as to how economy operates and feel the role of money.

Suggested Readings

1. Ahluwalia, I.J. 1992, Productivity and Growth in Indian manufacturing, Oxford University Press, New Delhi.
2. Bardhan, P. 1998, The Political Economy of Development in India: expanded edition with an Epilogue on the Political Economy of Reform in India, Oxford University Press, New Delhi.
3. Baru, S. 2000, Economic Policy and Development of Capitalism in India: The Role of Regional Capitalists and Political Parties, in (eds.) Frankel et al.
4. Bhaduri, A. 1983, The Economics of Backward Agriculture, Academic Press, New York.
5. Chandavarkar, R., 1996, Imperial Power and Personal Politics: Class Resistance and State in India, C. 1850-1951, Cambridge University Press, Cambridge.
6. Chandavarkar, R., 1994, The Origins of Industrial Capitalism in India: Business Strategies and the working classes in Bombay, 1900-1940. Cambridge University Press, Cambridge.
7. Corbridge, S. and Harriss, J., 2000, Reinventing India, Polity, London.
8. Dreze, 1., and A. Sen, (eds.) 1995, India: Economic Development and SocialOpportunity, Delhi, Oxford University Press.
9. Basu, Kaushik,(ed.) 2004, India's Emerging Economy: Performance and Prospects in the 1990s and beyond. Oxford University Press, New Delhi.
10. Roy, Tirthankar, 2001, The Economic History of India; 1857-1947, New Delhi, Oxford University Press.
11. Dandekar, V.M. and Rath, N., 1971, Poverty in India, Indian School of Political Economy, Poona. 14.
12. Jha, P. K. 1997, Agricultural Labour in India, Vikas, New Delhi.
13. Jhabvala, R. And Subramanyam, R.K.A., (eds) 2000, The Unorganised Sector: Work security and Social Protection, Sage, New Delhi.
14. Joshi, V. And Little, I.M., 1994, India: Macroeconomics and Political Economy:1964-91, Oxford University Press, New Delhi.
15. Joshi, P.C., 1996, India's Economic Reforms: 1991-2001, Oxford University Press, New Delhi.
16. Harriss-White, B., 2004, India Working: Essays on Society and Economy. Cambridge University press, Foundation Books, New Delhi.
17. Byres, T.J. (ed.) 1998, The Indian Economy: Major debates since independence, Oxford University Press, Delhi.
18. Byres, T.J. 1996, The State, Development Planning and Liberalisation in India. Oxford University Press, New Delhi.
19. Bose, S. And Jalal, A. (eds.) 1997, Nationalism, Democracy and Development: State and Politics of development, Oxford University Press, Delhi.
20. Mitra, Ashok, 1977, The Terms of Trade and Class relations, Cass, London.
21. Satyamurthy, T.V., 1995, Industry and Agriculture in India since Independence. Oxford University Press, New Delhi.

Pedagogy:

The course shall be taught through the interactive sessions, Close-Reading Sessions of texts, assignments and seminars.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

POL C16

Course Title: Modern Indian Political Thinkers	
Semester: VI	**Course Code: POL C16**
Total Contact Hours: 60	**Course Credits: 4**
No. of Teaching Hours/Week:4	**Duration of ESA/Exam: 2 Hours**
Formative Assessment Marks: 40	**Summative Assessment Marks: 60+40=100**

Course objectives:

1. To make students to understand the major contributions to modern Indian Political Thought.
2. To enable students to engage with the immediate past and examine its impact today.
3. To introduce students to different schools of thought that shaped the underlying philosophy of modern India.
4. To prepare students to face the challenges at the level of cracking of competitive examinations.

Learning outcomes:

At the end of the course the students shall –

1. Know the political ideas contributed in making of modern Indian Political System.
2. Understand the different schools of political ideas in Modern India.
3. Learn about the role of political thinking in resolving socio-political problems of the country.
4. Be eligible to make use of the knowledge for becoming success in competitive examinations.

Unit	Contents of Course- POL C16	60 Hours
Unit-I	**Introduction to Modern Indian Political Thought** **Chapter-1:** Early Social Reformers: Raja Ram Mohan Roy, Jyotiba Phule. **Chapter-2:** Spiritual Nationalism: Swami Vivekananda, Dayananda Saraswati. **Chapter-3:** Moderate Nationalists: Dadabai Naoroji and M.G.Ranade.	**15 Hours**
Unit-II	**Chapter-4** : Extremist Nationalists: Arabindo and Bal Gangadhar Tilak. **Chapter-5:** Emancipatory Phase: Sir Syed Ahamed Khan and M. Iqbal. **Chapter-6:** Views on Caste System and Social Justice: Dr.B.R.Ambedkar and Ramaswamy Naicker.	**15 Hours**
Unit- III	**Chapter-7:** Shades of Nationalism I **Chapter-8:** Shades of Nationalism II- Mahatma Gandhi and Jawaharlal Nehru. **Chapter-9:** National Integration: Vallabhbhai Patel and Critique of nationalism: Rabindranath Tagore.	**15 Hours**
Unit- IV	**Chapter-10:** Socialist thoughts: Jayaprakash Narayan and Ram Manohar Lohiya. **Chapter-11:** Volunteerism and Bhoodhan Movement- Vinobha Bhave and Thoughts on Tribes**:** Jaipal Singh. **Chapter-12:** Self Respect Movement: E. V. Ramaswami and Feminist thought: Pandita Ramabai	**15 Hours**

Exercise:

- Arrange for Movies and Videos of above Indian Political Thinkers.
- Conduct debates on different viewpoints of political thinkers about Indian Polity and Society.
- Have discussions in classroom on different schools of Political Thought in India.

Suggested Readings

1. C. Bayly, (2010) 'Rammohan and the Advent of Constitutional Liberalism in India 1800-1830', in Sh. Kapila (ed.), An intellectual History for India, New Delhi: Cambridge University Press, pp. 18- 34.
2. T. Pantham, (1986) 'The Socio-Religious Thought of Rammohan Roy', in Th. Panthom and K. Deutsch, (eds.) Political Thought in Modern India, New Delhi: Sage, pp.32-52.
3. A.V.Rathna Reddy: The Political Philosophy of Swami Vivekananda, New Delhi: Sterling Publishers, 1984.
4. Alhuwalia, B. and Alhuwalia, M., Raja Ram Mohan Roy and the Indian Renaissance, New Delhi, Mittal Publications, 1991.
5. Anderson, Walter and Shridhar D. Damle, The Brotherhood in Saffron: The RSS and Hindu Revivalism, New Delhi, Sage Publications, 1987.
6. Appadorai, A., Indian Political Thinking in the 20th century, New Delhi, South Asian Publishers, 1987.
7. Bhattacharjee, Arun, The Prophets of Modern Indian Nationalism, Delhi, Ashish Publishing House, 1993.
8. Cashman, R.L., Myth of Lokmanya Tilak and Mass Politics in India, Berkeley, University of California Press, 1975.
9. Chakaravati, G., Gandhi: A Challenge to the Hindu Muslim Problem, New Delhi, Eastern Books, 1991.
10. Dallmayr, Fred and Devy G.N. (Eds.), Between Tradition and Modernity: India's search for identity, New Delhi, Sage Publications, 2000.

    Desai, A.R., Social Background of Indian Nationalism, Bombay, Popular Prakashan, 1996.
11. Farquhar, J.N., Modern Religious Movements in India. Delhi, Munshiram Manoharlal, 1967.

    Ganguly, S.M., Leftism in India: MN Roy and. Indian Politics I920 1948, Calcutta, Minerva Publications, 1984.
12. Ghose, Sankar, Modern Indian Political Thought, New Delhi, Allied Publishers. 1984.
13. Gore, M.S., The Social Context of an Ideology: Ambedkar's Political and Social thought, New Delhi, Sage Publications, 1993.
14. Graham, B.D., Hindu Nationalism and Indian Politics, Cambridge, CambridgeUniversity Press, 1993. 16. Griffiths, Percival, The British Impact on India, London, Macdonald, 1952.
15. Ingham, Kenneth, Reformers in India, Cambridge, Cambridge University Press, 1956.
16. Kapoor, S., Sri Aurobindo Ghosh and Bal Gangadhar Tilak, New Delhi, Deep and Deep Publications, 1991.
17. Masselos, Jim, Indian Nationalism: An History, New DeIhi, Sterling Publishers, 1996.
18. Mehta, N.C., Lohia A Study, Delhi, Atma Ram and Sons, 1975.
19. Mehta, V.R., Foundations of Indian Political Thought, New Delhi, Manohar Publishers, 1992.
20. Pantham, Thomas and Kenneth L. Deutsch (Eds.), Political Thought in Modern India, New Delhi, Sage Publications, 1986.
21. Parekh, Bhiku, Gandhi's Political Philosophy: A Critical Examination, Hampshire, Macmillan Press, 1989.
22. Prasad, Bimal, J.P. and Social Change, New Delhi, Radiant Publishers, 1992.
23. Sathe, Shanta, Lokamanya Tilak: His Social and Political Thoughts, Delhi, Ajanta Publications, 1994.

24. Seervaj, H,M., Partition of India: Legend and Reality. Bombay, Emmenem Publications, 1989.
25. Selbourne, David (Ed.), In Theory and Practice: Essays on the Politics of J P., Delhi, Oxford University Press, 1985.
26. Singh, Chandrakant, Socialism in India: Rise, growth and Prospect, New Delhi, D.K. Publishers, 1986.
27. Terchek, Ronald J., Gandhi: Struggling for Autonomy, New Delhi, Vistaar Publications, 2000.
28. Trehan, J., Veer Savarkar: Thought and Action, New Delhi, Deep and Deep Publishers, 1991.
29. Verma, V.P., The Political Philosophy of Sri Aurobindo, Bombay, Asia Publishing House, 1960.

Pedagogy:

The course shall be taught through the lecture, interactive sessions, Close-Reading Sessions of texts, assignments, seminars and group discussions.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

General Pattern of Question Paper (NEP- 2020)

I. Term End Examination for Discipline Specific Core (DSC) Papers

Each paper will be for maximum of **60 marks.** The minimum marks to pass the examination is40% (24 marks) in each theory paper.

Note: Duration of Examination for Discipline Specific Core (DSC) Papers is **2 hours.**

Question paper pattern for **Discipline Specific Core (DSC) Papers** –

Section A: Multiple Choice Questions
Section B: Short Answer Questions
Section C: Long Answer Questions

Section A: Multiple Choice Questions

All Questions are Compulsory (10x1=10)

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Section B: Short Answer Questions (2x10=20)

Answer any Two of the following in not more than 500 words

11.

12.

13.

Section C: Long Answer Questions (2x15=30)

Answer any Two of the following in not more than 800 words

14.

15.

16.

MANGALORE UNIVERSITY

Mangalagangotri-574199

B.Sc. in Statistics

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SYLLABUS

With Effect from 2023-24

DISCIPLINE SPECIFIC CORE COURSE (DSCC) FOR SEM V & VI

AS PER N E P - 2020

Mangalore University, Mangalore

B.Sc. in Statistics

Effective from 2023-24

Sem.	Type of Course	Theory/ Practical	Course Code	CourseTitle	Instruction hour/ week	Total hours / sem	Duration of Exam	Marks			Credits
								Formative	Summative	Total	
V											
	DSCC-09	Theory	**BSCSTCN501**	**Design and Analysis of Experiments**	04hrs	60	02 hrs	40	60	100	04
	DSCC-10	Practical	**BSCSTPN501**	**Design and Analysis of Experiments**	04 hrs	60	03 hrs	25	25	50	02
	DSCC-11	Theory	**BSCSTCN502**	**Matrix algebra and Regression analysis**	04hrs	60	02 hrs	40	60	100	04
	DSCC-12	Practical	**BSCSTPN502**	**Matrix algebra and Regression analysis**	04hrs	60	03 hrs	25	25	50	02
	Other subject										04
	Other subject										04
	Other subject										04
	Total							**260**	**340**	**600**	**24**
VI	DSCC-13	Theory	**BSCSTCN601**	**Statistical Inference-II**	04hrs	60	02 hrs	40	60	100	04
	DSCC-14	Practical	**BSCSTPN601**	**Statistical Inference-II**	04 hrs	60	03 hrs	25	25	50	02
	DSCC-15	Theory	**BSCSTCN602**	Sampling techniques and Statistics for National Development	04hrs	60	02 hrs	40	60	100	04
	DSCC-16	Practical	**BSCSTPN602**	Sampling techniques and Statistics for National Development	04 hrs	60	03 hrs	25	25	50	02
	Other subject										04
	Other subject										04
	Other subject										04
	Internship-1	Practical	**BSCSTPN603**	**Mini Project**				50	0	50	02
							Total	**310**	**340**	**650**	**26**

MANGALORE UNIVERSITY

Program Name	**B.Sc. in STATISTICS**	Semester	**V**
Course Title	**Design and Analysis of Experiments (Theory)**		
Course Code:	**BSCSTCN501**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s):

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

CO1. Identity fixed and random effect models and one-way and two-way classified data.

CO2.Choose appropriate designs (CRD, RBD, LSD) and missing plot techniques for a real life problem.

CO3. Identity appropriate factorial experiments for the real life problem.

CO4. Develop complete and partial confounding for factorial experiments.

CONTENTS	**60 Hrs**
UNIT 1: Concepts of Experiment: Design and Analysis.	20 Hrs
Experiments and their designs, principles of designs of experiments, experimental error and interpretation of data contrasts and analysis of variance, Fixed and random effects models, Analysis of One-way and two-way classified data without interaction. Multiple comparison tests: Tukey's method, Critical difference.	
UNIT 2: Complete Block Design.	20 Hrs

Completely randomized, randomized block and Latin squaredesigns (CRD, RBD, LSD) – layout formation and the analysis using fixed effect models. Comparison of efficiencies of CRD, RBD and LSD. Estimation of one and two missing observations in RBD and LSD and analysis.	
UNIT 3: FACTORIAL EXPERIMENT	10 Hrs
Basic concepts – main and interaction effects, and orthogonal contrasts in 2^2 and 2^3 factorial experiments. Yates' method of computing factorial effects total. Analysis of $2^2$and 2^3factorial experiments in RBD.	
UNIT 4: CONFOUNDING	10 Hrs
Need for confounding. Types of confounding - Complete and partial, Confounding in a 2^3 - factorial experiment in RBD and its analysis.	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.Learn about fixed, random, and mixed effect models and one-way and two-way classified data.	x	x		x		x			x	x		
CO2.Understand different designs (CRD, RBD, LSD) and missing plot techniques.	x	x				x			x	x		
CO3. Understand the different factorial experiments.	x	x				x			x	x		
CO4. Develop complete and partial confounding for factorial experiments.	x	x		x		x			x	x		

Pedagogy:

1. The course is taught using traditional chalk and talk method using problem solving through examples and exercises.

2. Students are encouraged to use resources available on open sources.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Internal Test 1	15

Internal Test 2			15
Assignment/Seminar (7 marks)+Attendance(3marks)			10
Total			**40 Marks**
Course Title	**Design and analyses of experiments(Practical)**	Practical Credits	**2**
Course Code	**BSCSTPN501**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1. ANOVA for one-way classified data.
2. ANOVA for two-way classified data.
3. Analysis of CRD.
4. Analysis of RBD.
5. Analysis of LSD.
6. Missing plot techniques in RBD and LSD.
7. Analysis of 2^2 factorial experiment using RBD layout.
8. Analysis of 2^3 factorial experiment using RBD layout.
9. Analysis of 2^3 factorial experiment using RBD layout (Complete confounding).
10. Analysis of 2^3 factorial experiment using RBD layout (Partial confounding).

Pedagogy: Practical assignments 1 to 10 have to be first solved manually (using scientific calculators) and executed using R-programming.

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Internal Test 1	10
Internal Test 2	10
Attendance	5
Total	**25 Marks**

References	
1	Goon, A. M., Gupta, M. K., Das Gupta, B.(1991). Fundamentals of Statistics, Vol-I, World Press, Calcutta.
2	Montgomery. D. C. (2014): Design and Analysis of Experiments, Wiley. New York.
3	Joshi. D. D. (1987): Linear Estimation and Design of Experiments, New Age International (P) Limited, New Delhi.
4	Cochran. G and G. M. Cox, G. M. (1992): Experimental Designs, John Wiley and Sons, New York.
5	Mukhopadhyay. P (2015): Applied Statistics, Books and Allied (P) Ltd., Kolkata.
6	Giri N C And Das M.N (1979) Design and Analysis of Experiments, Wiley Easter

MANGALORE UNIVERSITY

Program Name	**B.Sc. in STATISTICS**	Semester	**V**
Course Title	**Matrix algebra and regression analysis (Theory)**		
Course Code:	**BSCSTCN502**	No. of Credits	**04**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s):

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Demonstrate and understanding of basic concepts of matrix algebra, including determinants, inverseand properties of various types of matrices.

CO2. Apply matrix algebra and linear algebra techniques to solve systems of linear equations, determinethe rank of matrix, understanding quadratic forms and their applications in statistics, characteristicroots and vectors.

CO3. Understand the various aspects in simple and multiple linear regression models and their interpretation.

CO4. Apply regression analysis techniques to real world data sets.

Contents	**60 Hrs**
Unit 1: Algebra of matrices and determinants	15 Hrs
A review of matrix algebra, theorems related to triangular, symmetric and skew symmetric matrices, idempotent matrices, orthogonal matrices, singular and non-singular matrices and their properties. Trace of a matrix, unitary matrices. Adjoint and inverse of a matrix and related properties. Determinants ants of Matrices: Definition, properties and applications of determinantsfor 3rd and higher orders, evaluation of determinants of order 3 and more using transformations.	
Unit 2: Linear Algebra	15 Hrs
Linear algebra: Use of determinants in solution to the system of linear equations, row	

reduction and echelon forms, the matrix equations AX=b, consistency of the linear system, solution sets of linear equations, inverse of a matrix. Vector space, subspace, linear dependence and independence of vectors. Basis and dimension, rank of a matrix row-rank, Column-rank, standard theorems on ranks, rank of the sum and the product of two matrices. Characteristic roots and Characteristic vector, Properties of characteristic roots, Cayley Hamilton Theorem, Quadratic forms, nature of quadratic form and properties.	
Unit 3: Simple linear regression	15 Hrs
Simple linear regressions Model, assumptions, Least Squares estimation, estimation of intercepts & slope along with Standard error. Residual vector and proprieties, estimation of error variance. Test on regression coefficients, prediction, standard error of prediction, coefficient of determination. Diagnostic checks:- residual analysis for testing deviation from normality, homoscedasticity, outliers, randomness and lack-of-fit testing	
Unit 4:Multiple Linear Regression	15 Hrs
Multiple Linear Regression Model, Assumptions, Gauss- Markov Theorem (Without proof), Least square Estimation, variance-covariance of least squares estimators, estimation of error variance ,least square estimation with restriction on parameters, Tests on linear restriction on the parameters, testing the signification of each regressor and testing for overall signification of the model. Confidence intervals.	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Demonstrate and understanding of basic concepts of matrix algebra, including determinants, inverse and properties of various types of matrices.	x	x								x		
Apply matrix algebra and linear algebra techniques to solve systems of linear equations, determine the rank of matrix, understanding quadratic forms and their applications in statistics, characteristic roots and vectors.			x							x		
Develop and understanding of simple and multiple regression models, including the assumptions underlying these models, techniques for inference and hypothesis testing and method diagnostics checks and corrections.				x	x					x		

Apply regression analysis techniques to real word data sets				x	x							

Pedagogy:

1. The course is taught using traditional chalk and talk method using problem solving through examples and exercises.

2. Students are encouraged to use resources available on open sources.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Internal Test 1	15
Internal Test 2	15
Assignment/Seminar (7 marks)+Attendance(3marks)	10
Total	**40 Marks**

Course Title	**Matrix algebra and Regression analysis (Practical)**	Practical Credits	**2**
Course Code	**BSCSTPN502**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1. Calculation of determinant of higher order
2. Calculation of rank of a matrix
3. Calculation of equivalent canonical form by using elementary row and column operations
4. Calculation of inverse of matrices of higher order
5. Calculation of Eigen values and Eigen vectors
6. Solution of simultaneous equations
7. Simple Linear Regression
8. Multiple Regression-I
9. Multiple Regression -II.
10. Residual Analysis

Pedagogy: Practical assignments 1 to 10 have to be first solved manually (using scientific calculators) and executed using R-programming.

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Internal Test 1	10
Internal Test 2	10
Attendance	5
Total	**25 Marks**

References	
1	Ramachandra Rao, A. and Bhimasankaram, P. (2000). Linear Algebra.Hindustan Book Agency
2	Searle, S. R. (1982). Matrix Algebra Useful for Statistics, John Wiley, New York.
3	Kumaresan, S. (2000). Linear Algebra: A Geometric Approach, Prentice Hall
4	Shanthi narayan (1991):A text of Matrices, S. Chand & Company, New Delhi.
5	Devi prasad (2012): Elementary Linear algebra,2nd Ed. Norosa Publishing House.
6	Gilbert strang (2016) Linear Algebra and its Applications, 5th edition Cengage Learning.

7	Montgomery, D. C., Peck, E. A. and Vining, G. G. (2003). Introduction to Linear Regression Analysis, Wiley.
8	Weisberg, S. (2005). Applied Liner Regression, Wiley.
9	Yan, X. and Su, X. G. (2009). Linear Regression Analysis: Theory & Computing, World Scientific.
10	Domodar .N Guajarati (2017):Basic Econometrics,5th Edition
11	Madanani GMK(2008):Introduction to econometrics Principles and applications, 8th Ed. Oxford and IBH Publishing company Pvt Ltd.

B.Sc. in Statistics

VI Semester

W. e. f.: 2023-24

MANGALORE UNIVERSITY

Program Name	**B.Sc. in STATISTICS**	Semester	**VI**
Course Title	**Statistical Inference-II (Theory)**		
Course Code:	**BSCSTCN601**	No. of Credits	**04**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s):

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Basic aspects of decision theory and apply decision principles and Bayes and minimax decision rule.

CO2. Apply and interpret UMP test, MLR property and Likelihood

ratio tests.CO3. Explore about sequential inference.

CO4. Apply one sample and two sample nonparametric tests.

Contents	**60 Hrs**
Unit-1: Statistical Decision Theory	15 Hrs
Basic elements of Statistical Decision Problem. Expected loss, decision rules (nonrandomized and randomized), decision principles (conditional Bayes, frequentist), inference as decision problem, Loss function, squared error loss, Bayes and minimax decision rule.	
Unit-2: Testing of Hypothesis-II	20 Hrs
Definition of UMP test, monotone likelihood ratio (MLR) property, Examples of distributions having MLR property, Construction of UMP test using MLR property. UMP test for single parameter exponential family of distributions. Likelihood ratio (LR)tests, LR test for normal, exponential.	
Unit -3: Sequential Inference	10 Hrs
Need for sequential analysis, Wald's SPRT, ASN, OC Functions, examples based on Bernoulli, Poisson, Normal and exponential distributions.	
Unit-4: Nonparametric tests	15 Hrs
Nonparametric and distribution-free tests, one sample problems: Sign test, Wilcoxon signed rank test, Kolmogorov-Smirnov test. Test of randomness using run test.	

General two sample problems: Wolfowitz runs test, Kolmogorov Smirnov two sample test (for sample of equal size), Median test, Wilcoxon-Mann-Whitney U-test. Several sample problems: Friedman's test, Kruskal Wallis test	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1. Understand expected loss, decision rules, decision principles and Bayes and minimax decision rule.	x	x	x	x					x	x		
CO2. Learn about UMP test, MLR property and Likelihood ratio tests.	x	x	x	x					x	x		
CO3. Explore about sequential inference.	x	x	x	x					x	x		
CO4. Learn about one sample and two sample nonparametric tests.	x	x	x	x					x	x		

Pedagogy:

1. The course is taught using traditional chalk and talk method using problem solving through examples and exercises.

2. Students are encouraged to use resources available on open sources.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Internal Test 1	15
Internal Test 2	15
Assignment/Seminar (7 marks)+Attendance(3marks)	10
Total	**40 Marks**

Course Title	**Statistical Inference-II (Practicals)**	Practical Credits	**2**
Course Code	**BSCSTPN601**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1. Problems on Bayes and minimax estimation.
2. UMP test based on sample from Bernoulli and Poisson distributions.
3. UMP test based on sample from Normal and exponential distributions.
4. Construction of SPRT for Bernoulli and Poisson distributions.
5. Construction of SPRT for Normal and Exponential distributions.
6. Evaluation of SPRT for Bernoulli and Poisson distributions using OC and ASN function.
7. Evaluation of SPRT for Normal and Exponential distributions using OC and ASN function.
8. One sample Nonparametric tests: Kolmogorov-Smirnov test, sign test, Wilcoxon signed rank test,
9. Two sample Nonparametric tests: Mann-Whitney (Wilcoxon rank sum test), Wald-Wolfowitz Run test,
10. Several sample Nonparametric tests: Kruskal -Wallis test, Friedman's test.

Pedagogy: Practical assignments 1 to 10 have to be first solved manually (using scientific calculators) andexecuted using R-programming.

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Internal Test 1	10
Internal Test 2	10
Attendance	5
Total	**25 Marks**

References

1	Berger, J.O.(1985): Statistical Decision Theory and Bayesian Analysis, 2nd Edition. Springer
2	Bernando, J.M. and Smith, A.F.M.(1993): Bayesian Theory, John Wiley and Sons.
3	Robert, C.P.(2007): The Bayesian Choice: A Decision Theoretic Motivation, Springer.
4	George Casella, Roger L. Berger (2020): Statistical Inference, 2nd ed., Thomson Learning.
5	Rohatagi, V.K.: (2010): Statistical Inference, Wiley Eastern, New Delhi.
6	Hogg Mckean and Craig (2009): Introduction to Mathematical Statistics, 6th edition ,Pearson Prentice Hall.

MANGALORE UNIVERSITY

Program Name	**B.Sc. in STATISTICS**	Semester	**VI**
Course Title	Sampling techniques and Statistics for national development **(Theory)**		
Course Code:	**BSCSTCN602**	No. of Credits	**04**
Contact hours	**60 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s):

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Understand the principles underlying sampling as a means of making inferences about a population.

CO2. Understand the difference between probability and nonprobability sampling.

CO3. Understand different sampling techniques.

CO4. To learn to estimate population parameters from a sample.

CO5. Understand official statistical system in India and their functions.

CO6. Understand the role statistics in national development.

Contents	**60 Hrs**
Unit 1: Introduction to sampling theory	10 Hrs
Objectives and principles of sampling theory; Concept of population and sample; Sampling design, Estimators, complete enumeration versus sampling; Planning, execution and analysis of a sample survey; practical problems at each of these stages; basic principle of sample survey; sampling and non-sampling errors; Types of sampling: non-probability and probability sampling, pilot survey.	
Unit 2: Simple random sampling	15 Hrs
Simple random sampling with and without replacement, definition, and procedure of selecting a sample, estimates of population mean, total and proportion, variances and SE of these estimates, estimates of their variances related proofs, sample size determination.	

Unit 3: Stratified sampling and systematic sampling	20 Hrs
Stratification and its benefits; basis of stratification, Technique, estimates of population mean and total, variances of these estimates, proportional, optimum allocations, Neyman's allocation, allocation with cost functions and their comparison with SRS. Practical difficulties in allocation, derivation of the expressions for the standard errors of the above estimators when these allocations are used, estimation of gain in precision, post stratification and its performance. Systematic Sampling: Linear systematic sampling Technique; estimates of population mean and total, variances of these estimates (N=n x k). Comparison of systematic sampling with SRS and stratified sampling in the presence of linear trend and corrections.	
Unit 4: National development	15 Hrs
An outline of present official statistical system in India, Role, function, and activities of Central and State Statistical organizations. Methods of collection of official statistics, their reliability and limitations. National statistical office (NSO), Registrar General Office and National Statistical Commission. Scope and content of Population census of India. Population census methods, economic census. Methods of national income estimation, problems in the estimation of national income. System of collection of Agricultural Statistics. . Crop yield, Production Statistics, Crop estimation and forecasting. Statistics related to industries, foreign trade, balance of payment, cost of living, inflation, educational and other social statistics.	

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.Understand the principles underlying sampling as a means of making inferences about a population.	x	x	x	x					x	x		
CO2.Understand the difference between probability and nonprobability sampling.	x	x	x	x					x	x		
CO3. Understand different sampling techniques.	x	x	x	x					x	x		
CO4. To learn to estimate population parameters from a sample.	x	x	x	x					x	x		
CO5. Understand official statistical system in India and their functions.	x	x	x	x					x	x		
CO6. Understand the role statistics in national development.	x	x	x	x					x	x		

Pedagogy:

1. The course is taught using traditional chalk and talk method using problem solving through examples and exercises.

2. Students are encouraged to use resources available on open sources.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Internal Test 1	15
Internal Test 2	15
Assignment/Seminar (7 marks)+Attendance(3marks)	10
Total	**40 Marks**

Course Title	Sampling techniques and Statistics for national development **(Practical)**	Practical Credits	**2**
Course Code	**BSCSTPN602**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1. Drawing of random sample under SRSWOR from a given population and estimation of the mean and total and the standard error of the estimator.
2. Drawing of random sample under SRSWR from a given population and estimation of the mean and total and the standard error of the estimator.
3. Construction of Confidence Intervals for mean and total for SRSWR and SRSWOR.
4. Estimation of the proportion, total and the standard errors of the estimators based on a random sample under SRSWR
5. Estimation of the proportion, total and the standard errors of the estimators based on a random sample under SRSWOR.
6. Estimation of the mean, total and the standard error of the estimator under stratified random sampling.
7. Exercise on allocation of samples in Stratified sampling. (Proportional Allocation)
8. Exercise on allocation of samples in Stratified sampling. (Neyman Allocation)
9. Systematic sampling
10. Estimation techniques in official statistics.

Pedagogy: Practical assignments 1 to 10 have to be first solved manually (using scientific calculators) and executed using R-programming.

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Internal Test 1	10
Internal Test 2	10
Attendance	5
Total	**25 Marks**

References	
1	Cochran, W. G. (2007): Sampling Techniques, Third Edition, Wiley India Pvt. Ltd., New Delhi.
2	Changbao Wu and Mary E. Thompson (2020): Sampling Theory and Practice, Springer Nature Switzerland.
3	Raghunath Arnab (2017): Survey Sampling Theory and applications (2017), Elsevier
4	Des Raj and Chandhok P. (1998): Sample Survey Theory, Narosa Publishing House.
5	Goon A.M., Gupta M.K. and Dasgupta B. (2001): Fundamentals of Statistics (Vol.2), World Press
6	Murthy, M. N. (1967): Sampling Theory and Methods, Statistical Publishing Society, Kolkata.
7	Mukhopadhyay P (2008): Theory and methods of survey sampling. Prentice-Hall of India, New Delhi
8	Mukhopadhyay, P. (1998): Theory and Methods of Survey Sampling. Prentice Hall
9	Singh, D. and Chaudhary, F. S. (1986): Theory and Analysis of Sample Survey Designs, Wiley Eastern Ltd., New Delhi.
10	Sukhatme, P.V., Sukhatme, B. V.(1984): Sampling theory of Surveys with Applications, Indian Society of Agricultural Statistics, New Delhi.
11	Sampath S. (2005): Sampling Theory and Methods, Second edition, Narosa, New Delhi.
12	Guide to current Indian Official Statistics, Central Statistical Office, GOI, New Delhi. http://mospi.nic.in/

B.Sc. Semester – VI

MINOR PROJECT

Course Title: Project Work

Course Code: *BSCSTPN603*

Type of Course	Theory / Practical	Credits	Instruction hour/ week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
MINOR PROJECT	**Practical**	**02**	**04**	**60 hrs.**	**-**	**50**	**0**	**50**

Course Outcomes (COs):At the end of the course students will be able to:

CO 1: Accountable for individual and team responsibilities and deliverables.

CO 2: Exercise the ability to compromise and problem solve with involved parties.

CO 3: Apply computing theory, languages, and algorithms, as well as mathematical and statistical models, and the principles of optimization to appropriately formulate and use data analyses

CO 4: Formulate and use appropriate models of data analysis tolls to solve hidden solutions to business-related challenges

CO 5**:** Interpret data findings effectively to any audience, orally, visually, and in written formats.

Expt. No	**Title:**	**60 hrs/ sem**
1	Identifying appropriate problem for the Project work. Specifying aim, objective and hypothesis.	
2	Choice of suitable secondary/primary data from data source for the project work.	
3	Develop and deliver engaging training sessions on various data science topics, including statistical analysis, machine learning, and data visualization	
4	Create comprehensive training materials, such as presentations and hands-on exercises, to facilitate effective learning for the students.	
5	Provide guidance and support to students, helping them solve problem undertaken for the statistical analysis and reinforcing their understanding of key concept	
6	Collaborate to enhance and update curriculum, ensuring that it remains current and aligned with industry trends.	
7	Conduct assessments and evaluations to measure student progress and identify areas for improvement, adapting teaching strategies accordingly.	
8	Presentation of the Project work carried and reporting the findings	
9	Preparing the Project report giving Aim, Objectives, Data source, Material and methods used, Data Analysis and Conclusion.	

Formative Assessment for Practical	
Assessment	**Distribution of Marks**
Collection of Data, Participate in project planning	10
Analyze data using models and descriptive statistics	10
Presentation of Project Work	10
Documentation of the project Report	20
Total	**50 Marks**
Formative Assessment as per guidelines.	