SEMESTER – V

Course Title	WOMEN'S WRITINGS IN ENGLISH
Total Hrs.	60
Hrs./Week	04
Course Code	21UEEN51A
Course Type	DSE 1 (A)
Credits	04
Marks	100

General Objective:

To introduce students to different dimension of women writers' writings and thoughts down the ages from varied nationalities.

Course Objectives:

CO	The learners will be able to:
CO-1	Associate themselves with the origin, growth and the relevance of women's writings in the modern context
CO-2	Differentiate and categorize the area of study for marginalized women oppressed by thepatriarchy.
CO-3	Apply various theories of Feminism on the available literary texts.
CO-4	Establish that women writers are equal on par with male writers in dealing with various human intricacies.
CO-5	Analyse literary texts produced by women and men in regard to the perspectives dealt with in the texts.

UNIT-I PROSE

1. "In Search of Our Mothers' Gardens" (Page no. 207 -218)Alice Walker (Taken from the book*In Search of Our Mothers' Gardens*: Womanist Prose)
2. "The Algebra of Infinite Justice" (Page no. 217 -238)Arundhati Roy (Taken from the book*The Algebra of Infinite Justice*)

UNIT-II POETRY

1. The Soul's Prayer	Sarojini Naidu
2. Passing away, Saith the World	Christina Rossetti
3. Lady Lazarus	Sylvia Plath
4. Umbilical Cord	Rachelle Prevost
5. Revolt against the Sun	Nazikal al-Mala'ika

UNIT –III SHORT STORIES

8. The Remains of the Feast	GithaHariharan
9. The Yellow Wallpaper	Charlotte Perkins Gilman
10. You're Ugly Too	Lorrie Moore

UNIT- IV DRAMA

1. *A Number*	Caryl Churchill

UNIT-V FICTION

1. *The Grip of Change: And, Author's Notes*	P. Sivakami

Textbooks:

1. Padmanabhan,Manjula. *Harvest.*Kali for Women,New Delhi.1998.
2. Roy,Arundhati.*The Algebra of Infinite Justice.*pp. 217-238.Penguin,2013.
3. Sivakami, P. *The Grip of Change: And Author's Notes.* Orient Black Swan Pvt. Ltd., 2006.
4. Walker, Alice. *In Search of Our Mothers'Gardens: Womanist Prose*pp.207-218. Open Road Integrated Media, 2011.

Reference Books:

Barry, Peter. *Beginning Theory.*Viva Books, 2010.

Hoffman, Michael J. and Patrick D. Murphy.*Essentials of the Theory of Fiction.* Duke UP,1988.

Churchill, Caryl, and Heidi Zerning.*Top Girls.*Bremen, 1980.

Semester – IV

Course Title	WOMEN IN LITERATURE
Total Hrs	90
Hrs/Week	6
Sub. Code	21PCEN42
Course Type	DSC-XIV
Credits	5
Marks	100

General Objective: To introduce the students to the tradition of Women's writing and understand and appreciate Women in Literature.

Course Objectives:

CO No.	The learners will be able to
CO-1	Identify the different feministic writings in literature across the globe.
CO-2	Develop literature from a woman's perspective.
CO-3	Analyze and appreciate writings with a critical perspective.
CO-4	Distinguish and assess students about gender, feminism both in India and the West.
CO-5	Encourage and enable students to write creatively from a woman's point of view.

UNIT I POETRY

Adrienne Rich	Snapshots of a Daughter- in-Law
Margaret Atwood	Siren Song
Maya Angelou	Phenomenal Woman
Taslima Nasrin	Things Cheaply Had

UNIT II PROSE

Sharon Spencer	Feminist Criticism and Literature
Elaine Showalter	Towards a Feminist Poetics

UNIT III SHORT STORY

Joyce Carol Oates	Where are you going? Where have you been?
Isabel Allende	And of Clay are we Created

UNIT IV DRAMA

David Henry Hwang:	M Butterfly
Mahaswetha Devi	Mother of 1084.

UNIT V FICTION

Anita Desai	Fasting, Feasting
EasterineKire	When the River Sleeps

TEXT BOOKS:

1. Allende, Isabel. *"And of Clay Are We Created" The short Stories of Eva Luna.* Macmillan Publishing Company 1991.
2. Desai, Anita.*Fasting, Feasting.* Chatto and Windus ,1991.
3. Devi, Mahasweta.*Water, Five Plays.*Trans. Sami Bandyopadhyay, Seagull, 2002.
4. Henry,Hwang David.*M Butterfly.* Plume Tie-in -Ed ,1993.
5. Kire, Easterine.*When the River Sleeps.* Zubaar Books, 2014.
6. Oates, Joyce Carol. *"Where Are You Going, Where Have You Been?" High Lonesome: New and Selected Stories*, 1966-2006. New York: Harper Collins, 2006.

REFERENCES:

1. Adair, ed. *Faber Book of 20th Century Women's Poetry*, Allahabad: St. Paul's Publications, 1900. Print.
2. Gaur, Rashmi. *Women's Writing*, New Delhi: Sarut and Sons, 2003. Print.
3. Keyssar, Helene. *Feminist Theatre*, London: Macmillan, 1984. Print.
4. Showalter Elaine. *A Literature of Their Own.* London: Virago, 1978. Print.
5. Thieme, John. ed. *The Arnold Anthology of Post Colonial Literatures in English.* London: Arnold, 1996. Print.

SEMESTER – V

Course Title	**WOMEN STUDIES**
Total Hrs.	**60**
Hrs./Week	**04**
Course Code	**21UEHS51A**
Course Type	**DSE – 1A**
Credits	**04**
Marks	**100**

General Objective:

To enable the students to critically examine various discourses from a women-centric perspective.

Course Objectives:

CO	The learner will be able to:
CO-1	Understand the Ideas of women studies as a discipline.
CO-2	Examine various Ideas and concepts on gender.
CO-3	Analyse the traditional notions and practices on women in India.
CO-4	Evaluate the role and status of women in Modern India.
CO-5	Estimate various laws for the protection of the rights of women in Modern India.

UNIT I Introduction to women's studies

Definition of Gender - Sexuality- Patriarchy – Matriarchy – Patriliny – Matriliny- Relationship between Gender – Caste – Class and Religion.

UNIT II Women in Pre-modern India

Pre-Modern India: Brahmanical Patriarchy – Widowhood – Wifehood – Sthree Dharma and Pativrata concepts – Sati – Jauhar – Purdah – Razia Sultana – Mira Bai – Rani Mangammal – Noor Jahan – Gulbadan Begum.

UNIT III Women Reformers

Role in Social reform movement – Savithri Bhai Phule and Fathima Sheikh – Panditha Rama Bhai – Muthulakshmi Reddy – Moovallur Ramamritham.

UNIT IV Women in India's Freedom Struggle

Women in the Revolt of 1857- Santhal, Bhil and Munda Revolts – Annie Besant- Sarojini Naidu- Kamaladevi Chattopadhya- Bi Amman – Women in Revolutionary Movement and INA.

UNIT V Women and Law

Constitutional rights of women in India – Abolition of Sati – Widow Re-marriage Act – Sarada Act – Equal remuneration Act – Anti-Dowry Act – Family Court Act – Eve teasing and Sexual Harassment (Prevention) of Women Act, 2004 - Domestic Violence Act , 2005.

Textbooks:

1. Bhasin, Kamla. Understanding Gender. New Delhi: Women Unlimited, 2009.
2. Verma, Anjali. *Women and Society in Early Medieval India: Re Interpreting* Epigraphs. New Delhi: Routledge India, 2020.
3. Roy, Kumkum. *Women in Early Indian Societies.* New Delhi: Manohar, 2011.
4. Sarkar, Sumit, and Tanika Sarkar. *Women and Social Reform in Modern India: A Reader.* Bloomington: Indiana University Press, 2008.
5. Forbes, Geraldine. *Women in Modern India.* Cambridge: Cambridge University Press, 1996.

Reference Books:

1. Bhasin, Kamla. *What Is Patriarchy?.* New Delhi: Women Unlimited, 2004.
2. Chakravarti, Uma. *Rewriting History: The Life and Times of Pandita Ramabai.* New Delhi: Zubaan, 2014.
3. Reeta, Vinith Raj. *First Indian Women Teacher: Savitribai* Phule. New Delhi: Edu creation Publishing, 2018.
4. Kaushik, Sushila. *Panchayati Raj in Action: Challenges to Women's Role.* New Delhi: Friedrich-Ebert-Stiftung, 1996.
5. Smith, Bonnie G. *Women Studies: The Basics.* London: Routledge, 2013.
6. Menon, Nivedita. *Gender & Politics in India.* New Delhi:OUP, 1999.

SEMESTER – II

Course Title	**ENVIRONMENTAL SCIENCE**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UEVS21**
Course Type	**AECC-II**
Credits	**2**
Marks	**100**

UNIT - I: Nature of Environmental Studies

Goals, Objectives and guiding principles of environmental studies. Towards sustainable development - Environmental segments– Atmosphere, Hydrosphere, Lithosphere, Biosphere – definition. Pollution episodes -– Hiroshima – Nagasaki, - Bhopal gas Tragedy, Fukushima. Stone leprosy in Taj Mahal, Minamata disease.

UNIT - II: Natural Resources

Renewable and Non-Renewable resources - classification.

- Forest resources: Use and over - exploitation, Afforestation and deforestation.
- Water resources: Use and over - utilization and conservation of surface and ground water – Rain harvesting.
- Marine Resources: Fisheries and Coral reefs.
- Mineral resources: Use and exploitation - environmental impacts of extracting and using mineral resources.
- Food resources: Effects of modern agriculture fertilizers - pesticide problem.
- Energy resources: Growing energy needs - use of alternate energy source - Solar cells & wind mills.
- Land resources: Land degradation

UNIT - III: Ecosystem

- Concept of Eco-systems - Tropic level, food chains, food web and Ecological pyramids, Living conditions on other planets (Brief account). Types, structure & Functions, prevention and control of pollution of the following:

a) Aquatic ecosystem

b) Terrestrial ecosystem – Grassland, Forest and Desert ecosystem

UNIT - IV: Biodiversity & Its Conservation

Introduction - Definition: ecosystem diversity, species diversity and Genetic diversity. Hot spots of biodiversity - Western Ghats, Eastern Himalayas and Gulf of Mannar. Threats to biodiversity - Habitat Loss, Poaching of wildlife and Man - wildlife conflicts. Nature reserves. Conservation of biodiversity: In-situ and Ex-situ, Environmental movements – Green peace and Chipco movement. Biodiversity law.

UNIT - V: Environmental protection, Policies and practices

Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.

Prevention, Control of Pollution and Environmental Laws:

- Water, Air and Noise (prevention & Control of Pollution) Act.
- Environmental Protection Act.
- Wildlife production Act, Forest Conservation Act, International agreements, Monstreal and Kyoto protocols and conservation on biological Diversity. The Chemical Weapons Convention (CWC)
- Role of Central & State Pollution Control Boards.

Field work : 5 marks

Visit to an area to document environmental assets: river/ forest / fauna.

or

Visit to a local polluted site-urban/rural/Industrial / Agricultural

or

Study of common plants, insects, birds and basic principles of identification

SEMESTER – I

Course Title	VALUE EDUCATION-1
Total Hrs.	30
Hrs./Week	2
Course Code	21USVE1A
Course Type	AECC-I
Credits	2
Marks	100

General Objective: To make students inculcate moral values, leading to faith and righteous action in their life.

Unit – I: Islam – Meaning – Importance – A complete Religion – The religion accepted by God – Five Pillars of Islam – Kalima – Prayers – Fasting – Zakat – Haj.

Iman – Monotheism – Angels – Books – Prophets – Dooms Day – Life after death – Heaven and Hell.

Unit – II: Quran – The Book of Allah – Wahi – Revelation to Prophet Muhammad(sal) – Compilation – Preservance – Structure – Content – Purpose – Source of Islamic Law – SuraFathiha, Kafirun, Iqlas, Falakh and Nas.

Unit – III: Hadith – Siha Sitha – Buhari – Muslim – Tirmithi – Abu Dawood – Nasai – Ibn Maja – Collection of Hadith – Meaning of 40 Hadith.

Unit – IV: Life History of Prophet Muhammad (sal) – AiamulJahiliya – Prophet's Childhood and Marriage – Prophethood – Life at Mecca – Life at Medinah – Farewell Address – Seal of Prophethood.

Unit – V: Good character – Etiquettes – Halal and Haram – Duties towards Allah – Duties towards fellow beings – MasnoonDuas.

Textbooks:

Publication of SadakathullahAppa College

Reference Books:

1.V.A. Moahmed Ashrof – Islamic Dimensions – Reflection and Review on Quranic Themes.

2.The Presidency of Islamic Researchers – Revised & Edited – The Holy Quran.

3.M. ManzoorNomani – Islamic Faith & Practice.

4.Ali Nadawi, Abul Hasan– Muhammad Rasulullah.,Muassasathus Sahafawa Nashr publication Lucknow, India,1999.

5.K. Ali – A Study of Islamic History.

6.Abdul Rahuman Abdulla h – Islamic Dress code for Women.

7.Dr. MunirAhamed Mughal – Code For Believers.

8. Abdul Malik Mujahid – Gems and Jewels.

SEMESTER – I

Course Title	VALUE EDUCATION II
Total Hrs.	30
Hrs./Week	2
Course Code	21USVE1B
Course Type	AECC I
Credits	2
Marks	100

UNIT I

Individual Morality – Objective of Moral life – Living in accordance with the code of Morality – the goodness of Morality – Morality and *Thirukural*- The need for faith.

UNIT II

Adherence to higher code of Morality – Fear of God – Good Moral Values – Duty to Parents – Teacher, respecting elders – Moral Etiquettes – Right-minded Principle – High Principles for Proper conduct.

UNIT III

Inculcating good attitudes – Open mindedness – Morale – analysing the pros and cons of good and bad – Service to others – Mind Power, tolerance, respecting others, showing love to others, patience – tranquility – Modesty, kindness and forgiveness.

UNIT IV

Quotations and moral Stories expressing Good characters of Great personalities – Life History of Great people: Mahatma Gandhi, Abraham Lincoln, Dr. A.P.J. Abdul Kalam.

UNIT V

Truth, the importance of uprightness, integrity, friendship – Health awareness on Alcohol and drug abuse – inculcating reading habit – reading good books – Hygiene – Dowry – Corruption.

TEXTBOOKS:

Publication of Sadakathullah Appa College.

Course Title	**ECO LITERATURE**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCEN65**
Course Type	**DSC-XVI**
Credits	**4**
Marks	**100**

General Objective:

To help students get acquainted with writings based on nature thereby examine human perception of wilderness and how it has changed throughout history.

Course Objectives:

CO	The learners will be able to:
CO1	Understand the influence of Nature in Literature, its impact on the writers and appreciate the works on ecological perspective.
CO2	Relate how individuals in society behave and react in relation to nature and ecological aspects.
CO3	Correlate the relation between humans and natural world in literature.
CO4	Identify the realistic portrayal of environment and nature through various genres in literature for collaboration between natural scientists, writers, literary critics anthropologists and historians.
CO5	Explain the conditions needed to preserve nature and analyse the impact of Science and Technology to life, nature and literature in the present context.

Unit I – Poetry

1. Little Sparrow – SubramaniaBharathiar
2. *Ode to The Autumn – John Keats*
3. The Road not Taken – Robert Frost
4. *Caged Bird – Maya Angelou*
5. *On Killing a Tree – Gieve Patel*

Unit II - Prose

1. Walden – Henry David Thoreau
   Chapter 2 - Where I lived and What I Lived for
   Chapter 8 - Village

2. Letter to President Pierce, 1855 – Chief Seattle
3. A Fable for Tomorrow – Rachel Carson
4. A Flowering Tree – A.K. Ramanujan

Unit III – Short Stories

1. Old Man at the Bridge – Earnest Hemmingway
2. The Cherry Tree – Ruskin Bond
3. Death by Landscape – Margret Atwood

Unit IV – Fiction

Animal's People – Indra Sinha (374 pages)

Unit V – Drama

Oil on Water- HelonHabila

Textbooks:

1. Garrard, Greg, *Ecocriticism(Routledge, 2004)*
2. NirmalSelvamony -*Tinai in Primal and Stratified Societies*
3. Ramanujan, A.K .*Selected Tale from Flowering Tree*
4. Sinha, Indra. *Animal's People* ,Paperback, 1st edition Publisher: Simon & Schuster
5. Habila, Helon.Oil on Water: A Novel, Hamish Hamilton. ISBN978-0-241-14486-2 (2010)
6. https://lmexpressions.com/2017/02/21/bharathiyar-poems-little-sparrow/#more-2642

Course Outcome

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO-1	Associate themselves with the environmental issues through the light of Eco literary narratives.	1	Understanding
CO-2	Compare how natural systems and human designed systems work together as well as in conflict with each other.	2	Understanding
CO-3	Interpret literature from an ecological perspective and understand the crisis through the intersection of literature, culture, and the physical environment.	4	Applying
CO-4	Analyse the hurdles between nature and human world in forming harmony by means of the texts prescribed.	2,5	Analysing
CO-5	Assess, through literary texts,the role of human beings in promoting environmental conservation besides promoting research in the specified area.	5	Evaluating

Semester – II

Course Title	**GREEN LITERATURE**
Total Hrs	60
Hrs/Week	4
Sub. Code	**21PEEN21A**
Course Type	DSE-IIA
Credits	3
Marks	100

General Objective: To interpret and contribute to the emerging Green literature.

Course Objectives :

CO No.	The learners will be able to
CO-1	Classify Green literature from that of other literature.
CO-2	Interpret and understand literature from an ecological perspective.
CO-3	Prioritize to know and understand the importance of ecology concerns by means of the literary texts prescribed.
CO-4	Support the world usefully as responsible citizens with the concerns reflected in the prescribed literary texts.
CO-5	Recommend the trends and style of Green literature.

Unit I Poetry

William Wordsworth	Daffodils
John Keats	To Autumn
Gieve Patel	Squirrels in Washington
Joy Harjo	Remember
Allison Hawthorne Deming	Human Habitat

Unit II Poetry

Dylan Thomas	Fern Hill
Rudyard Kipling	The Way through the Woods
Emily Dickinson	There is Another Sky
Dilip Chitre	The Felling of the Banyan Tree
K N Daruwalla	Boat Ride along the Ganga

Unit III Prose

Arundhati Roy	'End of Imagination' (18 pages. From the book End of Imagination)
Henry David Thoreau	Where I lived, and What I Lived For

Unit IV Short Stories

Ruskin Bond	My Father's Trees in Dehra
Salman Rushdie	Good Advice is Rarer than Rubies

Unit V Fiction

Emmi Itaranta	Memory of Water

TEXTBOOKS:

1. Bond, Ruskin. *My Tall Green Friends,* Rupa Publications, New Delhi, (Second Impression) 2020.
2. Emmi Itaranta, Memory of Water, Harper Collins, 2014.
3. Roy, Arundhati. *End of Imagination.* Haymarket Books. 2016.
4. Rushdie, Salman. East, West. Vintage Publication. 1996.

REFERENCE BOOKS:

Eco-Aesthetics: Art, Literature and Architecture in a Period of Climate Change (Radical Aesthetics-Radical Art) - by Malcolm Miles.

SEMESTER – II

Course Title	**DEVELOPEMENTAL BIOLOGY**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCZO21**
Course Type	**DSC-III**
Credits	**4**
Marks	**100**

General Objective:

To study the principles of developmental Biology and understand various steps that lead to the formation of a new progeny.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Understand the principles of developmental biology and the progression of gametogenesis.
CO-2	Execute the Spemann's experiment in lower organisms.
CO-3	Distinguish the types and physiology of placenta
CO-4	Justify the method of in vitro fertilization
CO-5	Construct a model of teratogenic embryo.

UNIT I – Gametogenesis and Fertilization

Spermatogenesis – Oogenesis. Structure of sperm and egg of Chick and Human. Sperm and egg interaction – pre and post fertilization, theories and biochemical events-Parthenogenesis.

UNIT II – Cleavage and Gastrulation

Cleavage in Chick and Human. Fate map of Chick and Human. Gastrulation in Chick and Human. Development of Brain and Heart in Chick.

UNIT III – Extra Embryonic Membranes and Placentation

Extra embryonic membranes in Chick – development, types and physiology. Placentation in mammals – types and physiology. Organizer – Primary and secondary organizers – Spemann's experiment.

UNIT IV – Human Reproduction and Birth Control

Reproduction in Human – Infertility (male and female), Artificial insemination – Assisted reproductive Technology,(ART)Invitro fertilization and embryo transfer –Test tube babies – Amniocentesis.

Contraceptive devices – Surgical method – Hormonal method – Intra Uterine Contraceptive Devices (IUCD).

UNIT V – Nuclear transplantation and Regeneration

Nuclear transplantation in *Acetabularia*. Regeneration- definition and types, Regeneration in *Planaria* and Amphibians. Teratogenesis,Embryonic stem cells and significance.Morphogenetic field and gradient hypothesis.

TEXT BOOKS :

Verma . P. S. and V. K. Agarwal. 2006, Chordate Embryology,S. Chand & Company Ltd.

REFERENCE BOOKS :

1. Arora,M.P., 2018 Embryology, Himalaya Publishing House,.
2. Berril, N. J., 1986 Developmental Biology, TataMc.Graw – Hill Publishing Company.
3. Balinsky,B.I.Fabian.B.C. 2012. An Introduction to Embryology, Thomson Press India Ltd.5th edition.

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Describe the development of spermatogenesis and oogenesis.	1,2,4	Understanding
CO-2	Chart the growth of brain and heart in chick.	1,2,3	Applying
CO-3	Correlate the varied type of placenta.	1,3,4,5	Analysing
CO-4	Predict the factors involved in infertility.	1,4,5	Evaluating
CO-5	Generate a model of various stages of human embryo.	1,3,4,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course				Hours		Credits		
II	21UCZO21	DEVELOPMENTAL BIOLOGY				60		4		
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓		✓		✓	✓		✓	
CO-2	✓	✓		✓		✓	✓	✓		
CO-3	✓	✓	✓		✓	✓		✓	✓	✓
CO-4	✓	✓	✓	✓		✓			✓	✓
CO-5		✓	✓	✓	✓	✓		✓	✓	✓
	Number of matches (✓) = ...35.... Relationship = High									

Prepared by
Dr.M.Sithi Jameela
Signature

Checked by

Head of the Department

SEMESTER - II

Course Title	**ECOLOGY**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCZO22**
Course Type	**DSC-IV**
Credits	**4**
Marks	**100**

General Objective:

To create an awareness on the mechanism of eco system and protection of natural resources and biodiversity.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Understand the concepts and scope of various branches of Ecology.
CO-2	Sketch the varied types of Food chain and Food web.
CO-3	Analyse the different types of animal relationship.
CO-4	Evaluate the faunal adaptations of different habitats.
CO-5	Construct innovative methods to conserve rare, endangered and critically endangered species.

UNIT – I Ecology factors

Ecology and Environmental Science – Definition - Scope – Branches - Abiotic factors –Water, Temperature and Light. Biotic factors – Animal relationship – Symbiosis – Commensalism – Mutualism –Antagonism - Antibiosis – Parasitism and its types and adaptations- Predation - Competition.

UNIT – II Ecosystem

Ecosystem –Definition Structure – Pond ecosystem – Primary production – Secondary production –Food chain – Food web – Trophic levels – Energy flow – Pyramid of biomass – Pyramid of energy. Biogeochemical cycles – carbon and nitrogen

UNIT – III Community& Population Ecology

CommunityEcology: Introduction – diversity – structure – community dominance – community stratification – periodicity – community interdependence -Ecotone – Edge effect – ecological niche – concepts of community –Ecological succession

Population Ecology – Definition – Density – Estimation –Natality – Mortality – Age distribution - Age pyramids – Population growth and Population equilibrium.

UNIT - IV Habitat Ecology

Characteristic features of different habitats and faunal adaptations of fresh water (Lentic and Lotic), marine, estuarine, mangrove, cave, forest and desert.

UNIT - V Biodiversity the Conservation

Biodiversity – definition, loss and cause. IUCN, CITES and brief outlines of Indian laws of conservation. Biodiversity hotspots in India, Indian endangered species and conservation, community reserves, sanctuaries, national parks and tiger reserves in TamilNadu. Afforestation and deforestation. Human animal conflicts

TEXT BOOKS:

1. P.S.Verma, V.K.Agarwal (2010) Environmental biology, S.Chand & Co. New Delhi.
2. Text book of Ecology & Animal Distribution by P.S.Verma V.K.Agarwal S.Chand & Co. New Delhi.

REFERENCE BOOKS:

1. Odum, E.P., 1971 – Fundamentals of Ecology., W.B. Saunders Company.
2. Verma, P.S. and V.K.Agarwal 2013. Cell Biology, Genetics, Molecular Biology, Evolution & Ecology. S.Chand & Company.
3. Arumugam.N and V.Kumaresan 2014. Environmental Studies, Saras Publication.
4. S.V.S. Rao (2013), Ecology and Emvironmental science, PHI Publishers.
5. P.D. Sharma (2011)Ecology and Emvironment, Rastogi publishers
6. Pranav Kumar (2017) Fundamentals of Ecology and Pathfinder Publication, Second edition.

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the relationship between the biotic and abioic factors.	1,2,3,5	Understanding
CO-2	Integrate the features of ecosystems and their diversity.	1,2,5	Applying
CO-3	Distinguish the features between Population and community.	1,2,4,5	Analysing
CO-4	Comment on the characteristics of different habitats and faunal adaptations.	1,2,4	Evaluating
CO-5	Devising the Strategies to improve the protection of Rare, endemic, threatened and endangered species.	1,2,3,4,5	Creating

SEMESTER – I

Course Title	ANIMAL DIVERSITY - I
Total Hrs.	60
Hrs./Week	4
Course Code	21UCZO11
Course Type	DSC-I
Credits	4
Marks	100

General Objective:

To understand Morphology, Taxonomy and general characters of Invertebrates

Course Objectives:

CO No.	The learners will be able to:
CO-1	List the characters and classification of Phylum Protozoa
CO-2	Describe the life history of Porifera and Coelenterata
CO-3	Interpret the pathogenesis of Platyhelminthes and Aschelminthes
CO-4	Distinguish the characters of Annelids and Arthropods
CO-5	Justify the economic importance of Mollusca

UNIT I

Introduction to Principles of Taxonomy (Binomial nomenclature), Types of classification-Natural, Artificial, Practical.

Protozoa: General characters and classification upto classes with examples.

Type study: Paramecium - Morphology – Nutrition – Locomotion – Reproduction - (Binary fission & Conjugation).

General topic: General structure, life cycle, pathogenicity and control measures of *Entamoeba histolytica,Plasmodium malariae.*

UNIT II

Porifera: General characters and classification upto classes with examples

Type study: Scypha (Sycon) - External characters and life history.

General topic: Canal system in sponges.

Coelenterata: General characters and classification upto classes withexamples.

Type study: *Obelia geniculata*- External characters and life history.

General topic: Coral formation and types of coral reefs.

UNIT III

Platyhelminthes: General characters and classification upto classes with example.

General topic : *Taenia solium* –External morphology, life cycle, pathogenicity and control measures.

Aschelminthes: General characters and classification upto classes with example

General topic: External morphology, life cycle, pathogenicity and control measures of *Ascaris lumbricoides*.

UNIT IV

Annelida: General characters and classification upto classes with examples.

Type study: Earthworm – external morphology and reproduction.

General topic: Metamerism in Annelids,

Arthropoda: General characters and classification upto classes with an example.

Type study: Cockroach- Morphology and nervous system.

General topic: 1.Economic Importance of Honey Bee. 2. Peripatus and its affinities

UNIT V

Mollusca: General characters and classification upto classes with examples.

Type study: *Pila globosa* -External characters and life history.

General topic: Economic importance of Molluscs. (Oyster and Mussels)

Echinodermata: General characters and classification upto classes with examples.

Type study: Star fish - External characters and water vascular system only.

General topic: Larval forms of Echinodermata.

TEXT BOOKS :

1. Jordon. E.L.and Verma. P. S. 1963 Invertebrate Zoology - S.Chand Publishers.
2. Kotpal, R. L. 2019. Modern Text Book of Zoology – Invertebrates, Rastogi Publications.

REFERENCE BOOKS - INVERTEBRATA

1. Arora, M. P. 2006. Non – chordates, Himalaya Publishing House.
2. Bhamrah, H.S. *et al.*, 2002- A text Book of Invertebrates –Anmol Publications.
3. Ekambaranatha Iyer .M.A. 1992. Manual of Zoology – Part I - Invertebrata - S.Viswanathan Printers and Publishers.
4. Nair N.C, Murugan. T, Arumugam .2010 -A Text Book of Invertebrates- Saras publications.

SEMESTER - V

Course Title	**AQUACULTURE**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCZO53**
Course Type	**DSC-IX**
Credits	**4**
Marks	**100**

General Objective:

To familiarize students with different practices of aquaculture and develop entrepreneur skills in the respective field.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Understand the varied practices in Aquaculture.
CO-2	Apply Cryopreservation techniques in aquaculture.
CO-3	Distinguish between the different types of integrated fish farming.
CO-4	Predict the different types of fish diseases.
CO-5	Propose innovative methods of fish Harvesting .

UNIT I - Introduction

Scope of Aquaculture - Aquaculture in India – Freshwater, Coastal and Marine aquaculture –Site selection- Pond construction - Maintenance of pond - Types of fish ponds- Nursery pond, Rearing pond and culture pond.

UNIT – II - Culture Practices

Biology of Indian major carps –Fin fish culture: collection of seeds and transportation of seeds – natural breeding, induced breeding, Marine prawn culture –*Penaeus monodon* - Transgenic fish production – Ploidy and Induction – Cryopreservation. Culture practices in Edible oyster: collection of seeds – induced breeding.

UNIT – III – Types of Culture

Types of culture: extensive - semi-intensive and intensive culture – monoculture - monosex culture – polyculture - cage culture - pen culture – seaweed culture - integrated fish farming – paddy cum fish culture - poultry cum fish culture - pig cum fish culture - sewage fed fish culture.

UNIT- IV - Fish Feed and Diseases

Fish feed: artificial feed – feed formulation – need - ingredients ratio – square method– pellets. Live feeds and their culture: *Artemia* and Rotifer – Seaweed culture. Fish Diseases: bacterial, viral, fungal, ecto and endo-parasitic diseases and nutritional deficiency diseases.

UNIT – V - Harvesting and Post-harvest Technology

Methods of fish harvesting – craft (Kattumaram and Trawlers) and gears (Gill net and trap net) used for inland and marine fisheries - Fish preservation – fishery by-products. Role of government organizations-CMFRI – CIFRI – FFDA - CIFT – CIFE - MPEDA – CIBA etc.

TEXT BOOKS :

1. Sandhu, G.S. 2010. A text book of fish and Fisheries of India. Wisdom Press, New Delhi.
2. N.Arumugam, Saras Publications, 114/35G, A.R.P. Camp Road, Periyavilai, Kottar Po, Nagercoil – 629002.

REFERENCE BOOKS :

1. Jhingran, V.G.(1997) Fish and fisheries of India. Hindustan Publishing Corporation (India), Delhi
2. Santhanam, R., N. Sukumaran and P. Natarajan.,(1990) A manual of freshwater aquaculture.Oxford & IBH Publishing Co. Pvt. Ltd., 66 Janpath, New Delhi – 110 001.
3. Sundararaj, V. and B. Srikrishnadhas,(2000) Cultivable aquatic organisms, Narendra Publishing House, 1417, Krishnan Dutt Street, Maliwara, Delhi – 110 006.
4. Pillai, T.V.R., Aquaculture and the environment. 1st edition, Fishing news Books, England, 1992.
5. Pandian, T.J., Sustainable indian fisheries, 2001
6. Samuel Paulraj., Shrimp farming techniques, problems and solutions-1995
7. Kurian, C.V and V.O. Sebastian. Prawns and prawn fisheries of India IV edition 1993
8. Victor, A.C., A. Chellam, S. Dharmaraj and T.S. Velayudhan, Manual on pearl oyster seed production, farming and pearl culture, CMFRI Special publication-1995
9. Vijayan, K.K. et al., 2007. Indian Fisheries: A progressive outlook. CMFRI Publications, Kochi.

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Describe the complete protocol of pond construction and management in freshwater Aquaculture.	1,2,4,5	Understanding
CO-2	Execute induced culture of breeding in Prawns.	1,2,3,4,5	Applying
CO-3	Identify the diverse culture systems of inland fisheries.	1,2,4,5	Analysing
CO-4	Assess the steps involved in artificial Fish Feed formulation.	1,2,4	Evaluating
CO-5	Devise suitable mechanism to use in fish harvesting.	1,2,4	Creating

SEMESTER – V

Course Title	WILDLIFE CONSERVATION AND MANAGEMENT
Total Hrs.	60
Hrs./Week	4
Course Code	21UEZO51B
Course Type	DSE-I-B
Credits	4
Marks	100

General Objective:

To equip students with adequate knowledge of various biodiversity monitoring methodologies and conservation and management of Wildlife.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Define the conservation of wild life
CO-2	Discuss the impact of habitat destruction.
CO-3	Determine the Damage caused by wildlife in India and its mitigation.
CO-4	Evaluate the exponential and logistic growth rates of wildlife.
CO-5	Investigate the population vulnerability.

Unit-I-Introduction to WildLife

Value of wildlife and its need for conservation. Definition and importance of wildlife, Causes of depletion of wildlife. Factors responsible for the extinction of animals; Types of protected areas. Wildlife Sanctuaries and National Parks in India-general strategies and issues.

Unit-II- Importance of WildLife conservation

Wildlife conservation, ethics and importance of conservation, Impact of habitat destruction and fragmentation on wildlife, Biological parameters

such as food, cover, forage and their impact on wild life. Identification and estimation of wild animals by faecal sample analysis and census methods..

Unit-III-Wildlife conservation

Objectives- strategies and issues; Captive breeding techniques and translocation and reintroduction- Inviolate area and critical habitats and their impact on wildlife; Different terrestrial habitats of wildlife in India- Restoration of degraded habitat- Damage caused by wildlife in India and its mitigation.

Unit-IV- Rehabilitation and management

Type of wildlife management-manipulative and custodial- Management of over abundant wild animal populations causing damages to nearby inhabitants and their crops and animals, Tools and techniques to control the menace of wild animals; man wildlife conflict resolution and mitigation. Habitat manipulation– control and regulation of grazing. Weed eradication- Major diseases of domestic and wild animals and their control and impact of wild life tourism.

Unit-V - Population Attributes

Theories of population dispersal, Population vulnerability analysis and its components Animal movement, concept of home range and territory; Tracking movement by remote sensing. Predator-prey models and impact of predation. Population attributes; concepts of exponential and logistic growth rates of wildlife, Density dependent and independent population regulation.

Reference books:

1. Caughley, G., and Sinclair, A.R.E. (1994) Wildlife Ecology and Management. Blackwell Science.
2. Woodroffe, R., Thirgood, S. and Rabinowitz, A. (2005) People and Wildlife, Conflict or Co-existence? Cambridge University.
3. Bookhout, T.A. (1996) Research and Management Techniques for Wildlife and Habitats (5th edition) The Wildlife Society, Allen Press.
4. Sutherland, W.J. (2000) The Conservation Handbook: Research, Management and Policy. Blackwell Sciences 95
5. 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. P

SEMESTER – V

Course Title	ENVIRONMENTAL TOXICOLOGY
Total Hrs.	60
Hrs./Week	4
Course Code	21UEZO52B
Course Type	DSE-II-B
Credits	4
Marks	100

General Objectives:

- To equip students with the skills to critically evaluate and understanding of the effects of chemicals on human health and environment.

Course Objectives:

CO	The learners will be able to:
CO-1	Define the basic concept of toxicology
CO-2	Discuss the process of eco-toxicology.
CO-3	Interpret the acute and chronic toxicity
CO-4	Distinguish the impact of various toxic chemicals in the Environment
CO-5	Evaluate the toxic effect on human and environment

Unit 1. Toxicology

Introduction- History of toxicants - Principles of toxicology – toxicants and toxicity, factors affecting toxic substances- their types – degradable and non-degradable toxicants.

Unit 2. Eco-toxicology

Introduction to eco-toxicology- the route and transport of toxicants by air, water and food- chain- biotransformation, bioconcetration and bio-magnification; Influence of ecological factors on the effects of toxicology. Global dispersion of toxic substances – dispersion and circulating mechanisms of pollutants.

Unit 3. Acute and chronic toxicity

Lethal and sub-lethal doses; Analysis of NOEL, LD50 and MLD; Dose-response relationship; Detoxification process –mechanisms – organs of detoxification. Carcinogens, mutagens and teratogens; Toxicity testing procedures.

Unit 4. Chemical toxicology :

Toxic chemicals in the Environment; Impact of Toxic chemicals on enzymes and biochemical effect of arsenic, cadmium, lead, mercury, carbon monoxide, nitrogen oxides, sulphur dioxide and cyanide.

Unit 5. Man and Environmental Toxins

Routes of toxicants to human body – inhalation, skin absorption, oral, injection; ADME – adsorption, distribution, metabolism and excretion; Response to toxin exposures – dose-response relationship, frequency and cumulative response. Environmental diseases: Asbestosis, silicosis, synopsis, asthma, fluorosis and allergis and epidemiological issues – Malaria, Kala azar, water borne diseases

References Books :

1. Calow.P. 1994. Handbook of Ecotoxicology. Blackwell Scientific Publications, London
2. Chatterji,M., M.Munasinghe and R.Ganguly. 1998. Environment and Health in Developing Countries. A.P.H.Publishing House, New Delhi.
3. Forbes,V.E. and T.L.Forbes. 1994. Ecotoxicology in Theory and Practice. Chapman & Hall, London.
4. Hayes, W.A. 2001. Principles and Methods of Toxicology, CRC, USA.
5. Jacobson-Kram,D. 2006. Toxicological testing handbook: Principles, Applications and Data Interpretation, Taylor and Francis, New York.
6. Klaassen,C.D. and Watkins,J.B. 2003. Essentials of Toxicology, McGrawHill Professional, New Delhi.
7. Levin,S.A. and M.A.Harwell, J.R.Kelley and K.D.Kemball. 1989. Ecotoxicology: Problems and Approaches. Springer-Verlag, New York.
8. Manahan,S.E. 2000. Environmental Chemistry, Lewis Publishers, New York.
9. Pery,G. 1980. Introduction to Environmental Toxicology, Elsevier, Amsterdam.
10. Walker,C.H., R.M.Sibly, S.P.Hopkin and D.B.Peakall. 2012. Principles of Ecotoxicology, CRC Press, New York.
11. Wright,D.A. and Welbourn,P. 2002. Environmental Toxicology, Cambridge University Press, London.

SEMESTER – V

Course Title	**POLYMER CHEMISTRY**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UECH51A**
Course Type	**DSE-I-A**
Credits	**4**
Marks	**100**

General Objectives:

This course describes the Polymers, its types, techniques involved in polymerization, synthesis, physical properties, biomedical applications, degradation and processing of polymers

Course Objectives:

CO	The learners will be able to :
CO-1	Distinguish a polymer on the basis of the structure and properties
CO-2	Elaborate the wide range of reagents applied in polymerization reactions
CO-3	Obtain knowledge of the different types of polymers and their applications.
CO-4	Point out the wide applications of polymers in bio-medicine.
CO-5	Determine the different mechanical and crystalline properties of polymers and processing of polymers based on their properties.

UNIT I - Polymer and its types

Polymer- Classification based on Structure, Application and Tacticity- Types- Homo and Copolymer – Distinction among plastics, elastomers and fibers. – Functionality, Degree of polymerization - Types of polymerization - addition, condensation and chain polymerization (Mechanism not required).

UNIT II – Polymerization Techniques and Rubbers

Bulk, Suspension, Emulsion and Solution polymerization Poly condensation techniques- melt polycondensation, solution polycondensation and interfacial condensation.

Bulk and Emulsion polymerization: polymerization of Styrene.

Precipitation polymerization: Polymerization of acrylonitrile.

Suspension polymerization: Polymerisation of methyl methacrylate.

Melt polycondensation: Preparation of Kevlar.

Solution polycondensation: Preparation of Polyacrylonitrile (PAN).

Interfacial polycondensation: Reaction of terephthaloyl chloride and ethylene diamine – Isolation and purification of polymers

Vulcanization of rubber, preparation and uses of synthetic rubbers: BUNA-S, BUNA-N and neoprene rubber.

UNIT III - Synthetic Polymers

Synthesis, properties and uses of - Polyethylene - HDPE, LDPE, LLDPE - Polypropylene - Polyvinyl chloride – Teflon - Polyvinyl acetate - Poly vinyl fluoride, Polyamides: Nylon 6, Nylon 6,6 and Nylon 11 - Polyester resins, Alkyd resins.

Resins: Preparation, properties and uses of Melamine formaldehyde and urea formaldehyde resins and Epoxy resins.

Cellulose esters: Preparation, properties and uses of Cellulose acetate and Cellulose nitrate.

UNIT IV - Physical States and Biomedical Applications

Molecular mass - number average, weight average, viscosity average molecular mass - Determination of molecular mass by viscosity and light scattering method - practical significance of molecular mass distribution - size of polymers. Kinetics of free radical polymerization - Carothers's equation - Bio - medical applications of polymers.

UNIT V – Physical Properties, Degradation and Processing

Glassy state - glass transition temperature, factors affecting glassy state - crystallinity in polymers.

Viscosity, Solubility, Optical, Electrical, Thermal and Mechanical properties of polymers.

Degradation of polymers by thermal, oxidative, mechanical and chemical methods.

Polymer processing:

Compression moulding-Torlon [Polyamide-imides]
Injection moulding – Polyethylene and Polystyrene
Transfer moulding – Polyurethanes or Epoxy resins
Extrusion moulding - Polypropylene
Blow moulding - Polyethylene Terephtalate (PET)
and dye casting.

REFERENCE BOOKS:

1. Alka Gupta L., *Polymer Chemistry*, Pragati Prakashan,Anu Books, 2019.
2. Billmeyer F.W., *Text Book of Polymer Science*, A Wiley–Inter science Publication, 3rd Edition, John Wiley & Sons New York, 2007.
3. Nayak P.L. &Lenka S., *Text Book of Polymer Science*, Kalyani publishers, New Delhi, 2000.
4. Bhatnagar M. S., *A Textbook of Polymer Chemistry*, S Chand Publishing; First edition, 2004, ISBN-10: 8121941121.
5. Carraher Jr. C. E., *Introduction to Polymer Chemistry*, 4th Edition, CRC Press, 2017, ISBN-13: 978-14987,37616
6. Gowarikar V.R., Viswanathan N.V. and Sreedhar J., *Polymer Science*; New Age International (P) Ltd., New Delhi, 2000.

SEMESTER – V

Course Title	MEDICINAL CHEMISTRY
Total Hrs.	60
Hrs./Week	4
Course Code	21UECH52B
Course Type	DSE-II-B
Credits	4
Marks	100

General Objectives:

This course describes the drug metabolism, medical diagnostic instruments, blood analysis, causes of diseases and their treatment.

Course Objectives:

CO	The learners will be able to :
CO-1	Describe the classification and metabolism of drugs.
CO-2	Explore the idea of metabolic reactions.
CO-3	Illustrate the working principle of common medical instruments.
CO-4	Identify different blood groups based on composition.
CO-5	Evaluate quantitively the glucose and urea present in the blood by different methods.

UNIT I- Concepts and metabolism of drugs

Concepts: Classifications of drugs – biological and chemical classification nomenclature of drugs – International Non-proprietary names (INNs).

Metabolism of drugs: Factors affecting metabolism - chemical pathway of drug metabolism – bio transformation - oxidative, reductive and hydrolytic bio transformations – conjugate reactions – glucouranides, amino acids, ethereal sulphate, methylated, acetylated and glucothione conjugations. Absorption of drugs – routes of administration – factors affecting absorption. Assay of drugs: Chemical, biological and immunological assay.

UNIT II - Diagnostic Medical Instruments

Design of medical instruments – general components – transducers – types – biopotential recorders – Electrocardiograph(ECG) – principles, block diagram, measurement and analysis of the ECG, X-ray - Principle, block diagram, measurement and analysis. Ultrasonic Scanning principle,block diagram, measurement and analysis of the scans. C.T.Scan - principle, block diagram, measurement and analysis.

UNIT III - Clinical Chemistry

Clinical chemistry: Composition of blood – blood grouping - determination of blood groups and matching – blood pressure – hyper tension – determination.

Determination of glucose in serum – Folin method, Wu's method - determination of serum cholesterol – Sackett's method – tests for cholesterol.

Estimation of glucose in urine – Benedict's test – tests for salts in serum – tests for chlorides in serum – tests for salts in urine – tests for cholesterol in urine.

Detection of diabetes and anaemia. Estimation of hemoglobin (Hb concentration) – estimation of red blood cells(count).

Analysis of blood – determination of blood urea – urease method.

Estimation of bile pigment in serum – estimation of total protein in serum – estimation of total proteins and albumin based on Biuret and BCG methods.

UNIT IV- Diseases and treatment I

Causes and treatment of some common diseases:

Insect borne diseases – malaria and filariasis.

Air borne diseases – diphtheria, whooping cough, influenza, cold, fever and tuberculosis.

Water borne – cholera, typhoid and dysentery.

Digestive disorders – jaundice – respiratory disorder – asthma – nervous disorder –epilepsy - other diseases – piles and leprosy.

Functions, uses and effects of the following drugs:

Cardiovascular drugs – antiarrhythmic drugs - quinidine.

Anti-hypertensive drugs - reserpine.

Anti-anginal drugs - glyceryl trinitrate and isosorbide dinitrate.

Sulpha drugs – sulphanilide and sulphadiazine.

UNIT V - Diseases and treatment II

Cancer – causes, spread and treatment – structure and effects of chloram-Bucil (Leukeran), methotrexate (Anti-metabolite), plant products and hormones.

Diabetes – control – structure and uses of insulin - Oral hypoglycemic drugs – tolbutamide and chloropropanamide.

Anti-convulsant agents – structure and uses of barbiturates and succinimides.

Uses and effects of the following drugs:

Analgesics – narcotic analgesics – action, uses and structural activity of morphine. Non-narcotic analgesics – asprin and paracetamol. Anesthetic – general anesthetic – uses and disadvantages of vinlyl ether and halothane. Intravenous anesthetics – tripental sodium – local anesthetics – cocaine and cinchocaine. Anti-psychotic drugs – piperazine and benzamides.

Anti-anxiety drugs – benzodiazepine.

REFERENCE BOOKS:

1. Chatwal G. R., *Medicinal Chemistry*, , Himalaya Publishing House, New Delhi, 2002.
2. Gosh J., *Text Book of Pharmaceutical Chemistry*, S.Chand and Company, New Dehi, 2003.
3. Krupadanam G.L.D, Prasad D.V., Rao K.V., Reddy K.L.N. and Sudhakar C., *Drugs*, Orient Longmann Pvt. Limited, Hyderabad, 2005.
4. KhandpurR. S., *Handbook of Biomedical Instrumentation*, II Edition, Tata McGraw - Hill Publishing, Company, New Delhi.

SEMESTER – VI

Course Title	**CHROMATOGRAPHIC TECHNIQUES AND GREEN SYNTHESIS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCCH6P2**
Course Type	**PRACTICAL-VIII**
Credits	**2**
Marks	**100/2**

General Objectives:
This practical course focuses on training the students with chromatography techniques like paper and thin layer chromatography and to synthesize organic compounds by applying green chemistry procedure.

Course Objectives:

CO	The learners will be able to :
CO-1	Classify the naturally occurring pigment and carbohydrates by ascending paper chromatography.
CO-2	Observe the mechanism of chromatographic separation.
CO-3	Adapt the appropriate mobile phases based on the compounds to be separated.
CO-4	Figure out the R_f value for a given compound by thin layer chromatography.
CO-5	Justify the importance of the atom economy and efficacy of an organic reaction by adopting green procedures.

A. Chromatographic technique:

I Paper Chromatography:

1. Separation of pigments present in spinach leaves by ascending paper chromatography.
2. Separation of the monosaccharides and disaccharides [Glucose, Fructose, Sucrose] by ascending paper chromatography.
3. Separation and identification of amino acids by ascending paper chromatography

II Thin Layer Chromatography

1. Thin layer chromatography: Separation of organic mixture containing *o* -, *m* - and *p* - nitrophenol and the determination of R_f values of the separated components in a mixture.
2. Separation and identification of Group II cations in a mixture [Cu^{2+} and Cd^{2+}] using TLC and report the R_f value.
3. Separation and identification of Group IV cations in a mixture Co^{2+} and Ni^{2+} by TLC and report the R_f value
4. Separation and identification of Aspirin, Phenacetin and Caffeine by TLC and report the R_f value.

B. Green Synthesis of the following compounds

1. Acetylation of Primary Amine - (Preparation of acetanilide)
2. Base Catalyzed Aldol Condensation - (Synthesis of dibenzalpropanone)
3. Bromination of trans-stilbene
4. [4+2] Cycloaddition Reaction - (Diels-Alder reaction between furan and maleic acid).
5. Rearrangement Reaction – (Benzil- Benzilic acid rearrangement)
6. Electrophilic Aromatic Substitution Reaction - (Nitration of phenol).

REFERENCE BOOKS:

1. Ahluwalia, V. K., Dhingra, S., Gulati, A., *College Practical Chemistry*, Universities Press, 2005, ISBN: 9788173715068.
2. Bajpai, D. N., Pandey O. P. and Giri, S., *Practical Chemistry*, S Chand & Co Ltd, 2013, ISBN: 9788121908122.
3. Jeffery G. H., Bassett J., Mendham J., Denneya. R C., *Vogel's Text book of Quantitative Chemical Analysis*, Fifth Edition, Longman Scientific and Technical, UK, 1989
4. Mukhopadhyay, R., Chatterjee, P., Arunabha Sen R., *Advanced Practical Chemistry*, Books & Allied(P) Ltd., Kolkata, 2007.
5. Nad, A.K., Mahapatra, B., Ghoshal, A., *Advanced Course in Practical Chemistry*, New Central Book Agency (P) Ltd., Kolkata, 2000.
6. Vishnoi, N. K., *Advanced Practical Chemistry*, Vikas Publishing House, New Delhi, 2005.

SEMESTER – VI

Course Title	DAIRY CHEMISTRY
Total Hrs.	60
Hrs./Week	4
Course Code	21UECH61B
Course Type	DSE-III-B
Credits	4
Marks	100

General Objectives:
This course describes the composition, properties, processing, lipids of milk and preparation of different milk products,

Course Objectives:

CO	The learners will be able to :
CO-1	Describe the composition and properties of milk.
CO-2	Demonstrate the processing of milk under different conditions.
CO-3	Classify the various milk products after processing.
CO-4	Investigate differentkinds of milk.
CO-5	Evaluate the nutrient values of milk andmilk products.

UNIT I - COMPOSITION AND PROPERTIES OF MILK

Milk – General properties – Chemical composition – Milk fat (taste, colour, acidity & pH, specific heat & gravity, electrical conductivity & freezing point) – Milk fat – Its properties like iodine number, RM number, Saponification number – Acid Degree Value Miner – Constituents of milk – Vitamins – factors affecting the composition of milk – Milk proteins – Its physical properties like electrical properties.

UNIT II - PROCESSING OF MILK

Destruction of microorganisms in milk – Physiochemical changes during processing – Boiling, Pasteurisation – types – bottle, batch, HTST (High Temperature Short Time), Vacuum, UHT (Ultra High Temperature) Pasteurisation.

UNIT III - MILK PRODUCTS – I

Special milks – Sterilized milk – advantages and disadvantages – Factors influencing homogenization – flow diagram of its manufacture – homogenizer – Soft curd – Milk – properties – method of its preparation – flavoured milks – flow diagram of its manufacture - sterilized flavoured milk – flow diagram of its manufacture – vitaminized/irradiated milk, frozen/concentrated milk – fermented milk – cultured buttermilk – flow diagram of its manufacture – acidophilus milk – flow diagram of its manufacture – Yogurt – flow diagram of its manufacture.

UNIT IV - MILK PRODUCTS – II

Standardized Milk – Merits reconstituted/rehydrated milk – flow diagram of its manufacture – Recombined milk – merits, fallow diagram of its manufacture – Toned milk – flow diagram of its manufacture – Double

toned milk – filled milk, Imitation milk, vegetable toned milk – soya milk cream – classification – manufacturing – Physiochemical properties – separation of cream, ghee – its composition.

Chemical analysis – isolation of casein from milk – estimation of lactose on milk – estimation of protein in milk – Determination of pH – Determination of specific gravity of milk, total solids in milk.

UNIT V - MILK LIPIDS

Milk lipids (or) esters (or) Oils (or) fats – compound lipids (Oils + fats) – structure of lecithin – derived lipids - churning operation – preparation of churn – filling cream into the churn – addition of colour – churning difficulties – refractive index – antioxidants – milk carbohydrates – its uses, properties – milk enzymes – condensed milk – its classification – differences between condensed milk & skim – condensed milk – nutritive value of milk – differences between human milk and Cow's milk.

REFERENCE BOOKS

1. Johnson, W. and Alford, *Fundamentals of Dairy Chemistry*, C.B.S. Publishers and Distributers Delhi, 2005.
2. Rangappa, K.S. and Achaya, K.T. *Indian Dairy products*, Asia Publishing House, Bombay, 1974.
3. Srinivasan, M. R. and Anantakrishnan, C.P.: *Milk Products of India, ICAR Animal Husbandry Series No. 4*, New Delhi, 1957.
4. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell V.W.,*Harper's Biochemistry*, 21stEdn., McGraw-Hill, 1990.
5. Sukumar De., *Outlines of Dairy Technology*, 1st Edition., Oxford University Press,1991.
6. Webb, B.H. and Whittier, E.O., *By-products from Milks*, the A.V.I. Publ. Co. Inc., Westport, Connecticut, 1970.

Course Outcomes

CO	Upon completion of the course, the students will be able to :	PSOs Addressed	Cognitive Level
CO-1	Explain the composition, properties, lipids of milk and processing of milk.	1,3,5	Understanding
CO-2	Discuss the manufacture of different forms of milk and its products	1, 3,5	Understanding
CO-3	Illustrate the flow diagram for the manufacture of the various kinds of milk.	1, 5	Applying
CO-4	Analyze the nutrient values of milk andmilk products.	1, 3, 5	Analyzing
CO-5	Determine the amount of lactose, protein, pH and specific gravity of milk	1, 3, 5	Evaluating

SEMESTER – V

Course Title	ENVIRONMENTAL CHEMISTRY
Total Hrs.	60
Hrs./Week	4
Course Code	21UECH61C
Course Type	DSE-IIIC
Credits	4
Marks	100

General Objectives:

The objective of the course is to acquaint the students about the composition of different matrices of the environment and various environmental pollutions.

Course Objectives:

CO	The learner will be able to
CO-1	Infer the basics of environmental chemistry
CO-2	Illustrate the details of source, types and impacts of air pollution
CO-3	Outline different types of water pollution and its consequences
CO-4	Perceive knowledge of soil pollution
CO-5	Elaborate Radioactive, Thermal and Noise pollutions

Unit I:Fundamentals and Components of the Environment

Environmental segments – Atmosphere, Hydrosphere, Lithosphere and Biosphere – The nature cycles-Hydrological, Carbon, Oxygen,Nitrogen,Sulphur, Phosphorous and Biogeochemicalcycles- features, active and passive pools - perturbation by manmade activities.

Unit II: Air Pollution

Air pollutants - Primary and secondary – Gases, small particulates, hydrocarbons – Cyclone separators, Fabric filters, Electrostatic precipitators, Wet scrubbers – Photochemical smog – Acid rain –Chemistry of greenhouse effect – Global warming – Ozone layer depletion – Propellants-Green propellants Unleaded petrol – Bhopal gas tragedy – Chernobyl disaster – Air quality standards [NAAQS and NEERI].

Unit III: Water Pollution

The aquatic environment - types of water pollutants – organic pollutants – Inorganic pollutants – Eutrophication and its effects - Chemical and Physical treatment of industrial effluents and the methods of disposal- Heavy metal contamination and their biochemical effects– Determination of DO, BOD, COD and their significance – Total dissolved solids – Determinationof fluorideand Removal from polluted water – Water quality parameters and standards[WHO, BIS and ICMR].

Unit IV: Soil Pollution

Composition of lithosphere – Soil water and Soil air – Sources of soil pollution – Solid waste, Sources of biodegradable, non-biodegradable wastes– general characteristics - Industrial waste, Urban waste, Agricultural waste, biomedical wasteand their detrimental effects. Environmental hazards from fertilizers- Bio-fertilizers – Solid waste management - control rules - Disposal of solid waste (open dumping, sanitary landfill, incineration, composting)-Recycling and potential methods of disposal [glass, paper, metals and plastics].

Unit V: Radioactive, Thermal and Noise pollution

Radioactive pollution - Types and sources of Radioactivity - Natural and man-made radioactivity -Radioactive pollution - Fukushima Nuclear reactor accident– a case study - Precautions and control measures.

Thermal pollution- Sources, Impacts of thermal pollution on aquatic fauna and flora- Control measures

Noise Pollution- Sources of noise pollution-measurement-noise levels-permissible noise levels (Indoor and outdoor)- Physiological and Psychological effects – control devices mufflers, silencers , ear muffs, ear plugs.

REFERENCE BOOKS:

1. Environmental chemistry with green chemistry, Asim K. Das, Books and Allied Pvt Ltd, 2010.
2. Environmental chemistry, A. K. De, 5th edition, New Age International, 2004.
3. Environmental chemistry, Peter O' Neill, 3rd edition, Blackie Academic & Professional, 1998.
4. Textbook of Environmental chemistry. V. Subramanian. Wiley india Ltd. 2020.
5. Fundamentals concept of Environmental chemistry. G.S. Sodhi. Narosa publishers.2020.
6. Industrial Chemistry, B.K. Sharma, Krishna Prakashan Media P. Ltd., Meerut, 2016.
7. Environmental Science and Biotechnology, Theory and Techniques, A.G. Murugesan, C. Rajakumari, MJP Publisher, Chennai, 2005

SEMESTER - IV

Course Title	ENERGY PHYSICS
Total Hrs.	30
Hrs./Week	2
Course Code	21USPH42
Course Type	SEC-IV
Credits	2
Marks	100

Objectives:

To provide an understanding of the present energy crisis and various available energy sources

Course Objectives:

CO	The learner will be able to
CO-1	Examine the conventional energy sources, their prospects and limitations with renewable ones
CO-2	Discuss the use of solar energy and the various components used in the energy production.
CO-3	Classify the types of wind machines and understand the advantages and disadvantages of wind energy
CO-4	Analyze the concepts of Photosynthesis and biogas generation.
CO-5	Appraise the features of chemical energy.

UNIT I: Introduction to Energy Sources

World's reserve of Commercial energy sources and their availability-India's production and reserves-Conventional and non-conventional sources of energy, comparison – Coal- Oil and natural gas –applications - merits and demerits.

Unit II Solar Energy

Introduction – Solar constant –Solar radiation at the Earth's surface –Solar radiation Geometry-Altitude angle –Zenith angle – Flat plate collectors- A typical liquid collector -Applications of solar energy – Solar Heaters – Solar cooking- Crop dryers.

Unit III Wind Energy

The nature of the wind – site selection considerations –Basic components of WECS- Types of Wind machines -Advantage and dis advantages of WECS- Applications of wind energy

Unit IV Bio mass energy

Biomass energy - classification - photosynthesis - biomass conversion process - Kachara gas plants – Materials used for bio gas generation - wood gasification - ethanol from wood - advantages and disadvantages of biomass as energy source

Unit V Chemical Energy sources

General Introduction – Design and principle of operation of a fuel cell – Classification of fuel cells – Types of fuel cells – Hydrogen – Fossil fuel – Advantage and disadvantage of fuel cell – Applications of fuel cells.

Books for Study:

1. Non Conventional Energy Sources, G.D. Rai, Khanna Publishers (4th Ed., 2010).

2. Energy Technology by S. Rao and Dr. B.B. Parulekar, Khanna Publishers (2015).

Books for Reference:

1.Non-conventional energy sources, B.H. Khan, McGraw Hill

2. Solar Energy by G.D. Rai, Ed. V, 1995.

SEMESTER - V

Course Title	**BIOMEDICAL INSTRUMENTATION**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEPH52A**
Course Type	**DSE-IIA**
Credits	**4**
Marks	**100**

General Objective:

To have an exposure on various diagnostic instruments used in the medical field and to study the basics of radiation and medical imaging Physics

Course Objectives:

CO	The learners will be able to:
CO-1	Identify the basic concepts of Biomedical Instrumentation
CO-2	Discuss the fundamentals of transducers as applicable to physiology
CO-3	Examine the various diagnostic instruments used in the medical field
CO-4	Correlate the use of ionizing radiation and its biological effects in the medical field.
CO-5	Appraise the basics of Medical imaging Physics

Unit-I Introduction to Biomedical instrumentation

Overview of Biomedical Instrumentation system – Types of biomedical equipments – Analytical, Diagnostic, Therapeutic and Surgical equipments – calibration of medical devices and testing of biomedical equipments, Electrical classification of Biomedical Equipments

Unit-II Bioelectric Potentials and Transducers

Transport of ions through cell membranes- Resting and acting potentials- biopotentials- bioelectric signals and their characteristics- design of medical instruments- components of biomedical instrument system-Transducers- active transducers- strain gauge- photoelectric type resistive transducers-metallic wire transducers- capacitive transducers- piezoelectric ultrasonic transducers

Unit-III Diagnostic Equipments:

Electrocardiography (ECG) –ECG in diagnosis –ECG Machine. Principles and applications–Vector cardiography (VCG), Magnetocardiography (MCG) – SQUIDS and Phonocardiography (PCG). Electro encephalography (EEG), EEG Machine, Artifacts, Evoked potentials – Visual, Auditory and Somatosensory EPs. Principles and applications–Magneto encephalography (MEG), Electroretinography (ERG) and Electrooculography (EOG). Principles and applications–Electromyography (EMG)- Electroneurography (ENG).

Unit- IV Radiation Physics

Principles of Radiation protection- protective materials- radiation effects-somatic, genetic stochastic and deterministic effect-External beam therapy (basicideal conformal radiation therapy- Image Guided Radiotherapy

Unit-V Medical Imaging Physics

Lasers in medicine- Endoscopy- radio graphic and fluroscopic techniques-computer tomography (CT)- applications of computer tomography- Thermography- Medical applications of thermography- ultrasonic imaging systems- Magnetic Resonance Spectroscopy (MRI)- Different types of bioelemetry systems and patient monitoring.

Books for study

1. Biomedical instrumentation- M.Arumugam, Anuradha Publications (2010)
2. Biomedical instrumentation/ Medical Electronics- R.L.Reka, C.Ravikumar, Lakshmi publications (2010)

Books for reference

1. Medical Physics- J.R.Cameron and J.G.Skofronick, WileyEastern(1978)
2. Bio medical Instrumentation -Khandpur

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Enumerate the basic concepts of Biomedical Instrumentation	2,4	Remembering
CO-2	Illustrate the fundamentals of transducers as applicable to physiology	1,4,5	Understanding
CO-3	Interpret the application of Electronics in diagnostics	4,5	Applying
CO-4	Analyze the use of ionizing radiation in medical and industrial applications	1,4,5	Analyzing
CO-5	Summarize Medical Imaging techniques for diagnosis along with other diagnostic and therapeutic devices.	1,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
V	21UEPH52A	BIOMEDICAL INSTRUMENTATION	60	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓				✓		✓	
CO-2	✓	✓	✓	✓	✓	✓			✓	✓
CO-3	✓	✓	✓		✓				✓	✓
CO-4	✓	✓	✓	✓	✓	✓			✓	✓
CO-5	✓	✓	✓	✓	✓	✓			✓	✓
	Number of matches (✓) = 35 Relationship = High									

SEMESTER- VI

Course Title	RADIATION SAFETY
Total Hrs.	30
Hrs./Week	2
Course Code	21USPH61
Course Type	SEC-V
Credits	2
Marks	100

General Objective:

To familiarize themselves with the awareness and understanding of radiation hazards and safety.

Course Objectives:

CO	The learners will be able to:
CO-1	Describe the production of X-rays and understand the various radioactive emissions
CO-2	Identify different units & doses of radioactivity
CO-3	Illustrate the basic concepts of radiation detection and working principles of various detectors
CO-4	Classify the standard protection and safety norms in radioactive wastes inclusive of nuclear waste
CO-5	Distinguish nuclear techniques involved in MRI , PET , PIGC & RT

UNIT I Basics of Atomic and Nuclear Physics:

Basic concept of atomic structure; X rays – Production and characteristics, concept of bremsstrahlung and auger electron- Compton scattering theory -The composition of nucleus, Unstable elements and radioactive emissions – various radioactive sources, Radiation Quantities and their units

UNIT IIRadiation monitoring devices :

Basic idea of different units of activity, KERMA, exposure, absorbed dose, equivalent dose, effective dose, collective equivalent dose, Annual Limit of Intake (ALI) and derived Air Concentration (DAC).

UNIT III Radiation detection:

Basic concept and working principle of gas detectors (Ionization Chambers, Proportional Counter, Multi-Wire Proportional Counters (MWPC) and Gieger Muller Counter), Scintillation Detectors (Inorganic and Organic Scintillators), Solid States Detectors and Neutron Detectors, Thermo luminescentDosimetry.

UNIT IV Radiation safety management:

Radiation protection standards, International Commission on Radiological Protection (ICRP) principles, justification, optimization, limitation- introduction of safety and risk management of radiation. Nuclear waste and disposal management-

Management of radioactive waste in medical, industrial, agricultural and research establishments.

UNIT V Application of nuclear techniques:

Application in medical science (e.g., MRI, PET, Projection Imaging Gamma Camera, radiation therapy)- Archaeology, Art, Crime detection, Mining and oil. Industrial Uses: Tracing, Gauging, Material Modification, Sterization,Foodpreservation.

Books for Study:

1. *Text Book of radiological Safety – K Thayalan - Jaypee Brothers, Medical Publishers Pvt. Limited (2010).*
2. *Basic Radiological Physics – Second Edition – Kuppusamy Thayalan - Jaypee Brothers, Medical Publishers Pvt. Limited (2017).*

Books for Reference:

1. *W.E. Burcham and M. Jobes – Nuclear and Particle Physics – Longman (1995)*
2. *G.F.Knoll, Radiation detection and measurements (4th Edition) , Wiley; (2010)*
3. *W.J. Meredith and J.B. Massey, "Fundamental Physics of Radiology". John Wright and Sons, UK, 1989.*
4. *J.R. Greening, "Fundamentals of Radiation Dosimetry", Medical Physics Hand Book Series, No.6, Adam Hilger Ltd., Bristol 1981.*
5. *Practical Applications of Radioactivity and Nuclear Radiations, G.C. Lowental and P.L. Airey, Cambridge University Press, U.K., 2001*
6. *A. Martin and S.A. Harbisor, an Introduction to Radiation Protection, John Willey & Sons, Inc. New York, 1981.*
7. IAEA Basic safety standards 115, 2006
8. AERB Radiation Protection Rules 2004

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Classify different radioactive emissions & sources	1,2 & 5	Understanding
CO-2	Illustrate Annual Limit of Intake (ALI) & Derived Air Concentration (DAC)	3, 4 & 5	Applying
CO-3	Analyze various detections related to IC, MWPC , GM, SD & SSD	2 & 3	Analyzing
CO-4	Explain safety standards in nuclear and radioactive wastes in industry, agricultural and other research establishments	2, 3 & 4	Analyzing
CO-5	Interpret the results of MRI, PIGC & RT in medical field and study the techniques involved in various industrial uses.	1 & 5	Evaluating

SEMESTER – I

Course Title	**BUSINESS ORGANISATION AND MANAGEMENT**
Total Hrs.	**75**
Hrs./Week	**5**
Course Code	**21UCCO12**
Course Type	**DSC-II**
Credits	**4**
Marks	**100**

General Objective:

To enable the students understand the concepts of businessand principles of management byfacilitating them to become successful entrepreneurs.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the basic aspects of business organization.
CO-2	Distinguish the various forms of business organization.
CO-3	Discover the functions of the principles of management and to experiment the application of principles in an organization.
CO-4	Analyse the traditional management functions of planning and decision making.
CO-5	Assess the process involved in reorganizingthe principles of Staffing, Co-ordination and Controlling.

UNIT I: Concept of Business Organization

Economics and Non- Economics activities- Profession and Employment- Meaning of Business- Characteristics of Business- Business Distinguished from Profession and Employment- Scope, Objectives and Importance of Business - Social Responsibilities of Business

UNIT II: Forms of Business Organization

Forms of Business Organization- Sole Proprietorship- Joint Hindu Family Business- Partnership- Joint Stock Company- Public and Private Company- Co-operative Organization- Meaning- Definition- Factors influencing the section of suitable forms of organization- Relative Characteristics-Differences between the above forms - Merits and Demerits

UNIT III: Management

Meaning- Definition- Features - Importance Principles of Management- Management: Science or Art- Management as Profession- Functions of Management- Management and Administration.

UNIT IV: Planning, Decision Making and Organising

Planning- Meaning- Definition- Features- Steps- Types of Planning- Merits and Demerits- **Decision Making**- Process- **Organising**- Meaning- Definition- Characteristics of Organising- Principles of Organizing- Different forms of Organization.

UNIT V: Profit Analysis:

Meaning – Types – Functions of Profit; Profit Policy – Break Even Analysis – Assumptions – Uses – Limitations – Profit Forecasting – Concepts – Methods.

TEXTBOOK:

1. S. Sankaran, Business Economics, Margham Publications, Chennai.

REFERENCE BOOKS:

1. Business Economics By Bani Mazumdar &V.G.Mankar–Himalaya Publishing House, Bombay
2. Business Economics – A.R.Arya Sri, V.V.Ramamoorthy, Tata McGraw Hill Companies

3.Managerial Economics by R.L.Varshney&K.L.Maheswari – Sultan Chand & Sons, New Delhi

Course Outcomes:

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the concept andscope ofBusiness Economics.	1,3	Understanding
CO-2	Apply the various methods of measuring elasticity of demand	1,2	Applying
CO-3	Distinguish between short run and long run cost curves.	1,2,5	Analyzing
CO-4	Assess the operations of markets under various competitive conditions	1,5	Evaluating
CO-5	Construct break – even analysis	1,2,5	Creating

Relationship Matrix

Semester	Course Code			Title of the Course				Hours		Credits
I	21UAEC11			BUSINESS ECONOMICS				90		4
Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓		✓		
CO-2	✓	✓	✓	✓		✓	✓			
CO-3	✓	✓	✓	✓		✓	✓			✓
CO-4	✓	✓	✓	✓		✓				✓
CO-5	✓	✓	✓	✓		✓	✓			✓
	Number of matches (✓) = 32 Relationship = Medium									

SEMESTER – III

Course Title	MODERN BANKING
Total Hrs.	60
Hrs./Week	4
Course Code	21UCCO33
Course Type	DSC-VII
Credits	4
Marks	100

General Objective:

To enable the students learn the basic principles of modern banking.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the nature of present-day banking in India.
CO-2	Explain the function of banking along with legal framework related to that.
CO-3	Apply their exposure in the operations of banking and its services.
CO-4	Evaluate the lending operation of banks and identify causes of NPA in banks.
CO-5	Justify the adaptations of the concepts related to Islamic Banking.

UNIT I

Banking – meaning and definition - Banking Regulation Act,1949- Banking Regulation Amendment Act 2017- Types of Banks-Reserve Bank of India-Functions-Various Departments of RBI - Methods of credit Control - FRDI, Standing Deposit Policy.

UNIT II

Opening and Operation of Bank account-saving-current-recurring deposit - fixed deposit - procedure for opening of account –special type of customer-minor-partnership firm-joint stock companies-clubs and association-Cheques-features-Types-Crossing - types - Material alteration - marking of a cheque –IFSC -meaning- importance-endorsement – types.

UNIT III

Paying banker - duties and liabilities - legal protection – Collecting banker - duties - core banking - ATM - Debit Card - Credit Card - TeleBanking-Internet banking-E-Cash-mobile banking- electronic transfer- SWIFT, NEFT, IMPS and RTGS.

UNIT IV

Types of Loan – Cash credit – Bank overdraft – Mortgage - Hypothecation – Pledge – Non-Performing Assets - Causes - Remedial Measures - Management of NPA

UNIT V

Islamic banking-Meaning-origin of Islamic banking-definition-objectives - features - principles - Islamic Banking Vs conventional banking-operating structure of Islamic banks-models of Islamic banking; sources and application of funds.

TEXTBOOKS:

1. Banking Theory Law and Practice-E. Gorden and Dr.K.Natarajan
2. An Introduction to Islamic banking andfinance – Abdul Fathah M.Farah

REFERENCE BOOKS:

1. Theory and Practice of Banking – Reddy and Appanaiah - M/S.Himalaya Publishing House, Mumbai
2. Theory and Practice of Banking –Radha swamy and Vasudevan.
3. Banking Law and Practice-S.N.LAL
4. Banking Law and Practice-Sundaram and Varshney
5. Banking Theory Law and Practice-Dr.S.Gurusamy,Thomson Learning

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Discuss the principles of modern banking in comparison with the erstwhile banking systems.	1	Understanding
CO-2	Summarise the functions of banking in legal framework in line with Islamic banking.	1	Understanding
CO-3	Examine the operations of banking and its services.	3	Applying
CO-4	Analyse the lending operation of banks and thecauses of NPA in banks.	5	Analysing
CO-5	Assess concepts pertaining to Islamic bankingand its benefits to the society.	1	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
III	21UCCO33	MODERN BANKING	60	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓		✓	✓	✓
CO-2	✓	✓	✓	✓		✓		✓	✓	✓
CO-3	✓	✓	✓	✓		✓		✓	✓	✓
CO-4	✓	✓	✓	✓		✓		✓	✓	✓
CO-5	✓	✓	✓	✓		✓		✓	✓	✓
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – VI

Course Title	Tally ERP
Total Hrs.	60
Hrs./Week	4
Course Code	21UECO61A
Course Type	DSE-III-A
Credits	4
Marks	100

General Objective:

To inculcate theoretical knowledge and skill in Tally.

Course Objectives:

CO	The learners will be able to:
CO-1	Locate company in Tally Software
CO-2	Estimate Vouchers
CO-3	Apply the Inventory management in Tally
CO-4	Analyze various financial Reports
CO-5	Measure the various statements Other than Final Accounts with the help of Tally

UNIT I

Introduction to Tally, Company and Accounting Information Menu Tally Features - Technological advantages of tally accounting software - Tally Screen components - Gateway of Tally - Company information menu - Creating a company - Accounting information menu - Managing of cost centers and cost categories - Concepts of Groups in Tally - Managing and Operating groups - Managing and operating Ledgers - F11 Features - F12 Configuration

UNIT II

Managing and Operating Vouchers - Meaning of Voucher - Predefined vouchers in Tally, Accounting Vouchers - Inventory Vouchers and Unconventional Vouchers - Entering Transaction in Vouchers

UNIT III

Managing and Operating Inventory Information Menu - Stock items - Units of measure; Stock groups, Stock categories, Godown, Price list, inventory vouchers

UNIT IV

Tally Reports - Reports which can be accessed from gateway of Tally under "Reports", Reports which can be accessed through the menu "Display" under report - Export and import of data - Printing reports - Tally ODBC

UNIT V

Tally Advanced Financial Management and Control - Preparation of Bank Reconciliation statement, Fund Flow Statement, Branch Accounting, Flexible period accounting, Budgeting and Control, Variance Analysis and Ratio Analysis

(Theory 2 hours Practical 2 hours)

TEXTBOOK:

Tally –NamrataAgarwal

REFERENCE BOOKS:

1. Tally User Manual, Tally Solutions (P) Limited
2. Tally –Nadani

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the various features of Tally.	1,2,3	Understanding
CO-2	Explain the system of Tally accounting in a business concern.	1,2,3	Understanding
CO-3	Apply the various vouchers in Tally.	1,2,3	Applying
CO-4	Appraise Inventory, godown and the price list.	2,4,5	Analysing
CO-5	Summarize report based on the Tally systems.	2,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UECO61A	Tally ERP	60	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓	✓		✓	✓
CO-2	✓	✓	✓		✓	✓		✓		✓
CO-3	✓	✓		✓		✓	✓	✓	✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	✓
CO-5	✓	✓	✓		✓	✓	✓	✓		✓
	Number of matches (✓) = 39 Relationship = High									

SEMESTER – V

Course Title	ADVERTISING
Total Hrs.	30
Hrs./Week	2
Course Code	21USCO51
Course Type	SEC-V
Credits	2
Marks	100

General Objective:

To learn the role of Advertising in commercial endeavors and to appreciate functions of advertising and advertising agencies.

Course Objectives:

CO	The learners will be able to:
CO-1	Identify objectives behind advertising
CO-2	Observe the marketing research
CO-3	Explain various advertising media
CO-4	Categorize the functions of Advertising Agency
CO-5	Grade the ethical and legal issue of advertising

UNIT I: Advertising

Advertising in Marketing Mix -Nature -Scope –Kinds -Advertising as a career-Economics aspects of advertising.

UNIT II: Marketing research and advertising budget

Marketing research for advertising - Consumer, media and product - Advertising Strategy - Objectives - Principles - DAGMAR - Advertising budget -Process- Methods

UNIT III: Advertising copy and media

Advertising campaign - Planning Creativity-Advertisement copy - Types - Components -Essentials - Copy layout - Visualisation to layout --Advertising Media -Types -Selection Scheduling -New media options: Internet.

UNIT IV: Advertising agency

Advertising Agency- Functions– Organisation - Agency relationship with client and with media selection of an agency- Agency compensation.

UNIT V: Effectiveness of advertising

Measuring effectiveness of advertising - Pre-testing – Post-testing- Advertising audit - Social, ethical and legal aspects of advertising - Control and regulation over advertising.

TEXTBOOKS

S.A. Chunawalla,K. J Kumar, K.C. Sethia, G.V. Subramanian UG Suchark, Advertisingtheory and practice 4thEd., Himalaya Publishers.

REFERENCE BOOKS:

1. Manendra Mohan – Advertising Management – Concepts and Cases, TMH
2. S.A.Chunawalla – Advertising Sales and Promotion Management , Himalaya Publishers
3. M.N.Mishra – Sales Promotion and Advertising Management 2nd Ed, Himalaya Publishers

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Define the concept of advertising	1,2	Remembering
CO-2	Explain the marketing research	2,3	Understanding
CO-3	Interpret the importance of advertising copy and various types of adverting media	3,4	Applying
CO-4	Appraise the concept of advertising agency	3, 4, 5	Analyzing
CO-5	Evaluate the effectiveness of advertising	4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
V	21USCO51	ADVERTISING	30	2

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓		✓		
CO-2	✓	✓	✓	✓		✓	✓	✓		✓
CO-3	✓	✓	✓	✓		✓	✓	✓		
CO-4	✓	✓	✓	✓		✓	✓	✓		
CO-5	✓	✓	✓	✓		✓	✓	✓		✓
	Number of matches (✓) = 36 Relationship = High									

SEMESTER – VI

Course Title	INTERNATIONAL BUSINESS
Total Hrs.	4
Hrs./Week	60
Course Code	21UECO61B
Course Type	DSE-III-B
Credits	4
Marks	100

General Objective:

To familiarize the students with the concepts of international business

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the concepts of international business environment.
CO-2	Identifythe concepts of international monetary system
CO-3	Articulate the concept of Balance of Payment and study about flow of goods and services between countries
CO-4	Classify multinational corporations
CO-5	Evaluate foreign direct investment

UNIT I: International Business:

Nature, importance, and scope – Mode of entry into international business - Framework for analyzing international business environment – geographical, economic, socio-cultural, political and legal environment. International trade barriers.

UNIT II: International Monetary and Financial System:

Importance of international finance; Bretton woods conference and afterward, IMF and the World Bank-ADB-WTO-

UNIT III: The balance of Payment and International Linkages:

Balance of payments and its components; the international flow of goods, services, and capital

UNIT IV: Multinational Corporations:

Conceptual framework of MNCs; MNCs and host and home country relations; Technology transfers – importance and types.

UNITV: Foreign Direct Investment:

Foreign Direct Investment (FDI) – foreign indirect investment- foreign investment instrument – GDR, ADR.

TEXTBOOKS:

1. International Business, BimalJaiswal, Himalaya Publishing House, Mumbai.
2. International Business, Paul, Justin, Prentice Hall of India, New Delhi

REFERENCE BOOKS:

1. International Business: Text and Cases, Francis Cherunilam, Prentice Hall of India, New Delhi
2. International Business, SumatiVerma, Pearson Education
3. International Business, V.K. Bhalla, S.Chand Publishing
4. Adhikary, Manab, Global Business Management, McMillan, New Delhi.

5. Black and Sundaram, International Business Environment, Prentice Hall of India, New Delhi
6. Aswathappa, International Business, Tata McGraw Hill Publications, New Delhi.

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the international business environment in the current scenario.	1,3	Understanding
CO-2	Discuss about the role of IMF, World Bank, ADB and WTO in initiating international business ventures.	1,3	understanding
CO-3	Chart out the importance of a balanced international trade.	2,3	Applying
CO-4	Categorize the function of Multinational Corporations and their trade relationship with Indian Companies.	1,2,5	Analyzing
CO-5	Justify the Foreign Direct Investment.	2,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
VI	21UECO61B	INTERNATIONAL BUSINESS	60	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓		✓		✓	✓		✓		
CO-2	✓	✓	✓			✓		✓		
CO-3	✓		✓		✓		✓	✓		
CO-4			✓	✓	✓	✓	✓			
CO-5		✓		✓	✓		✓		✓	
	Number of matches (✓) = 25 Relationship = High									

SEMESTER – V

Course Title	PERSONALITY DEVELOPMENT
Total Hrs.	60
Hrs./Week	4
Course code	21UECS52C
Course Type	DSE II C
Credits	3
Marks	100

General Objective:

The course aims to help the students learn a self-awareness, self-esteem and self-respect and also overcome social conflicts and schedule the contribution of team work. This course helps to step-up the skills in the region of employability.

Course Objectives:

CO	The learners will be able to :
CO-1	Create self-awareness, self-esteem and self-respect.
CO-2	Create SELF MONITORING, PERCEPTION, ATTITUDE, ASSERTIVENESS Shine as an exemplary model with impeccable character traits.
CO-3	Set a reasonably challenging goal exerting enough labor and effectively managing time.
CO-4	Build relationships in a world filled with different ideologies, overcome social conflicts, excel in team work and contribute constructively.
CO-5	Exhibit skills and manners required in the place of work and win over the approbation of the employers.

UNIT -I

PERSONALITY - Definition – Determinants – Personality Traits –Theories of Personality – Importance of Personality Development. SELF AWARENESS – Meaning – Benefits of Self – Awareness – Developing Self – Awareness. SWOT – Meaning – Importance- Application – Components.

UNIT – II

SELF MONITORING – Meaning –Advantages and Disadvantages self monitor - Self – monitoring and job performance. PERCEPTION- Definition- Factor influencing perception- Perception process. ATTITUDE – Meaning- Formation of attitude – Types of attitude - Measurement of Attitudes. ASSERTIVENESS - Meaning – Assertiveness in Communication – Assertiveness Techniques.

UNIT – III

TEAM BUILDING – Meaning – Types of teams – Importance of Team building- Creating Effective Team. LEADERSHIP – Definition – Leadership style – Qualities of an Effective leader. NEGOTIATION SKILLS – Meaning – Principles of Negotiation – Types of Negotiation – The Negotiation Process. CONFLICT MANAGEMENT – Definition- Types of Conflict- Levels of Conflict.

UNIT –IV

COMMUNICATION – Definition – Importance of communication – Process of communication –Barriers in communication – Overcoming Communication Barriers. EMOTIONAL INTELLIGENCE: Meaning – Components of Emotional Intelligence- Significance of managing Emotional intelligence. STRESS MANAGEMENT – Meaning – Sources of Stress – Symptoms of Stress – Consequences of Stress – Managing Stress.

UNIT – V

SOCIAL GRACES – Meaning – Social Grace at Work – Acquiring Social Graces. TABLE MANNERS – Meaning – Table Etiquettes in Multicultural Environment- Do's and Don'ts of Table Etiquettes. DRESS CODE – Meaning- Dress Code for selected Occasions – Dress Code for an Interview. GROUP DISCUSSION – Meaning – Personality traits required for Group Discussion- Process of Group Discussion. INTERVIEW – Definition- Types of skills – Employer Expectations –Planning for the Interview – Interview Questions- Critical Interview Questions.

References :

1. Dr.S. Narayana Rajan, Dr. B. Rajasekaran, G. Venkadasalapthi, V. Vijuresh Nayaham and Herald M.Dhas, Personality Development, Publication Division, Manonmaniam Sundaranar University, Tirunelveli

2. Stephan P.Robbins, Organisational Behaviour, Tenth Edition, Prentice Hall of India Private Limited, New Delhi,2008

3. Jit S. Chandan, Oragnisational Behaviour, Third Edition, Vikas Publishing House Private Limited, 2008

4. Dr.K.K. Ramachandran and Dr.K.K. Karthick, From Campus to Corporate, Macmillan Publishers India Limited, New Delhi, 2010.

SEMESTER – IV

Course Title	**HUMAN RESOURCE MANAGEMENT**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCCO42**
Course Type	**DSC-X**
Credits	**4**
Marks	**100**

General Objective:

To enable the students understand the concepts pertaining to human resources and manpower planning.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the basic concepts of Human Resource Management.
CO-2	Associate themselves with Human Resources Planning and the procedures related to recruitment and selection.
CO-3	Develop knowledge on training and career planning.
CO-4	Determine the modalities in fixing salary and wages.
CO-5	Analyse the methods of performance appraisal.

UNIT I:Concepts

Meaning - Definition - Evolution - Nature of HRM – Role – Scope - Importance - Functions of HRM. Human Resource Accounting - meaning–Human Resource Audit–meaning.

UNIT II:Human Resource Planning

Manpower Planning-Job analysis -Job Description and Specification-Recruitment-Characteristics and types-Selection Process- Tests and Interviews

UNIT III:Training and Development

Introduction-Need and Importance--steps in training-Methods in training-Career Planning and Development-Career counseling, Job rotation - Promotion and transfer- Retirement and other separation process

UNIT IV:Compensation

Meaning-Wages and Salary Administration-factors-Wage Policy- Time rate and Piece rate-Bonus, Incentives and Benefits- Compensation administration-development of a sound compensation structure-Grievances Handling and Discipline.

UNIT V: Performance Appraisal

Performance Appraisal--Factors affecting Performance Evaluation-PAS (Performance Appraisal System)-Need and Importance- Methods of performance appraisal- 360 Degree Method, Assessment Centre Method, Behaviour Anchored Rating Scale (BARS)

TEXTBOOKS:

1. Human Resource Management- L.M.Prasad, Sultan Chand and Sons
2. Human Resource Management - Aswathappa, McGraw-Hill Education.

REFERENCE BOOKS:

1. Human Resource Management-Dr.C.B.Gupta, Sultan Chand and Sons
2. Personal Management-C.B. Memoria – Himalaya Publishing House-Mumbai
3. Human Resource Management-Randi. L. Decimone, Thomson Learning Third Edition

Course Outcomes:

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Explain the concepts and functions of Human Resource Management with relevant examples.	1,2	Understanding
CO-2	Discuss the processes involved in recruitment of suitable employees.	1,2	Understanding
CO-3	Develop competence and calibre in training and managing professionals.	1,2	Applying
CO-4	Organise compensation packages funds for employees after evaluating the procedures.	3,4	Analysing
CO-5	Appraise employees' performance and offer remedial measures where needed.	2,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
IV	21UCCO42	Human resource Management	60	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓		✓		✓	✓	✓			✓
CO-2	✓	✓	✓		✓	✓	✓	✓		
CO-3	✓	✓	✓	✓		✓	✓			✓
CO-4	✓		✓	✓	✓	✓		✓	✓	
CO-5	✓	✓	✓	✓		✓	✓		✓	✓
	Number of matches (✓) = 35 Relationship = High									

SEMESTER – V

Course Title	**HUMAN RIGHTS PERSPECTIVES**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEHS51B**
Course Type	**DSE –I-B**
Credits	**4**
Marks	**100**

General Objective: To know about the Definition of Human Rights: Nature and its cope and understand the International, National, State Human Rights Commissions.

Course Objectives:

CO	**The learner will be able to:**
CO-1	Understand the Definition of Human Rights
CO-2	Determine the Universal Declaration of Human Rights and International Covenant on Civil and Political Rights
CO-3	Estimate the Non –Governmental Organisations
CO-4	Review on the prisoners' Rights
CO-5	Assess the State Human Rights Commission

UNIT I - Definition of Human Rights

Nature and Scope, Content – Theories of Human Rights-Philosophical-Historical – Sociological Perspectives.

UNIT II-UNO AND HUMAN RIGHTS

Universal Declaration of Human Rights-International Covenant on Civil and Political Rights – International Covenant on Economic, Social and Cultural Rights.

UNIT III - Role of NGO's

Non – Governmental Organisations – Amnesty international – Human Rights Helsinki Declaration – International Human Rights and Courts

UNIT IV - Contemporary challenges

Child and Women's Rights – Bonded Labour- Problem of Refugees – Capital punishment – Rights of Prisoners of War

UNIT V - Human Rights Commissions

National Human Rights Commission of India and State Human Rights Commissions in India – functions – Problems and Solutions

Textbooks:

1. Clapham,Andrew. *Human Rights: A Very short introduction.*Oxford:OUP, 2007.

2.O'Byrne, Darren. *Human Rights: An Introduction.* London & New York: Routledge,2014.

3.Kanan, Satya, P. *Human Rights Evolution and Development.* New Delhi: Wisdom Press, 2012.

4.Brownlie, Ian, and Guy S. Goodwin-Gill. *Basic Documents on Human Rights.* Oxford: Oxford University Press, 2010.

5. Fagan, Andrew, and Clive S. Smith. *The Atlas of Human Rights: Mapping Violations of Freedom Around the Globe*. Berkeley: University of California Press, 2010.
6. Juss, Satvinder. *Human rights in India*. New York: Routledge, 2021.

Reference Books:

1.Sachar, Rajinder. *Human Rights Perspectives and Challenge*. New Delhi:Gyan Publishing Home, 2004.
2.Nirmal, Chiranjivi J. *Human Rights in India: Historical, Social and Political Perspectives*. New Delhi: Oxford University Press, 2010.
3. Symonides, nusz. *Human Rights: New Dimensions and Challenges: Manual on Human Rights*. Brookfield: Ashgate, 1998.
4.Desai, A.R. *Assault on Democratic Rights in Contemporary India*. Bombay: E.G. Shah Memorial Trust Publication, 1985.
5.Ujjwal, Kumar S. *Human Rights and Peace: Ideas, Laws, Institutions and Movements*. New Delhi: SAGE, 2009.

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understandthe Definitions of Human Rights and its Perspectives	PSO1	Understanding
CO-2	Summarize the Universal Declaration of Human Rights	PSO4	Understanding
CO-3	Determine the Amnesty international and Human Rights Helsinki Declaration	PSO3	Applying
CO-4	Estimate the Contemporary Challenges of Child and Women's Rights, Bonded Labour	PSO3	Analysing
CO-5	Review on the National and State Human Rights Commissions in India	PSO3	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course				Hours	Credits			
V	21UEHS51B	Human Rights Perspectives				60	4			
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	-	✓	✓-	-	✓	-	✓	✓	-
CO-2	✓	✓		✓	-	✓	-	✓	-	✓
CO-3	✓	✓	✓		✓	✓	✓	✓	✓	-
CO-4	✓	-	✓	✓	✓	✓	-	✓	-	✓
CO-5	✓	✓	✓			✓	-	✓	✓	-
	Number of matches (✓) =33 Relationship = Medium									

Course Title	SOFTWARE ENGINEERING
Total Hrs.	75
Hrs./Week	5
Course code	21UCCS51
Course Type	DSC-XI
Credits	4
Marks	100

General Objective:

The course aims to develop a broad understanding of the software engineering discipline with a detailed knowledge of techniques for analyzing and designing complex software-intensive systems.

Course Objectives:

CO	The learners will be able to :
CO-1	Understand the discipline of software engineering.
CO-2	Understand project management and its requirements.
CO-3	Application of system models.
CO-4	Understand the concept of real-time software.
CO-5	Understand the user interface, design, application, and testing in real-time projects.

Unit – I

Introduction - What is Software - What is Software Engineering – Software Process –software Process model – software engineering methods. Emergent system properties - systems engineering – system requirements – system design – system modelling – sub-system development – system integration –system evolution – system decommissioning – system procurement. Software processes: Software Process models: the waterfall model – Evolutionary development – Spiral development – CASE

Unit – II

Project Management - Management activities – Project Planning – Milestones and Deliverables - Project Scheduling – Bar charts and activity networks. Software requirement : Functional and non-functional requirements – Domain requirements - User requirements – System

requirements – Structured language specification - Software Requirements Document(SRS) .

Unit – III

System Models – Context models – Behavioural models – Data-flow models – State machine models. Architectural Design - System Organisation - Repository model – Client-server model – Layered model

Unit – IV

Real time software - System design – Real-time operating systems – Monitoring and control systems – Data Acquisition systems. User Interface design: User Interface design issues – User Interface design process - User Interface prototyping - interface evaluation .

Unit - V

Verification and Validation – Software inspections. Clean – room software development. Software testing: System testing – Integration testing – Release testing - Performance testing –Component testing – Interface Testing. Software cost estimation: Algorithmic cost modeling – The COCOMO model. Quality management: Process and product quality – Software measurement and metric.

Textbooks:

Software Engineering, IAN SOMMERVILLE, 8th Edition,Pearson Education Asia.

UNIT I - Chapters 1.1,2.1,2.2,4.1,4.2,4.3,4.5
UNIT II - Chapters 5,6.1,6.2,6.3,6.5
UNIT III – Chapters 8.1,8.2,11, UNIT IV – Chapters 15,16
UNIT V - 22 , 23.1, 23.2 , 26.1 , 26.2, 26.3 , 27.1,27.3,27.4,27.5

Reference Book:

Software Engineering Theory and Practices, Shari Lawrence Pfleeger, 8thEdition, Pearson Education Asia.

Course Outcomes

CO	Upon completion of the course, the students will be able to :	PSOs Addressed	Cognitive Level
CO-1	Understand the system requirements and software process model	1,3	Understanding
CO-2	Explain project management its requirements and project scheduling	1,3	Understanding
CO-3	Illustrate system models and their types	1,3	Applying
CO-4	Analyzing data acquisition models and user interface prototyping	1,3	Analyzing
CO-5	Evaluate the techniques of Verification and Validation and quality management techniques	1,3,5	Evaluating

SEMESTER – V

Course Title	ARTIFICIAL INTELLIGENCE
Total Hrs.	60
Hrs./Week	4
Course code	21UECS52B
Course Type	DSE-II-B
Credits	3
Marks	100

General Objective:

The course aims to help the students learnthe basic principles, models, and algorithms of AI to recognize, model, and solve problems in analyzing and designing information systems. Analyze the structures and algorithms of various techniques related to searching, reasoning, machine learning, and language processing.

Course Objectives:

CO	The learners will be able to :
CO-1	Understand the concept of Artificial Intelligence.
CO-2	Apply the concept of knowledge reasoning and planning.
CO-3	Analyze the concept of Natural Language Processing.
CO-4	Develop Perception.
CO-5	Develop the concept of Robotics.

UNIT I

Introduction: What Is AI? - **Intelligent Agents:** Agents and Environments - Good Behavior: The Concept of Rationality-Structure Of Agent - **Problem Solving:** Problem Solving Agents-Searching for Solutions – Uninformed Search Strategies - Informed (Heuristic) Search Strategies- Heuristic Function.

UNIT II

Knowledge Reasoning and Planning: Local Agents: Knowledge-Based Agents – Logic - Propositional Logic-**First Order Logic:** Syntax And Semantics of First Order Logic-Using First Order Logic

UNIT III

Natural Language Processing: Language Models - Text Classification - Information Retrieval - Information Extraction - **Natural Language Communication:** Phrase Structure Grammars-Syntactic Analysis (Parsing)- Machine Translation-Speech Recognition

UNIT IV

Perception: Image Formation-Early Image-Processing Operations-Object Recognition by Appearance-Reconstructing The 3d World-Object Recognition from Structural Information-Using Vision

UNIT V

Robotics: Introduction- Robot Hardware- Robotic Perception- Planning to Move- Planning Uncertain Movements- Moving- Robotic Software Architectures- Application Domains

Textbook :

"Artificial Intelligence-A Modern Approach" by Stuart J. Russell and Peter Norvig, 3rd Edition, 2010, Pearson Publication

Course Outcomes

CO	Upon completion of the course, the students will be able to :	PSOs Addressed	Cognitive Level
CO-1	Understand the concept of Artificial Intelligence.	1,4,5	Understanding
CO-2	Apply the concept of knowledge reasoning and planning in AI.	1,5	Applying
CO-3	Analyze the concept of Natural Language Processing and Communication in AI.	1,4,5	Analyzing
CO-4	Solve real-world organizational processes and workflows problems by applying critical thinking, problem-solving, and cognitive computing skills.	1,4,5	Creating
CO-5	Develop robotic process automation to manage business processes and to increase and monitor their efficiency and effectiveness.	1,4,5	Creating

Course Title	DATA MINING
Total Hrs.	60
Hrs./Week	4
Course code	21UECS61B
Course Type	DSE-III-B
Credits	3
Marks	100

General Objective:

The course aims to introduce to students the data mining principles and techniques and acquaint the students with different data mining techniques with basic terminologies and modeling and analyze and produce reports/memos of any large sets of data of any business to make decisions and demonstrate basic data mining algorithms, methods, and tools.

Course Objectives:

CO	The learners will be able to :
CO-1	Understanding the basic concepts of Data Warehouse and Data Mining techniques
CO-2	Examine the types of data to be mined and apply pre-processing methods to raw data
CO-3	Explain the designing of Data Warehousing schema for applications
CO-4	Predict interesting patterns, analyze supervised and unsupervised models, and estimate the accuracy of the algorithms.
CO-5	Design various tools of Data Mining and their techniques to solve real-time problems and to develop the ability to design various algorithms based on data mining tools.

UNIT I

Introduction:What is Data Mining-Data Mining Applications – Data Mining Techniques-**Data Understanding and Data Preparation** - Introduction-Data Collection and Pre-Processing - Types of Data – Displaying Data Graphically

UNIT II

Association Rules Mining: Basics – The task and a Naïve Algorithm– The Apriori Algorithm –Improving the efficiency of the Apriori Algorithm–Apriori TID–Direct has hing and pruning–Dynamicitem setcounting–Mining frequent patterns without candidate generation –

Performance evaluation of algorithms–Software for association rulemining.

UNIT III

Classification: Decision tree – Building a decision tree – The tree induction algorithm – Split algorithm based on information theory – Split algorithm based on the Gini index – Over fitting and Pruning – Decision tree rules –Naïve Bayes Method–Estimating predictive accuracy of classification methods – Improving accuracy of classification methods – Other evaluation criteria for classification methods–Classification software.

UNIT IV

Cluster analysis: Introduction- Desired features of cluster analysis – Types of cluster analysis methods – Partitional methods – Hierarchical methods –Density-based methods – Dealing with large databases – Quality and validityof cluster analysis methods – Cluster analysis software - **Web Data Mining**:Web terminology and characteristics – Locality and hierarchy in the Web –Webcontent mining–Webusage mining–Webstructure mining–-WebData Mining – Web terminology and characteristics – Locality and hierarchy in the Web – Webcontent mining – Web usage mining –Web structure mining–Webmining software

UNIT V

Search Engines and Query Mining: Introduction-Search Engine Functionality -Search Engine Architecture - Ranking of Web pages – Search Query Mining-Data Warehousing Introduction- Data warehouse design-Dataware house Metadata –**OLAP**: Introduction-Multidimensional View and Data Cube-OLAP Software.

Textbook:

"Introduction to Data Mining with Case Studies" by G.K. Gupta, 2nd Edition, 2008, Prentice Hall Publications.

Reference book:

"Data Mining Techniques",Arun K.Pujari, 1st Edition, 2001, Universities Press (India) Private Limited.

SEMESTER – VI

Course Title	**INTERNET OF THINGS**
Total Hrs.	**30**
Hrs./Week	**2**
Course code	**21USCS61**
Course Type	**SEC-V**
Credits	**2**
Marks	**100**

General Objective:

The course aims to Toprovide an overview of an Internet of Things & enabling technologies and design IoT applications using the generic methodology of IoT.

Course Objectives:

CO	The learners will be able to :
CO-1	Discover the IOT level in real time challenges.
CO-2	Illustrate the concept of IOT application in specific domain such as Agriculture, Home,etc.,
CO-3	Analyze the concept of IOT and Machine-to-Machine.
CO-4	Design an IOT application.
CO-5	Manage the functions of Raspberry Pi model.

UNIT - I : INTRODUCTION TO IOT

Internet of Things - Physical Design - Logical Design - IoT Enabling - Technologies - IoT Levels & Deployment Templates

UNIT – II : DOMAIN SPECIFIC IOTs

Introduction – Homes – Cities – Environment - Agriculture – Industry

UNIT – III : IoT and M2M

Introduction - M2M - Difference between IoT and M2M

UNIT – IV : DEVELOPING INTERNET OF THINGS

Introduction - IOT Design Methodology

UNIT - V : IOT PHYSICAL DEVICES AND END POINTS

What is an IoT Device - Basic building blocks of an IoT Device - Exemplary Device:Raspberry Pi

Textbook:

ArshdeepBahga, Vijay Madisetti, –Internet of Things – A hands-on approach Universities Press, 2015

Reference book:

"Getting Started with Internet of Things" – Cuno Pfister

Course Outcomes

CO	Upon completion of the course, the students will be able to :	PSOs Addressed	Cognitive Level
CO-1	Understand the basic concepts of IoT and enabling Technologies	1,2,3,5	Understanding
CO-2	Construct the Domain Specific IoTs	1,2,3,5	Applying
CO-3	Distinguish the functions of IoT and M2M	1,2,3,5	Analyzing
CO-4	Estimate the concept of IoT Design Methodology	1,2,3,5	Evaluating
CO-5	Create an IoT application using the Raspberry Pi model	1,2,3,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
VI	21USCS61	Internet of Things	30	2

Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		✓
	Number of matches (✓) = 45 Relationship = Low/Medium/**High**									

SEMESTER - I

Course Title	**PRINCIPLES OF MANAGEMENT**
Total Hrs	**75**
Hrs/Week	**5**
Course Code	**21UCBA11**
Course Type	**DSC-I**
Credits	**4**
Marks	**100**

General Objective:

The Course focuses on management principles, functions and techniques in running an organisation successfully.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the fundamentals of management.
CO-2	Classify the various forms of business organisation.
CO-3	Establish the requirements of human resource for an organisation.
CO-4	Appraise the performance of subordinates in an organisation.
CO-5	Consider and control techniques in order to rectify business related issues.

Unit I: Management

Definition of management – Science or art or profession – Manager Vs Entrepreneur – Managerial Skills – Levels of management – Managerial skills and organizational Hierarchy – The emergence of Management thought – Frederick W. Taylor, Henri Fayol and Elton Mayo.

Unit II: Planning

Importance of Planning - Types of Plans – Steps in planning - Nature and objectives of planning – Hierarchy of objectives – Setting objectives and the organizational Hierarchy – Management by Objectives (MBO) – Benefits of MBO.

Unit III: Organizing

Nature and Purpose – Formal and Informal Organisation – Organisation chart – Organisation structure – Types - Line and Staff authority - Departmentalization – delegation of authority – Centralization and decentralization.

Unit IV: Staffing

Importance - Situational factors affecting staffing – Internal and External factors – Recruitment – Sources of recruitment - Selection – Process of selection – Training and Development.

Unit V: Directing and Controlling

Meaning and Nature of Directing – Elements of Directing – Importance of directing – Basic Control Process or Steps – Budgetary and Non budgetary control Techniques – Use of Computer and IT in Management control.

Text Book:

1. Harold Koontz and Heinz Weihrich, *Essentials of Management: An International & Leadership Perspective,* 8th edition, Tata McGraw-Hill Education, 2016.

Reference Books:

1. Don Hellriegel, Susan E. Jackson and John W. Slocum, Management- A Competency Based Approach, Thompson South Western,11th edition, 2008.
2. Heinz Weihrich, Mark V Cannice and Harold Koontz, Management- *A global entrepreneurial perspective*, Tata McGraw Hill, 12th edition,2008.
3. Stephen P. Robbins, David A.DeCenzo and Mary Coulter, Fundamentals of management, Prentice Hall of India, 2012.

SEMESTER – I

Course Title	MANAGERIAL COMMUNICATION
Total Hrs.	75
Hrs./Week	5
Course Code	21UCBA12
Course Type	DSC-II
Credits	4
Marks	100

General Objective:

The Course facilitates the learners to develop adequate communication skills for effective business correspondence.

Course objectives:

CO No.	The learners will be able to:
CO-1	Understand the process and barriers of effective communication.
CO-2	Rewrite the layout of business letters.
CO-3	Practice the format of business letters, applications and their importance
CO-4	Categorize the types of report writing prior to drafting business reports.
CO-5	Choose techniques and tools to promote judicious and efficient utilization of electronic media.

UNIT – I Introducing communication and media

Communication – Meaning- Process and Significance – Objectives – Principles –Types – Media – verbal communication-non verbal communication-Barriers of Communication – The making of effectivecommunication.

UNIT – II Business Correspondence

Correspondence – need-functions –business letter – need-function and Kinds of Business Letters – Layout of Business Letters – mechanical structure-style format and punctuation

UNIT – III Business Letters formation and Application

Enquiry and Reply –Offers and Quotations – important terms used in Offers and Quotations- Orders – Execution of order and Cancellation of order- Complaints-Claims and Adjustments – Collection Letters – Sales Letters – Circular Letters.

UNIT – IV Report writing and preparing

Report writing- importance of reports-contents – features of good report writing- Types and forms of reports – preparing a report –organization of report- characteristics of good report-Specimen of Reports.

UNIT – V Electronic communication

Modern means of E-Communication – Internet – E-Mail – Video conferencing– Social Media Communications – Ethical ways of using social media for communication.

BOOKS FOR REFERENCE:

1. R.C.Sharma, Krishna Mohan – Business Communication, Tata McGraw Hills, 2012
2. Urmila Rai – Business Communication, Himalaya Publishing House,2015.

Course Outcomes

CO No.	Upon completion of the course, The students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Gain adequate knowledge in business correspondents and obtain the skills required for writing business letters.	1,2,3	Understanding/ Applying
CO-2	Categorize the formats of business letters, their applications and importance	1,2,3	Applying/ Analysing
CO-3	Discover soft skills in particular business etiquette.	1,2,3	Applying
CO-4	Prepare good business letters and reports	1,2,3	Creating
CO-5	Construct suitable e-communication models to become skilled communicators.	1,2,3	Creating

SEMESTER – II

Course Title	ORGANIZATIONAL BEHAVIOUR
Total Hrs.	75
Hrs./Week	5
Course Code	21UCBA21
Course Type	DSC-III
Credits	4
Marks	100

General Objective:

The general objectives of the course are designed to focus on the BBA students:

1. To understand the behavioural theories & patterns in an organization
2. To know the motivational theories & factors that will shape the personality traits
3. To get along with the working culture of an organisation

Course Objectives:

CO	The learner will be able to:
CO-1	To comprehend the theories involved to identify an individual's behavioural pattern in an organization.
CO-2	To know the different types of personality & leadership styles.
CO-3	To realize the significance of motivation & various motivational theories.
CO-4	To accustom to the various organizational culture & it's significance.
CO-5	To examine the different methods of conflict resolution with its merits & demerits

Unit - I

Introduction to Organizational Behavior

Organizational Behaviour - Definition- Disciplines contribute to Organizational Behaviour -Key elements of Organizational Behaviour - Hawthorne experiments- Organizational Behaviour Models-Autocratic, custodial, supportive, collegial.

Unit - II

Individual Behavior

Foundations of Individual Behaviour – Ability, Intellectual, Physical. Learning-Theories-Classical conditioning theory, Operant conditioning theory. Perception-factors-process

Unit - III

Personality

Personality-Determinants- Big Five Model Theory. Leadership –Distinction between a Leader and a Manager – Styles of Leadership – Leadership Theory Transformational – Transactional.

Unit - IV

Group Behavior

Motivation – Importance – Methods – Monetary – Non-Monetary-Theories of motivation – Maslow's Hierarchy Need Theory - Herzberg Two Factor Theory. Groups in Organisation Foundations of group behaviour -Stages of group development – Decision Making and the groups.

Unit - V

Culture and Conflict

Organizational culture - Importance of culture – Types of culture - Conflict and Negotiation-Conflict process – Conflict Resolution – Transactional Analysis - Bargaining strategies – WLB (Work Life Balance).

Textbooks:

1. Stephen P. Robins, Timothy, A. Judge and Neharika Vohra, Organisational Behavior, PHI Learning / Pearson Education, 15th edition, 2013.

Reference Books:

1. Fred Luthans, Organisational Behavior, McGraw Hill, 11th Edition, 2001.
2. Mc Shane & Von Glinov, Organisational Behaviour, 4th Edition, Tata Mc Graw Hill, 2007.
3. Nelson, Quick, Khandelwal. ORGB – An innovative approach to learning and teaching. Cengage learning. 2nd edition.

SEMESTER – III

Course Title	**MARKETING MANAGEMENT**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCBA32**
Course Type	**DSC-VI**
Credits	**4**
Marks	**100**

General Objective:

1. To fulfil the customer requirements i.e., needs and wants through various marketing tools and techniques.
2. To create a marketing mix strategies for gaining the competitive advantage and core competence for surviving in the market.
3. To understand the abstract foundations of Marketing Management as a useful space for the business.

Course Objectives:

CO	The learner will be able to:
CO-1	To Understand the basic concept of marketing management
CO-2	To inculcate the knowledge about Product, its Life Cycle a Methodology of New Product Development.
CO-3	To realize the pricing methods and its strategies for products among the students.
CO-4	To know about the different marketing channels for distribution of the produced goods and rendering services f producers to customers.
CO-5	To Evaluate the best promotional tools for marketing product and services.

UNIT I

Marketing – Definition – Concepts of marketing – Significance - Segmenting, Targeting and Positioning, MarketingMix.

UNIT II

Product Mix-Product characteristics and classification-Product Life Cycle and New product development. Branding, Packaging andLabeling

UNIT III

Pricing – Importance – objectives-Factors affecting pricing Decision- Kinds of pricing – steps in pricing.

UNIT IV

Marketing Channels – Channels of Distribution - Nature of Channels - Wholesaling-Retailing - Role of Marketing channels.

UNIT V

Promotional Mix- Advertisements - Sales Promotion-Public Relation- Direct Marketing -Personal Selling – Recent Trends in Marketing– Relationship Marketing and its importance – GreenMarketing

Text Book

Kotler, P., Keller, K. L., Manceau, D., & Dubois, B. (2016). Marketing Management, 15e édition. *New Jersy: Pearson Education.*

Reference Books:

1. BerkovizKerinHontleyRudelivs,MARKETING,NewYork,McgrawHill
2. Kotler, P. (1997). Gary Armstrong. *Principles of marketing.*
3. Rajan Saxena, Marketing Management, 2nd edition, New Delhi, Tata Mcg raw Hill Publishing Co.Ltd.

Semester – IV

Course Title	**OFFICE MANAGEMENT**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UNBA41**
Course Type	**NME-II**
Credits	**2**
Marks	**100**

General Objective:

To give on hand knowledge on the issues related to office environment. The students should become familiar with modern office mechanism for conducting business transactions through electronic office appliances.

Course Objectives:

CO	The learner will be able to:
CO-1	Demonstrate the fundamentals of office functions and office management
CO-2	Show the features of office accommodation and environment
CO-3	Identify the concepts of office appliances and office maintenance
CO-4	Analyse ethics in report writing and report maintenance
CO-5	Develop system enabled solutions for Office Service and Supervision

Unit I: Office and Office Management

Office- Meaning – Features – Importance – Functions of office - Modern office-Principles of modern office management and organization- Office Management – Nature, Functions and Scope – Office Manager – Functions and Qualification – Centralization vs. decentralization of office services.

Unit II: Office Accommodation and Environment

Office Accommodation – Principles – Location of an office – office Layout – Office furniture – Office Environment working conditions - Requirements Selection of site-Qualifications and qualities of office manager-The status of office manager in total organization- The authorities and responsibilities of an office manager.

Unit III: Office Appliances and Office Maintenance

Office appliances-types of commonly used appliances- office Machines and Equipments- objectives of using machines- types of machines -office stationary and Supplies- Office Safety and Security – Meaning- importance of office Safety-safety hazards and steps to improve office safety.

Unit IV: Office Records Management

Records –classification of regards-principles of record keeping-Meaning, importance of record keeping management-types of records kept in a business organization Filing – Essentials of a good filing system-Classification of filing system - Indexing – Meaning – objects – Indexing types.

Unit V: Office Service and Supervision

Office service- centralization and decentralization- advantages – disadvantages- modern office department -measurement of office work – importance- purpose - difficulty in measuring office work- different ways of measurement - setting of work standards - benefits of work standards. Office supervision and Control –characteristics of supervision -effective supervision.

Text & Reference Books:

1. B.N.Tandan, Manual of Office Management and Correspondence, S.Chand & Co., New Delhi
2. R. K. Chopra, Office Organisation and Management, Himalaya Publishing House, Mumbai

Course Outcomes

CO	Upon completion of the course, The students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the modern office and office management and get aware of the duties to the office manager	1,2,3	Understanding
CO-2	Experiment with the Office Environment and Illustrate the working conditions	1,2,3	Applying
CO-3	Examine the different measures of office maintenances and office appliances and the steps to improve office safety.	1,2,3	Analyzing
CO-4	Perceive an idea about proper filing and indexing of office documents	1,2,3	Evaluating
CO-5	Develop different methods to measure the office Service and Supervision	1,2,3	Creating

SEMESTER - V

Course Title	**BUSINESS LAW**
Total Hrs.	**75**
Hrs./Week	**5**
Course Code	**21UCBA51**
Course Type	**DSC-XII**
Credits	**4**
Marks	**100**

General Objective:

To provide in-depth knowledge of the law of contracts and the legal framework influencing Business Operations

Course Objectives:

CO	The learner will be able to:
CO-1	Understand the concepts and classification of contracts
CO-2	Enlighten the students on the valid contract and legal aspects of business
CO-3	Acquire knowledge on the performance, discharge and remedies of breach of contract
CO-4	Explain the law of agency ,the rights and duties of an agent
CO-5	Create knowledge on the legal aspects in bailment

UNIT – I

Introduction – Contract– Essential elements – Kinds of Contracts – Void, Voidable and Valid Agreement –Contingent Contract – Offer and Acceptance.

UNIT – II

Consideration – Capacity of Parties – Free Consent – Legality of Object – Void Contracts.

UNIT –III

Performance of Contracts – Discharge of contracts – Remedies for Breach of contract.

UNIT – IV

Law of Agency– Modes of creation – Rights and Duties of an Agent – Agency by Ratification – Sub-Agent and Substituted Agent – Termination ofAgency.

UNIT – V

Bailment- Features - Rights, duties of Bailor and Bailee-fundamentals in Sale of Goods Act-Unpaid seller-caveatemptor.

TEXTBOOK RECOMMENDED:

N.D. Kapoor – Elements of Mercantile Law, Sultan Chand & Sons.

BOOKS FOR REFERENCE:

1. Davar – Mercantile Law, Progressive Corporation.
2. R.S.N.Pillai and Bhagavathi–Business Law, Sultan Chand & Sons.
3. M.C.Shukla–Mercantile Law, S.Chand & Co.

Course Outcomes

CO	Upon completion of the course, The students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the concept and fundamentals of valid agreements	1,3,4	Understanding
CO-2	Analyse the capacity of parties and legality of objects	3,4	Analysing
CO-3	Asses the performance, discharge, and remedies breach of contracts.	3,4	Applying
CO-4	Develop the agency procedures and rights & duties of an agent.	3,4	Applying
CO-5	Create knowledge in bailment and sale of goods act	3,4	Creating

Relationship Matrix

Semester	Course Code		Title of the Course			Hours			Credits	
V	21UCBA51		BUSINESS LAW			75			4	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓		✓		
CO-2	✓		✓	✓	✓	✓		✓	✓	
CO-3	✓		✓	✓	✓			✓	✓	
CO-4	✓		✓	✓				✓	✓	
CO-5	✓		✓	✓				✓	✓	
	Number of matches (✓) =29 Relationship = Medium									

SEMESTER – VI

Course Title	COMPENSATION MANAGEMENT
Total Hrs.	60
Hrs./Week	4
Course Code	21UEBA61B
Course Type	DSE -IIIB
Credits	4
Marks	100

General Objective:

The general objectives of the course are designed to prepare the BBA students to be familiar with the compensation rules and to understand the various theories of wage fixation. It also helps them to know about the benefits entitled to the workforce.

Course Objectives:

CO	The learner will be able to:
CO-1	Categorize the different theories of compensation in an organization
CO-2	Know about the different models of determining wages in organisation
CO-3	Examine the different methods of remunerating labour
CO-4	Identify the types of fringe benefits available to the employees
CO-5	Understand the benefits entitled to the workforce

Unit - I

Introduction – Compensation – Compensation Management – Definition-Objectives of Compensation Management-Principles of Compensation Management-Stakeholders in Compensation Management-Process of Compensation Management

Unit – II

Compensation Theories-Economic theories – Behavioural Theories-Factors influencing Compensation Management- – Equity in Compensation

Management-Concepts of Job Evaluation- Objectives of Job Evaluation-Process of Job Evaluation-Techniques of Job Evaluation

Unit – III

Wage Determination Models-Internal Labour Market Model, Insider-Outsider Model, Human Capital Model, Matching Model, Competitive Model-Determinants of Compensation-Designing Compensation Structure-Compensation systems planning-Designing a Compensation System.

Unit - IV

Meaning of Wages & Salaries -Methods of Remunerating Labor-Time rate System-Advantages & Disadvantages –Piece Rate System- Advantages & Disadvantages –Different Incentive Plans- Methods of Remunerating Employees-Factors affecting Wages & Salary structure.

Unit - V

Fringe Benefits – Definition - Types of Fringe Benefits - Voluntary Benefits – Statutory Benefits– Stock Based Compensation-Kinds of Stock Based Compensation-Methods to measure Stock Based Compensation-Activities involved in Stock Based Compensation –Executive Compensation-Principles of Executive Compensation.

Textbook:

1. Essentials of Human Resource Management & Industrial Relations – P.SubbaRao., Himalaya Publishing House.

Reference Book:

1. A Text book of Human Resource Management – C.B.Mamoria., S.V.Gankar., Himalaya Publishing.

Web Reference:

1. Epgpathshala- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=1610

SEMESTER – III

Course Title	FUNDAMENTALS OF COMPUTING AND SECURITY
Total Hrs.	30
Hrs./Week	2
Course Code	21USFC31
Course Type	SEC-I
Credits	2
Marks	100

General Objectives:

Introduce the fundamentals of computing devices and particularly with respect to personal use of computer hardware and software, the Internet, Cyber Crime and Cyber Security.

UNIT I Fundamental of Computers

The Role of Computers in Modern Society - Block Diagram of Digital Computer - Working Principle of Computer - Hardware-Software- Types of Software - Operating system-Definition-Single user and multi-user operating system-Time sharing-multitasking-multiprogramming-Batch Processing-on-line processing-spooling.

UNIT II Microsoft Office Package

Basics of Office Automation Tools - Microsoft Word: Create Documents - Edit and Format Documents - Microsoft Excel: Create Worksheet – Edit and Filter - Microsoft PowerPoint: Create Presentation – Edit and format Presentation – Microsoft Access: Create Database and Table – Designing database.

UNIT III Networks

Components of a Communication System - Types of Networks : Local Area Network - Metropolitan Area Network - Wide Area Network - Wireless and Wired Network – Network Topologies - World Wide Web (WWW) - Client - Server Computing.

UNIT –IV Cyber Security for ICT

Information and Communication Technology: Introduction-Basics of ICT-Ethical & Social Issues in ICT -Digital Citizenship-Elements of Digital Citizenship- Need for Cyber Security

UNIT –V Cyber Crime & Cyber Security

Cyber Crime: Introduction--Types of Cyber Crime-Security Issues: Threats-Attacks-Vulnerabilities - Cyber Space-Security Services - Cyber Security: Definition, Key Concepts, Fundamentals, Cyber Challenges and Ethics.

Textbooks:

1. Cyber Crime & Cyber Security – "Unit IV and V , Dr. S. Shajun Nisha,PG and Research Department of Computer Science ".

Reference Book:

1. Fundamentals of Computers, by V.Rajaraman, PHI, Fifth Edition, April 2010.
2. Microsoft Office – Complete Reference – BPB Publication
3. "Introduction to Data communication and networking" – Behrouz Forouzan- Tata McGraw Hill 2nd Edition, 2006.

SEMESTER – V

Course Title	E-COMMERCE
Total Hrs.	75
Hrs./Week	5
Course Code	21UCBA52
Course Type	DSC-XIV
Credits	4
Marks	100

General Objective:

1. To describe the major themes underlying the study of e-commerce in the modern era.
2. To analyze the pros and cons of electronic based business environment.
3. To know the strong physical infrastructure for safety use of electronic devices

Course Objectives:

CO NO.	The learner will be able to:
CO-1	Access the various modes of e-commerce and its benefits to the organization and the customers.
CO-2	Analyze the growth of Mobile Commerce and its application for the ease of doing the business.
CO-3	Realize the impact of various electronic data interchange tools and standards for smooth business transactions in the technological world.
CO-4	Assess the various risks involved in handling electronic based business environment in the modern era
CO-5	Summarize the legislative acts towards supporting e-commerce for the business and its environment.

UNIT I

Welcome to Electronic Commerce – Introduction, Concepts of B2B, B2C, C2C, B2G; benefits of E-Commerce to Organization, Consumers. The Network infrastructure for E-Commerce–Electronic Payment Applications.

UNIT II

M-Commerce(Mobile Commerce) – Growth of M-Commerce – Wireless Applications – Technologies for M-Commerce – GPRS – Wireless Technologies (CDMA & GSM) – Generations in Wireless Communication – Security Issues in CellularTechnology.

UNIT III

Electronic Data Interchange-Definition - Benefits of EDI- EDI Application in Business –Un/EDIFACTS Standard.

UNIT IV

Security on Internet – Network and WebsiteSecurity Risks – Security incidents on Internet – Security and Email – Firewall Conceptsand Constituents–Benefits–SecurePhysicalInfrastructure.

UNIT V

E- Commerce in India- The Internet in India-Laws for E-Commerce inIndia.

Text Book:

1. Kamlesh, B., &Debjani, N. (1999). E-commerce: the cutting edge of business.

Reference Books:

1. S.Jaiswal: Doing Business on the Business on the Internet commerce, Galgotia Publication,2011.
2. David Whitely:E-Commerce, Tata McGraw Hill Publications Co. Ltd., New Delhi, 2010.
3. Jaffrey F.Rayport: E-Commerce, Tata McGraw Hill Publications Co. Ltd., New Delhi,2012

SEMESTER – I

Course Title	Knowledge Processing and Retrieval – Classification (Theory)
Total Hrs.	60
Hrs./Week	4
Sub.Code	21UCLS13
Course Type	DSC-III
Credits	4
Marks	100

General Objective:

To understand the role of Library classification in knowledge organization, mode of formation of subjects in the universe of knowledge, and various concepts, theories and principles in classification.

Course Objectives:

CO	The learner will be able to
CO-1	Understand the nature and attributes of universe of knowledge and basic concepts of Library Classification
CO-2	Interpret the meaning, purpose, functions, theories and canons of library classification and elaborate meaning and types of subjects and modes of subject formation.
CO-3	Explain the fundamental categories and devices in library classification
CO-4	Construct Call number with reference to various facet notation.
CO-5	Estimate the characteristics, merits and demerits of different species of library classification schemes with reference to major classification schemes and recent developments in library classification

Unit 1: Library Classification

Universe of Knowledge: Nature, Attributes - Subject: Meaning, Types (Basic, Compound, Complex) Library Classification: Concepts, Terminology, Need Purpose and Functions

Species of classification Schemes – History and Development of Library Classification - Universe of Knowledge as Mapped in Different Classification Schemes

Unit 2: Theory of Library Classification

General Theory – Descriptive Theories of J. D. Brown, E. C. Richardson, E. W. Hulme, W.C. B. Sayers, H. E. Bliss.

DynamicTheory: S. R. Ranganathan – Normative Principles for various levels – Basic Laws, Fundamental Laws, Canons, Postulates, Principles of facet sequence, Principles of Helpful Sequence.

Unit-3: Approaches to Library Classification

Postulational Approach and Systems Approach, Fundamental Categories, Facet Analysis and Fact Sequence, Phase Relation and Common Isolates, Devices in Library Classification - Modes of Formation of subjects.

Unit-4: Notation and construction of Classification Number

Notation: Meaning, Need, Functions, Types, Qualities, Call number: Class Number, Book Number and Collection Number, construction of Class Number.

Unit 5: Classification Schemes and Current Trends

Classification Schemes: Species of Library Classification Schemes - Dewey Decimal Classification (DDC), Colon Classification (CC); Universal Decimal Classification (UDC), - Library of Congress Classification (LCC)

Current Trends: Simple Knowledge Organization Systems (SKOS) - Automatic Classification, Web Dewey – Taxonomies – Folksonomy - Classification Research Group (CRG)

Text Books:

- S.R. Ranganathan, Prolegomena to Library Classification, Sarada Ranganathan Endowment.
- S.R. Ranganathan, Classification and Communication, Sarada Ranganathan Endowment.
- S.R. Ranganathan, Elements of Library Classification, Sarada Ranganathan Endowment.
- Chakrabati, B, Library Classification theory, Calcutta, World Press.
- Krishan Kumar: Theory of Classification, Vikas Publisher.

Reference Books:

- A.A.N. Raju, Dewey Decimal Classification [DDC-20]: Theory and Practice: A Self Instructional Manual, T.R. Publications.
- M.S. Achdeva, Colon Classifications, Sterling Publisher.
- S. R. Ranganathan, Colon Classification, Asia Publishing House.
- Rowley, Jennifer E. Organizing Knowledge: an introduction to information retrieval 2nd ex. Ashgati, 1992.
- Rajendra Kumbhar, Library Classification Trends in the 21st Century, Chandos Publishing, 2012.

SEMESTER – II

Course Title	Knowledge Processing and Retrieval: Cataloguing (Practical)
Total Hrs.	120
Hrs./Week	8
Sub.Code	21UELS2P1
Course Type	Core Practical
Credits	4
Marks	100/2

General Objective:

To impart skills in cataloguing documents using AACRII and CCC

Course Objectives:

CO	The learner will be able to
CO-1	Describe the catalogue codes.
CO-2	Group catalogue entries for various types of information sources.
CO-3	Choose catalogues according to the catalogue codes for non-printing materials.
CO-4	Select catalogue cards for documents with various perspectives.
CO-5	Distinguish main entry into different added entries.

Cataloguing using

1. Classified Catalogue Code, Ed.5
2. Anglo-American Cataloguing Rules – II (1978).

Works of Single Authorship, Shared Authorship, Pseudonyms, Mixed Responsibilities, Editorial Works, Composite Works, Multi-volume Works, Serial Publications, Uniform Titles, Works of Corporate Authorship

Reference Books:

- Ranganathan S.R.: Classified Catalogue Code with additional rules for dictionary catalogue code, Bangalore, 1989.
- Anglo-American Cataloguing Rules. 2nd ed. London, Library Association, 1988.

Course Outcomes:

CO	Upon completion of the course, the student will be able to	PSOs Addressed	Cognitive Level
CO-1	Apply the catalogue codes.	2, 4, 5	Applying
CO-2	Interpret main entry into different added entries.	2, 4, 5	Evaluating
CO-3	Choose catalogue entries for various types of information sources.	2, 4, 5	Evaluating
CO-4	Compose catalogues according to the catalogue codes for non-printing materials.	2, 4, 5	Creating
CO-5	Create catalogue cards for documents with various perspectives.	2, 4, 5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit
II	21UCLS2P1	Knowledge Processing and Retrieval: Cataloguing Practical	120	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓		✓		✓	✓
CO-2	✓	✓	✓	✓	✓		✓		✓	✓
CO-3	✓	✓	✓	✓	✓		✓		✓	✓
CO-4	✓	✓	✓	✓	✓		✓		✓	✓
CO-5	✓	✓	✓	✓	✓		✓		✓	✓
	Number of matches (✓) = ...40.... Relationship = High									

SEMESTER – I

Course Title	**COMMUNICATION SKILLS**
Total Hrs	**30**
Hrs/Week	**2**
Sub.Code	**21UELS11**
Course Type	**AECC**
Credits	**2**
Marks	**100**

General Objective:

- To discuss the importance of Ethics in English Communication and to develop reading, writing, and vocabulary skills.

Course Objectives:

CO No.	The learner will be able to
CO-1	Understand the basic skills and fundamental aspects of language learning.
CO-2	Develop their interest in vocabulary and awareness of the structure of English.
CO-3	Correlate verbal fluency for face-to-face communication.
CO-4	Distinguish the comprehension skills and clear pronunciation.
CO-5	Create confidence to have more professional approach and expose them to suitable employment opportunities, challenges and jobs.

Unit I

Communication Skills: An Overview

Unit II

Basic Grammar: Parts of Speech

Unit III

Listening Skill

Unit IV

Reading and Speaking Skills

Unit V

Letter Writing

TEXTBOOK:

Communication Skills. PG Department of English.

REFERENCE BOOKS:

1. Fowler H.W. Fowler's Modern English Usage. New Delhi: Oxford University Press, 1996.
2. Hornby. A.S.,ed. Oxford Advanced Learner's Dictionary of Current English. New York: Oxford University Press, 2010.

Course Outcomes:

CONo.	Upon completion of the course, the student will be able to	PSOs Addressed	Cognitive Level
CO-1	Understand the different methods of communication.	1,2	Understanding
CO-2	Apply the various techniques and tools for an effective English communication.	1,2, 4	Applying
CO-3	Analyze the recent learning techniques for an effective communicator.	2,3	Analyzing
CO-4	Evaluate the importance of non-verbal communication.	3, 4	Evaluating
CO-5	Create an appropriate method and engage themselves with good written communication.	2,4,5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit
I	21UCLS11	COMMUNICATION SKILLS	30	2

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓	✓	✓		✓
CO-2	✓	✓	✓	✓	✓	✓		✓	✓	✓
CO-3	✓	✓		✓		✓	✓		✓	✓
CO-4	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO-5	✓	✓	✓	✓	✓		✓	✓	✓	✓
	Number of matches (✓) = 42 Relationship = High									

SEMESTER – VI

Course Title	**POLITICAL HISTORY OF ISLAM**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCAR64**
Course Type	**DSC- XV**
Credits	**4**
Marks	**100**

General Objective: To identify the classics and learn the political history of Islam with appreciation and account for their literariness

Course Objectives:

CO	The learners will be able to:
1	Understand the present existing social political, religious and economic conditions of the people.
2	Show using their knowledge to develop skills and attitudes that helps to evaluate progress and encourage taking social responsibility.
3	Explain the terminal behaviour and desired changes in attitudes.
4	Experiment in understanding, thinking, practical skills, and attitudes relating to the historical affairs concerned.
5	Categorize moral and ethical values from political Islamic history to live a dignified life.

Unit –I:

من العصر الجاهلي إلى العصر الإسلامي – العصر الجاهلي - تمهيد – البيئة الجغرافية – أوضاع العرب قبل الإسلام – الإمارة في الحجاز – الممالك في الشمال – الممالك في الجنوب- أوضاع لدولتي الفاطمية والفيزندية

Unit –II:

من العصر الاسلامي – الي العصر الأموي عصر الرسالة – المرحلة المكية – محمد صلى الله عليه وسلم قبل البعثة – البعثة – هجرة النبي صلى الله عليه وسلم إلى المدينة خصائص الدعوة المكية – المرحلة المدنية – أسس الدولة الإسلامية – بناء المسجد – المؤاخاة بين المهاجرين والأنصار – الغزوات والسرايا- صلح الحديبية – كتب النبي صلى الله عليه وسلم إلى الملوك والأمراء- فتح مكة – وفاة النبي – عصر الراشدين

Unit–III:

من العصر الأموي – الي – العصر العباسي العصر الأموي – معاوية بن أبي سفيان – يزيد بن معاويةة – معاوية بن يزيد – معاوية الثاني – مروان بن الحكم – عبد الملك بن مروان – الوليد بن عبد الملك- سليمان بن عبد الملك – عمر بن عبد العزيز – يزيد بن عبد الملك يزيد الثاني – هشام بن عبد الملك- مروان بن محمد الجعدي مروان الثاني-

Unit–IV:

من العصر العباسي إلي الخليفة هارون رشيد العصر العباسي الأول – عصر القوة التوسع – أبو العباس عبد الله السفاح – عبد الله أبو جعفر المنصور – الأوضاع الخارجية في عهد المنصور- أبو عبد الله محمد المهدي – أبو محمد موسى الهادي أبو جعفر هارون الرشيد – العلاقات الداخلية والخارجية في عصره وفاة الرشيد

Unit–V:

من هارون رشيد – إلي – العلم في عهد المستنصرأبو موسى محمد الأمين – أبو جعفر عبد الله المأمون – الحركات المناهضة للدولة في عهد المأمون أبو إسحاق محمد المعتصم – أبو جعفر هارون الواثق – أبو الفضل جعفر المتوكل – أبو جعفر محمد المنتصر

Textbook: Taqoosh.Mohamed Suhail.Al Thareekhul Islami Al wajeez.

Dharun Nafayis. Lebnan, 2011.

SEMESTER – V

Course Title	பெண்ணியமும் பெண்ணெழுத்தும் **Feminism and the Writings of Women**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCTA54**
Course Type	**DSC-X**
Credits	**4**
Marks	**100**

General Objective:

பெண்ணெழுத்தின் சமூக பங்களிப்பு பற்றி மாணவர்களுக்கு எடுத்துரைத்தல்.

Course Objectives:

CO	The learners will be able to:
CO-1	Generalize women creators and creations in terms of its role.
CO-2	Observe to realise the uniqueness of women writings.
CO-3	Establish the value and importance of women.
CO-4	Record and realise the contribution of women in society.
CO-5	Explain the centre of women creations.

அலகு – 1

பெண் கல்வி – விளக்கம் - நோக்கம் - பெண்கல்வியின் முக்கியத்துவம் - பெண் இயல்கல்வி – பாடங்கள் - பெண்கல்வி நிலையங்கள் - பெண்கல்வியும் - சமுதாய வளர்ச்சியும்

அலகு – 2

சங்க காலப் பெண்பாற்புலவர்கள் - பக்தி காலப் பெண்பாற் புலவர்கள் - தற்காலப் பெண்பாற் புலவர்கள்

அலகு – 3

பெண்கள் மதிப்பு நிலை – 21ஆம் நூற்றாண்டில் பெண்கள் - பெண்ணியத்தின் சமுதாய நோக்கு – பெண்மையின் பெருமை – பெண்ணுரிமைக்கான அமைப்புகள்

அலகு – 4

பெண் படைப்பாளர்கள் - வை.மு.கோதை நாயகி – குமுதினி, அனுத்தமா, ராஜம் கிருஷ்ணன், அம்பை, லட்சுமி ரமணன், வாஸந்தி, சிவசங்கரி, இந்துமதி, சிவகாமி,

அனுராதா, பாமா, சல்மா, தாமரை, நீலாவதி, ஆண்டாள் பிரியதர்ஷினி, உமா மகேஸ்வரி, திலகவதி IPS

அலகு 5

பெண்களும் பணியும் - ஆசிரியப் பணி – ஊடகம், பொதுப்பணி – அரசியல் - சமூகப்பணி, குடும்பப்பணி – சட்டப்பணி

பாடநூல்

பெண்ணியமும், பெண்ணெழுத்தும், தமிழ்த்துறை வெளியீடு, சதக்கத்துல்லாஹ் அப்பா கல்லூரி, திருநெல்வேலி.

பார்வை நூல்

பெண்ணியம் அணுகுமுறைகள், டாக்டர் இரா.பிரேமா, தமிழ்ப்புத்தகாலயம், சென்னை-17

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Illustrate the origin of women education, its growth, progress and the social contribution.	1,2,3	Understanding
CO-2	Discuss the progress of women over the times, their contribution in social, political and economical growth.	1,2,3,4,5	Understanding
CO-3	Explain feminist research, feminist traits, god consciousness, purity and skills.	1,2,3,4,5	Applying
CO-4	Analyze women's creations and its growth, life, adapting to changes in the course of time.	1,2,3,4,5	Analyzing
CO-5	Consider job-oriented plan, growth, self-development and global multifaceted environment.	1,2,3,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course					Hours	Credits			
V	21UCTA54	பெண்ணியமும் பெண்ணெழுத்தும					60	4			
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)					
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	
CO-1	✓	✓	✓			✓	✓	✓			
CO-2	✓	✓	✓	✓		✓	✓	✓	✓	✓	
CO-3	✓	✓	✓	✓		✓	✓	✓	✓	✓	
CO-4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO-5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Number of matches (✓) = 44 Relationship = High										

SEMESTER – VI

Course Title	தொல்லியல் Archeology
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USTA61**
Course Type	**SEC-VI**
Credits	**2**
Marks	**100**

General Objective:

மனிதப் பண்பாட்டின் தோற்றத்தையும், வளர்ச்சியையும் ஆவணப்படுத்துதல்.

Course Objectives:

CO	The learners will be able to:
CO-1	Classify the birth and growth of human culture before history and after history.
CO-2	Illustrate culture into time periods and to categorize articles found in archealogical excavations besides researching about human tendencies.
CO-3	Focus on the South Indian culture based on stone inscriptions and archealogical findings to determine the time period of an article from the depth in which it is found in the ground.
CO-4	Experiment collecting, documenting, safeguarding, segregating, renewing stone inscriptions, documents and ancient things.
CO-5	Choose to find out archealogical places that add to the history and to conduct excavations.

அலகு – 1

தொல்லியல் ஓர் அறிமுகம் - தொல்லியல் பொருளும் முக்கியத்துவமும் - வரலாற்றிற்கு ஆதாரமானத் தொல்லியல் - தொல்லியலின் வகைகள் - அகழாய்வின் நோக்கம் - மேற்பரப்பாய்வும் அகழாய்வும் - அகழாய்வின் வகைகள் - அகழாய்வு முறைகள்

அலகு – 2

கற்காலப் பண்பாடு விளக்கம் - காலப்பாகுபாடு ஒரு பார்வை – பழங்கற்காலம் வாழ்க்கை நிலை – புதிய கற்காலம் ஒரு புரட்சிக்காலம் - புதிய கற்கால மக்கள் வாழ்வும் பண்பாடும் - இடைக்கற்காலத்தின் தட்ப வெப்ப மாறுதல்கள் - பெருங்கல் காலம் விளக்கம் - பெருங்கல் சின்ன வகைகள் - உலோக காலப் பண்பாடு தோற்றம் - செப்புக்காலப் பண்பாடு - ஹரப்பாவில் அகழாய்வுகள் - இரும்புக்காலப்

பண்பாடு – மட்கலப் பண்பாடு - இந்தியத் தொல்லியல் பரப்பாய்வுத்துறை தொடக்கம்

அலகு – 3

தொல்லியலும் பிற அறிவியற்பிரிவுகளும் - மண்ணியல் விளக்கம் - மண் வகை ஆய்வியல் - புவியியற் கூறுகள் - நாணவியல் விளக்கம் - எழுத்தமைதி அல்லது தொல்லெழுத்துக்கலை புதைப் படிவ இயல் - மானிடவியல் - உயிரின வாழ்வுச் சூழலியல் கல்வியின் முக்கியத்துவம்

அலகு – 4

பழம் பொருட்களின் காலத்தைத் துல்லியமாகக் கணிக்கும் நவீன காலக் கணிப்பு முறைகள் அறிமுக விளக்கம் - உத்தேச ஒப்பீட்டுக் காலக்கணிப்பு – ரேடியோ கார்பன் முறை – மகரந்தப் பொடி ஆய்வு முறை – காந்தவியல் கணிப்பு முறை – மரவளையம் கணக்கீடு – வெப்ப ஒளி உமிழ் காலக் கணிப்பு – ஒலி அதிர் வாய்வுக் காலக்கணிப்பு – ஆப்சிடியன் படிவக் காலக் கணிப்பு – நாணவியல் பொருளும் முக்கியத்துவமும் - வரலாற்றிற்கு ஆதாரமான நாணவியல் - அசோகர் காலத்திய நாணயங்கள் - கனிஷ்கரின் காசுகள் - சாளுக்கியர் நாணயங்கள் - பாண்டியர் நாணயங்கள் - சோழர் நாணயங்கள் - விசயநகரத்தார் நாணயங்கள் - இந்தியாவில் அயல்நாட்டுக் காசுகள் - தமிழ் நாட்டில் அயல் நாட்டார் நாணயங்கள்

அலகு – 5

கல்வெட்டியல் அறிமுகமும் முக்கியத்துவமும் - கல்வெட்டுகளின் உள்ளடக்கமும் வழக்காறுகளும் - கல்வெட்டின் அமைப்பு – கல்வெட்டின் பல்வேறு வகைகள் - கல்வெட்டுகள் வரலாற்று ஆதாரங்கள் - கல்வெட்டுகளின் கால நிர்ணயம் - கல்வெட்டுக்கள் உணர்த்தும் அறிய செய்திகள் - தமிழி எழுத்தின் பெயர் பற்றிய விளக்கம் - தமிழி கல்வெட்டுகளின் முக்கியத்துவம் - வட்டெழுத்துக்களின் தோற்றம் பற்றி அறிஞர்களின் கருத்து – எழுத்துக்களின் தோற்றம் - கிரந்தம் விளக்கம் - அசோகரின் கல்வெட்டுக்கள் - மாங்குளம் தமிழிக் கல்வெட்டு – உங்கள் பகுதியில் உள்ள கல்வெட்டுகளைப் படிஎடுத்து வாசிக்கக் கற்றுக் கொள்ளுதல் - கல்வெட்டுகளை இணையத்தில் ஆவணப்படுத்துதல் - கல்வெட்டுகளை நிழற்படம் எடுத்துத் திட்டக்கட்டுரை வடிவில் தருதல்.

பாடநூல்கள்:

1) தொல்லியல் (Archaeology), ம.இராசசேகர தங்கமணி, கொங்கு பதிப்பகம், கரூர்.

2) கல்வெட்டியல், ஜே.தர்மராஜ், டென்சி பப்ளிகேஷன்ஸ், சிவகாசி

பார்வை நூல்கள்:

1) தமிழ் இலக்கியத்தில் கல்வெட்டியல் கூறுகள், ஆ.ஜெகதீசன், ராமையா பதிப்பகம், சென்னை-14.