SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

POST GRADUATE PROGRAMMES

NON-MAJOR ELECTIVES SUBJECTS

CURRICULUM & SYLLABUS

(For students admitted from the academic year 2018-19 onwards)

UNDER CHOICE BASED CREDIT SYSTEM

FACULTY OF SCIENCE AND HUMANITIES
SRM IST
SRM NAGAR, KATTANKULATHUR – 603 203

POST GRADUATE PROGRAMMES
LIST OF NON-MAJOR ELECTIVE SUBJECTS
(For students admitted from the academic year 2018-19 onwards)

Semester	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
DEPARTMENT OF JOURNALISM AND MASS COMMUNICATION							
II	PJM18E81	Scripting for Media	2			2	2
	PJM18E82	Copy writing					
III	PJM18E83	Media trends, challenges and issues	2			2	2
	PJM18E84	Media and Cultural Studies					
DEPARTMENT OF COMMERCE (A&F and CS)							
II	PAF18E81	Financial Accounting	2			2	2
	PAF18E82	Strategic Management					
III	PAF18E83	Consumer Behaviour	2			2	2
	PAF18E84	Cost and Management Accounting					
DEPARTMENT OF ECONOMICS							
II	PES18E81	Money and Banking	2			2	2
	PES18E82	Managerial Economics					
	PES18E83	Demography					
III	PES18E84	International Business	2			2	2
	PES18E85	Economic Administration					
	PES18E86	Women Studies					
DEPARTMENT OF COMPUTER SCIENCE							
II	PIT18E81	Office Automation		1	1	2	2
	PIT18E82	Web Technologies		1	1	2	2
III	PIT18E83	PHP Basics		1	1	2	2
	PIT18E84	Android Fundamentals		1	1	2	2
DEPARTMENT OF COMPUTER APPLICATIONS							
II	PCA18E81	Database Management Systems		1	1	2	2
	PCA18E82	Web Technology		1	1	2	2
III	PCA18E83	Programming in Java		1	1	2	2
	PCA18E84	Content Management Systems		1	1	2	2

Semester	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
DEPARTMENT OF VISUAL COMMUNICATION							
II	PVC18E81	Media Campaign			2	2	2
	PVC18E82	Media Planning And Strategies					
III	PVC18E83	Film Appreciation			2	2	2
	PVC18E84	Advertisement Film Making					
DEPARTMENT OF BIOTECHNOLOGY							
II	PBT18E81	Vermitechnology			2	2	2
	PBT18E82	Mushroom Culture Techniques					
III	PBT18E83	Bio-Processing Technology			2	2	2
	PBT18E84	Hematology and Blood Banking					
DEPARTMENT OF MATHEMATICS							
II	18PMA2NA	Numerical Methods Using C++	2			2	2
	18PMA2NB	Applied Mathematics - I					
III	18PMA3NA	Applied Mathematics - II	2			2	2
	18PPH3NB	Bio-Mathematics					
DEPARTMENT OF PHYSICS							
II	18PPH2NA	Introduction To Nanotechnology	2			2	2
	18PPH2NB	Laser Physics					
III	18PPH3NA	Medical Physics	2			2	2
	18PPH3NB	Energy Storage and Devices					
DEPARTMENT OF CHEMISTRY							
II	18PCY2NA	Nanochemistry	2			2	2
	18PCY2NB	Electrochemical Energy Systems					
III	18PCY3NA	Chemistry of Biomolecules	2			2	2
	18PCY3NB	Forensic Science					

DEPARTMENT OF JOURNALISM AND MASS COMMUNICATION

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PJM18E81	SCRIPTING FOR MEDIA	2	0	0	2	2

INSTRUCTIONAL OBJECTIVES

SUBJECT REQUIREMENT
At the end of every unit, the students will be expected to submit an assignment or make a presentation as a part of internal assessment.

UNIT I
Script-writing as a creative enterprise:
• Creative thinking
• The creative process
• Stages in the craft of script-writing
• Basic story idea
• Narrative synopsis outline – scene breakdown and full-fledged script

UNIT II
Narrative structure:
• Beginning – middle – end
• Conflict, development, climax, and denouement
• Story, storyline, plot and treatment
• Principles of suspense and surprise

UNIT III
Elements of a narrative: Point of attack, exposition, planting, point of view, pace, tone subject matter, title, openings, contrast, coincidence, tension, release, laughter

UNIT IV
Characterisation
• Character biography,
• tags,
• stereotyping,
• two dimensional versus three-dimensional characters,
• guiding principles for evolving effective and credible characters

UNIT V
Formats for media scripts:
• Audio versus audio-visual scripts, shooting scripts and storyboards
• Writing versus directing and other related areas
   a. Writing for current affairs for TV and radio – news, sports, cultural, documentaries
   b. Writing for fiction – ads, short film, converting the narrative into a video script

TEXT BOOKS
1. Ahuja (2005), B.N: Audio Visual Journalism, Delhi, Surjeet Publications,.
2. Gothams (2006), 'Writers' Workshop Faculty': Writing Movies, New York, Bloomsberg,.

REFERENCE
1. Anthony Friedmann (2010), Writing for Visual Media, Taylor & Francis,.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PJM18E82	COPY WRITING	2	0	0	2	2

INSTRUCTIONAL OBJECTIVES

- To familiarize the students with various types of copywriting and develop their inherent writing skills.
- To train students to generate, develop and express ideas.
- To familiarize the students with contemporary advertising techniques.

SUBJECT REQUIREMENT

At the end of every unit, the students will be expected to submit an assignment or make a presentation as a part of internal assessment.

UNIT I

Copy writing, Introduction, Principles of copy writing, writing for direct mail-letters, product brochures, leaflets, folders etc.

UNIT II

The skill of proof-checking - Copy for specialized areas - Corporate advertising,Recruitment ads,Political advertising, Image advertising, Fashion and Life style advertising, Non-commercial / public service advertising, Awareness advertising, Food and beverages, Durables, Personal products

UNIT III

Different types of copy: Advertorials, Infomercials, Slogan and jingle ads, Humour/sex/fear/anxiety ads, Feel-good ads, Light fantasy, Demonstrations/testimonials, Use of celebrity, Slice of life, Reason why, Fund raising copy, Comparative copy, Motivational copy.

UNIT IV

Copy for different audiences: Children, Women-Homemakers, modern women, Senior citizens, Executives, Youth

UNIT V

Website copywriting – content marketing and blogging – writing email and newsletter – direct mail copywriting – writing persuasive advertisement – press release writing

TEXT BOOKS
1. Mark Shaw (2012), Copywriting: Successful Writing for Design, Advertising and Marketing, Laurence King Publishing,.
2. Joseph Sugarman (2012), The Adweek Copywriting Handbook: The Ultimate Guide to Writing Powerful Advertising and Marketing Copy From one of the Top Amercian Copywriter's, John Wiley & Sons, 2012.

REFERENCE
1. Robert W. Bly (2005), The Copywriter's Handbook: A Step-By-Step Guide To Writing Copy That Sells, Owl Books Henry Holt and Company.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PJM18E83	MEDIA TRENDS, CHALLENGES AND ISSUES	2	0	0	2	2

SUBJECT REQUIREMENT

At the end of every unit, the students will be expected to submit an assignment or make a presentation as a part of internal assessment.

UNIT I - RELIGION AND MEDIA

Mediatisation of Religion Transformation of Religious Authority Contemporary media and Religious genres (Reality TV, Spiritual TV mythological, e portals of religious institutions) Religion, Spirituality and Consumer Culture

UNIT II - GENDERED SPACES AND MEDIA

Analysing gender in media texts (advertising, news genre, TV) Media and Modern Masculinities Queer Identities News, gender and Journalism Public spaces, gender and media

UNIT III - ISSUES OF MEDIA OWNERSHIP

Concentration of Media Ownership: Debates and Issues Mergers and acquisitions Politicians and media control Ownership and its impact on editorial independence/ news content and pluralism Advertising revenue vs editorial policies

UNIT IV - NATIONAL SECURITY, DEMOCRACY AND THE MEDIA

National Security and Role of Media Terrorism and Challenges before Media Parliament, Democracy and Role of Media Political reforms and Media Coverage

UNIT V - MEDIATED TECHNOLOGY AND SOCIETY

Media Technologies as mediation Media Technologies and Empowerment of Rural communities Media Technologies and identity
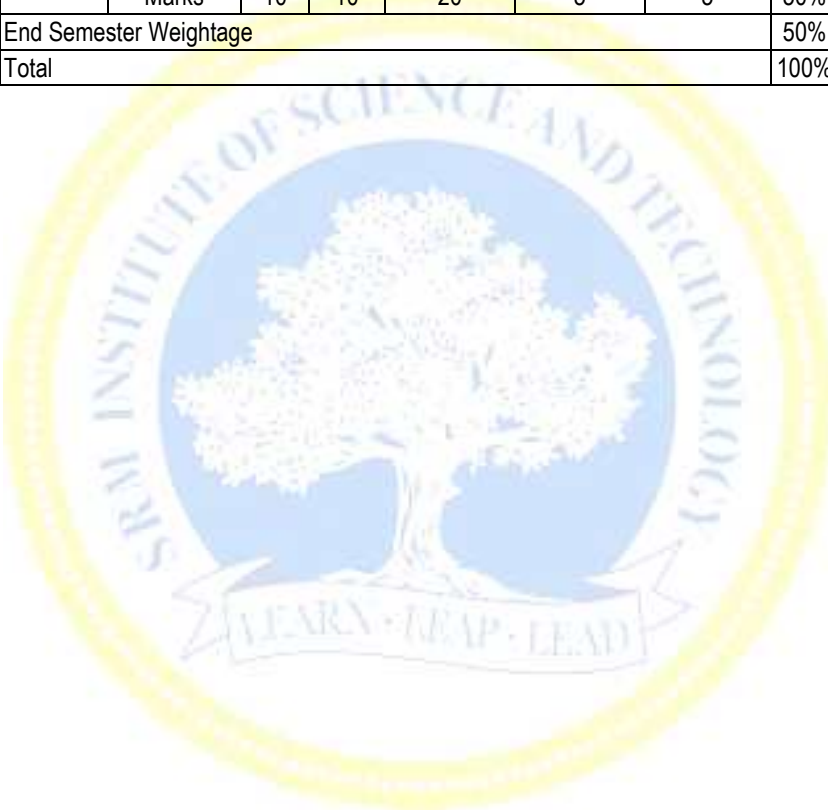
TEXT BOOKS:

1. Freedman, Des, and Daya Kishan Thussu, eds. Media and Terrorism: Global Perspectives, SAGE Publications Limited, 2011.
2. Herrick, Dennis F. Media management in the age of giants: Business dynamics of journalism, UNM Press, 2012.

REFERENCE

1. Stephen J. A. Ward, Global Media Ethics: Problems and Perspectives, John Wiley & Sons, 2013.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PJM18E84	MEDIA AND CULTURAL STUDIES	2	0	0	2	2

SUBJECT REQUIREMENT
At the end of every unit, the students will be expected to submit an assignment or make a presentation as a part of internal assessment.

UNIT I - UNDERSTANDING CULTURE
Definitions: Mass Culture, Popular Culture, Folk Culture Media and Culture Folk Media as a form of Mass Culture Live performance Media Technologies and Marshall McLuhan

UNIT II - CRITICAL THEORY AND MEDIA STUDIES
Reality as Construct Consumer Culture & Gratification Political Economy Ideology and Hegemony

UNIT III - SEMIOTICS AND MEDIA
Media as Texts Sign as Exchange Representation

UNIT IV - AUDIENCES
Active Audiences, Reception Studies Approach Women as Audiences Sub Cultures Fandom

UNIT V - CROSS CULTURAL COMMUNICATION: CONCEPT, GENESIS AND PROCESS
Methods of cross cultural communication Barriers in cross cultural communication Imperialism and colonization
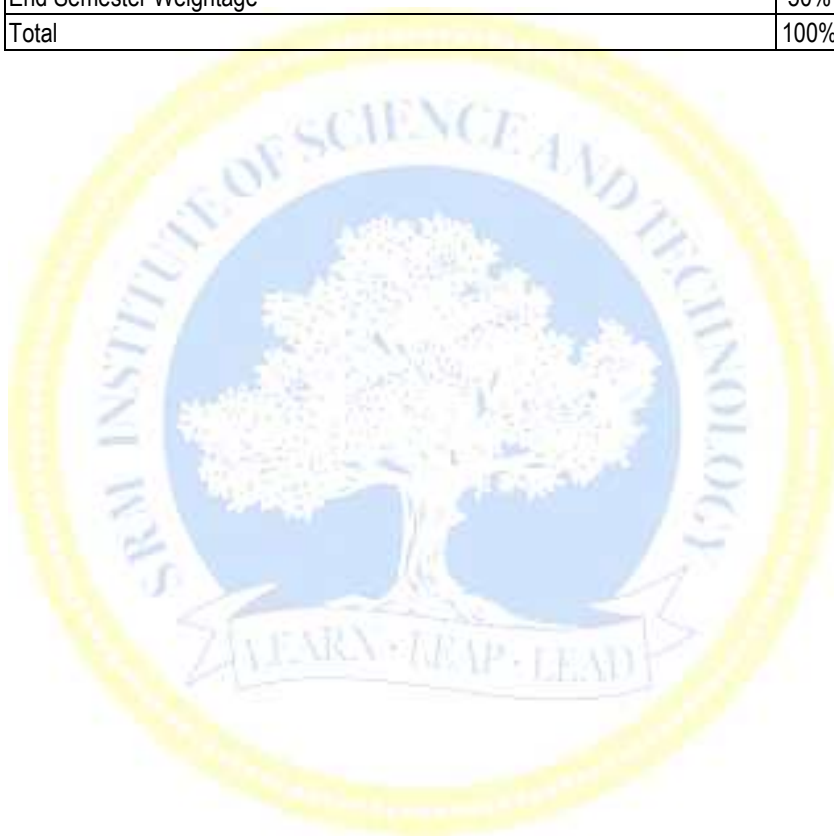
TEXT BOOKS
1. Fill C, Marketing Communications: Interactivity, Communities and content5th ed., FT Prentice Hall, 2009.
2. Pickton D & Broderick A, Integrated marketing communications 2ND ED., Pearsons, 2009.

REFERENCE
1. Jane Stokes, How to Do Media and Cultural Studies, SAGE Publication, 2012.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PAF18E81	FINANCIAL ACCOUNTING	2	0	0	2	2

OBJECTIVES
1. To make the students to acquire basic accounting knowledge
2. To inculcate necessity of accounting uses

UNIT I
Meaning and scope of Accounting, Basic accounting concepts and conventions – Objectives of accounting – accounting transactions.

UNIT II
Double entry book keeping Journal, Ledger, - -Subsidiary books and cash books

UNIT III
Preparation of Trial balance- Errors affecting Trial Balance and not affecting trial balance-Rectification of errors only simples problems)

UNIT IV
Preparation of Final accounts – Adjustments – Closing stock, outstanding and prepaid items, Depreciation, Provision for bad debts, provisions for discount for debtors, interest on capital and drawings.
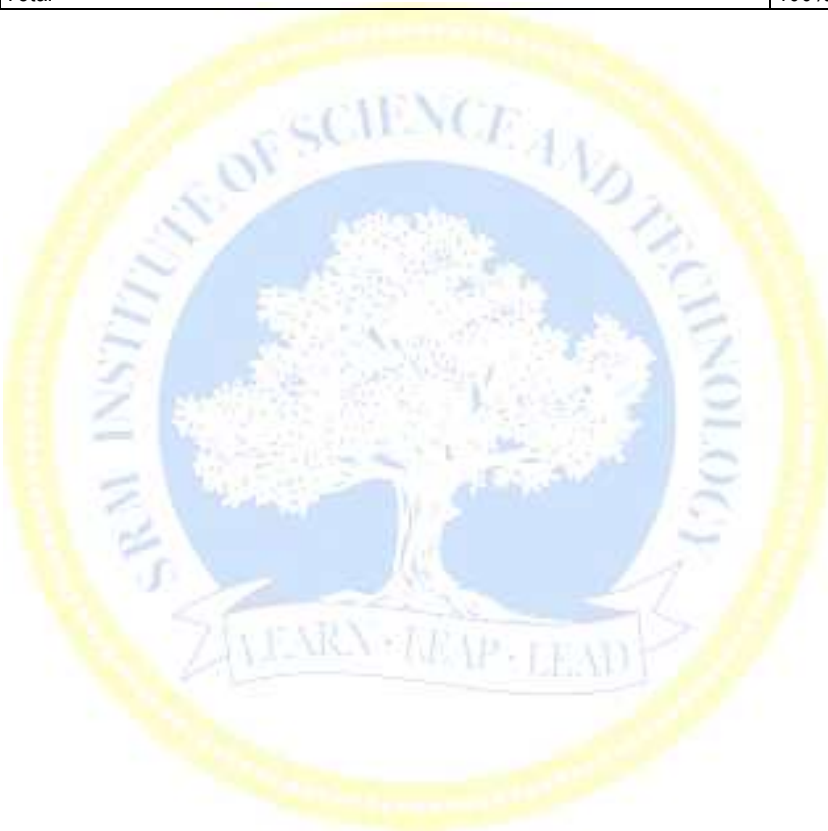
UNIT IV
International accounting standards- Accounting, Reporting

REFERENCES
1. Reddy & Murthy, T.S "Margham Publications", 2014 Edition
2. Pillai RSN, Bagavathi & Uma,S "Fundamentals of Advanced Accounting Financial Accounting", S.Chand & Company, Vol – II, 2013.
3. Battacharyya SK, "Accounting for Management", Vikas publishing house Pvt Ltd, 3rd Edition, 2007
4. Carl S. Warren, James M.Reeve & Philip E.Fess, "Financial Accounting",Thomson-
5. South –Western Publications, 9th Edition, 2004
6. Ashok Sehgal & Deepak Sehgal, "Advanced Accounting / Financial Accounting", Taxman s Publications, 6th Edition, 2008.

Course Nature : Theory

Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PAF18E82	STRATEGIC MANAGEMENT	2	0	0	2	2

OBJECTIVES
1. To make the students to learn practical decision making
2. To acquire knowledge about strategic decision models

UNIT I
The Business System – Objectives of a business up and balancing of objectives – mission – vision – goals.

UNIT II
Corporate Strategy – Nature and scope – Process of strategic planning – Formulation of strategy – Project life cycle – Strategic Management – Strategic decision – Making – business level sub-strategies.

UNIT III
Genetic Strategic alternatives – Stability strategy – Growth strategy – Retrenchment strategy – Combination strategy and Turnaround strategy

UNIT IV
External Growth Strategy – Merger, acquisition, amalgamation, joint ventures and others – Problems.

UNIT V
Implementation of Strategy – Elements of strategy – Leadership and organizational climate – Planning and control of implementation.

REFERENCES
1. Michael E.Porter, *"Corporate Strategy",* Competitive advantage
2. Peter F Drucker, *"Management Tasks",* Responsibilities, Practices
3. Bhattacharya S.K., *"Achieving managerial excellence",* Macmillan
4. Greek W.P. and Jauch L.R., *"Business policy and strategy management",* Mc.Graw.Hill

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%
SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C

III	PAF18E83	CONSUMER BEHAVIOUR	2	0	0	2	2

OBJECTIVES

1. To provide an in-depth understanding of the consumer and I buying processes.
2. To make the students to understand their determinants as relevant for marketing decision making.

UNIT I

Importance and nature of consumer behaviour – Types of consumer and their role – Consumer behaviour and marketing concept

UNIT II

Consumer Buying Process – Levels of Consumer Decision-making

UNIT III

Individual differences in consumers – Needs and Motivation, Perception, Attitude and Change

UNIT IV

Family and household influence on consumer buying behaviour – Group and their influences

UNIT V

Models of Consumer Behaviour and Business buying behaviour – An overview of contemporary models.

REFERENCES

1. Schiffman, L.G. and L.L.Kanuk, *"Consumer Behaviour",* Prentice Hall
2. Engel, J.F., Roser D. Blackwell and Paul W. Miniard, *"Consumer Bheaviour",* Cengage Learning
3. Peter, J.Paul, and Jerry C. Olson, "*Consumer Bheaviour and Marketing Strategy",* McGraw Hill
4. Assael, H., *"Consumer Behaviour and Marketing Action",* Cengage Learning.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PAF18E84	COST AND MANAGEMENT ACCOUNTING	2	0	0	2	2

OBJECTIVES
1. To make the students non major allied students to have cost and management accounting knowledge
2. To inculcate the cost and management accounting practices

UNIT I
Introduction of Cost Accounting – Definition Cost, Costing and Cost accounting-Objectives

UNIT II
Cost Sheet-Elements of Cost-types of Cost-Tender and Quotations.

UNIT III
Management Accounting – Meaning, scope, importance and limitations – Management Accounting Vs. Cost Accounting – Analysis and Interpretation of Financial Statement-common size statements and comparative balance sheets.

UNIT IV
Ratio Analysis – Meaning - Classification of Ratios- Short term and long term solvency ratios

UNIT V
Budgets and Budgetary Control – Types of Budgets – Fixed and Flexible Budgets.

REFERENCES
1. Reddy and Hariprasad reddy T.S 'Cost and Management Accounting' Margham Publications
2. 2.Choudhary Anu Prasad Roy and Amitava Bhattacharya, Cost and Management Accountancy Methods and Techniques, Calcutta New central book Agency 1991.
3. Horncren C.T 11th edition, cost accounting- A managerial emphasis, Newdelhi, Pearson education, 2002.
4. Kaplan, Advanced management accounting, 3rd edition Pearson education, NewDelhi ,2002

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%

| End Semester Weightage | 50% |
| Total | 100% |

DEPARTMENT OF ECONOMICS

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PES18E81	MONEY AND BANKING	2	0	0	2	2

UNIT I - INTRODUCTION

Evolution and functions of money – the barter system – evolution of money classification-functions – circular flow of money- monetary standard – the gold standard- bimetallism- greshams law- paper currency- principles and methods of note issue.

UNIT II – VALUE OF MONEY

Fishers quantity-theory of money- the cash transactions approach-the Cambridge equation-the cash balance approach- Milton Friedman's restatement of quantity theory of money- Keynes reformulated quantity theory of money- its superiority.

UNIT III – SUPPLY OF MONEY

Supply of money- different views- determinants- changes in supply of money- supply function-volume of money supply in India- factors affecting inflation- definitions-types-effects- control.

UNIT IV – COMMERCIAL BANKING

Origin and growth- types – process of credit creation- credit instruments-bankers clearing house-progress of nationalized banks.

UNIT V – CENTRAL BANK

Nature and functions of central bank-reserve bank of India-history structure traditional and promotional central banking- functions of reserve bank of India.

REFERENCES

1. R.Cauvery, Sudhanaya U.K., *Monetary economics,* S.Chand and Co,2011
2. Chandler, L.V., *Economics of Money and Banking* (UBS) Revised Edition, Harper and Brothers Publishers , New York,1948.
3. Sachdeva.T.N., *Money, Banking and international trade* ,Sudha Publications,2007
4. Suraj B.Gupta, *Monetary Economics, Institutions, Theory and Policy*, S.Chnad and Co.
5. Gail E.Makinen, *Money, Interest and the Price Level*, Prentice Hall, 1978.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PES18E82	MANAGERIAL ECONOMICS	2	0	0	2	2

UNIT I - INTRODUCTION TO MANAGERIAL ECONOMICS

Meaning and Definition – Nature and scope – Economic Theory and Managerial Theory – Role and Responsibility of Managerial Economist – Managerial Economics and Decision Making – objectives of Business firms - Fundamental Economic concepts - Incremental Principle– Opportunity cost principle – Discounting Principle – Equi marginal principle.

UNIT II - THEORY OF DEMAND AND SUPPLY

Law of demand – Demand Function – Demand curves – Types of Demand - Elasticity of Demand – Types of Elasticity of Demand – Measurement of price Elasticity of Demand – Application of Elasticity in Managerial Decisions - Law of Supply and Elasticity of Supply.

UNIT III - THEORY OF CONSUMER CHOICE

Indifference curve Approach, Revealed preference theory of consumer. Choice under Risk – demand Forecasting – Methods of Demand forecasting.

UNIT IV - PRODUCTION THEORY

Production Function – Production with one and two variable inputs, law of Diminishing returns and Business Decisions – Cost Concepts – their Nature, Shape and Interrelationship.

UNIT V - MARKET STRUCTURE

Market Structure and Price Determination-Characteristics of Different Market structures- Price Determination and firms Equilibrium in short run and long run under Perfect Competition- monopoly – monopolistic competition & oligopoly - Pricing Practices - Classification and Measurement of Profit – Break Even Analysis.

REFERENCES

1. D. N. Dwivedi, *Managerial Economics*, 7th edition, Vikas Publishing,2009.
2. Prof. ABN Kulkarni and Dr. A. B. Kalkundrikar, *Managerial Economics*, R.Chand & Co, 2009.
3. Dr. D. M. Mithani, *Managerial Economics*, 5th edition, Himalaya Publishing House, 2009.
4. Paul A. Samuelson, *Economics*, 19th edition, Tata McGraw Hill,1948.
5. Petersen, Lewis and Jain, *Managerial Economics*, 4th edition, Pearson,2006

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PES18E83	DEMOGRAPHY	2	0	0	2	2

UNIT I - INTRODUCTION TO DEMOGRAPHY

Meaning and scope of demography; Components of population growth and their inter-dependence; Theories of population — Malthus; Optimum theory of population; Theory of demographic transition

UNIT II - POPULATION CHANGE: DETERMINANTS AND TECHNIQUES

Determinants – Fertility, Nuptiality, Migration and Mortality; Techniques - Crude birth and death rates, age specific birth and death rates, standardized birth and death rates; Fertility - Factors affecting fertility — Socio-economic factors; Nuptiality - Concept and analysis of marital status, single mean age at marriage - Migration – Net migration rate - Mortality — Mortality at birth and infant mortality rate; Sex and age pattern of mortality; Factors for decline in mortality in recent past.

UNIT III - POPULATION: STRUCTURE AND PROJECTION

Population trends in the twentieth century; Population explosion - International aspects of population growth and distribution; Demographic effects of sex and age structure, economic and social implications, Demographic Dividend and Age pyramids; concept of stationary, stable and quasi - stationary population; Projections — Uses and techniques – Cohort Component Projection technique.

UNIT IV - SOURCE OF DEMOGRAPHIC DATA IN INDIA

Study of census in India— History of Census in India; Nature of information collected in 2001 and 2011 census in India; National Family Health Survey (NFHS) I, II and III and District Level Household Survey(DLHS); their relative merits and demerits.

UNIT V - POPULATION AND DEVELOPMENT WITH REFERENCE TO INDIA

Population policy in India — Population, economy and environment linkages – population and human development issues – Population and Millennium Development Goals (MDG); education and fertility, Migration and urbanization – trends, pattern and consequences; population aging – Causes, trends, issues and consequences; Skewed sex ratio in India.

REFERENCES

1. Jacob S. Siegel and David A. Swanson , *The Methods and the materials of Demography,*
2. Second Edition, Elsevier Science. USA, 2004
3. John weeks , *Population: An introduction to concepts and issues*, Wordsworth Learning.
4. Singapore 9th edition, 2005.
5. Pathak, K.B. and F.Ram, *Techniques of Demographic Analysis*, Mumbai: Himalaya
6. Publishing House,1998.
7. Agarwal, S.N.,*India's Population Problem*, Tata McGraw Hill, Mumbai, 1985.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PES18E84	INTERNATIONAL BUSINESS	2	0	0	2	2

UNIT I - GLOBALISATION

The Globalisation of the world Economy -The Changing Nature of International Business.Differences in International Business.

UNIT II - WORLD BUSINESS ENVIRONMENT

Political Environment -Economic Environment – Legal Environment -The Determinants of Economic Development - States in Transition. Difference in Culture: Introduction - Social Structure - Religion - Language - Education -Culture and the Workplace - Cultural Change -Cross-Cultural Literacy - Culture and competitive Advantage - Risks in international business.

UNIT III - THE GLOBAL TRADE AND INVESTMENT ENVIRONMENT

Introduction – An Overview of Trade Theory - Absolute Advantage - Comparative Advantage - Heckscher - Ohlin Theory - The New Trade Theory - National Competitive Advantages - Porter's Diamond The Revised Case for Free Trade - Development of the Multilateral Trading System- WTO & development of World trade - Regional grouping of countries and its impact.

UNIT IV - FOREIGN DIRECT INVESTMENT

Introduction - Foreign Direct Investment in the World Economy - Horizontal Foreign Direct Investment - Vertical Foreign Direct Investment. Benefits and advantages to host and home countries. The Global Monetary System -The Foreign Exchange Market: Introduction - The Function of the Foreign Exchange Market.

UNIT V - STRATEGIES OF INTERNATIONAL BUSINESS

Strategy and the Firm - Profiting from Global Expansion - Pressure for Cost Reductions and Local Responsiveness - Strategic Choice. Mode of Entry and Strategic Alliances: Introduction - Entry Modes - Selecting and Entry Mode - Strategic Alliances - Making Alliances Work – International Marketing Operations. Exporting, importing and counter trade- introduction - Export and Import Finance- Export assistance.

REFERENCES

1. Hill.C.W; *International Business:* Competing In The Global Market Place, Irwin – McGraw Hill 1999.
2. Philip R.Cateora, *International Marketing*, Irwin McGraw Hill, 9th Edn,2007.
3. Shivaramu, *International Business*, Macmillan India.
4. Francis Cherunilam, *International Business*, Wheeler Publications,2007.
5. Charles W.L, *International Business,* Hill, Irwin - McGraw Hill, 1998.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PES18E85	ECONOMIC ADMINISTRATION	2	0	0	2	2

UNIT I - NATIONAL INCOME

Concept of National Income -Circular flow of income; Methods of calculating National Income: Value Added or Product method, Expenditure method, Income method. Concepts and Aggregates Related to National Income: Gross National Product (GNP), Net National Product (NNP), Gross and Net Domestic Product (GDP and NDP) – at Market Price, at Factor Cost; National Disposable Income (Gross and Net), Private Income, Personal Income and Personal Disposable Income; Real and Nominal GDP-GDP and Welfare.

UNIT II - GOVERNMENT BUDGET AND THE ECONOMY

Concept and Types of Tax – Direct Tax and Indirect Tax, Canons of Taxation, Subsidy, Transfer Policy ; Budgetary Procedure-Types of Budget-Classification of Receipts : Revenue Receipt and Capital Receipt; Classification of Expenditure : Revenue Expenditure and capital expenditure; Various Measures of Government Deficit : Revenue Deficit, Fiscal Deficit, Primary Deficit-their Meaning and Implications.

UNIT III - REVENUE RESOURCES AND PUBLIC DEBT

Deficit Financing and Methods - An Evaluation of Fiscal Policy of Government of India – Highlights of Recent Budget; Sources of Public Debt-Internal and External Debt; Burden of Public Debt; Redemption of Public Debt; Debt Trap; Role of Public Debt with Special Reference to Developing Countries.

UNIT IV - MONEY MARKET AND CAPITAL MARKET

Nature and Functions of Indian Money Market- Nature and Functions of Indian Capital Market-Stock Markets - Meaning and functions of Stock Market - Functions of Securities Exchange Board of India (SEBI). Credit Control: Quantitative Measures: Bank Rate -Open Market Operations - Variable Reserve Ratio - Statutory Liquidity Ratio - Qualitative Credit Control: Limitations.

UNIT V - INDEX NUMBERS AND INFLATION

Inflation – Meaning and types – Effects of Inflation – Measures to Control Inflation – Inflationary Gap – Deflation – Meaning, Causes, Types, Effects – Deflationary Gap. Index Numbers: Type – Construction of Simple, Weighted, Chain-Base Index Numbers-Difficulties-Limitation- Index Numbers and Inflation.

REFERENCES

1. Dutt and Sundaram- *Indian Economy*, S Chand and Company, Delhi,2013
2. Agarwal- *Indian Economy*, Vikas Publishing Company, Delhi,2012
3. Misra and Puri -*Indian Economy*, Himalaya Pub.House,2005

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PES18E86	WOMEN STUDIES	2	0	0	2	2

UNIT I - WOMEN AND EMPLOYMENT

Sex Vs Gender-Visible and invisible work - Feminisation of Employment-Rural and Urban - Organised and unorganised sector-Time allocation and gender - Women in corporate sector-Globalisation and its impact on women's work - Women as entrepreneurs - Farm and non farm - Self employment and wage employment - Theories of labour market discrimination-Women and migration - Economic evaluation of women's work-Women's role in GDP.

UNIT II - WOMEN AND EDUCATION

Human capital Theory– Women's education - Determinants-school dropouts-Obstacles in women's higher education- Poverty and rural women's education-gender divide in higher education-professional and non professional education-Educational opportunities of rural women and urban women-Role of marriage in women's higher education-Women and technical education-Women's educational benefits in the family and in the economy.

UNIT III - WOMEN AND DEVELOPMENT

Theories of development-The paradigm shift in women"s development- Women in development - Women and Development - HDI-GDI-GEM-Milliennium Development Goals-Women and decision making-Intra household allocation of resources-Gender equality and equity-Dimensions and measurement of gender gap-Causes of gender in equalities-Wellbeing and quality of life-Empowerment and gender equality
.

UNIT IV - WOMEN, ENVIRONMENT AND HEALTH

Environment and gender issues-Women in nature - Women and CPR management - Waste management in the households-Environmental degradation - women in green economy-Green budgeting problems in healthy environment - women and environment in rural and urban. Reproductive healthcare-health care programmes - ageing problems- behaviour-nutritional status – Role of institution in women's health – Occupational health hazards.

UNIT IV - ROLE OF STATE AND WOMEN

Rights of women legal, social and political - Policies and programmes – Poverty employment and welfare programmes - National commission on women -Ministry of women and child development – Women's participation in local governance - women in administration – women as leaders-capacity building programmes - Role of NGO's- Panchayet Raj and co-operative institutions-Educational and health policies of women.

REFERENCES

1. Becker G.S. , "Human Capital: A Theoretical and Empirical Analysis", Columbia University Press, New York. 1995
2. Kind M and Hill M.A (eds) ,"Women's Education in Developing Countries: Barriers Benefits and Politics", John Hopkins, Baltimore. 1993
3. Seth M, "Women and Development", Sage Publications, New Delhi. 2001
4. Shanthi K. , "Women in India", Anmol Publications, New Delhi, 2005
5. ILO , "Women's Participation in the Economic Activity of Asian Countries", ILO, Geneva, 1978.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

DEPARTMENT OF COMPUTER APPLICATIONS (PG)

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PCA18E81	DATABASE MANAGEMENT SYSTEMS	0	1	1	2	2

INSTRUCTIONAL OBJECTIVES
1. To understand the concepts of database security and reliability.
2. To enable the learner to become a Database application programmer.

UNIT I - INTRODUCTION AND CONCEPTUAL MODELING
Purpose of database system - Advantages of DBMS over file processing System-View of data-Data abstraction-Data Independence - Data models - Database users - Database Administrator - DBMS system structure.

UNIT II - SQL
Data Definition Language Statements – Data manipulation language statements – Transaction Control Language Statements - Data Control Language statements

UNIT III - FUNCTIONS
Scalar functions – Group functions – Set operators – Joins. PL/SQL: Basics – Trigger – Exception Handling.

UNIT IV - RELATIONAL MODEL AND NORMALIZATION
Entity Relationship model basic concepts – Relational model - Decomposition – Functional Dependency – Normalization: 1NF - 2NF-3NF - BCNF- Multi value dependency and 4NF - 5NF.

UNIT V - DATA STORAGE
Data Storage: Physical Storage media – Magnetic Disks – File and Record organization. Indexing: Primary index – Secondary indices. Hashing: Static hashing – Dynamic hashing.

TEXT BOOK
1. Abraham Silberschatz, Henry F. Korth, Sudarshan, S (2005), Database System concepts, Fourth Edition, McGraw Hill, New Delhi (For 1 to 5 units).

REFERENCES

1. Kevin Loney, Gerorge Koch (2002), Oraclei The Complete Reference, McGraw Hill, New Delhi.
2. Ragu Ramakrishnan (1998), Database management Systems, WCB / Mc Graw Hill, New Delhi.
3. Alexis Leon, Mathews Leon (1999), Database Management Systems, Vikas Publishing House Pvt. Ltd., New Delhi.
4. Date C.J (2003), An Introduction to database, version 2, Addison Wesley, New York.

Course Nature : Practical						
Assessment Method (Max.Marks: 100)						
In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	Total LTP	C
II	PCA18E82	WEB TECHNOLOGY	0	1	1	2	2

INSTRUCTIONAL OBJECTIVES

1. To provide knowledge on Internet and its related concepts.
2. To enrich the knowledge of scripting languages.
3. To introduce advance HTML tags.
4. To enable the learner to become a Web Designer.

UNIT I - INTRODUCTION TO INTERNET AND WORLD WIDE WEB

History of the Internet, Email concepts, Sending and Receiving files by E-mail, Intranet, Domain Name System, Web Browsers, Web Pages.

UNIT II - HYPERTEXT MARKUP LANGUAGE

Basics of HTML, HTML Document display, Formatting Text, Link, Lists, Images, Tables, Forms, and Frames.

UNIT III - USAGE OF CASCADING STYLE SHEET

Syntax of CSS, Style sheets types, Properties and Text attributes Padding, List properties, List Properties, Positioning, Margins, Colors, Properties and Table attributes

UNIT IV - FUNDAMENTALS OF JAVA SCRIPT

Introduction to JavaScript, JavaScript Elements, Variables, Operators, Control Statements, Arrays, Functions.

UNIT V - SERVER-SIDE PROGRAMMING

Client-Side Scripting and Server-Side Scripting, Servlets – Definition, Active Server Pages –Comparison of ASP over JSP.

TEXT BOOK

1. Deven N. Shah (2012), A Complete Guide to Internet and Web Programming, DreamTech Press, New Delhi (For 1 to 5 units).

REFERENCES

1. Raj Kamal (2002), Internet and Web Technologies, TataMcGraw Hill, New Delhi.
2. Margaret Levine Young (2002), Internet the Complete Reference, TataMcGraw Hill, Second Edition, New Delhi.

Course Nature : Practical
Assessment Method (Max.Marks: 100)

In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PCA18E83	PROGRAMMING IN JAVA	0	1	1	2	2

INSTRUCTIONAL OBJECTIVES:
1. To understand the principles and concepts of object programming.
2. To learn multithreading concepts.
3. To enable the learner to pursue careers in Java solution Architect/Java Programmer

UNIT I - INTRODUCTION TO JAVA
The Creation of Java- The Java Buzzwords- An Overview of Java- Data Types,- Variables-Arrays- Operators- Control Statements.

UNIT II - OBJECT ORIENTED CONCEPTS
Introducing Classes- Overloading Methods- Introducing Access Control- Introducing final- Inheritance Basics- Method Overriding- Using Abstract Classes- The String Constructors- Special String Operations- String Comparison- String Buffer.

UNIT III - PACKAGES INTERFERENCE EXCEPTION HANDLING AND MULTITHREADING
Packages – Interfaces - Exception Handling - The Java Thread Model - The Main Thread - Creating a Thread - Thread Priorities – Synchronization - Interthread Communication.

UNIT IV - APPLET, AWT AND EVENT HANDLING
Applet Basics - Applet Architecture - An Applet Skeleton - Simple Applet Display Methods - Requesting Repainting - The HTML APPLET Tag - AWT Classes - Window Fundamentals - Working with Graphics - Event Handling - The Delegation Event Model - Event Classes - Event Listener Interfaces.

UNIT IV - JAVA CONSOLE INPUT AND OUTPUT AND FILE
Enumerations - I/O Basics - Reading Console Input - Writing Console Output - The PrintWriter Class - Reading and Writing Files - Collections Overview - The Java I/O Classes and Interfaces – File - The Stream Classes - The Byte Streams - The Character Streams.

TEXT BOOK

1. Herbert Schildt (2007), Java: The Complete Reference, The McGraw-Hill, Seventh Edition, New Delhi (For 1 to 5 units).

REFERENCES

1. S.Horstmann, Gray Cornell (2001), Core Java 2 Volume In, Fundamentals, Addition Wesley, New York.
2. Amold and Gosling, J. (2000), The Java Programming Language, Addition Wesley, 2nd Edition, New Delhi.
3. Art Gittleman (2002), Ultimate Java Programming, Wiley Publications, New York.
4. Herbert Schildt (2007), Java: The Complete Reference, the McGraw-Hill, Eight Edition, New Delhi.

Course Nature : Practical					
Assessment Method (Max.Marks: 100)					
In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PCA18E84	CONTENT MANAGEMENT SYSTEMS	0	1	1	2	2

SUBJECT OBJECTIVES

At the end of this SUBJECT the learner is expected:
1. To acquire basic knowledge about CMS
2. To gather extensive knowledge in designing skills in CMS
3. To learn about various types of CMS

UNIT I - CONTENT

Defining Data, Information, and Content - Content Format - Content Structure - Content Functionality - What Is Content Really?

UNIT II - CONTENT MANAGEMENT

Understanding Content Management - Major Parts of a CMS - The Branches of Content Management - The Roots of Content Management.

UNIT III - DOING CONTENT MANAGEMENT PROJECTS

Doing CM Projects Simply - Staffing a CMS - Getting Ready for a CMS - Doing Requirements Gathering - Doing Logical Design - Selecting Hardware and Software - Implementing the System.

UNIT IV - DESIGNING A CMS

Designing a CMS Simply - The Wheel of Content Management - Working with Metadata - Cataloguing - Designing Publications - Designing Content Types - Designing Content Access - Designing Workflow and Staffing Models.

UNIT V - BUILDING A CMS & CASE STUDY

Building a CMS Simply - Building Collection Systems - Building Publishing Systems. Case Tools – Joomla.

TEXT BOOK

1. Bob Boiko – Content Management Bible, 2nd Edition - Wiley Publishing, Inc.- 2005 (Unit I – V)

REFERENCES

1. Eric Tiggeler - Joomla! 3 Beginner's Guide - PACKT Publishing – 2013.
2. Sofia Hauschildt - CMS Made Simple 1.6 Beginers Guide – PACKT Publishing – 2010.
3. Ishai Sagi – SharePoint 2010 How To – Pearson Education – SAMS 2011.

Course Nature : Practical						
Assessment Method (Max.Marks: 100)						
In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

DEPARTMENT OF COMPUTER SCIENCE

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PIT18E81	Office Automation	0	1	1	2	2

INSTRUCTIONAL OBJECTIVES
At the end of this SUBJECT the learner is expected:
1. To practice day to day document creating using MS-Word
2. To develop the skills in using MS-Office software for administrative purposes.
3. To practice powerpoint for efficient presentations.

List of Experiments
1. Document Creation, Text Manipulation With Scientific Notations
2. Design An Advertisement
3. Design A Visiting Card
4. Table Creation, Table Formatting And Conversion
5. Mail Merge And Letter Preparation
6. Drawing—Flow Chart
7. Formula – Formula Editor
8. Spreadsheet – Inclusion Of Object, Picture And Graphics, Protecting The Document
9. Chart – Line, Xy, Bar And Pie
10. Impress Presentation Using Wizard
11. Presentation   On Tourism
12. Presentation about Your College and Department Using Animations.

Course Nature : Practical						
Assessment Method (Max.Marks: 100)						
In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PIT18E82	Web Technologies	0	1	1	2	2

INSTRUCTIONAL OBJECTIVES
1. To familiarize basics of Internet.
2. To manage the Web designing and uploading.
3. To understand various scripting languages like Java scripts and VB scripts.

List of Experiments
1. Create an XHTML page to demonstrate the usage of a. Text Formatting tags, b. Links c. Images d. Tables
2. Develop and demonstrate the usage of inline and external style sheet using CSS
3. Develop and demonstrate a XHTML file that includes JavaScript script for the following problems: a) Input: A number n obtained using prompt Output: The first n Fibonacci numbers b) Input: A number n obtained using prompt Output: A table of numbers from 1 to n and their squares using alert.
4. Develop and demonstrate using JavaScript, a XHTML document that displays random numbers (integers).
5. Develop and demonstrate, using JavaScript script, a XHTML document that collects the USN (the valid format is: A digit from 1 to 4 followed by two uppercase characters followed by two digits followed by two upper-case characters followed by three digits; no embedded spaces allowed) of the user. Event handler must be included for the form element that collects this information to validate the input. Messages in the alert windows must be produced when errors are detected. b) Modify the above program to get the current semester also (restricted to be a number from 1 to 8).
6. a) Develop and demonstrate, using JavaScript script, a XHTML document that contains three images, stacked on top of each other, with only enough of each showing so that the mouse cursor can be placed over some part of them. When the cursor is placed over the exposed part of any paragraph, it should rise to the top to become completely visible. b) Modify the above document so that when an image is moved from the top stacking position, it returns to its original position rather than to the bottom.
7. Develop using JavaScript script, an XHTML document that use of onload and onfocus events.

8. a) Design an XML document to store information. The information must include USN, Name, Name of the College, Brach, Year of Joining, and e-mail id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the

document. b) Create an XSLT style sheet for one student element of the above document and use it to create a display of that element.

Course Nature : Practical						
Assessment Method (Max.Marks: 100)						
In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PIT18E83	PHP Basics	0	1	1	2	2

INSTRUCTIONAL OBJECTIVES

At the end of this SUBJECT the learner is expected:
1. To acquire knowledge about Server Scripting Language.
2. To learn to create dynamic web pages.

List of Experiments

1. Write a PHP script to get the PHP version and configuration information.
2. Write a PHP script to display the following strings.
3. Create a simple HTML form and accept the user name and display the name through PHP echo statement.
4. Write a PHP script to get the client IP address.
5. Write a PHP script, which changes the color of the first character of a word.
6. Create a script that displays 1-2-3-4-5-6-7-8-9-10 on one line. There will be no hyphen (-) at starting and ending position.
7. Create a script using a for loop to add all the integers between 0 and 30 and display the total.
8. Write a function to sort an array.
9. Write a PHP function that checks if a string is all lowercase.
10. Write a PHP function that checks whether a passed string is a palindrome or not.

Course Nature : Practical						
Assessment Method (Max.Marks: 100)						
In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PIT18E84	Android Fundamentals	0	1	1	2	2

INSTRUCTIONAL OBJECTIVES

At the end of this SUBJECT the learner is expected:
1. To Design and develop useful Android applications with compelling user interfaces by using, extending, and creating your own layouts and Views and using Menus.
2. To transfer apps to mobile. Understanding the new technology in java integrated with android.
3. To do Exercises using PhoneGap and the Android SDK using various features of Android.

List of Experiments

1. Introduction to android operating system and study of basic widgets.
2. Study of android lifecycle and demonstration of it.
3. Study of intents and types of intents
4. Study of list views and adapters
5. Study of dialog interfaces in android
6. Study of Sensors in android
7. Study of Services in android
8. Study of touch in android

Course Nature : Practical						
Assessment Method (Max.Marks: 100)						
In Semester	Assessment Tools	Observation Note Book	Output Result in time	Model Examination	Regularity and Discipline	Total
	Marks	10	10	20	10	50
End Semester	Assessment Tools	Record Note Book	Program Writing	Debugging	Result / Output	Total
	Marks	10	10	15	15	50
Total						100

DEPARTMENT OF VISUAL COMMUNICATION

SEMESTER	COURSE CODE	Course Title	L	T	P	L+T+P	C
II	PVC18E81	Media Campaign	0	0	2	2	2

INSTRUCTIONAL OBJECTIVES
1. To understand the basics of Media Campaign
2. To apply the techniques in Media Campaign
3. To solve practical problems in the real life situations.

CLASS EXERCISE
(Students has to practices all the exercises)
(Each exercise carries 4 marks)
(Ten exercises x 4 marks = 40 marks & 10 marks for Regularity & Discipline- Total-50 Marks)
1. Set objectives
2. Research your Target audience
3. Evaluate the competition
4. Set a budget
5. Consider communication channels
6. Develop the right messages
7. Project the right image
8. Don't forget the legals
9. Monitor and measure
10. Feedback

RECORD WORK:
1. Create a Media Plan for a specific product or service.
2. Engage in primary and secondary research to understand the marketing problem.

(The students have to conduct one Media Campaign as a group (Maximum 5 members) for any one product as a group inside the campus and the media campaign should be professionally recorded and submitted in Print/ Digital form, which will be evaluated by the External Examiner)

MANUALS FOR PRACTICALS

1. Allison Saget (2012). The Event Marketing Handbook, First Edition, Dearborn Trade Publishing, USA
2. Julia Rutherford Silvers (2012). Professional Event Coordination, First Edition, John Wiley & Sons, USA
3. Entrepreneur Press (2011). Start Your Own Event Planning Business, First Edition, Entrepreneur Press, USA

Course Nature: Practical				
Assessment Method (Max. Marks: 100)				
In Semester	Assessment Tool	Studio/ Lab	Regularity and Discipline	Total
	Marks	40	10	50
End Semester	Assessment Tool	Record Work	Exam	Total
	Marks	20	30	50
Total				100

SEMESTER	COURSE CODE	Course Title	L	T	P	L+T+P	C
II	PVC18E82	Media Planning and Strategies	0	0	2	2	2

INSTRUCTIONAL OBJECTIVES
1. To understand the basics of Media planning and strategies
2. To apply the techniques in Advertising industry
3. To solve practical problems in the real life situations.

CLASS EXERCISE
(Students has to practices all five exercises)
(Each exercise carries 8 marks)
(Five exercises x 8 marks = 40 marks & 10 marks for Regularity & Discipline- Total-50 Marks)
1. Develop Situation Analysis
2. Define Media Objectives
3. Determine Media Strategy.
4. Detail Decisions in Media Flowchart
5. The challenges facing strategic
6. The data sources used in media analysis
7. Calculation of audience ratings, media share, reach and frequency
8. The strengths and weaknesses of various media

Record Work
1. Create a Media Plan for a specific product or service.
2. Engage in primary and secondary research to understand the marketing problem.

(The students have to conduct one Media Campaign for any one product as a group (Maximum 5 members) inside the campus and the media campaign should be professionally recorded and submitted in Digital form, which will be evaluated by the External Examiner)

MANUALS FOR PRACTICALS
1. William Goodrich (2011). Media Planning Workbook, First Edition, Marketing Communications LLC, USA
2. Ronald D. Geskey Sr., (2010). Media Planning and Buying In the 21st Century, First Edition, Palgrave MacMillan, New York
3. Roger Baron (2010). Advertising Media Planning, First Edition, McGraw- Hill Companies, USA

Course Nature: Practical				
Assessment Method (Max. Marks: 100)				
In Semester	Assessment Tool	Studio/ Lab	Regularity and Discipline	Total
	Marks	40	10	50
End Semester	Assessment Tool	Record Work	Exam	Total
	Marks	20	30	50
Total				100

SEMESTER	COURSE CODE	Course Title	L	T	P	L+T+P	C
III	PVC18E83	Film Appreciation	0	0	2	2	2

INSTRUCTIONAL OBJECTIVES

1. To understand the basics of Film appreciation
2. To apply the techniques in film industry
3. To solve practical problems in the real life situations.

CLASS EXERCISE

(Students has to view all eight screenings) (Each exercise carries 5 marks)
(Eight exercises x 5 marks = 40 marks & 10 marks for Regularity & Discipline- Total-50 Marks)

1. International award winning movies will be screened (once in a week/ 4 Movies)
2. National award winning movies will be screened (once in a week/ 4 Movies)
3. Student will be trained in reviewing and analyzing the movies
4. Students will be encouraged to participate and visit the film festivals.

RECORD WORK

1. Should write review for all screened movies

(The Students have to submit the exercise in the Record form for Practical exam, which will be evaluated by the External Examiner)

MANUALS FOR PRACTICALS

1. James Monaco (2009). How to Read a Film: Movies, Media and Beyond, First Edition, Oxford University Press, UK
2. Terry Bolas (2009). Screen Education: From Film Appreciation to Media Studies, First Edition, Intellect Books, UK
3. V. F. Perkins (1993). Film As Film: Understanding And Judging Movies, Third Edition, Da Capo Press, USA

Course Nature: Practical				
Assessment Method (Max. Marks: 100)				
In Semester	Assessment Tool	Studio/ Lab	Regularity and Discipline	Total
	Marks	40	10	50
End Semester	Assessment Tool	Record Work	Exam	Total
	Marks	20	30	50
Total				100

SEMESTER	COURSE CODE	Course Title	L	T	P	L+T+P	C
III	PVC18E84	Advertisement Film	0	0	2	2	2

			Making					

INSTRUCTIONAL OBJECTIVES
1. To understand the basics of Ad Film
2. To apply the techniques in Advertising industry
3. To solve practical problems in the real life situations.

CLASS EXERCISE
(Students has to practices all five exercises) (Each exercise carries 8 marks)
(Five exercises x 8 marks = 40 marks & 10 marks for Regularity & Discipline- Total-50 Marks)
1. Students should write original script for Ad film with story board (two excises)
2. Students should prepare Production Team & Budget
3. Student should get trained in handling camera and shoot scene or shot.
4. Students should handle non-linear editing with AVID/ FCP Software
5. Students should handle dubbing, Sound Effects & Jingles using the Audio Software

RECORD WORK
1. Commercial Ad Film for any concept (maximum 10 secs)
2. PSA film for any social issues (maximum 10 sces)

(The Students have to submit any one exercise in the digital form for Practical exam, which will be evaluated by the External Examiner)

REFERENCE
1. George E Belch (2010). Advertising and Promotion, First Edition, Tata McGraw Hill company Ltd., New Delhi
2. J.V. Vilanilam (2004). Advertising Basics A Resource Guide for Beginners, Second Edition, Jain Books, New Delhi
3. David Ogilvy (1985). Ogilvy on Advertising, Fifth Edition, Random House, USA

Course Nature: Practical				
Assessment Method (Max. Marks: 100)				
In Semester	Assessment Tool	Studio/ Lab	Regularity and Discipline	Total
	Marks	40	10	50

End Semester	Assessment Tool	Record Work	Exam	Total
	Marks	20	30	50
Total				100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	PBT18E81	VERMITECHNOLOGY	0	0	2	2	2

INSTRUCTIONAL OBJECTIVES
1. To understand the Vermi culture needs in environment
2. To develop an attitude for vermin culture business.

List of Experiments
1. General properties of the soil - structure of the soil -sand, clay, salt, types of soils
2. Soil organisms
3. Introduction to earthworm biology -physical and chemical effects of earth worms on soils
4. Types of vermicomposting
5. Container preparation
6. Bed method
7. Pit method
8. Vermicopost -setting up vermicompost quality N, P, K, C, N
9. Problems in vermiculture units - remedial suggestions
10. Vermicomposting as a tool for solid waste management - a small scale industry and it's economics

Course Nature : Practical							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tools	Observation Note Book	Practical Performance	Model Examination	Record Note book	Attendance	Total
	Marks	10	10	20	5	5	50
End Semester	Assessment Tools	Record Note Book	Spotters	Major Experiment	Minor Experiment	Result / Output	Total
	Marks	5	5	15	10	15	50
Total							100

.SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C

II	PBT18E82	MUSHROOM CULTURE TECHNIQUES	0	0	2	2	2

INSTRUCTIONAL OBJECTIVES
1. To provide students with a basic understanding and knowledge of mushroom cultivation.
2. To develop awareness among students about storage and utility of mushroom.

List of Experiments
1. Introduction about Fungi
2. Edible and non-edible mushroom
3. Morphology and raising a pure culture
4. spawn cultivation methods
5. Spawn preparation
6. Preparation of compost
7. Cultivation of button mushroom
8. Cultivation of oyster mushroom
9. Harvesting of mushroom
10. Pests and diseases of Edible mushrooms

Course Nature : Practical							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tools	Observation Note Book	Practical Performance	Model Examination	Record Note book	Attendance	Total
	Marks	10	10	20	5	5	50
End Semester	Assessment Tools	Record Note Book	Spotters	Major Experiment	Minor Experiment	Result / Output	Total
	Marks	5	5	15	10	15	50
Total							100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PBT18E83	BIO-PROCESSING TECHNOLOGY	0	0	2	2	2

INSTRUCTIONAL OBJECTIVES

1. To ensures the students to understand about the industrial processes and production of commercial products.
2. To study the design of the bioreactors and the kinetics and dynamics behind the bioprocess technology.

List of Experiments

1. Introduction to fermentation
2. Fermentation – types and classification
3. Basic requirements for fermentation
4. Design of a Fermentor
5. Sterilization methods
6. Media Preparation
7. Isolation of microorganisms
8. preservation of industrially important microorganisms
9. Fermentation processing
10. Biosensors - types and application in various industries.

Course Nature : Practical						
Assessment Method (Max.Marks: 100)						
In Semester	Assessment Tools	Observation Note Book	Practical Performance	Model Examination	Record Note book	Attendance	Total
	Marks	10	10	20	5	5	50
End Semester	Assessment Tools	Record Note Book	Spotters	Major Experiment	Minor Experiment	Result / Output	Total
	Marks	5	5	15	10	15	50
Total							100

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
III	PBT18E84	HEMATOLOGY AND BLOOD BANKING			2	2	2

INSTRUCTIONAL OBJECTIVES
1. To understand the basics and mechanisms of blood system.
2. To introduce students the different properties of blood and to explain how they act and mediate biochemical reactions.

List of Experiments
1. Blood: Definition, Characters and Composition
2. Coagulation Mechanism: Factors: Bleeding time, Clotting time
3. Anticoagulants
4. Collection Of Blood
5. Serum separation
6. Counting of Blood Cells
7. Total RBC count
8. WBC Count
9. Preparations of stains and staining techniques
10. ABO Grouping

Course Nature : Practical							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tools	Observation Note Book	Practical Performance	Model Examination	Record Note book	Attendance	Total
	Marks	10	10	20	5	5	50
End Semester	Assessment Tools	Record Note Book	Spotters	Major Experiment	Minor Experiment	Result / Output	Total
	Marks	5	5	15	10	15	50
Total							100

DEPARTMENT OF MATHEMATICS

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	18PMA2NA	NUMERICAL METHODS USING C++	2	0	0	2	2
INSTRUCTIONAL OBJECTIVES							
1.	To expose the students to various tools in solving numerical problems.						
2.	To enable the students to apply these methods in a computer environment.						

UNIT I - INTRODUCTION TO C++

Variables – Input and Output – If statement – Logical operators – Nested If and Switch statements – For statement – While statement – Arrays – Pointers – Library functions – Userdefined functions.

UNIT II - SYSTEM OF LINEAR EQUATIONS

Gauss-Elimination method – Pivoting – Gauss-Jordan Elimination method – Gauss-Seidal Iteration method.

Unit III - NON-LINEAR EQUATIONS AND INTERPOLATION

Bisection method – Newton's method – Interpolation - Newton's divided difference formula – Lagrange's interpolation – Newton's forward and backward difference formula.

UNIT IV - DIFFERENTIATION AND INTEGRATION

Numerical differentiation – Numerical Integration – Newton Cotes method – Trapezoidal rule – Simpson's rule.

UNIT V - ORDINARY DIFFERENTIAL EQUATIONS

Initial value problem – Euler's method – Runge-Kutta method – Boundary value problem.

TEXT BOOK:

1. JamesM.Ortega andAndrewS.Grimshaw., An Introduction to C++and Numerical Methods, Oxford University Press, New York, 1999.
2. JainMK, Iyengar S R K, Jain R K., Numerical Methods for Scientific and Engineering Computation, Second Edition, Wiley Eastern Ltd, New Delhi.

REFERENCES:

1. Balagurusamy E., Object Oriented Programming with C++, Tata McGraw Hill Publishing Company Ltd, New Delhi, 1996.
2. Froberg C E., Introduction to NumericalAnalysis, Second Edition, Addison-Wesley Publishing Company, 1972.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	P	L+T+P	C
II	18PMA2NB	APPLIED MATHEMATICS – I	2	0	0	2	2

INSTRUCTIONAL OBJECTIVES

1.	To expose the students to various tools in solving numerical problems.
2.	To enable the students to apply these methods in a computer environment.

UNIT I - ORDINARY DIFFERENTIAL EQUATIONS Second and higher order linear ODE – Homogeneous linear equations with constant and variable coefficients – Non-homogeneous equations – Solutions by variation of parameters.

UNIT II - FUNCTIONS OF SEVERAL VARIABLES Partial derivatives – Total differential – Taylor's expansions – Maxima and minima of functions– Differentiation under integral sign.

UNIT III - PARTIAL DIFFERENTIAL EQUATIONS Formation of PDE by elimination of arbitrary constants and functions – Solutions –General and singular solution- Lagrange's linear equation – Linear PDE of second and higher order with constant coefficients.

UNIT IV - FOURIER SERIES
Dirichlet conditions – General fourier series – Half range sine and cosine series – Parseval's identity – Harmonic analysis.

UNIT V - BOUNDARY VALUE PROBLEMS
Classification of PDEs – Solutions by separation of variables - One dimensional heat and wave equation.

REFERENCES:

1. *"Advanced Engineering Mathematics"* by **E. Kreyszig**, Eighth Edition,
2. John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2000.
3. "Higher Engineering Mathematics" by **B.S. Grewal, T**hirty Eighth Edition,
4. Khanna Publishers, New Delhi, 2004.

Course Nature : Theory

Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	L+T+P	C
III	18PMA3NA	**APPLIED MATHEMATICS – II**	2	0	2	2

INSTRUCTIONAL OBJECTIVES	
1.	To expose the students to various tools in solving differential equations.
2.	To enable the students to apply these methods in a computer environment.

UNIT I - Systems of differential equations, Phase Plane, Stability: Introduction: Vectors, Matrices - Introductory examples - Basic concepts and theory – Homogeneous linear systems with constant coefficients.

UNIT II - Phase Plane, Critical Points, Stability - Phase Plane methods for nonlinear systems – Nonhomogeneous linear systems.

UNIT III - Fourier integral theorem - Fourier transform pairs - Fourier sine and cosine transforms - Properties - Transforms of simple functions - Convolution theorem, Parseval's identity, ZTransforms.

UNIT IV - COMPLEX INTEGRATION
Line integral in the complex plane - Two integration methods - Cauchy's integral theorem - Existence of indefinite integral - Cauchy's integral formula - Derivatives of analytic functions.

UNIT V - RESIDUE INTEGRATION METHOD
Residues - Residue theorem - Evaluation of real integrals - Further types of real integrals.

REFERENCES:
1. "Advanced Engineering Mathematics" by **E. Kreyszig**, Eighth Edition, John Wiley and Sons, (Asia) Pvt Ltd., Singapore, 2000.
2. "Higher Engineering Mathematics" by **B.S. Grewal,** Thirty Eighth Edition, Khanna Publishers, New Delhi, 2004.

Course Nature : Theory
Assessment Method (Max.Marks: 100)

In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

SEMESTER	COURSE CODE	COURSE TITLE	L	T	L+T+P	C
III	18PMA3NB	BIO-MATHEMATICS	2	0	2	2

INSTRUCTIONAL OBJECTIVES	
1.	To introduce Mathematics as a tool in the study of Biology.
2.	Be familiar with graphs and subgraphs

UNIT I - DETERMINANTS

Properties of determinants, Minors, Cofactors, Multiplications of determinants. **Matrices -**Operations on matrices, Inverse of matrices, Solution of simultaneous equations.

UNIT II - Permutation and Combination

Identities and simple problems, Binomial theorem, Exponential and Logarithmic series (statement only), Simple problems.

BASIC IDEAS OF GRAPH THEORY -Connectivity, Trees, Various matrices connected with graphs, Construction of evolutionary trees, Phylogeny Construction.

UNIT III - Limits, Differentiation, Successive differentiation, Maxima And Minima, Simple problems. Integration of f(x) = xn, ex, logx, Definite integrals, Simple problems.

UNIT IV - Fundamentals of computers, algorithms, flowcharts. Introduction to systems and Application programs. Concept of data processing and handling of file for large volume of data. Elements of Database management in connection with Biological data bases.

UNIT V - C – programming and internet programming fundamentals. Specific features of Image Analysis in Java. Software characteristics and applications – ClustalWVI.7, Rasmol, Oligo, Molscript, Tree view, ALSCRIPT, Genetic analysis software, Phylip.

REFERENCES:
1. Narayanan**,**S and Manikavasagam Pillai, T.K., *Calculus*, Vol.I, S.Viswanathan
a. Printers, 1996.
2. Manickavachagam Pillai, T.K, Natarajan,T. and Ganapathy,K.S. *Algebra*,Vol I,
a. S.Viswanathan Printers & Publishers,1994.

3. David W.Mount, *Bioinformatics: Sequence and Genome Analysis,* Cold Spring
a. Harbor Laboratory Press, New York.
4. Daniel C. Liebler, *Introduction to Proteomics: Tools for New Biology*, Humana Press, Totowa, NJ., 2002.
5. Pennington S., M.J.Dunn, *Proteomics: From Proteins Sequence to Function*, Springer Publications, 2001.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

Course Code	Course Title	L	T	P	O	L+T+P	C
18PPH2NA	Introduction to Nanotechnology	2	0	0	0	2	2

INSTRUCTIONAL OBJECTIVES

1. To impart the basic knowledge on nanoscience and nanotechnology.
2. To develop understanding on the exotic properties of nanostructured materials.
3. To introduce various techniques available for the processing of nanostructured materials.
4. To emphasize the importance and development of nanotechnology in various fields.

UNIT I - INTRODUCTION TO NANOSCIENCE

History and importance of nanotechnology, opportunity at the nanoscale, length and time scale in structures, difference between bulk and nanoscale materials and their significance, properties at nanoscale, optical, electronic, magnetic and chemical.

UNIT II - NANOSTRUCTURES AND DIMENSIONS

Classification of nanostructures: zero, one, two and three dimensional nanostructures, size dependency in nanostructures, quantum size effects in nanostructures, chemistry of tailored nano shapes, quantum dots, nanowells, nanoribbons and nanowires.

UNIT III - SYNTHESIS OF NANOMATERIALS

Synthesis of nanomaterials, top down and bottom up approach, method of nanomaterials preparation, wet chemical routes of synthesis: reduction, sol-gel, hydrothermal, sonochemical synthesis, physical routes, physical vapor deposition (PVD), chemical vapor deposition (CVD), laser ablation, sputtering.

UNIT IV - CHARACTERIZATION OF NANOMATERIALS

Scanning electron microscope (SEM), transmission electron microscope (TEM), scanning probe microscope (SPM), comparing SEM, TEM and SPM for different classes of nanomaterials.

UNIT V - APPLICATIONS OF NANOMATERIALS

Nanotechnology in energy systems, textiles, food and health care, agriculture, automotive industry, solar technology, pharmaceutical and drugs, nanoelectronics, nanosensors and devices.

TEXTBOOKS

1. T. Pradeep, *Nano: The Essentials*, 1st Ed., McGraw Hill, 2007.
2. Chattopadhyay, Banerjee, *Introduction to Nanoscience and Nanotechnology*, PHI, 2009.

REFERENCES

1. C. Binns, *Introduction to Nanoscience and Nanotechnology*, Vol. 14, John Wiley & Sons, 2010.
2. P.C. Poole Jr, and F.J. Owens, *Introduction to Nanotechnology*, John Wiley & Sons, 2003.
3. R. Kelsall, I.W. Hamley, and M. Geoghegan, *Nanoscale Science and Technology*, John Wiley & Sons, 2005.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

COURSE CODE	COURSE TITLE	L	T	P	O	L+T+P	C
18PPH2NB	**Laser Physics**	**2**	**0**	**0**	**0**	**2**	**2**

INSTRUCTIONAL OBJECTIVES

1. To develop knowledge in the basics of lasers.
2. To enhance comprehension in the principles of lasers.
3. To explore the control of laser properties.
4. To familiarize with the diverse applications of lasers.

UNIT I - INTERACTION OF RADIATION WITH MATTER

Introduction to electromagnetic radiation, wavelength, wave number, frequency, interaction of light with atoms and molecules, absorption, emission, kinetics of optical absorption, stimulated and spontaneous emission, intensity of spectral lines, line broadening mechanism.

UNIT II - BASIC PRINCIPLES OF LASER

Principle of lasers, population inversion, conditions of lasing action, characteristics of a laser-coherence, monochromaticity, divergence, intensity, Einstein's co-efficients, laser pumping, two and three level laser systems.

UNIT III - TYPES OF LASERS

Solid state lasers, the ruby laser, Nd:YAG Laser, semiconductor lasers, features of semiconductor lasers, diode lasers, gas laser: He-Ne laser, CO_2 laser, liquid lasers: dye lasers and chemical lasers.

UNIT IV - CONTROL OF LASER PROPERTIES AND PRODUCTION

Laser pumping, resonators, vibrational modes of resonators, number of modes/unit-volume, open resonators, control resonators, Q factor, losses in the cavity, threshold condition, quantum yield, mode locking (active and passive).

UNIT V - APPLICATIONS OF LASERS

Ether drift and absolute rotation of the earth-laser isotope separation, laser range finder- laser in pollution detection, holography- optical communication, optical fiber.

TEXTBOOKS

1. B.B. Laud, *Lasers and Nonlinear Optics*, 3rd Ed, New Age Int.Pub.2011.
2. K. Thyagarajan, and A.K. Ghatak, *Lasers Theory and Applications*, 2nd Ed, Plenum Press, 1986.

REFERENCE

1. A.K. Ghatak and K. Thyagarajan. *Optical electronics*, Cambridge University

Press, 1989.

2. Seigman, *Lasers*, 3rd Ed., Oxford Univ. Press, 1986.
3. Maitland and Dunn, *Laser Physics*, N.H. Amsterdam, 1969.
4. J. Hecht, *The laser guidebook*, 1986.
5. O. Seelto, *Principles of Laser*, 5th Ed., Springer Publication, 2010.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

COURSE CODE	COURSE TITLE	L	T	P	O	L+T+P	C
18PPH3NA	Medical Physics	2	0	0	0	2	2

INSTRUCTIONAL OBJECTIVES

1. To understand the general concepts in radiation and its interaction and dose measurement.
2. To apply the physics concepts in clinical trials.
3. To educate scientifically the principles of radiation and its effect in the medical field.
4. To emphasize the significance of various medical techniques and therapy.

UNIT I - IONISING RADIATION AND DOSIMETRY

Generation of radiation, Interaction of charged particles with matter, interaction of high energy photons with matter, radiation depth of interaction, range, attenuation curves, dose and exposure measurement, maximum permissible levels, overview of measurement methods: film dosimeters, thermo luminescent dosimetry (TLD), dose measurement during radiography.

UNIT II - RADIOISOTOPES AND NUCLEAR MEDICINE

Diagnosis with radioisotopes, isotopes, half-life, nuclear radiations, energy of nuclear radiations, units of activity, isotope generators, principles of measurement: counting statistics, sample counting, liquid scintillation counting, non-imaging investigations examples: haematological measurements, Glomerular filtration rate, radionuclide imaging, bone imaging, dynamic renal function.

UNIT III - IMAGE PRODUCTION-I

Radionuclide imaging: the gamma camera, energy discrimination, collimation, image display, single-photon emission tomography (SPET), positron emission tomography (PET), ultrasonic imaging: pulse–echo techniques, tissue interaction with ultrasound, transducer arrays, applications: Doppler imaging, CT imaging: absorption of X-rays, data collection, image reconstruction, beam hardening, spiral CT.

UNIT IV - IMAGE PRODUCTION-II

Electrical impedance tomography (EIT): image reconstruction, data collection, multi-frequency and 3D imaging, magnetic resonance imaging (MRI): the nuclear magnetic moment, precession in the presence of a magnetic field, T1 and T2 relaxations, the saturation recovery pulse sequence, the spin–echo pulse sequence, localization: gradients and slice selection, frequency and phase encoding, the FID and resolution, imaging and multiple slicing.

UNIT V - ELECTROPHYSIOLOGY

Sources of biological potentials, the nervous system, neural communication, the interface between ionic conductors: Nernst equation, membranes and nerve

conduction, muscle action potentials, volume conductor effects, the ECG/EKG and its detection and analysis, characteristics of the ECG/EKG, the electrocardiographic planes, recording the ECG/EKG, ambulatory ECG/EKG monitoring.

TEXTBOOKS

1. B.H. Brown, R.H. Smallwood, D.C. Barber, P.V. Lawford, and D.R. Hose, *Medical Physics and Biomedical Engineering*, Institute of Physics Publishing, 1999.
2. S.A. Kane, *Introduction to Physics in Modern Medicine*, CRC Press, 2009.

Unit-I   : Chapter 5 (Brown, Smallwood, Barber, Lawford, Hose)
Unit-II   : Chapter 6 (Brown, Smallwood, Barber, Lawford, Hose)
Unit-III   : Chapter 12 (Brown, Smallwood, Barber, Lawford, Hose)
Unit-IV   : Chapter 12 (Brown, Smallwood, Barber, Lawford, Hose)
Unit-V   : Chapter 16 (Brown, Smallwood, Barber, Lawford, Hose)

REFERENCES

1. F.M. Khan, and J.P. Gibbons, *Khan's the physics of radiation therapy*. Lippincott Williams and Wilkins, 2014.
2. P. Suetens, *Fundamentals of Medical Imaging*. Cambridge university press, 2017.
3. W.J. Meredith, and J.B. Massey, *Fundamental Physics of Radiology*. Butterworth-Heinemann, 2013.
4. F.A. Smith, *A Primer in Applied Radiation Physics*, World Scientific Publishing Co. Inc, 2000.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

COURSE CODE	COURSE TITLE	L	T	P	O	L+T+P	C
18PPH3NB	ENERGY STORAGE AND DEVICES	2	0	0	0	2	2

INSTRUCTIONAL OBJECTIVES

1. To understand the basic concepts of energy storage.
2. To study different types of energy storage devices
3. To realize the applications of energy storage devices

UNIT I - BASIC CONCEPTS AND ENERGY STORAGE

Definition and units of energy, power, conservation of energy, second law of thermodynamics, renewable energy resources, energy storage - need of energy storage; different modes of energy storage. capacitors, electrochemical storage, electrical and magnetic storage, chemical energy storage, hydrogen for energy storage.

UNIT II - ELECTROCHEMICAL ENERGY STORAGE SYSTEMS

Electrochemical energy storage systems batteries: primary, secondary, lithium, solid-state and molten solvent batteries; lead acid batteries; nickel cadmium batteries; advanced batteries. roleof carbon nano-tubes in electrodes.

UNIT III - MAGNETIC AND ELECTRIC ENERGY STORAGE SYSTEMS

Magnetic and electric energy storage systems superconducting magnet energy storage (SMES) systems; capacitor and batteries: comparison and application; super capacitor: electrochemical double layer capacitor (EDLC), principle of working, structure, performance and application, role of activated carbon and carbon nano-tube.

UNIT IV - FUEL CELL BASICS AND STORAGE

Basics Fuel cell definition, difference between batteries and fuel cells, fuel cell history, components of fuel cells, principle of working of fuel cell advantages and disadvantages of fuel cell power plant, fuel cell types: alkaline fuel cell, polymer electrolyte fuel cell, phosphoric acid fuel cell, molten carbonate fuel cell, solid oxide fuel cell, problems with fuel cells, applications of fuel cells.

UNIT V - HYDROGEN PRODUCTION AND STORAGE METHODS

Production: from fossil fuels, electrolysis, thermal decomposition, photochemical, photocatalytic, hybrid; Storage: Metal hydrides, metallic alloy hydrides, carbon nano-tubes; sea as the source of deuterium.

TEXTBOOKS

1. R.A. Huggins, *Energy Storage*, 1st Ed., Springer, 2010.

2. J.-M. Tarascon, and Patrice Simon, *Electrochemical Energy Storage*, 1st Ed., Wiley, 2015.
3. F. Díaz-González, A. Sumper and O. Gomis-Bellmunt, *Energy storage in power systems*, 1st Ed., Wiley, 2016.
4. Srinivasan, *Fuel Cells from Fundamentals to Applications*, 1st Ed., Springer, 2006.
5. A. Basile, A. Iulianelli, *Advances in Hydrogen Production*, 1st Ed., *Storage and Distribution*, Woodhead Publishing, 2014.

REFERENCES

1. N. Kularatna, *Energy Storage Devices for Electronic Systems: Rechargeable Batteries and Supercapacitors*, Academic Press, 2014**.**
2. X. Feng, *Nanocarbonsfor advanced energy storage*, Vol. 1, John Wiley and Sons, 2015.
3. M. Sylvin, *Fundamentals of electrochemistry*, 1st Ed., Sarup Book Publishers Pvt. Ltd., 2009.
4. A.G. Ter-Gazarian, *Energy Storage for Power Systems*, IET, 1994

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

COURSE CODE	COURSE TITLE	L	T	P	O	L+T+P	C
18PCY2NA	**NANOCHEMISTRY**	**2**	**0**	**0**	**0**	**2**	**2**

INSTRUCTIONAL OBJECTIVES

1. To acquire knowledge about nanochemistry.
2. To learn about the synthesis of nanomaterials, their characterization and applications.

UNI-I - INTRODUCTION TO NANOCHEMISTRY

Definition of nano dimensional materials, some historical milestones in the saga of nano forms, size effects, importance of nanomaterials, classification of nanomaterials, simple examples of unique properties of nano sized materials, elementary aspects of bio nanotechnology, some important recent discoveries in nanoscience and technology.

UNIT II - TECHNIQUES IN NANOCHEMISTRY

Techniques for characterisation of nanoscale materials (basic aspects): atomic force microscope (AFM), transmission electron microscope (TEM), resolution and scanning transmission electron microscope (STEM), scanning tunneling microscope (STM), scanning near field optical microscope (SNOM), and surface plasmon spectroscopy.

UNIT III - SYNTHESIS OF NANOMATERIALS

Chemical methods in preparation of nanomaterials: sol–gel technique, co-precipitation hydrolysis, sonochemical method, combustion technique, colloidal precipitation, template process. Inorganic nanoparticles and nanoporous materials: oxide nanoparticles, oxomolybdates, nano catalysis, porous silicon, transition and non- transition metal phosphates.

UNIT IV - Carbon clusters and nanostructures

Nature of carbon bond, new carbon structures, carbon clusters: discovery of C60, alkali doped C60, superconductivity in C60,larger and smaller fullerenes, carbon nanotubes: synthesis, single walled carbon nanotubes, structure and characterization, mechanism of formation, chemically modified carbon nanotubes, doping, functionalizing nanotubes, application of carbon nanotubes, nanowires, synthetic strategies, gas phase and solution phase growth, growth control, properties.

UNIT V - ORGANIC FILMS AND SUPRAMOLECULAR ASSEMBLY

Organic films, insulating and passivating layers, electron transfer, organic nanostructures, optical properties, organic semiconductors, active organic devices, polymerization, sizes of polymers, nanocrystals, conductive polymers, block co-

polymers, supramolecular structures, transition-metal mediated types, dendritic molecules, supramolecular dendrimers, micelles, biological nanostructures, examples of proteins. Applications of nanomaterials: applications of nanoparticles in fundamental research, industries, medical field and environmental issue, toxicity, biosafety and ethical issues.

TEXTBOOKS:
1. C. N. R. Rao, A. Muller and A. K. Cheetam, (Eds) The Chemistry of Nanomaterials, Vol.1, and 2, Wiley – VCH, Weinheim, 2004.
2. C. P. Poole, and Jr. F. J. Owens, Introduction to Nanotechnology, Wiley Interscience, New Jersey. 2003.
3. K. J. Klabunde, Nanoscale materials in Chemistry, Wiley- Interscience, New York, 2001.
4. T. Pradeep, Nano: The Essentials in Understanding Nanoscience and Nanotechnology, Tata McGraw Hill, New Delhi, 2007.
5. T. Tang and P. Sheng, Nano Science and Technology – Novel Structures and Phenomena, Taylor & Francis, New York, 2004.
6. U. Heiz, and U. Landman, Nanocatalysis, Springer, New York, 2006.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

COURSE CODE	COURSE TITLE	L	T	P	O	L+T+P	C
18PCY2NB	ELECTROCHEMICAL ENERGY SYSTEMS	2	0	0	0	2	2

INSTRUCTIONAL OBJECTIVES

1. To understand the role of electrochemistry in energy systems.
2. To learn the kinetics and thermodynamics of electrochemical reactions.

UNIT I - INTRODUCTION AND THERMODYNAMICS OF ELECTROCHEMICAL REACTIONS

Basic physics of galvanic cells, electrochemical energy conversion, electrochemical energy storage, dynamics of equivalent circuits, impedance of electrode, statistical thermodynamics, the Nernst equation, Gibbs free energy, standard electrode potentials, redox reactions, the Fermi potential, thermodynamics of the transfer of ions between two phases and reconstitution electrodes, thermal and electrochemical stability.

UNIT II - KINETICS OF ELECTROCHEMICAL REACTIONS

Faradaic reactions in concentrated solutions, theory of chemical kinetics and charge transfer based on nonequilibrium thermodynamics, Butler-Volmer equation, electrocatalysis, ion adsorption and intercalation, electrochemical phase transformations, charge transfer at metal electrodes, electrode-electrolytes interfacial/surface studies, charge transfer kinetics at the solid/solid interface in porous electrodes, mass transfer kinetics, transient diffusion, charge diffusion in electrolytes, charge transport in bulk electrolytes.

UNIT III - TRANSPORT PHENOMENA

Concentration polarization, activation polarization, ion concentration polarization, solution impedance, charge transfer impedance, Warburg impedance percolation, porous electrodes for batteries and supercapacitors, non-equilibrium thermodynamics of porous electrodes, properties of aqueous electrolytes, organic electrolytes, ionic liquid electrolytes, solid electrolytes.

UNIT IV - ELECTROCHEMICAL ANALYTICAL TECHNIQUES

Cyclic voltammetry, electrochemical impedance spectroscopy, chrono-amperometry/potentiometry, scanning electrochemical microscopy.

UNIT V - ENERGY STORAGE AND CONVERSION DEVICES

Charge storage mechanism, lead-acid batteries, metal ion batteries, metal sulfur batteries, metal air batteries, supercapacitors, pesudocapacitors, fuel cells, advanced Li-ion and beyond Li-ion battery systems (multivalent battery systems), redox-flow batteries, solid state thin film batteries, solid state micro supercapacitors.

TEXTBOOKS

1. C. **Breitkopf** and K. **Swider-Lyons**, (Eds.) *Springer Handbook of Electrochemical Energy,* Springer, 2017.
2. J. Newman, E. Karen Thomas-Alyea, *Electrochemical Systems*. 3rd Ed.,Wiley-Interscience, 2004.
3. O' Hayre, Ryan, Suk-Won Cha, et al. *Fuel Cell Fundamentals*. 2nd Ed., Wiley, 2009.
4. A.*J. Bard and L.R. Faulkner, Electrochemical Methods: Fundamentals and Applications*. 2nd Ed.,Wiley, 2001.

In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

COURSE CODE	COURSE TITLE	L	T	P	O	L+T+P	C
18PCY3NA	CHEMISTRY OF BIOMOLECULES	2	0	0	0	2	2

INSTRUCTIONAL OBJECTIVES

1. To get a basic understanding about the chemistry of biomolecules like amino acids, proteins, nucleic acids, lipids and carbohydrates.
2. To appreciate the role of these biomolecules in biology.

UNIT I - AMINO ACIDS AND PROTEINS

Classification and structure of amino acids, configuration of amino acids, acid-base properties and isoelectric point, separation of amino acids, peptide bonds, disulfide linkages, proteins classification based on solubility, shape, composition and function, structure of proteins, determination of the primary structure of a protein, secondary, tertiary and quaternary structures, protein denaturation.

UNIT II - ENZYMES, CO-ENZYMES AND THEIR MECHANISM OF ACTION

Enzymes, Classification, kinetics, inhibition, mechanisms of enzyme action, cofactors as derived from vitamins, co-enzymes, prosthetic, prosthetic group and apoenzymes, structure and biological functions of coenzyme-A, thiamine pyrophosphate, pyridoxal phosphate, NAD+, NADP+, FAD, lipoic acid, overview of reactions catalysed by the above cofactors.

UNIT III - NUCLEIC ACIDS

Nature of genetic material, structure of purine and pyrimidine, nucleotides and nucleosides, types of nucleic acids, structure of DNA, properties of nucleic acids, - Tm, denaturation and renaturation, hypo and hyperchromicity, basic ideas on replication, transcription and translation, determination of the base sequence of DNA.

UNIT IV - LIPIDS

Fatty acids classification, nomenclature, structure and properties of fatty acids - structure and function of prostaglandins, tri-acyl glycerol, structure and functions of phospholipids, spingomyelin, plasmologens, structure and function of glycolipids, cholesterol.

Unit V - Carbohydrates

Classification of carbohydrates, stereo isomerism and optical isomerism of sugars, mutarotation, occurrence, structure and biological importance of mono, di and

polysaccharides, an introduction to mucopolysaccharides, reactions of carbohydrates due to the presence of hydroxyl, aldehyde and ketone groups.

TEXTBOOKS

1. D. L. Nelson, M. M. Cox, *Lehninger Principles of Biochemistry*, 5th Ed., W. H. Freeman; New York, USA, 2005.
2. R. K. Murray, D. K. Grammer, *Harper's Biochemistry,* 29th Ed., McGraw Hill, Lange Medical Books, United Kingdom, 2009.
3. J.L. Jain, S. Jain, N. Jain, *Fundamentals of Biochemistry*, S. Chand & Company. India, 2013.
4. P. Y. Bruice, *Organic Chemistry*, 5th Ed., Pearson, 2014.

Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%

Course Code	Course Title	L	T	P	O	L+T+P	C
18PCY3NB	*Forensic Science*	2	0	0	0	2	2

Instructional Objectives

1. To introduce the student to the basic ideas in forensic science.
2. To familiarize the student with chemical and biological techniques used in forensic science.

UNIT-I - FORENSIC CHEMISTRY

Introduction to forensic science, development of forensic science and criminal prosecution in India, forensic science and victims: Indian scenario, forensic chemistry, theory of forensic analysis, fingerprint development, presumptive drug analysis, soil analysis, thin layer chromatography and ink analysis: introduction, examination process, analysis, clandestine drug laboratories.

UNIT II - THE HISTORY OF FORENSIC CHEMISTRY AND CHEMICAL ANALYSIS

Introduction, some important techniques of forensic chemistry (trace evidence, fingerprinting, testing for alcohol, serology, bloodstain pattern analysis, fire debris analysis, toxicology),the role of analytical chemistry in forensic science (laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS), alternative light photography, high-speed ballistics photography, video spectral comparator 2000, digital surveillance for xbox (XFT device), 3D forensic facial reconstruction, DNA sequencer, forensic carbon-14 dating, magnetic fingerprinting and automated fingerprint identification (AFIS), high-performance liquid chromatography, gas chromatography, ion chromatography)

UNIT III - FORENSIC BIOLOGY: SEROLOGY AND DNA TESTING

Introduction, types of evidence examined, planning the examination, evidence processing, note taking, and report writing, serology testing, identification of blood, identification of saliva.

UNIT IV - FORENSIC BIOLOGY: DNA TESTING

DNA testing, combined DNA index system (CODIS) database, DNA in criminal proceedings, sample processing, quality assurance, laboratory accreditation, educational requirements for forensic biology personnel, proficiency testing.

UNIT V - POLYGRAPH TEST AND ITS LEGAL IMPLICATION IN THE INDIAN CRIMINAL JUSTICE SYSTEM

Introduction, brief history, application and utility, procedure of interrogation and questioning to the subject, legal status of polygraph, rights of the subject, NHRC's guidelines on administration of lie detector or polygraph test.

TEXTBOOKS

1. D. Collins, *Forensic Chemistry*, Brigham Young University – Idaho, 2006.
2. L. Gefrides and K. Welch, *The Forensic Laboratory Handbook, Procedures and Practice*, Springer Science+Business Media, 2011.

REFERENCES

1. M. G. Tarase, D. H. Prakash, and M. S. Ramadurg. "*Scientific and legal procedure of polygraph test."*
2. N. Grover and I. Tyagi, *International Journal of Scientific and Research Publications*, Volume 4, Issue 12, December 2012.
3. R. K. Jena*, International Journal of Applied Research,* 2017; 3(2): 283-287.
4. M. Barar, *International Journal of MediPharm Research,* 2016; 2(1),pp 10-16

In Semester	Assessment Tool	Cycle Test I	Cycle Test II	Model Examination	Assignment	Attendance	Total
Course Nature : Theory							
Assessment Method (Max.Marks: 100)							
	Marks	10	10	20	5	5	50%
End Semester Weightage							50%
Total							100%