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विद्यया अमृतम् अश्नुते

PROGRAM OUTCOMES ,PROGRAM SPECIFIC OUTCOMES &COURSE OUTCOMES

POSTGRADUATE COURSE
UNDERGRADUATE COURSES

DAV INSTITUTE OF MANAGEMENT
(APPROVED BY AICTE & AFFILIATED TO M.D.UNIVERSITY,ROHTAK)
MANAGED by: DAV COLLEGE MANAGING COMMITTEE ,NEW DELHI.

INDEX

PROGRAM OUTCOMES (POs) OF UNDERGRADUATE PROGRAMS

PO1-Ability to take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2- Ability to demonstrate empathetic social concern and equity-centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO3- Ability to recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO4- Ability to think rationally, analyze situations and solve problems adequately.

PO5-Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

PO6-Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

PO7-Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

PO8-Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

Programme specific outcomes(PSOs) of 3 year (six semester} BBA(BE) program are as follows:

PS01:The BBA (BE) is an undergraduate management degree, the course is basically the answer in three words to the question "How to develop business sense" within opportunity to make career out of the economic situations in the business world.

PS02:The BBA (BE) course trains students with business and trading skills to intellectual and interpersonal skills and help students to have a better understanding of the functioning of a business organisation and management of the same

.

PS03:Entrepreneurship, interpersonal skills, leadership skill etc are the core take away pf the course while boosting the job opportunities and career development of the candidate.

PS04:Larger perspective of business world is another advantage of the co
urse, where students acquire business and trading skills at a very early stage, they also develop business based intellectual and interpersonal skills.

PS05:The degree is designed to give a broad knowledge of the operational aspects of businesses of an organisation and the interconnection, so they can get employment in banks, business houses, export companies, tourism industries etc. Also, the course incorporates training and practical experience, in the form of case projects, presentations, internships, industrial visits, and interaction with experts from the industry.

COURSE OUTCOMES BBA(BE)

Micro Economics Analysis BBEN101

CO1: define the basic elements of micro economic aspects of a firm.
CO2: forecast demand for a product.
CO3: know what to produce, where to, when to, how to, for whom to produce.
CO4: frame policy for production to minimize the cost and maximize the profit.
CO5: construct the cost function.
CO6: understand the basic nature of various markets.

Management Principles & Applications BBEN102

CO1: To make the students learn how management technique is to be adopted to run the organization effectively by using principle of management..
CO2: Demonstrate the roles, skills and functions of management.
CO3: It describe the students about delegation and decentralization and the details about planning and MBO
CO4: Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.

Business Mathematics BBEN103

CO1: To understand the different concepts of sets & Venn diagrams and their applicability in business.
CO2: To understand the students to solve the problems related to Arithmetic Progression and Geometric Progression.
CO3: To learn the practical solutions of permutation and combination problems.
CO4: To learn the applications of matrices and Determinants in businesses.

Economics Geography & Demography BBEN 104

CO1: Learn the importance of environmental, cultural and other factors in determining economic activities.
CO2: Analyze the location and viability of economic activities in local, regional and global systems.
CO3: Explain the alternative paradigms of economic geography.
CO4: To learn concepts, methods and theories of Demographic transition and population.
CO5: To learn characteristics of population and importance of demography in development.

Business Ethics BBEN105

CO1: analyze the impact of environmental issues on business.
CO2: understand the social responsibilities of business.
CO3: evaluate the effects on a firm's costs of meeting its ethical, social and environmental responsibilities.
CO4: learn about various standards and codes related to business
CO5: understand Basic concepts of Business Ethics understand Values, Norms and Beliefs
CO6: analyze the Role of values for managers .
CO7: understand Ethical Codes understand Corporate Social Responsibility Analyze CSR initiatives
CO8: understand Ethical issues in employer – employee relation

Business Communications BBEN106

CO1: Students will be able to describe the basics of communication and its process, its importance and various elements.
CO2: Students will be able to understand and familiarize themselves withvarious barriers in the communication and how to overcome them.
CO3: Students will be able to identify the various types of Office Communication and various forms office communication, their importance, benefits and features.
CO4: Students will be outlined the listening skills and the characteristics of good and poor listeners.
CO5:Students will be able to understand importance of listening, its approaches, and barriers.
CO6: Students will be able to explain the effectiveness of oral communication.
CO7: Students will be able to understand presentation skills and its application in-group presentation.

BBA (BE) 2nd Semester

Macroeconomics Analysis BBEN201

CO1: The course is to help students learn the fundamentals of Macro Economics and they can apply these concepts to Business Practices.

CO2: Economic theory is useful to understand macro economic concepts and working of an economy. Students will understand the interdependence
CO3: It helps in improving decision making skills to achieve desired outcomes.
CO4: To understand the prevailing economic and business policy in totality and its impact on the energy sector.
CO5: It improves the ability of the students to apply economic concepts to complex business realities as well as support them to forecast in the energy business.

Business Statistics BBEN202

CO1: Gain knowledge of basic concept / fundamentals of business statistic such as statistical collection, statistical series, tabular and graphical representation of data.
CO2:Identify statistical tools needed to solve various business problems.
CO3:Compute various measures of central tendency, measures of Dispersion, Correlation and Regression analysis, Time Series Analysis, Index Number, and their implication on Business performance.
CO4: Based on the acquired knowledge to interpret the meaning of the calculated statistical indicators

Basic Accounting BBEN203

CO1: understand and apply accounting concepts, principles and conventions for their routine monetary transaction;
CO2: recognize circumstances providing for increased exposure to fraud and define preventative internal control measures.
CO3: create and prepare financial statements in accordance with Generally Accepted Accounting Principles
CO4: analyze, interpret and communicate the information contained in basic financial statements and explain the limitations of such
statements.

Computer Fundamentals & Applications BBEN204

CO1: Describe the organization, operations, generation and classification of computer
CO2: Understand computer hardware, software, types of software, compiler and computer applications in business
CO3: Understand binary, decimal, octal and hexadecimal number systems, their conversion and binary operations.
CO4: Learn applications of Ms Office in business
CO5: Demonstrate the ease to work with MS Word, MS Excel and MS PowerPoint.

Business Organisation BBEN205

CO1: Understand the concepts related to Business
CO2: To enable them to analyze and understand the environment of the organization
CO3: Assess strengths, weaknesses, opportunities and threats of the business environment
CO4: understand and identify security issues of E-Commerce
CO5: understand the concept of virtual organization and workspace.

Environmental Management BBEN206

CO1: To articulate the multidisciplinary nature of environmental studies
CO2: To understand the concept and methods from renewable and non renewable sources
CO3: To acquire knowledge on ecosystem.
CO4: To Study sustainable development concept.
CO5: To make them understand the challenges of Environmental issues and measures.
CO6: To enlighten them with Environmental Legislations.

BBA (BE) 3rd Semester

Development Economics BBEN301

CO1: Demonstrate familiarity with some central themes and issues of economic development.
CO2: Provide students with the essential tools and concepts of development economics, to prepare them to understand what makes underdevelopment persist and what helps development succeed. CO3: Explore diverse dimension and measures of development
CO4:Demonstrate the understanding of the difference between growth and development, major growth theories, the measurement of inequality, significance of agriculture in developing countries, poverty and population issues facing the world, international trade, and importance of foreign aid.

Marketing Management BBEN302

CO1: understand the marketing concepts and its evolution
CO2: analyze the market based on segmentation, targeting and positioning
CO3: know the consumer behavior and their decision making process
CO4: make decisions on product, price, promotion mix and distribution
CO5: understand the rural markets and the contemporary issues in marketing

Management Accounting BBEN303

CO1: Understand and apply management accounting concepts, principles and conventions for their routine monetary transactions.
CO2: Aware about managerial applications of techniques of accounting for planning, decision making and control.
CO3: Understand the concept of analysis of financial statements through cash flow and fund flow analysis.
CO4: To know about the concept of financial control through budgetary control and inventory control.

Consumer Protection BBEN304

CO1: Understand the Consumer Protection Act, 1986 & different philosophies existing from time to time in the interest of the consumers.

CO2: To learn about the three tier redressal machinery of consumer forums and the basic provisions of CPA 1986.

CO3: To gain complete knowledge about the approaches to consumerism; how government and business play a role in consumer welfare.

CO4: To study the role of media in increasing consumer awareness.

CO5: To acquire knowledge about how information is a tool in the hands of consumers to be safe and role of ethical marketing in consumer protection.

Indian Financial System BBEN305

CO1: Understand the working of financial institutions and markets both individually and as an interlinked system.

CO2: Understand the factors affecting interest rates and yield curve and the importance of change in interest rates for all constituents of the financial system.

CO3: Identify the existence and development of non-banking financial institutions, know the important role of Mutual funds, LIC, investment companies etc., utilize and effectively participate in the development process.

CO4: Understand the organization, role, functioning and need for regulation of different types of financial markets and the implications of the same on society.

CO5: Critically analyze the pivotal role of banking in a financial system and the reasons for it being among the most tightly regulated industries in the world.

Disaster Management BBEN306

CO1: To instill an understanding of the Structure of Atmosphere
CO2: To understand the Issues Related to Environmental Impacts
CO3: To give insight to Natural Disaster and Prevention thereof.

BBA (BE) 4th Semester

Business Environment BBEN401

CO1 : To Understand the relationship between Business and Environment
CO2 : To Familiarize the students with Various factors affecting the Business
CO3: To know the Economic Reforms
CO4 To Enlighten the students with different laws influencing the consumer.
CO5 : To provide knowledge about Foreign Investments and their impact

Consumer Behavior BBEN402

CO1: gain strategic understanding of the influential and persuasive mechanisms involved in consumer attitude, belief, and behavior

change, and will be able to apply this knowledge in addressing specific marketing problems.
CO2: examine the consumer from a managerial perspective and to develop marketing strategies to respond to consumers' changing
attitudes and behaviors.
CO3: understand how to anticipate, adapt, and respond to consumer needs by applying the insight from basic consumer behavior concepts
to their marketing strategies.
CO4: understand the current and future research technologies for consumer insight and will be able to critically assess how they can beused in strategy formulation
.

Human Resource Management BBEN 403

After studying this course student will have clear understanding of functioning of HR department of an organization. After completing the course students would be able to:
CO1: Understand the importance of people and HR department in the organization, role and responsibilities of HR managers, challenges faced the HR department;
CO2: Assess the process of human resource planning, job analysis and designing for compensation purpose, training and development methods along with methods of performance evaluation of employees working in various departments;
CO3: Identify strategic HRM process, retention strategies and HR Outsourcing procedures and its benefits
CO4:Clarify the importance of harmonious industrial relations, trade unions, methods of collective bargaining and importance of workers' participation in Management.
At the end students will have thorough understanding of personnel, welfare and IR concepts of human resource management.

Financial Management BBEN404

After completing the course students would be able to:
CO1: Describing the goal of financial management and concept of Time Value of Money.
CO2: Understand the distinctiveness of various capital budgeting techniques and risk management in Investment Decision..
CO3: Different techniques of calculating cost of capital of various long term sources of finance.
CO4: Understanding the concept of financial leverage and its significance in capital structure planning.
CO5: Knowing the determinants of dividend and their implications.

Computer Networking in Business BBEN405

After completing the course students would:
CO1: Understand the fundamental concepts of Computer Networking.
CO2: Identify different networking devices & their functions in a network.
CO3: Demonstrate the functioning of Internet & Intranet and various tools.
CO4: Understand the fundamentals of E-commerce & application areas.
CO5: Design web pages &understand various user interfaces.

Human Rights & Values BBEN406

CO1: Understand the concept of human rights, evolution of rights at international and national level, types of human rights.
CO2: Gain knowledge about their fundamental rights provided in Indian constitution.
CO3: Become aware about different disadvantaged groups and how they are deprived of their fundamental rights.
CO4: Gain knowledge about the factors behind human rights violation and its redressal mechanism.
CO5: Understand the concept of human values, evolution of value oriented education and type of values.
CO6: Analyze the importance of values and character in their life and develop feeling of national integration and international understanding.

BBA (BE) 5th Semester

OrganisationalBehaviour BBEN501

CO1: analyze the behavior of individuals and groups in organizations in terms of the key factors that influence organizational behavior.
CO2: identify the core competencies, managerial roles and significance of emotional intelligence at work.
CO3: organization behavior needs and trends with emerging issues prevailing
CO4: explain the organizational culture and describe its dimensions and to examine various organizational designs
CO5: Students will learn to resolve conflict and make negotiation in organization and to handle stress in organization
CO6: apply motivational and leadership theories to resolve problems of employee absenteeism, turnover, stress, job satisfaction, job performance and organizational commitment.
CO7: Students will get to know about organization structure and culture, team building and group behavior in organization

Business Law BBEN502

After studying this course student will have understanding of various corporate legislations formed by the government and their applications in organizations. After completing the course students will have knowledge of following acts:
CO1: Companies Act 1956;
CO2: Contract Act 1872, Sales of Goods Act;
CO3: Negotiable Instrument Act;
CO4: Right To Information Act;
CO5: Insurance Act.

Economics Research Methods BBEN503

CO1:Understandthe various kinds of research and their types.
CO2:ResearchDesign and Sources of Data Collection
CO2:Measurement & Scale, type of Scaling and scale construction techniques
CO3:Role of Computer & SPSS in Research
CO4: Understand the scope of Research Report Writing.

Industrial Economics BBEN504

CO1: The paper deals with the in-depth knowledge of the industrial economics.
CO2: Describe and explain the determinants of the size and structure of firms and the implications of the separation of ownership and control
CO3: Describe and explain the pricing behaviour by firms with market power and its welfare implications
CO4: Apply analytical models of firm behaviour and strategic interaction to evaluate various business practices, including tacit collusion, entry deterrence, product differentiation, price discrimination and vertical restraints
CO5: Recognise and explain the basic determinants of market structure and the key issues in competition policy and regulation.

Money & Banking BBEN505

CO1: Understand the evolution and classification of Money.
CO2: Be aware about different factors of demand and supply of money.
CO3: know about the operations and credit creation by commercial banking in India.
CO4: Be aware about the credit control measures of RBI and consolidation of banking sector in India.

Cyber Security BBEN506

CO1: know about various policies and procedures which are made to ensure the security of computers, communications, networks, data, information and other computer related resources in Cyberspace
CO2: understand the concept of information society, knowledge society, critical infrastructure and critical information infrastructure
CO3: understand the concept of cyber terrorism and know about the various factors that are contributing to the existence of cyber terrorism
CO4: know about various types of cyber crimes, how to deal with cyber crimes, cyber attacks, concept of cyber jurisdiction and Indian IT Act

BBA (BE) 6th Semester

International Business BBEN601

CO1: Students will be able to Define the concept of International Business environment.
CO2: Students are expected to Evaluate the models & theories of international trade.
CO3: Students will be able to explain how international factors affect domestic concerns.
CO4: Knowledge on the concept of country risk analysis and responsibilities of International trade will be enhanced.
CO5: Students will be able to develop Analytical skill to understand the economic crisis of developing countries.
CO6: awareness will be created to understand and explain regional economic integration and economic and political integration
CO7: Cognitive knowledge and social responsibility on global issues will be enhanced; understanding of interpersonal skills with individuals from various cultures will be created.

Public Economics BBEN602

CO1: To understand the economics of government expenditure and taxation.

CO2: To discuss the implications of policy for efficiency and equity.
CO3: To analyze public goods, externalities, and information asymmetries; market failures resulting
CO4: From these conditions and policies to address those market failures; taxes; and expenditures. Further critically analyze fiscal policies and its implication in Indian Economy.
CO5: To analyze policy applications including welfare assistance, education, healthcare spending, and tax policies such as income taxes and consumption taxes.

Rural Business BBEN603

CO1: Critically analyze with regard to shifts of rural development
CO2: Understand implications on the livelihoods of the poor and schemes to empower them
CO3: Understand the prospects and problems of rural development in India
CO4: Understand the trend and pattern of agricultural growth, cropping patterns
CO5: Know the major schemes of rural development in India.

Management Information System BBEN604

CO1: Explain the role of Management Information Systems in achieving business competitive advantage through informed decision making.
CO2 : Explain the decision making process and applications of DSS.
CO3: Get knowledge of technologies such as Management Information System (MIS), Executive Information System (EIS), Decision Support System (DSS), Office Automation System (OAS), Transaction Processing System (TPS) and Business Expert System (BES).
CO4: Study the processes of developing and implementing information systems.

Production and Materials Management BBEN605

CO1: Understand the role of Production in overall Business Strategy of the firm.
CO2: Understand the trends & challenges of Production Management in ongoing business world.
CO3: Understand the concept of Purchasing and Materials Management.
CO4: Identify purchasing activities and know the importance of purchase management.
CO5: Describe the concept of Materials Management and explain the relationship between Materials Management Department and other Departments
CO6: Gain the In-depth knowledge of mechanism for disposal of scrap, surplus and obsolete materials

Programme specific outcomes(PSOs) of 3 year (six semester} B.Sc(H) program are as follows:

PS01:Course focuses on detailed learning about computer science, IT, Applications.
PS02:Various activities are organized for the enhancement of the students, which includes basic and advanced learning about Programming languages.
PS03:Practical Lab based learning programmes. Project report development learning.
PS04:Hands on Communication skills learning capsules. Add on courses related to IT. TRAINING PROGRAMS ON Soft Skills lab twice a week.
PS05:Promote Research based projects/activities in the emerging technology

COURSE OUTCOMES B.Sc(H) Computer Science

B.SC HONS. COMPUTER SCIENCE 1st Semester

B.Sc-101: Computer Fundamentals and Programming in C

CO1: Student will be able to understand the basic fundamentals of Computers, its applications, types of computers, different operating systems in real life.
CO2: Students will be to learn the problem solving by using If Else, Swtich case as well as with the help of looping concepts(by using for, while, do while Loops) and C Programming fundamentals.
CO3: Student will be able to understand the concepts of different types of Arrays and different types of functions such as User defined and built in functions available in C Language.
CO4: Student will be to understand the concepts of Structures and Union and implement the concept of File handling in C language.

B.Sc-102 :Mathematics-I

CO1: Understand the various properties of algebraic systems like Rings, Monoids andGroups.
C02: able to simplify problem of vector function and perform operation on vector function
C03: understand various properties of circle,parabola,ellipse and hyperbola.
C04: able to perform n time derivation on any function using leibnitz theorem.
C05: understand basic concept of asymptotes, curvature and quadrature.

B.Sc-103: Data and File Structure

C01: Understand the concept of Dynamic memory management, data types, algorithms, Big Onotation.
C02: Understand basic data structures such as arrays, linked lists, stacks andqueues.
C03: Describe the hash function and concepts of collision and its resolutionmethods
C04: Solve problem involving graphs, trees andheaps.
C05: Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

B.Sc-104:Analog Electronics

CO1: Acquire a basic knowledge in solid state electronics including diodes, MOSFET, BJT, and operational amplifier.
CO2: Develop the ability to analyze and design analog electronic circuits using discreteComponents
CO3: To understand Basic Analog Circuits and their applications using Active Devices
CO4: To learn basic function of single stage amplifier, multistage amplifier and power Amplifierand their working principle.
CO5: To understand basicconstructionof feedback circuits and their application inOscillatorsunderstand basic amplifier and oscillator circuits and their application in analog circuits.

B.SC HONS. COMPUTER SCIENCE 2nd Semester

B.Sc-201:System Analysis and Design

CO1:Student will be able to understand the basic concept Information System, their classifications and application in various business areas.
CO2: Learn new IT concepts of planning, scheduling and designing of System developing.
CO3: Learning the taxonomy of various interface designing, detailed designing of Information systems, tools of structured analysis.
CO4: Student can implement learning of software testing, quality assurance in project management in an industry.

B.Sc-202: Mathematics-II

C01:- Understand basic concept of neighborhood and limit point
C02:- Able to understand basic knowledge of real number system.
C03:- Understand Continuity and types of continuity.
C04:- Able to understand sequence and series and learn various test to prove nature of series.
C05:- Ability to solve problem using Taylor's series and Maclaurin's series and generate exponential and logairthmatic series.

B.Sc-203:Algorithms and Advanced Data Structures

C01:- Define the basic concepts of algorithms and analyze the performance of algorithms.
C02;- Understand the data structure such as tree and graph.
C03:- Solve problem involving graphs and trees.
C04:- Apply algorithm for solving problems like sorting, searching , insertion and deletion of data.
C05:- Understand THE CONCEPT of dynamic programming, NP completeness and identify different NP complete problems.
C06:- Understand the concept of Parallel Algorithms.

B.Sc-204: Digital Electronics

C01:- Apply principles of number system , binary codes and boolean algebra to minimize logic operation.
C02:- Develop K-Map to minimize and optimize logic functions.
C03:- Design various Combinational and Sequential circuits such as Encoder, decoder, and counters using multiplexers and Flip Flop.
C04:- Describes and Compare various Memory System.

B.Sc-301:Software Engineering

CO1: Learn basic principles of Software Engineering.
CO2: Understand Software Engineering concepts, methodologies and best practices.
CO3: Students would be able to implement Software Engineering principles and approach used in Industry.
CO4: Various project planning Automation tools: PERT, GANTT, etc charts.
CO5: Learn Software Engineering principles and approach used in industry.

B.Sc-302 :Mathematical Foundations of Computer Science

C01:- Define the basic concepts of algorithms and analyze the performance of algorithms.
C02;- Ability to apply mathematical logic to solve problems.
C03:- Able to model and solve real world problem involving graphs and trees.
C04:- Apply algorithm for solving problems like sorting, searching, insertion and deletion of data.

B.Sc-303 : Object Oriented Programming and Design

C01:- To describes the procedural and object oriented paradigm with the concept of classes , function, data, and objects.
C02:- Understand dynamic memory management techniques using constructors ,destructors.
C03:- Classify inheritance with demonstration.
C04:- Describes the concept function overloading , operator overloading , virtual function and polymorphism.
C05:- Demonstrates the use of various OOP's concepts with the help of programs using C++.

B.Sc-304 : Computer System Architecture

C01:- Explain the organization of basic computer,its design and the design of control unit
C02:- Demonstrates the working of CPU and Risc and Cisc architectures.
C03:- Describes the operations and languages of the register transfer , micro operations and input output organization.
C04:- Understand the organization of memory and memory management Hardware.

Fourth Semester

B.Sc-401 :Data Base Systems

CO1: Student will be able to have basic knowledge about data management concepts historical and latest.
CO2: Demonstrate an understanding of the DBMS, Relational data model and other modeling techniques.
CO3:Transform an information model into a relational database schema and to use a data definition language and/or utilities to CO4: implement the schema using a DBMS.
CO5: Formulate, using relational algebra, solutions to a broad range of query problems.
CO6: Formulate, using SQL, solutions to a broad range of query and data update problems.

B.Sc-402: Scientific and Statistical Computing

CO1: Analyze statistical data graphically using frequency distributions and cumulative frequency distribution.
CO2: Analyze statistical data using measures of central tendency,dispersion and location

CO3: Use discrete and continousprobability distributions,including mean and variance
CO4: Use poisson,exponential distributions to solve statistical problems.
CO5: Employee the principles of linear regression and correlation,including least square method ,predicting a particular value of y for a given value of x and signifance of the correlation coefficient.

B.Sc-403 : Operating Systems and UNIX

C01:- Understand the basic of operating system like kernel, shell , types of operating system.
C02:- Describes the various Cpu Scheduling algorithms.
C03:- Explains various memory management techniques and concept of thrashing.
C04:- Use disk management and disk scheduling algorithms for better utilization of exernal memory.
C05:- Recognize file system interface , protection and security mechanism.
C06:- Explain the various features of distributed OS like UNIX, LINUX,WINDOWS etc.

B.Sc-404 : Microprocessor-I

C01:- Program in 8086 assembly languages for small applications.
C02:- Implement ALU design using its constructs through relevant micro operation,
C03:- Understand the taxonomy of microprocessor and knowledge of microprocessors.
C04:- Explore Technologies for interfacing I/O devices to the microprocessor 8085 including specific standard I/o device such as 8255.
C05:- Demonstrate programming using the various addressing modes and instruction set of 8086 .

B.Sc-407: Summer Training/Project

C01:-Student will have practical learning about the software development procedure.
C02:- They would have learned in detail any phase of software development in any organization.
C03:- This would be a minor project development for the time of 4-5 weeks in an industry or any faculty project guide.
C04:- They will be able to prepare a project report based on Computer Application, IT development consisting of maximum 100 pages.

Fifth Semester

B.Sc-501 : Data Communication and Computer Networks

CO1: Understand computer network basics, network architecture, TCP/IP and OSI referencemodels.
CO2: Identify and understand various techniques and modes of transmission.
CO3: Describe data link protocols, multi-channel access protocols and IEEE 802 standards forLAN
CO4: Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressingscheme
CO5: Discuss the elements and protocols of transportlayer.
CO6: Understand network security and define various protocols such as FTP, HTTP, Telnet,DNS

B.Sc-502 : Computer Graphics

CO1: Understand the basics of computer graphics,different graphics systems and applications of computergraphics.
CO2: Discuss various algorithms for scan conversion and filling of basic objects and their comparativeanalysis.
CO3: Use of geometric transformations on graphics objects and their application in compositeform.
CO4: Extract scene with different clipping methods and its transformation to graphics displaydevice.
CO2: Explore projections and visible surface detection techniques for display of 3D scene on 2Dscreen.
CO2: Render projected objects to naturalize the scene in 2D view and use of illumination models forthis.

B.Sc-503 : Principles of Visual and Windows Programming

C01 Learning how to write Skelton program in C++ language.
C02 Learning how to dealing with the windows operating system, windows and there properties.
C03 Learning some of API function that enable to dealing with windows os
C04 Learning how to dealing with some controls (menus, dialog boxes,...).

B.Sc-504 : Microprocessor-II

CO1: Implement ALU design using its construct through relevant micro-operation.
CO2: Understand the taxonomy of 80286, 80386 and 80486 microprocessor.
CO3: Explore techniques for interfacing I/O devices to the microprocessor 80286, 80386 and 80486 including specific standard I/O devices such as 8251.
CO4: Programming in Assembly language for small applications.

B.Sc-507 : Essential Entrepreneurship Skills

CO1: To understand the concept of entrepreneurship and process of EntrepreneurshipDevelopment
CO2: To know the process of starting a new venture and create their business plan.
CO3: To know about valuation of Business and the sources for financing new venture.
CO4: To familiarize the students for government policy relating to entrepreneurship and EDP Schemes
CO5: To Enlighten the students with the concept of Stress Management and Success Management.
CO6 : To give them insights on Nishkam and Sakam Karma

Sixth Semester

B.Sc-601 : Internet Technologies

C01:- Explain the history of internet and related internet concept that are vital in understanding web development.
C02:- Discuss the insight of internet programming and implement application over the web.
C03:- Demonstrate the important HTML tags for designing static pages and seprate design from content using CSS.
C04:-utilize the concept of java and java script.

C05:- use Web application development software tools i.e Ajax, PHP,XMLetc and identify the environment currently available on the market to design web sites.

B.Sc-602 : Multimedia

C01: Student will be able to develop understanding of technical aspect of Multimedia Systems and various file formats, text, audio, speech, video, animation etc..
C02: Apply various communication and networking protocols for Multimedia systems.
C03: To evaluate Multimedia applications for its optimum performance.
C04: Apply various Intelligent Multimedia systems in different applications and architecture of IMS.
C05: Will be able to relate new technologies, devices in their surroundings to Intelligent Multimedia Systems.

B.Sc-603 : Programming in JAVA

C01:-To understand object oriented programming concepts and apply them in solving problem.
C02:- To introduce the principles of inheritance, polymorphism and demonstrate how they are implemented in java.
C03:- To introduce the concept the expectation handling and multithreading.
C04:- To introduce the implementation of packages and interfaces.
C05: To introduce the design of graphical user interface using Applets.

B.Sc-604 : Theory of Computation

C01: Understand the basic concepts of formal languages, automata and grammar types, as well as the use of formal languages and reduction in normalforms
C02: Demonstrate the relation between regular expressions, automata, languages and grammar with formal mathematicalmethods
C03: Design push down automata, cellular automata and Turing machines performing tasks of moderate complexity
C04: Analyze the syntax and formal properties, parsing of various grammars such as LL(k) andLR(k).
C05: Describe the rewriting systems and derivationlanguages

B.Sc-607 : Behavioral and Communication Skills

C01:-To discuss the development of the field of organizational behavior and explain the micro and macro approaches to analyze and compare different models used to explain individual behavior related to motivation and rewards.
C02: To identify the processes used in developing communication and resolving conflicts.
C03: To explain group dynamics and demonstrate skills required for working in groups (team building).
*C04: To identify the various leadership styles and the role of leaders in a decision making process.
C05: To explain organizational culture and describe its dimensions and to examine various organizational designs, to discuss the implementation of organizational change.

Programme specific outcomes (PSOs)of 3 year (six semester} BBA (General) program are as follows:

PS01: Students are expected to apply knowledge of managerial theories and practices to improvise organizational working.
PS02: Ability to analyze and offer solutions to multivariate business problems.
PS03: Understanding the complexities of working environment of business world.
PS04: Comprehend and analyze the importance of values and ethical concerns in business organizations.
PS05: Preparing the students at undergraduate level to have varied knowledge in all the disciplines.
PS06: Providing students, the strong foundation to pursue higher studies in managerial field.

COURSE OUTCOMES BBA(G)

BBA (G) 1st Semester

BBAN101 Business Organization

CO1: To Enlighten with nature and scope of Business organization
CO2: To familiarize the students with different forms of business organization
CO3: To create awareness about stock market
CO4: To make them understand about entrepreneurship Development.

BBAN 102 Business Mathematics

CO1: To understand the basic concepts of Mathematics.
CO2:Understanding basic terms in the areas of business calculus solving of business problems.
CO3: Student can acquire basic-level knowledge of management for beginners.
CO4: The objective of the course is to equip the students with the ability to analyze, interpret and apply the basic concepts and theories of mathematics in business management.
CO5: Develop proficiency in the application to solve Business Mathematics problems

BBAN-103 Financial Accounting

CO1: Understand and apply accounting concepts, principles and conventions for their routine monetary transaction;
CO2: Create and prepare financial statements in accordance with Generall Accepted Accounting Principles
CO3: Gain knowledge of rectification of errors
CO4:Develop practical understanding of Bank Reconciliation Statement, Receipts and Payments Account and Single Entry System.
CO5: Describe the concepts and preparation of Consignment and Joint venture.

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BBAN 104 Computer Fundamentals

CO1: Bridge the fundamental concepts of computers with the present level of knowledge of the students.
CO2: Familiarise operating systems, programming languages, peripheral devices, networking, multimedia and internet
CO3: Understand binary, hexadecimal and octal number systems and their arithmetic.
CO4: Understand how logic circuits and Boolean algebra forms as the basic of digital computer.

BBAN 105 Business Communication

CO1. Understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, organizational, intercultural communication etc. from multiple perspectives.
CO2. Understand and evaluate key theoretical approaches used in the interdisciplinary field of communication. I.e., students will be able to explain major theoretical frameworks and concepts for the study of communication and language.
CO3. To find, use, and evaluate primary academic writing associated with the communication discipline.
CO4. To make students able to communicate effectively orally and in writing.

BBAN 106 Micro Economics

CO1: Define the basic elements of micro economic aspects of a firm.
CO2: Forecast demand for a product.
CO3: Know what to produce, where to, when to, how to, for whom to produce.
CO4: Frame policy for production to minimize the cost and maximize the profit.
CO5: Construct the cost function.
CO6: Understand the basic nature of various markets.

BBAN 201 Principles of Management

CO1: To develop knowledge about evolution of management thought.
CO2: To help the students gain understanding of the functions and responsibilities of managers.
CO3: To help students to develop cognizance of importance of management principles.
CO4: To familiarize them with process of Management
CO5: To meet the challenges of modern management

BBAN 202 Macro Economics

CO1: Understand the basic elements of macroeconomics.
CO2:National Income and its Method of Calculations.
CO3:Government Policy and balance of payment with another country
CO4:Role of RBI and bank in Monetary policy of Country.
CO5:Aggregate Demand and aggregate supply and its equilibrium.

BBAN 203 Company Accounts

CO1: Understand the regulatory environment in which the companies are formed and operate
CO2: Have a solid foundation in accounting and reporting requirements of the Companies Act and relevant Indian Accounting Standards
CO3: Understand the treatment regarding issue of shares, debentures and treatment of prior period profits
CO4: Understand the treatment of Acquisition of Business
CO5: Understand the Valuation of goodwill and shares under various methods
CO6: Draft Final Accounts for Banking and Insurance Companies.

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BBAN 204 Computer Aided Management

CO1:Give students an in-depth understanding of why computers are essential components in business, education and society.
CO2: Introduce the fundamentals of computing devices and reinforce computer vocabulary, particularly with respect to personal
use of computer hardware and software, the Internet, networking and mobile computing.
CO3:Provide hands-on use of Microsoft Office applications Word, Excel and PowerPoint. Completion of the assignments will
result in MS Office applications knowledge and skills
CO4:Solve common business problems using appropriate Information Technology applications and systems.
CO5:Identify categories of programs, system software and applications. Organize and work with files and folders.
CO6:Describe various types of networks network standards and communication software.

BBAN 205 Organizational Behaviour

CO1: Understand the applicability of the concept of organizational behavior to analyze the behavior of people in theorganization.
CO2: Understand individual behavior in organizations, including diversity, attitudes, job satisfaction, emotions, moods, personality, values, perception, decision making, and motivational theories.
CO3: Identify the core competencies, managerial roles and significance of emotional; intelligence at work.
CO4: Assess the potential effects of organizational factors on organizational behavior.

BBAN 206 Business Statistics:

CO1: Gain knowledge of basic concept / fundamentals of business statistics.
CO2: Develop practical understanding of various statistical concepts.
CO3: Compute various measures of central tendency, measures of Dispersion,
CO4: Understand basic concepts of Correlation and Regression analysis, index numbers, time series and their implication on Business performance.

BBA (G) 3rd Semester

BBAN301 Cost and Management accounting:

CO1: Understand and apply management accounting concepts, principles and conventions for their routine monetary transactions.
CO2: To know about the classification of cost and techniques of cost reduction and control.
CO3: Aware about managerial applications of techniques of accounting for planning, decision making and control.
CO4: Understand the concept of analysis of financial statements through cash flow and fund flow analysis.
CO5: To know about the concept of financial control through budgetary control and inventory control.

BBAN302 Marketing Management

CO1: understand the marketing concept and its environment.
CO2: formulate a marketing plan including marketing objectives, marketing mix, strategies and budgetary considerations.
CO3: make decisions on product mix, pricing and packaging.
CO4: develop strategies for the efficient distribution of products and services.

BBAN303 Capital Markets

CO1: understand the basic concepts of capital market and its instruments.
CO2: gain knowledge of the role, features, reforms and regulatory framework of capital market.
CO3: understand the functioning of primary market and secondary market.
CO4: describe the fundamental concept and functioning of depository system and debt market.
CO5: critically analyze the pivotal role and policies of financial institutions and mutual funds.

BBAN304 Introduction to Information Technology

CO1 :Describe the usage of computers and why computers are essential components in business applications.
CO2: Creating document in Microsoft Word with formatting, editing features of word processor.
CO3:Write various functions in Microsoft Excel to perform basic calculations and to convert number to text and text to number, CO4: Business and statistical functions used in industries and accounts.
CO5: Learning about pivot tables, charts for business purpose and how to implement them.
CO6: Create a presentation in Microsoft PowerPoint that is interactive and legible content with the use of PowerPoint animations.
CO7: Modify text using various formatting options, using Mail merge tools in Office suite. understanding the concepts of Tally accounting in day to day accounts and ledgers creation in industry and analyzing the profit, credit statements.

BBAN305 Environment Studies

CO1: To articulate the multidisciplinary nature of environmental studies
CO2: To understand the concept and methods from renewable and non renewable sources
CO3: To acquire knowledge on ecosystem.
CO4: To Study sustainable development concept.
CO5: To make them understand the challenges of Environmental issues and measures.
CO6: To enlighten them with Environmental Legislations.

BBAN306Disaster Management

CO1: To Understand basic concepts in Disaster Management, Definitions and Terminologies Types and Categories of Disasters, the Challenges posed by Disasters and Impacts of Disasters.
C02: To develop awareness among students in the disaster medicine and also prepared them for natural and manmade disaster.
CO3: The aim public health management of disaster is to build capacities that will reduce disaster health risks and contribute to public health based relief following disasters thereby reducing morbidity and mortality following disasters.
CO4: Project Work: (Field Work, Case Studies) The project /fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. A few ideas or suggestions on topics for projects for Student work could be as follows.
a. Development Disaster preparedness plans
b. Monitoring and evaluation plan for disaster response
c. Low cost Home based water purification methods
d. Planning Nutrition intervention programmes
e. Preparedness plans for public health response.

BBAN401 Financial Management

CO1: describing the goal of financial management and concept of Time Value of Money.
CO2: understand the distinctiveness of various capital budgeting techniques and their application.
CO3: different techniques of calculating cost of capital of various long term sources of finance.
CO4: understanding the concept of financial leverage and its significance in capital structure planning.
CO5: knowing the determinants of dividend and their implications.

BBAN402Human Resource Management

After completing the course students would be able to:
CO1: understand the history and evolution of HRM.
CO2: develop necessary skill set for application of various HR issues.
CO3: identify strategic HR Planning and the HRM process to the organization's strategic management and decision making process.
CO4: evaluate the developing role of human resources in the global arena.

BBAN403Business Research Methods

CO1:To familiarize participants with basic of research and the research process, to enable the participants in conducting researchwork and formulating research synopsis and report.
CO2:Better awareness of business research methods enabling the participant to critically evaluate research, and become moreinformed consumers of research.
CO3:Apply and interpret the different types of quantitative methods of analysis.
CO4: Effectively communicate research in a written report and presentation.

BBAN404Business Laws

CO1: Gain knowledge about the concepts of Law of Contract and various kinds of contracts like Indemnity, Guarantee, Bailment, Pledge and Agency.
CO2: To learn about various elements of contract of Sales.
CO3: To acquire knowledge about the concepts of Negotiable Instruments-meaning, types of negotiable instrument, holder & holder in due course, negotiation of negotiable instrument.

CO4: To gain knowledge about various concepts of Digital signature, Electronic governance, penalties adjudication & offences under Information Technology Act, 2000.
CO5: To be well versed with various concepts of RTI act 2005.

BBAN405Database Management System

CO1: Understand the fundamental elements of database management system.
CO2: Demonstrate an understanding of the DBMS, its various types of architectures
CO3: transform an information model into a relational database schema, mapping and to use a data definition language and/or utilities to implement the schema using a DBMS.
CO4: Gain knowledge about data mining, warehousing and other latest concepts of managing Database.
CO5: knowledge of organize, maintain and retrieve data efficiently and effectively from a DBMS using Ms-Access.

BBAN406Human Rights and Values

CO1: understand the concept of human rights, evolution of rights at international and national level, types of human rights.
CO2: gain knowledge about their fundamental rights provided in Indian constitution.
CO3: become aware about different disadvantaged groups and how they are deprived of their fundamental rights.
CO4: gain knowledge about the factors behind human rights violation and its redressal mechanism.
CO5: understand the concept of human values, evolution of value oriented education and type of values.
CO6: analyze the importance of values and character in their life and develop feeling of national integration and international understanding.

BBAN501Production and Materials Management

CO1: Understand Production Management objectives and functions
CO2: Understand Techniques of Location and Facility Planning; Line Balancing
CO3: Understand Materials Management
CO4: Plan and implement Suitable Materials Handling Principles and Practices in the Operations
CO5: Plan and implement Suitable Quality Control Measures
CO6: Understand the concept of Inventory and Stores Management

BBAN502 Company Law

CO1: To gain complete knowledge of The Companies Act, 2013.
CO2:To learn about the various important documents required for registration such as MOA, AOA.
CO3: To acquire knowledge about the issue, redemption, forfeiture & reissue of shares And debentures.
CO4:To acquire an insight about the company administration, various meetings and Winding up of a company.

BBAN503Indian Business Environment

CO1: Understand relationship between environment and business and applying the environmental

analysisTechniques in practice
CO2: Understand Economic, Socio-Cultural and Technological Environment
CO3: Evaluate state policies, Economic legislations and Economic reforms laid down by the government

BBAN504Computer Networking & Internet

CO1: Understand the fundamental concepts of Computer Networking.
CO2: Identify different networking devices & their functions in a network.
CO3: Demonstrate the functioning of Internet & Intranet and various tools.
CO4: Understand the fundamentals of E-commerce & application areas.
CO5: Design web pages &understand various user interfaces.

BBAN505Presentation Skills and Personality Development

CO1: Understand the concept of presentation skills, types of presentation, outcomes of presentation and steps in structuring of presentation.
CO2: Be able to plan presentation, prepare presentation notes, session plan and use different methods of presentation.
CO3: Deliver effective presentation and can handle difficult situation and nerves.
CO4: Understand the concept of personality, symbols of self, factors responsible for moulding personality patterns, personality determinants and body language.
CO5: Develop self awareness, manage personal stress and can do problem solving.
CO6: Be groomed in terms of appearance, dressing sense, personal hygiene and etiquettes.
CO7: Manage time effectively and can do public speaking confidently.

BBAN506Cyber Security

CO1: Know about various policies and procedures which are made to ensure the security of computers, communications, networks, data, information and other computer related resources in cyberspace
CO2: Understand the concept of information society, knowledge society, critical infrastructure and critical information infrastructure
CO3: Understand the concept of cyber terrorism and know about the various factors that are contributing to the existence of cyber terrorism
CO4: Know about various types of cyber crimes, how to deal with cyber crimes, cyber attacks, concept of cyber jurisdiction and Indian IT Act

BBAN507Summer Training Report

CO1: apply business concepts and theories to real-world decision-making
CO2: increase proficiency in specific business disciplines; such as human resources management, operationsmanagement, marketing, accounting, statistics, economics, finance, and business law.
CO3: assist the student's development of employer-valued skills such as teamwork, communications and attention to detail.
CO4: enhance and/or expand the student's knowledge of a particular area(s).
CO5: expose the student to professional role models or mentors who will provide the student with support in the early stages of the internship and provide an example of the behaviours expected in the intern's workplace.

BBAN601Income Tax

CO1: Understand rules and regulations of Income Tax Act
CO2: Understand computation of Taxable Income under different heads
CO3: Understand computation of Set off carry Forward of losses and Clubbing of Income
CO4: understand the deductions under Income Tax Act.

BBAN602System Analysis & Design

CO1: Elicit user's requirements, analyze and specify software requirements in a logical model
CO2: Represent the specified requirements using tools of structured analysis
CO3: Understand the concept of system analysis and development using SDLC (System Development Life Cycle)
CO4: Understand the concept of distributed data processing and real time systems

BBAN603Foundations of International Business

CO1: explain the Concepts in International Business With Respect to Foreign Trade/International Business
CO2: evaluate the Global Business Environment in terms Of Economic, Social and Legal Aspects
CO3: analyze the Principles and Strategies Adopted By Firms to Expand and Control International Business
CO4: understand the functioning Of Global Trade And Global Financial Systems
CO5: understand Risk Management in International Business

BBAN604Consumer Protection

CO1: Understand the Consumer Protection Act, 1986 & different philosophies existing from time to time in the interest of the consumers.
CO2: Learn about the three tier redressal machinery of consumer forums and the basic provisions of CPA 1986.
CO3: Gain complete knowledge about the approaches to consumerism; how government and business play a role in consumer welfare.
CO4: To study the role of media in increasing consumer awareness.
CO5: Acquire knowledge about how information is a tool in the hands of consumers to be safe and role of ethical marketing in consumer protection.

BBAN605E-Commerce

CO1: programmed data framework to direct business on the internet.
CO2: making, subsidizing, and overseeing E-commerce businesses.
CO3: writing business plans.
CO4: buying and selling goods or services online.
CO5: collaborating with marketing and business partners to ensure profitable input and output

Programme specific outcomes of 3 year (six semester} BCA program are as follows:

PS01:To foster among students an interest and confidence in using computer and related applications.
PS02:To demonstrate a knowledge and understanding of using computers to solve problems related to practical application.
PS03:To show positive attitude for adapting and coping with a changing society with widespread utilization of computer.
PS04:To prepare students who wish to go for further studies in computer science and related subjects.

COURSE OUTCOMES BCA

BCA 1st Semester

Computer Fundamentals

CO 1:- Introduction to computer system that demonstrate a knowledge and understanding of using computers to solve problems related to practical applications.
CO 2 :-An opportunity to develop understanding of the basic operations of a computer system and computer applications software. Meanwhile, developing the skill of using computer applications software for solving problems.The implications of developments in information technology using different applications of computers.
CO 3:- To familiarized the students with different computer languages.
CO 4 :- Interaction with the outside world by moving data into and out of the computer system using different input and output devices.
CO5 :- Introduction to operating system and types of operating system.
CO 6:-Use of networking in real life and various transmission medias.

PC SOFTWARE

CO1: Concept of Operating System and Control Panel.
CO2: Helps in understanding the basic of system.
CO3: Understanding the concept of Word Processing like Mail-merge, Header & Footer.
CO4: Describe concept of Spreadsheet using Excel like Charts, Functions and Cell Reference.
CO5: Use of advance Excel like Data Validation, filter, and Goal Seek.
CO6: Describe concept of Presentation using PowerPoint like animations, sound effects.

Logical Organization of Computer-I

CO 1:- To impart how to design Digital Circuits.
CO 2:- Convert different type of codes and number systems which are used in digital communication and computer systems.
CO 3:- To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
CO 4:- Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.
CO 5:- To enable the students to understand, analyze and design various combinational and circuits.

Maths-1.

CO1:-Students will understand how to use limits to compute the derivative of a function.
CO 2:- Students will be able to utilize methods of integration.
C0 3:- Students will become skilled in computations and applications of matrices to solve industrial problems.
CO 4:- Solve problems using mathematics in unfamiliar settings.
CO 5:- Solve applied problems using differentiation and integration.

BCA 2nd SEM
"C"PROGRAMMING

CO 1:-What are the different programming tools.
CO 2:- Logic Building.
CO 3:- Help to do system programming.
CO 4:- Help to identify different type of data and explain data mgmt.

Logical Organization of Computer-II

CO 1:- To acquire knowledge about the design procedures of basic sequential circuits.
CO 2:- Develop a digital logic & apply it to solve real life problems.
CO 3:- Assess the nomenclature & technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world applications.

Mathematical Foundation of Computer Science

CO 1:- Apply algorithms and use of graphs and trees as tolls to visualize and simplify problem.
CO 2:- Solve problems like sorting, recursion, searching.
CO 3:- Apply basis statistics in real life problems.
CO 4:- Organize, manage and present data; Analyze statistical data graphically using frequency distributions and measures of central tendency, dispassion.
CO 5:- Determine and analyze the complexity of given algorithm.

Structured System Analysis and Design

CO 1:-System Analysis and Design program is the application of computer technology, modern materials and construction techniques to the overall design of structures, including project planning, costs estimatedand management of the project.
CO 2:- Perform standard analysis and design of structural systems following codes and modern practices.
CO 3:- The major goal of systems analysis and design is to improve organizational systems. Often this process involves developing or acquiring application software and training employees to use it.

BCA 3rd SEM
DBMS

CO 1:- DBMS puts on emphasis on how to organize, maintain and retrieve - efficiently, and effectively – information for maintain the data base.
CO 2:- Explored fundamental and advanced concepts of relational database management systems, entity-

relationship model, relational database design, relational algebra and SQL.
CO 3:- Designing of data base using normalization techniques and the current developments in database theory and their practice.

Data Structure-I

CO1- Describe Data structure and management of data.
CO2- Explain the role of complexity of a program in software development.
CO3- Explain the applicability of different type of data structure in real life.
CO4- Describe memory management of each data structures.

Operating System

C01: understanding the concept of operating system and analyzing its different types.
C02: developing the understanding about how different functions are performed by OS.
C03: help in understanding the basic functionality of OS by taking UNIX operating system.
C04: understanding UNIX multiuser and multi tasking behavior with practical implementation

Communication Skills

CO 1:- To understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. from multiple perspectives.
CO 2:- To understand and evaluate key theoretical approaches used in the interdisciplinary field of communication. i.e., students will be able to explain major theoretical frameworks, constructs, and concepts for the study of communication and language, summarize the work of central thinkers associated with particular approaches, and begin to evaluate the strengths and weaknesses of their approaches.
CO 3:-To find, use, and evaluate primary academic writing associated with the communication discipline.
CO 4:-To make students able to communicate effectively orally and in writing.

BCA 4th SEM

Web Designing

CO 1:- Concept of Internet and related protocol used in Internet.
CO 2:- Developing of website using HTML using different feature of HTML language.
CO 3:- Developing of website using DHTML using features of DHTMS.
CO 4:- Introduction of JavaScript and related features.

Data Structure-II

CO 1:- Complete understanding of Trees with its operations, applying compression using trees.
CO 2:- Application of graphs, operations on Graph.
CO 3:- Understanding the concept of Searching and Sorting Techniques.
CO 4:- Storage Devices with its advantages and disadvantages. How to store data in universe using hashing and how to resolve Collision

Object Oriented Programming using C++

CO 1:-Use the charactuistics of an object oriented programming language in a program.
CO 2:- Use the basic object oriented design principles in computer problem solving.
CO 3:- Apply c++ features to program design and implementation.
CO 4:- Design and implementation programs of constructor, Destructor and Inheritance.
CO 5:-Design and Implementation Programs of polymorphism, Exception handling and also design and implementation programs of Templates and working with files.

Software Engineering

CO1: elicit user's requirements using requirement engineering techniques, analyze, organize and specify software requirements in a logical model
CO2: translate the specified requirements into a design, develop code on the basis of design, test and manage the overall software quality
CO3: able to apply software life cycle models, plan and manage software projects
CO4: prepare software documentation, debug and maintain the software.

BCA 5th SEM

MIS

CO1: Understand the basic system concepts and study the processes of developing and implementing information systems.
CO2: Understand the role of Management Information Systems and Decision Support System in achieving business competitive advantage through informed decision making.
CO3: Study the applications of information systems in various functional areas of business.
CO4: Understand the concept of E-Commerce & describe the opportunities &challenges offered by E-Commerce.

Visual Basic

CO 1:- Understanding of VB environment and Event Driven Programming
CO 2:- Development of Window application using various I/O controls .
CO 3:- Use of Loop constructs, decision constructs and array .
CO 4:- Development of project in visual basic using VB procedures , multiple forms.

DCNA

C01: Understanding the concept of data communication and networks with the help of underlying network models.
C02: Understanding the basic concept of each layer with its functionality.
C03: Exploring the various protocols and hardware devices used in each layer.
C04: Explaining the concept of internet with the help internet addressing techniques .

Computer Graphics

1. To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
2. To learn the basic principles of 3- dimensional computer graphics.

3. Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
4. Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.
5. To be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications. 6. To comprehend and analyze the fundamentals of animation, virtual reality, underlying technologies, principles, and applications.

BCA 6th SEM

E-Commerce

CO 1:- Understand concept of E-Commerce, its application and Future.
CO 2:- Help in understanding value chains and their models.
CO 3:- Explain security of E-Commerce and Payment System.
CO 4:- Describe Business to business E-Commerce and EDI concept and EDI standards.

Object Technologies & Programming using Java

CO 1:-To demonstrate the use of oop concepts & solve real world problems using OOPS technique.
CO 2:-To Understand & learn how to develop robust programs in java using excetion handling.
CO 3 :-To understand the basic approaches to the design of software application.
CO 4:- To demonstrate the use of Multithreading in applications.

Artificial Intelligence

CO 1:- Understand the concept of Artificial Intelligence and its application in computer science.
CO 2:- How creating knowledge base different from Data base.
CO 3:- How learning takes place in computer with the help of AI.
CO 4:- Use & Architecture of Expert system in current scenario.

Introduction to .Net

CO 1:-Introduction to .Net and architecture Development of .Net.
CO 2:- .Understanding the concepts if C#.
CO 3 :- Understanding of operation, control constructs inC#.
CO 4:- Understanding of reusability concept in C# , Advance feature of C#.

Program Specific Outcomes of the three year (Six Semester) BBA (Computer Aided Management)

PSO1: Demonstrate critical thinking skills in understanding managerial issues related to business in the fast changing economic scenario.
PSO2: Become a job provider instead of a job seeker by developing necessary entrepreneurial skills
PSO3: Apply the theoretical knowledge gained during the course in real life business situations for effective decision making.
PSO4: Develop problem solving and leadership skills by acquiring in-depth knowledge of managerial and IT skills.
PSO5: Create and manage innovation, new business development, and high-growth potential entities.

COURSE OUTCOMES BBA(CAM)

BBA(CAM) 1st Semester

BCAMN101 Conceptual Foundations of Management

C01 To make the students learn how management technique is to be adopted to run the organization effectively by using principle of management..
C02Demonstrate the roles, skills and functions of management.
C03 It describe the students about delegation and decentralization and the details about planning and MBO..
C04 Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.

BCAMN102 Business Economics

C01 To familiarize the students with the basic concept of microeconomics.
C02To make student understand the demand and supply analysis in business applications
C03To familiarize the students with the production and cost structure under different stages of production.
C04To understand the pricing and output decisions under various market structure.
C05To integrate the concept of price and output decisions of firms under various market structure.
C06To help students understand and apply the various decision tools to understand the market structure.
C07 To understand the basic concepts of National Income, Fiscal & Monetary Policy.

BCAMN103 Mathematics for Managers

C01 Define basic terms in the areas of business calculus and financial mathematics,
C02 Explain basic methods of business calculus, types and methods of interest account and their basic applications in practice,
C03 Solve problems in the areas of business calculus, simple and compound interest account, use of compound interest account, loan and consumer credit,
C04 Discern effects of various types and methods of interest account,
C05Connect acquired knowledge and skills with practical problems in economic practice.

BCAMN104 Financial Accounting

C01 To understand and apply book keeping accounting concepts, principles and conventions for their routine monetary transaction

C02 To describe the main elements of financial accounting information – assets, liabilities, revenue and expenses

C03 To create and prepare financial statements in accordance with generally accepted accounting principles
C04 To analyze, interpret and communicate the information contained in the basic financial statements and explain the limitation of such statements

BCAMN105 Introduction to Computers

C01 Introduction to computer system demonstrate a knowledge and understanding of using computers to solve problems related to practical applications.
C02 An opportunity to develop understanding of the basic operations of a computer system and computer applications software. Meanwhile, developing the skill of using computer applications software for solving problems.The implications of developments in information technology using different applications of computers.
C03 To familiarized the students with basic as well as advance MS office.

BCAMN201 Business Environment

C01 To acquaint students with the issues of domestic and global environment in which business has to operate.
C02 To related the impact of environment on business in an integrated manner.
C03To give an exposure to important commercial and industrial laws.

BCAMN202 Organization Behaviour

C01 Analyze the behavior of individuals and groups in organizations in terms of the key factors that influence organizational behavior.
C02 Identify the core competencies, managerial roles and significance of emotional intelligence at work.
C03 organization behavior needs and trends with emerging issues prevailing
C04 explain the organizational culture and describe its dimensions and to examine various organizational designs
C05 Students will learn to resolve conflict and make negotiation in organization and to handle stress in organization
C06 Apply motivational and leadership theories to resolve problems of employee absenteeism, turnover, stress, job satisfaction, job performance and organizational commitment.
C07 Students will get to know about organization structure and culture, team building and group behavior in organization

BCAMN203 Business Statistics

C01 On completion of this course, the students will be able to:
C02 Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis
C03 Critically evaluate the underlying assumptions of analysis tools
C04 Understand and critically discuss the issues surrounding sampling and significance

C05 Discuss critically the uses and limitations of statistical analysis
C06 Solve a range of problems using the techniques covered CO6. Conduct basic statistical analysis of data.

BCAMN204 System Analysis and Design

C01 System Analysis and Design program is the application of computer technology, modern materials and construction techniques to the overall design of structures, including project planning, costs estimate and management of the project.
C02 Perform standard analysis and design of structural systems following codes and modern practices.
C03 The major goal of systems analysis and design is to improve organizational systems. Often this process involves developing or acquiring application software and training employees to use it.

BCAMN205 Operating System and Networking

C01 understand the concept of operating system , functions of Operating system, Memory management and file management.
C02 understand the concept of UNIX operating system, Device driver and terminals.
C03 implement various commands of UNIX related to files and Directories.
C04 understand various concepts of networking and Topologies.
C05 understand various concepts of Programming Languages.
C06 understand protocols for communication (HTTP, TCP/IP,SMTP) and office communication system.

BCAMN206 Cost and Management Accounting

C01 To understand the basic concepts and processes used to determine the product cost
C02 To be able to understand the basic management accounting concepts and techniques.
C03 To be able to interpret cost accounting statements
C04 To be able to analyze and evaluate the information for cost ascertaining ,planning, control and decision making.
C05 To help in understanding right decision making tool like CVP analysis, pricing decision

BCAMN 301HUMAN RESOURCE MANAGEMENT

CO1: Discuss the history and evolution of HRM.
CO2: Explain the importance of HRM in the organizations through their roles &responsibilities, challenges etc.
CO3: Assess the major HRM functions and processes of HRM planning, job analysis and design, recruitment, selection, training and development, compensation and benefits, and performance appraisal
CO4 To make the students learn the industries relation and industrial unrest.
CO5: Explain how training helps to improve the employee performance.

BCAMN 302FINANCIAL MANAGEMENT

CO1: describe about various financial system concepts.
CO2: apply the concept the time value of money
CO3: categorize and analyze different capital budgeting techniques
CO4: appraise different project proposals for decision making
CO5: estimate cost of capital for long term source of finance

BCAMN 303MARKETING MANAGEMENT

CO1: Describe about various financial system concepts.
CO2: Apply the concept the time value of money
CO3: Categorize and analyze different capital budgeting techniques
CO4: Appraise different project proposals for decision making
CO5: Estimate cost of capital for long term source of finance

BCAMN 304PRODCUTION MANAGEMENT

CO1: Understand the role of Production in overall Business Strategy of the firm.

CO2: Understand the trends & challenges of Production Management in ongoing business world.

CO3: Plan and implement suitable quality control measures in Quality Circles to TQM.

CO4: Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.

BCAMN 305 INTERNET TECHNOLOGY

CO1: To understand the concept of Internet, Intranet and Extranet & applications of internet.
CO2: To understand the concept of Intranet, Extranet and Business values of intranet.
CO3: To understand the concept of Enterprise collaboration system, Email and internet phone .
CO4: To understand and identify security issues of Internet and future scope of internet
CO5: To understand protocols for communication (HTTP,TCP/IP,SMTP) and office communication system.
CO6: To understand and implement HTML and DHTML for website Design.

BCAMN 306DISASTER MANAGEMENT

CO1: The overall aim of this is to provide broad understanding about the basic concepts of Disaster Management. i.e. To Understand basic concepts in Disaster Management, Definitions and Terminologies Types and Categories of Disasters, the Challenges posed by Disasters and Impacts of Disasters.
CO2: To develop awareness among students in the disaster medicine and also prepared them for natural and manmade disaster.
CO3: The aim public health management of disaster is to build capacities that will reduce disaster health risks and contribute to public health based relief following disasters thereby reducing morbidity and mortality following disasters.
CO4: Project Work: (Field Work, Case Studies) The project /fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. A few ideas or suggestions on topics for projects for Student work could be as follows.

a. Development Disaster preparedness plans
b. Monitoring and evaluation plan for disaster response
c. Low cost Home based water purification methods
d. Planning Nutrition intervention programmes
e. Preparedness plans for public health response.

BCAMN 401Public Relations and Management

CO1: Coordinate and contribute to the planning of public relations activities, including the development of clear, measurable communication objectives.

CO2: Use research results and analytical skills to guide the development of communication objectives and public relations activities, evaluate their impact, and support organizational objectives and stakeholder relationships.

CO3: Monitor emerging social and economic trends, and local, national and global issues to guide the planning and implementation of public relations strategies

CO4: Select strategies and tools to build and manage stakeholder relationships to support public relations activities, organizational objectives and career development.

BCAMN 402Quantitative Analysis

The objective of this paper is to equip the students with various quantitative tools and techniques which are of great importance for quantitative decision-making.

BCAMN 403 DBMS

Co1: understand relational table schema(including keys and foreign key references)
C02: To design a database using ms-access.
C03: design e-r diagrams for new database.
C04: apply and relate the concept of transaction, concurrency control & recovery in database.
C05: discuss web database, distributed database, data warehousing & mining.

BCAMN 404Multimedia Technology

CO1: To understand the basic concept of Multimedia and Multimedia Systems and Speech Generation and Recognition.
CO2: To understand the various concepts of Compression and various compression standards (JPEG ,MPEG , DVI)
CO3: To understand various applications of Multimedia in different fields.
CO4: To understand the basic elements of Multimedia (Text, Audio, Video, Image, Graphics).
CO5: To understand various software and Hardware of Multimedia and process of designing multimedia systems.
CO6: implementation of Flash tool for developing multimedia applications.

BCAMN 405BUSINESS RESEARCH METHODS
After completing the course students would be able to:
CO1: students will be able to explain the meaning& role of Research Methodology
CO2: Managerial decision can be taken by students for the application of the Concept of Business Analytics.
CO3: students will have awareness regarding ethical and philosophical consideration that is related to research.
CO4. Gain knowledge of basic concept / fundamentals of Business Research Methods.
CO5: students will be familiar with good practices in conducting a qualitative interview and observation.
CO6: Students will be able to acquire knowledge on various kinds of research questions and research designs.
CO7: They will understand how to distinguish between qualitative, quantitative and mixed methods of research.

BCAMN 406HUMAN RIGHTS AND VALUES

CO1: Understand the concept of human rights and its types, evolution of rights at international and national level.
CO2: Gain knowledge about their fundamental rights provided in Indian constitution.

CO3: Create awareness about different disadvantaged groups and how they are deprived of their fundamental rights.
CO4: Gain knowledge about the factors behind human rights violation and its redressal mechanism.
CO5: Understand the concept of human values and types of values,evolution of value oriented education.
CO6: Analyze the importance of values and character in their life and develop feeling of national integration and international understanding.

BCAMN501 Business Policy and Strategic Management

CO1. To equip students to develop requisite skills for developing long term strategic plans for an organization.
CO2. To develop conceptual understanding of strategy formulation, implementation and evaluation.
CO3. To develop skills of students to think strategically in competitive global environment.

BCAMN502 – Mercantile Law

CO1: To learn about features and types of companies and the steps involved in it's formation. CO2: To learn about Indian contract act 1872 and valid requisites for a contract
CO3: Gain knowledge about Sale of Goods Act 1930 and its various terminologies and about factories Act 1948 and its provisions for health, safety and welfare of the workers.
CO4: To learn about information regarding Consumer Protection act 1986 and consumer rights

BCAMN503 – Consumer Behavior

CO1: Gain strategic understanding of the influential and persuasive mechanisms involved in consumer attitude, belief, and behavior change, and will be able to apply this knowledge in addressing specific marketing problems.
CO2: Examine the consumer from a managerial perspective and to develop marketing strategies to respond to consumers' changing attitudes and behaviors.
CO3: Understand how to anticipate, adapt, and respond to consumer needs by applying the insight from basic consumer behavior concepts to their marketing strategies.
CO4: Understand the current and future research techno.

BCAMN504 – RDBMS

CO1: understand the Basic concepts of RDBMS, CODD's rule of RDBMS, Data models and advantages and limitations of RDBMS .
CO2: able to draw and design ER Diagrams for various applications.
CO3: understand the various concepts of SQL.
CO4: Implementation and handling of queries of SQL.
CO5: understand the relational database design and concepts of ERP.

BCAMN505 – Software Engineering

CO1. Plan a software engineering process life cycle, including specification, design, implementation, testing.
CO2. Analyze and translate a specification into design
CO3. Know how to develop the code from the design effectively apply different types testing.
CO4. Study different types of metrics used to measure software life cycle process.

BCAMN506 – Cyber Security

CO1. Understand the meaning of various terms-Data, Information, Digital divide & role of different societies.
CO2. Understand the role ICT in Cyber security.
CO3. Analyze the risk of cyber terrorism and strategies for protection.
CO4. Understand cyber crime& the preventive techniques that can be applied.
CO5. Understand the concepts of confidentiality, availability, and integrity (CIA) in context of Information Assurance.
CO6. Understand risk & maintain various risk management strategies.
BCAMN507 – Summer Training Report

6th Semester
BCAMN601 – Entrepreneurship Development

CO1: develop entrepreneurship as a field of study and as a profession.
CO2: understand the creative process of opportunity identification and screening.
CO3: understand the importance of innovation in the creation of sustainable competitive advantage.
CO4: understand techniques to test a business model to ensure its viability.

BCAMN602 – International Business

CO1: Students will be able to Define the concept of International Business environment.
CO2: Students are expected to Evaluate the models & theories of international trade.
CO3: Students will be able to explain how international factors affect domestic concerns.
CO4: Knowledge on the concept of country risk analysis and responsibilities of International trade will be enhanced.
CO5: Students will be able to develop Analytical skill to understand the economic crisis of developing countries.
CO6: awareness will be created to understand and explain regional economic integration and economic and political integration
CO7: Cognitive knowledge and social responsibility on global issues will be enhanced, understanding of interpersonal skills with individuals from various cultures will be created.

BCAMN603 – Distributed Database Management
CO1. Understanding of Distributed processing and design issues in distributed processing systems.
CO2. Need of Distributed Database in Real life with the help of architecture and Design.
CO3. To perform query optimisation in homogeneous and heterogeneous Database.
CO4. Technology and applications in E-commerce.
CO5. Concept of Digital marketing and electronic payment systems.
CO6. IT Strategies in Global Market. Visual Basic

BCAMN604 – E – Commerce

CO1: understand the concept of E-Commerce & describe the opportunities & challenges offered by E-Commerce
CO2: able to handle electronic payment technology and requirements for internet based payments
CO3: understand the categories of E-Commerce and understand the different applications of E-commerce
CO4: understand and identify security issues of E-Commerce

CO5: understand the concept of virtual organization and workspace

BCAMN605 – Programming in Visual Basic

CO1: Concept of IDE, Event Driven Programming
CO2: Helps in Logic Building.
CO3: Understanding the concept of Controls and their uses in programming.
CO4: Describe concept of Properties, Methods and Events.
CO5: Use of debugging tools.
CO6: Concept of Error Handling Technique.
CO7: Applications of Graphics and database controls.

BCAMN606 – Project Report
BCAMN607 – Comprehensive Viva Voce

The Program Specific outcomes of BBA(Industry Integrated) program are as follows:

PS01 -To provide real life industry exposure to students for enhancing the industry relevant skills.
PS02-To develop in depth knowledge and understanding of the Principles & Concepts of the core area of business such as Finance, Marketing & HR
PS03- To inculcate strong human value, business ethics and sense of social responsibility
PS04- To build self confidence, awareness, strong leadership skills and effective communication.
PS05-To give them strong foundation to pursue higher education such as MBA,CA,CS, M.Phil or Ph.D. etc

COURSE OUTCOMES BBA(II)

Foundations of Management (BBA II N 101)

CO1: Understand the basic concepts of management and gain appreciation for emerging ideas, techniques, procedures and practices in the field of management.
CO2: Identify the core competencies of manager and managerial role
CO3: examine various organizational designs and flow of information within organization
CO4: describe contribution of manager in various functional areas of management
CO5: Equip themselves with knowledge, skills and attitude that they need for effective business management.

Business Economics (BBA II N 102)

CO1: To make the students understand and identify the factors impacting managerial decision making.
CO2: To enable students to critically think about the contribution of economics in business.
CO3: To make the students understand the economic models to examine current economic issues.
CO4: To make the students equipped with the tools for analyzing consumer behavior as well as forecasting demand and analyzing production and costs.
CO5: To make the students understand the causes and consequences of different market structures.

Financial Accounting (BBA II N 103)

CO1: understand the basic concepts and conventions of Accounting.
CO2: Understand the concept and framing the Accounting Equation.
CO3: know the process of accounting and Rectification if there is any error
CO4: prepare the financial statements
CO5: know the basics of Joint Venture and its Accounting Treatment.

Computer and Information System (BBA II N 104)

CO1: Introduction to computer system, demonstrate a knowledge and understanding of using computers to solve problems related to practical applications.
CO2: To familiarize the students with basic as well as advanced MS-Office.
CO3: Understanding the concept of Hardware, Software and Network types
CO4: Interaction with the outside world by moving data into and out of the computer system using different input and output devices.

Research Methodology (BBA II N 105)

CO1:Understand the various kinds of research and their types.

CO2: Research Design and Sources of Data Collection
CO2:Scale and type of Scaling with scale construction techniques
CO3:Design a good quantitative purpose statement and good quantitative research
CO4: Understand the scope of Research Report Writing.

Marketing Management (BBA II N 201)

CO1: To provide exposure to the students regarding core concepts, tools and techniques of Marketing
CO2: To acquaint the students regarding how the marketing mix can be a significant tool for marketers in creating value and competing with rivals.
CO3: To discuss how an organization can apply the concepts of the product life cycle to product development and market positioning, taking into consideration influences unique to domestic and overseas markets
CO4: To distinguish the key components of market promotion and be able to select an appropriate promotional channel based on the nature of the product/service and the target market
CO5: To describe the students about appropriate distribution channels based on the nature of the product/service being offered and the unique nature of the market; and to make them understand the managerial issues connected with the proper management of these channels.

Human Resource Management (BBA II N 202)

CO1:Foundationand evolution of HRM.
CO2: Importance of HRM Function for Business and its stakeholders.
CO3:Sources of Recruitment for Organisations.
CO4:Need for Human resources Planning and Policy
CO5: Employee compensation and Performance Appraisal.

Business Statistics (BBA II N 203)

CO1: gain knowledge of basic concept / fundamentals of business statistic.
CO2: develop practical understanding of various statistical concepts.
CO3: compute various measures of central tendency, measures of Dispersion, Time Series Analysis, Index Number, Correlation and Regression analysis.
CO4: understand basic concepts of probability and judge probability theoretical distributions.

Internet and Intranet (BBA II N 204)

CO1 Explain the meaning and advantages of internet related concept that are vital in understanding web development.
CO2 Discuss the insights of internet programming and implement complete application along with the working of the internet.
CO3 Demonstrate the important HTML tags for designing static pages.
CO4 Discuss the terms & technologies used in internet for communication and web designing tools using HTML.
CO5 Explain the concept of Intranet & Extranet and its business values also regarding the enterprise collaboration system.

Financial Management (BBA II N 205)

CO1 understand the basic concepts of Financial Management.
CO2 use the concept of time value of money.
CO3 learn the techniques of capital Budgeting
CO4 understand the concept of cost of capital
CO5 understand the importance of capital structure decisions and its theories.
CO6 learn the dividend policy decisions and its model

Business Communication (BBA II N 206)

CO1 Describe the basics of communication and process , elements and importance
CO2 Understand the various barriers in communication and their gateways
CO3 Outline the various listening skills and its importance, barriers and ways to overcome
CO4 Explain the effectiveness of written communication in an organizational environment
CO5 Understand the etiquettes and their importance in corporate behavior And Role of Public relations in organizational success.

Indian Business Environment (BBA II N 301)

CO1 To acquaint students with the issues of domestic and global environment in which business has to operate.

CO2 To related the impact of environment on business in an integrated manner.

CO3 To give an exposure to important commercial and industrial laws.

Operations Management (BBA-II-N-302)

CO1 Understand The Concept And Purpose Of Operations Management .

CO2 Understand The Relationship Between Operations And Other Business Functions.

CO3 Understand Techniques Of Location, Facility Planning, Line Balancing and Scheduling

CO4 Understand Product Designing, Job Designing; And Capacity Planning In Operations Management.

CO5 Understand The Concepts Of Supply Chain Management And Logistics

CO6 Understand The Concept of Quality and Inventory Management

SYSTEM ANALYSIS &DESIGN(BBA-II-N-303)

C01: Articulate the basic learning about the systems, Information systems-analysis and requirements.
C02: Skills necessary to develop business Information systems.
CO3: Student will inculcate detail system development, testing and implementation procedures
CO4: Designing the system involving management control and quality measures.
CO5: Student will learn the Computer based project planning and management tools (MicroSoft Project).

Disaster Management (BBA-II-N-304)

CO1: The overall aim of this is to provide broad understanding about the basic concepts of Disaster Management .ie To Understand basic concepts in Disaster Management, Definitions and Terminologies Types and Categories of Disasters, the Challenges posed by Disasters and Impacts of Disasters.
CO2:To develop awareness among students in the disaster medicine and also prepared them for natural and manmade disaster.

CO3:The aim public health management of disaster is to build capacities that will reduce disaster health risks and contribute to public health based relief following disasters thereby reducing morbidity and mortality following disasters.

4. Project Work: (Field Work, Case Studies) The project /fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. A few ideas or suggestions on topics for projects for Student work could be as follows.
a. Development Disaster preparedness plans
b. Monitoring and evaluation plan for disaster response
c. Low cost Home based water purification methods
d. Planning Nutrition intervention programmes
e. Preparedness plans for public health response.
Project Management (BBA-II-N-305)

Course Outcomes

CO1 explain the importance, scope and functions of project management in successful project and understand the life cycle of any given project.
CO2 prepare estimation of guidelines for time, costs and resources required for project management by applying different methods.
CO3 demonstrate the scheduling resources and reducing project duration.
CO4 define role and responsibilities of the project manager, planning, organizing, skills of the project manager

INTERNATIONAL MARKETING (BBA-II-N-307)

COI: Understand the Concept of International marketing
CO2:Know the international marketing research, international PLC model
CỎ3:Understand the channels of international distribution
CÕ: Understand the basic export procedures and documentation

Fifth Semester

BBA-II-N-501 Advertising and Sales Management

CO1: Understand the Concept of Advertising
CO2: Know the Media, Advertising layout and Laws and ethics of advertising in India
CO3: Understand the Sales Management
CO4: Understand the Sales Budget, Sales Quotas, Sales Territories, Sales control and cost analysis

BBA-II-N-502 Business Policy and strategic Management

CO1: To equip students to develop requisite skills for developing long term strategic plans for an organization.
CO2: To develop conceptual understanding of strategy formulation, implementation and evaluation.
CO3: To develop skills of students to think strategically in competitive global environment.

BBA-II-N-503 Consumer Behaviour

CO1: Understand the concept of Consumer behaviors and Market Strategies
CO2: To develop models and theories of attitude, personality
CO3: To explain the environmental factor, social class, family & Life Style and culture
CO4: Understand the Consumer Decision Models

BBA-II-N-504 MIS and E-Business

CO1. Understand the basic concepts and technologies used in the field of management information systems;
CO2. Inculcate the processes of developing and implementing information systems in organization.
CO3. Outline the role of the ethical, social, and security issues of information systems in day to day working of the business processes.
CO4. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
CO5. Student will have knowledge about web designing, using various software's.
CO6. Using of various web concepts, tools, methods in E-Business and online processing.
CO7. Would be able to adapt security techniques while using E- payment methods in Online business procedures.

BBA-II-N-505 Cyber Security

CO1: Understand the meaning of various terms-Data, Information, Digital divide & role of different societies.
CO2: Understand the role ICT in Cyber security.
CO3: Analyze the risk of cyber terrorism and strategies for protection.
CO4: Understand cyber crime& the preventive techniques that can be applied.
CO5: Understand the concepts of confidentiality, availability, and integrity (CIA) in context of Information Assurance.
CO6: Analyze risk & maintain various risk management strategies.

BBA-II-N-506 Financial Markets and Environment

Co1: Understand The Financial System And Financial Markets
Co2: Understand The Foreign Exchange Market And Components
Co3: Understand Meaning , Purpose And The Regulation Of NBFC Sector
Co4: Understand Foreign Exchange Market, Derivatives Trading , Euro Market, American Market and Japanese Market
Co5: Understand The Evolution, Reforms And Products Of Insurance Industry In India

BBA-II-N-508 Foreign Exchange Management

CO1: understand the basic concepts and importance of international Business activities.
CO2: identify the factors which are responsible for foreign Exchange rate fluctuations.
CO3: understand the different approaches of determining Foreign Exchange Rates.
CO4: Understand the Risk and Exposure associated with Foreign Exchange and to learn to manage these risk and exposures.
CO5: identify the linkages between international financial prices

Sixth Semester

BBA-II-N-601 Entrepreneurship Development

CO1: To understand the concept of entrepreneurship and process of Entrepreneurship Development
CO2: To know the process of starting a new venture and create their business plan.
CO3: To know about valuation of Business and the sources for financing new venture.
CO4: To familiarize the students for government policy relating to entrepreneurship and EDP Schemes

BBA-II-N-602 International Business

CO1: To discuss the importance of globalization and its impact on international business.
CO2: To discuss the development of different international political economies.
CO3: To explain the impact of international institutions and organisations on international business.
CO4: To develop a broad understanding of international trade theory and trade policy Instruments and implications for international business.
CO5: To make the students understand the major drivers behind and barriers to foreign direct investment.
CO6: To evaluate and assess opportunities and threats arising in the international environment.

BBA-II-N-603 Mercantile Law

CO1 acquire a sound understanding of the legal aspects of the laws affecting business.
CO2 apply basic legal knowledge to business transactions.
CO3 understand the provisions of companies Act 1956.
CO4 communicate effectively using basic understanding of the applicable Acts and develop a suitable operational framework.
CO5 describe current law, rules and regulations related to setting business disputes.

BBA-II-N-604 Service Marketing

CO1: Understand the unique challenges of the services and appreciate the difference between marketing physical products and intangible services.
CO2: Analyse the various components of the "services marketing mix" (the 7 p's).
CO3: Identify the role of employees and customers in service delivery, customer satisfaction, and service recovery; Recognise the challenges faced in services delivery
CO4: Develop students' abilities to identify services decision problems, integrate course concepts into individual performance to become better customer service representatives in the service environment.

BBA-II-N-605 Management of Financial Services

CO1: Understanding the concept of Merchant Banking and their functions.
CO2: To know the concept and classification of leasing and its financial aspects.

CO3: To discuss the legal and financial aspects of factoring and the concept of venture capital.
CO4: Gain knowledge about the concept of financial engineering and its technical and financial aspects.

BBA-II-N-607 Retail Marketing Management

COI: Understand the Concept of Effective Retailing
CO2: Know the Supply Chain Management
CO3: Understand the Retail Communications

PROGRAM OUTCOMES (POs) OF POSTGRADUATE PROGRAMS

PO1- Ability to equip the students with knowledge of current practices and techniques of the major business disciplines.

PO2- Ability to develop students into leaders ready to tackle the challenges of today's business environment.

PO3- Ability to develop entrepreneurial mind set in students so that they can demonstrate knowledge, skills and techniques to lead entrepreneurial and strategic ventures

PO4- Ability to create awareness and sensitivity among the students towards environmental problems and its conservation

PO5- Ability to Design and develop applications to analyse and solve all computer science related problems

PO6-Ability to Integrate and apply efficiently the contemporary IT tools to all computer applications

PO7-Ability to Solve and work with a professional context pertaining to ethics, social, cultural and cyber regulations

PO8-Ability to Involve in perennial learning for a continued career development and progress as a computer professional

PO9-Ability to Create and design innovative methodologies to solve complex problems for the betterment of the society

SCHEME OF EXAMINATIONS

FOR

TWO YEAR MBA PROGRAMME FROM THE SESSION 2019-20

FIRST YEAR: FIRST SEMESTER

Course Code	Title of the Course (s)	External Marks	Sessional Marks	Practical Marks	Total Marks	Credits (L-T-P)
CORE COURSES						
19IMG21C1	**Management Concepts and Organizational Behavior**	80	20	-	100	3-1-0
19IMG21C2	**Managerial Economics**	80	20	-	100	3-1-0
19IMG21C3	**Accounting for Managers**	80	20	-	100	3-1-0
19IMG21C4	**Business Statistics and Analytics**	80	20	-	100	3-1-0
19IMG21C5	**Operations Management**	80	20	-	100	3-1-0
19IMG21C6	**Computer Fundamentals and Office Automation Tools**	50	-	50	100	3-0-1
19IMG21C7	**Business Environment**	80	20	-	100	3-1-0
Discipline Specific Elective Courses (Each student will opt one course)						
19IMG21D1	**Business Communication Skills**	80	20	-	100	3-1-0
19IMG21D2	**Event Management**	80	20	-	100	3-1-0
Total Credits in 1st Semester						**32**

FIRST YEAR: SECOND SEMESTER

Course Code	Title of the Course (s)	External Marks	Sessional Marks	Practical Marks	Total Marks	Credits (L-T-P)
CORE COURSES						
19IMG22C1	**Financial Management**	80	20	-	100	3-1-0
19IMG22C2	**Marketing Management**	80	20	-	100	3-1-0
19IMG22C3	**Human Resource Management**	80	20	-	100	3-1-0
19IMG22C4	**Business Research Methods**	80	20	-	100	3-1-0
19IMG22C5	**IT Infrastructure Management**	50	-	50	100	3-0-1
19IMG22C6	**Comprehensive Viva-voce**	**100**	**-**	**-**	**100**	**4**

Foundation Elective Course						
Each student will opt one course from the pool of Foundation Elective Courses provided by the University, excluding the Foundation Elective Course prepared by the Institute of Management Studies and Research.						2
Open Elective Course						
Each student will opt one course from the pool of Open Elective Courses provided by the University, excluding the Open Elective Courses prepared by the Institute of Management Studies and Research.						3
Discipline Specific Elective Courses (Each student will opt one course)						
19IMG22D1	**Entrepreneurship**	80	20	-	100	3-1-0
19IMG22D2	**Creativity and Innovation Management**	80	20	-	100	3-1-0
Total Credits in 2nd Semester						**33**

NOTE: Immediately after the completion of the Second semester, the students shall proceed for their Summer Vacation Training (SVT) of eight weeks duration. The Summer Training Report prepared after the completion of SVT shall be assessed in the third Semester as a compulsory course. The SVT will be submitted by the candidates in the manner as specified in the Ordinance.

SECOND YEAR: THIRD SEMESTER

Course Code	Title of the Course (s)	External Marks	Sessional Marks	Practical Marks	Total Marks	Credits (L-T-P)
CORE COURSES						
20IMG23C1	**Strategic Management**	80	20	-	100	3-1-0
20IMG23C2	**Corporate Laws**	80	20	-	100	3-1-0
20IMG23C3	**Operations Research**	80	20	-	100	3-1-0
20IMG23C4	**Summer Training Report**	100	-	-	100	4
Open Elective Course						
Each student will opt one course from the pool of Open Elective Courses provided by the University, excluding the Open Elective Courses prepared by the Institute of Management Studies and Research.						3
Discipline Specific Elective Courses (specialization areas offered under dual specialization scheme) Students will opt two papers in each of the two SAME specialization areas in III as well as IV semester.						
HUMAN RESOURCE MANAGEMENT						
20IMG23GH1	**Compensation and Benefits Management**	80	20	-	100	3-1-0
20IMG23GH2	**Organizational Change and Intervention Strategies**	80	20	-	100	3-1-0
20IMG23GH3	**Human Resource Metrics and Analytics**	80	20	-	100	3-1-0
20IMG23GH4	**Management of Industrial Relations**	80	20	-	100	3-1-0
20IMG23GH5	**Strategic Human Resource Management**	80	20	-	100	3-1-0
FINANCE MANAGEMENT						
20IMG23GF1	**Indian Financial System and Financial Markets**	80	20	-	100	3-1-0
20IMG23GF2	**Project Management**	80	20	-	100	3-1-0
20IMG23GF3	**Business Taxation**	80	20	-	100	3-1-0
20IMG23GF4	**Investment Management**	80	20	-	100	3-1-0
20IMG23GF5	**Bank Management**	80	20	-	100	3-1-0
INFORMATION TECHNOLOGY MANAGEMENT						
20IMG23GT1	**E-Commerce and Applications**	50	-	50	100	3-0-1
20IMG23GT2	**Data Ware Housing and Data Mining**	80	20	-	100	3-1-0
20IMG23GT3	**E-Governance and Framework of ICT**	80	20	-	100	3-1-0

20IMG23GT4	**Multimedia and Web Development**	50	-	50	100	3-0-1
20IMG23GT5	**Enterprise Resource Planning**	80	20	-	100	3-1-0
INTERNATIONAL BUSINESS MANAGEMENT						
20IMG23GI1	**Foreign Exchange Management**	80	20	-	100	3-1-0
20IMG23GI2	**International Business Environment**	80	20	-	100	3-1-0
20IMG23GI3	**Export Import Management and Documentation**	80	20	-	100	3-1-0
20IMG23GI4	**Regional Economic Blocks**	80	20	-	100	3-1-0
20IMG23GI5	**International Logistics**	80	20	-	100	3-1-0
MARKETING MANAGEMENT						
20IMG23GM1	**Digital Marketing**	50	-	50	100	3-0-1
20IMG23GM2	**Customer Relationship Management**	80	20	-	100	3-1-0
20IMG23GM3	**Services Marketing**	80	20	-	100	3-1-0
20IMG23GM4	**Consumer Behavior**	80	20	-	100	3-1-0
20IMG23GM5	**Retail Management**	80	20	-	100	3-1-0
OPERATIONS MANAGEMENT						
20IMG23GO1	**Project Management**	80	20	-	100	3-1-0
20IMG23GO2	**Total Quality Management**	80	20	-	100	3-1-0
20IMG23GO3	**Supply Chain and Logistics Management**	80	20	-	100	3-1-0
20IMG23GO4	**Service Operations Management**	80	20	-	100	3-1-0
20IMG23GO5	**Research and Development Management**	80	20	-	100	3-1-0
PUBLIC POLICY MANAGEMENT						
20IMG23GP1	**Legal Institutional Dynamics**	80	20	-	100	3-1-0
20IMG23GP2	**Development Economics**	80	20	-	100	3-1-0
20IMG23GP3	**Right To Information Act**	80	20	-	100	3-0-1
20IMG23GP4	**Public Finance Administration**	80	20	-	100	3-1-0

20IMG23GP5	**Risk and Disaster Management**	80	20	-	100	3-1-0
BUSINESS ANALYTICS						
20IMG23GB1	**Business Analytics**	80	20	-	100	3-1-0
20IMG23GB2	**Fundamentals of Data Mining**	80	20	-	100	3-1-0
20IMG23GB3	**Fundamental of Econometrics**	80	20	-	100	3-1-0
20IMG23GB4	**Predictive Business Analytics**	80	20	-	100	3-1-0
20IMG23GB5	**Time Series Econometrics**	80	20	-	100	3-1-0
AGRI-BUSINESS MANAGEMENT						
20IMG23GA1	**Agri-business Environment and Policy**	80	20	-	100	3-1-0
20IMG23GA2	**Food Technology and Process Management**	80	20	-	100	3-1-0
20IMG23GA3	**Agri-business Management**	80	20	-	100	3-1-0
20IMG23GA4	**Agri-business Entrepreneurship**	80	20	-	100	3-1-0
20IMG23GA5	**Agri-Supply Chain Management**	80	20	-	100	3-1-0
Total Credits in 3rd Semester						**35**

SECOND YEAR: FOURTH SEMESTER

Course Code	Title of the Course (s)	External Marks	Sessional / Internal Marks	Practical Marks	Total Marks	Credits (L-T-P)
Core Courses						
20IMG24C1	**B2B Marketing**	80	20	-	100	3-1-0
20IMG24C2	**CSR and Business Ethics**	80	20	-	100	3-1-0
20IMG24C3	**Project Report**	100	100	-	200	8
20IMG24C4	**Comprehensive Viva-voce**	100	-	-	100	4
Discipline Specific Elective Courses (specialization areas offered under dual specialization scheme)						
HUMAN RESOURCE MANAGEMENT						
20IMG24GH1	**Business Negotiations and Employee Relations**	80	20	-	100	3-1-0
20IMG24GH2	**Training and Development**	80	20	-	100	3-1-0
20IMG24GH3	**Managing Interpersonal and Group Processes**	80	20	-	100	3-1-0
20IMG24GH4	**International Human Resource Management**	80	20	-	100	3-1-0
20IMG24GH5	**Performance Management Systems**	80	20	-	100	3-1-0
FINANCE MANAGEMENT						
20IMG24GF1	**Insurance and Risk Management**	80	20	-	100	3-1-0
20IMG24GF2	**Management of Financial Services**	80	20	-	100	3-1-0
20IMG24GF3	**Financial and Commodity Derivatives**	80	20	-	100	3-1-0
20IMG24GF4	**International Financial Management**	80	20	-	100	3-1-0
20IMG24GF5	**Financial Decision Analysis**	80	20	-	100	3-1-0
INFORMATION TECHNOLOGY MANAGEMENT						
20IMG24GT1	**Knowledge Management**	80	20	-	100	3-1-0
20IMG24GT2	**Information Security and Cyber Laws**	80	20	-	100	3-1-0

20IMG24GT3	**Systems Analysis and Design**	80	20	-	100	3-1-0
20IMG24GT4	**Programming in Visual Basic**	50	-	50	100	3-0-1
20IMG24GT5	**E-Business Information Systems Management**	80	20	-	100	3-1-0
INTERNATIONAL BUSINESS MANAGEMENT						
20IMG24GI1	**International Marketing Management**	80	20	-	100	3-1-0
20IMG24GI2	**Cross Cultural and Global Management**	80	20	-	100	3-1-0
20IMG24GI3	**International Business Laws**	80	20	-	100	3-1-0
20IMG24GI4	**Management of Multinational corporations**	80	20	-	100	3-1-0
20IMG24GI5	**International Trade Theory and Practices**	80	20	-	100	3-1-0
MARKETING MANAGEMENT						
20IMG24GM1	**Integrated Marketing Communications**	80	20	-	100	3-1-0
20IMG24GM2	**Marketing Research**	80	20	-	100	3-1-0
20IMG24GM3	**Product and Brand Management**	80	20	-	100	3-1-0
20IMG24GM4	**Sales and Distribution Management**	80	20	-	100	3-1-0
20IMG24GM5	**Industrial Marketing**	80	20	-	100	3-1-0
OPERATIONS MANAGEMENT						
20IMG24GO1	**Transportation Management**	80	20	-	100	3-1-0
20IMG24GO2	**Technology Management**	80	20	-	100	3-1-0
20IMG24GO3	**Warehouse Management and Inventory Control**	80	20	-	100	3-1-0
20IMG24GO4	**Sourcing Management**	80	20	-	100	3-1-0

20IMG24GO5	**Supply Chain Analytics**	80	20	-	100	3-1-0
PUBLIC POLICY MANAGEMENT						
20IMG24GP1	**Public Policy Evaluation**	80	20	-	100	3-1-0
20IMG24GP2	**Social Campaign Promotion**	80	20	-	100	3-1-0
20IMG24GP3	**Sustainable Development**	80	20	-	100	3-1-0
20IMG24GP4	**Rural Development**	80	20	-	100	3-1-0
20IMG24GP5	**Indian Social and Political System**	80	20	-	100	3-1-0
BUSINESS ANALYTICS						
20IMG24GB1	**Economics for Business Strategy**	80	20	-	100	3-1-0
20IMG24GB2	**Applied Multivariate Analysis**	80	20	-	100	3-1-0
20IMG24GB3	**Information Economics and its Applications**	80	20	-	100	3-1-0
20IMG24GB4	**Mathematical Statistics**	80	20	-	100	3-1-0
20IMG24GB5	**Market Microstructure**	80	20	-	100	3-1-0
AGRI-BUSINESS MANAGEMENT						
20IMG24GA1	**Agricultural Input Marketing and Post-Harvest Management**	80	20	-	100	3-1-0
20IMG24GA2	**Livestock Business Management**	80	20	-	100	3-1-0
20IMG24GA3	**Agribusiness Financial Management**	80	20	-	100	3-1-0
20IMG24GA4	**Agricultural Marketing Management**	80	20	-	100	3-1-0
20IMG24GA5	**International Agribusiness Trade**	80	20	-	100	3-1-0
Total Credits in 4th Semester						**36**
Total Credits in MBA Programme						**136**

UNDER DUAL SPECIALIZATION SCHEME EACH STUDENT WILL OPT FOR ONE SPECIALIZAION AREA FROM GROUP A AND ONE FROM GROUP B.

Minimum of fifteen students are required for offering any specialization area in Group A and Group B by the Colleges/Institutions.

GROUP A	GROUP B
FINANCE MANAGEMENT	MARKETING
HUMAN RESOURCE MANAGEMENT	INFORMATION TECHNOLOGY MANAGEMENT
INTERNATIONAL BUSINESS MANAGEMENT	PUBLIC POLICY MANAGEMENT
BUSINESS ANALYTICS	AGRI-BUSINESS MANAGEMENT
OPERATIONS MANAGEMENT	---

PROGRAM SPECIFIC OUTCOMES

The program specific outcomes of Two Year (Four Semester) MBA (General) program are as follows:

PSO1: Graduates are expected to collaborate and lead teams across organizational boundaries and demonstrate leadership qualities, maximize the usage of diverse skills of team members in the related context.
PSO2: Comprehend and analyze the importance of functional and inter functional areas.
PSO3: Recognize opportunities available and face the challenges in national and global business environment and adapt accordingly.
PSO4: Employ appropriate models to select suitable projects for a business enterprise and manage firm growth through strategies such as mergers, acquisitions, international expansion, and new venture development.
PSO5: Function as ethical, conscious and socially responsible managers, capable of contributing to the sustainable development of the nation.
PSO6: Preparing the students to lead a successful career in industry or pursue higher studies or become an entrepreneur
PSO7: Ability to offer commercially feasible and socially acceptable, managerial solutions to technical/non-technical problems.
PSO8: Turning out graduates having the capability to demonstrate strong leadership skills, effective communication skills, professional etiquette and a desire to be a lifelong leaner.

Note:

1. The duration of all the end term theory examinations shall be 3 hours.
2. The Criteria for awarding internal assessment of 20 marks shall be as under:
   a) Class test : 10 marks.
   b) Assignment and Presentation : 5 marks
   c) Attendance : 5 marks
      Less than 65% : 0 marks
      Upto 70% : 2 marks
      Upto 75% : 3 marks
      Upto 80% : 4 marks
      Above 80% : 5 marks

Management Concepts and Organizational Behavior

Course Code: 19IMG21C1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: analyze the behavior of individuals and groups in organizations in terms of the key factors that influence organizational behavior.
CO2: identify the core competencies, managerial roles and significance of emotional intelligence at work.
CO3: assess the potential effects of organizational factors on organizational behavior.
CO4: explain the organizational culture and describe its dimensions and to examine various organizational designs
CO5: assess organization and classify the contributing disciplines, approaches to OB and understanding challenges and opportunities for OB.
CO6: apply motivational and leadership theories to resolve problems of employee absenteeism, turnover, stress, job satisfaction, job performance and organizational commitment.

UNIT- I
Nature, Scope and Evolution of Management, Functions, Skills, Roles of Management. Managerial Competencies, Core competencies, Emotional intelligence at work place, Dynamics in social Milieu.

UNIT- II
Motivation: Nature and Theories; Content and Process Theories
Leadership: Nature and Theories: Trait, Behavioral and Contingency approach, Leadership development for learning organizations.

UNIT- III

Foundations and Background of Organizational behavior, Interpersonal: Group behavior, Dynamics Formation and stages, Team building and Intrapersonal process: Attitude, Personality, Perception

UNIT- IV
Organizational process and structure: Work Innovation and Job design, Organization climate and culture, Organization change and development and control.

Recommended Readings:

1. Robbins, S.P. and Decenzo, D.A. Fundamentals of Management, Pearson Education
2. Hellreigel, Management, Thomson Learning, Bombay
3. Koontz, H and Wechrich, H; Management, Tata McGraw Hill
4. Stoner, J et. al, Management, Pearson Education
5. Robbins and Coulter, Management, Pearson Education
6. Pravin Durai, Principles of Management, Pearson Education.
7. Satya Raju, Management – Text and Cases , PHI, New Delhi
8. Richard L. Daft, Management, Thomson South-Western
9. Nelson, Debra L and James C Quick, Organizational Behavior, Thomson Learning
10. Hellgiegel, D and J.W. Slocum, Organizational Behavior, Thomson Learning
11. Luthans, Fred, Organizational Behavior, McGraw Hill, New York
12. New Storm and Keith Davis, Organization Behavior , TMH, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Managerial Economics

Course Code: 19IMG21C2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: define the basic elements of managerial economic aspects of firm.
CO2: forecast demand for a product.
CO3: know what to produce, where to, when to, how to, for whom to produce.
CO4: frame policy for production to minimize the cost and maximum the profit.
CO5: construct the cost function.

UNIT-I
Nature and scope of managerial economics; nature of marginal analysis; alternative objectives of business firms; cardinal utility theory; indifference curve technique and the theory of consumer choice; consumer surplus; price, income and substitution effects; demand elasticity; demand estimation and forecasting; relationship between price elasticity and marginal revenue.

UNIT-II
Law of variable proportions; laws of return; optimal input combination; output-cost relations; engineering cost curves; technological change and production decisions; revenue curves of a firm; price-output decisions under alternative market structures; shut-down points; Baumol's sales maximization model; advertising and price-output decisions.

UNIT-III
Product differentiation; price-output decision in multi-plant and multi-product firms; general pricing strategies; special pricing techniques – limit pricing, peak load pricing and transfer pricing; dumping analysis; pricing of public utilities.

UNIT-IV
Risk analysis; investment and capital replacement decisions; locational choice of a firm; measures of national income; business cycles; operative aspects of macroeconomic policies; inflation analysis; tariff analysis.

Recommended Readings:

1. Hirschey, Mark, Managerial Economics, Thomson Learning, Bangalore
2. V. Agarwal, Managerial Economics, Pearson Education.
2. Monroe, Kent B., Pricing-Making Profitable Decisions, McGraw-Hill, New York
3. Keat, Paul B., and Philip K.Y. Young, Managerial Economics – Economic Tools for Today's Decision Makers, Pearson Education
4. Salvatore, Dominick, Managerial Economics in a Global Economy, Thomson Learning, Hyderabad

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Accounting for Managers

Course Code: 19IMG21C3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand and apply accounting concepts, principles and conventions for their routine monetary transaction;
CO2: recognize circumstances providing for increased exposure to fraud and define preventative internal control measures.
CO3: create and prepare financial statements in accordance with Generally Accepted Accounting Principles
CO4: analyze, interpret and communicate the information contained in basic financial statements and explain the limitations of such statements.

UNIT-I

Accounting- Meaning, types, objectives and users of accounting system, Accounting principles- concepts and conventions, accounting cycle-journalization, posting to ledger accounts, preparation of trial balance and final accounts. An overview of IFRS and accounting standards (AS) in India

UNIT-II

Depreciation accounting for fixed assets- objectives, factors affecting depreciation and methods, financial statement analysis- ratio analysis, fund flow analysis and cash flow statement analysis. ^

UNIT-III

Reporting of financial performance- Disclosure in corporate financial reports and their importance, Budgetary control- Budget, budgeting and budgetary Control, classification of budget and preparation, importance and limitations of budgetary control.

UNIT-IV

Marginal Costing and analysis- contribution, break-even point, profit-volume ratio, margin of safety and their applications in managerial decision making, Balanced scorecard- a tool of interactive control.

Recommended Readings:

1. Dhamija, S. Financial Accounting for Managers, Pearson Education.
2. P.C Tulsian, Financial Accounting, Pearson Education.
3. Horngren/Sundem- Introduction to Management Accounting, Pearson Education.
4. Khatri, K. Dhanesh, Financial Accounting, McGraw Hill Education.
5. Ramachandran, N. andKakani, R.K. Financial Accounting for Management, McGraw Hill Education.
6. Bhattacharya, S.K, Accounting for Management: Text and Cases, Vikas Publishing House.
7. Khan, M. Y and Jain, P.K Management Accounting, McGraw Hill Education.
8. Horngren, Charles T., Sundem, Gary L., Elliott, John. A and Philbrick, Donna, Introduction to Financial Accounting, Pearson Education. -
9. Narayanaswamy, R., Financial Accounting - A Managerial Perspective, PHI Learning.
10. Gupta, Ambrish, Financial Accounting for Management: An Analytical Perspective, Pearson Education.
11. Anthony, Robert N. etal. Accounting: Text and cases, McGraw Hill Education.
12. Shah: Management Accounting, Oxford University Press. '
13. Hansen, D.R. andM owen, M.M., Management Accounting, Thomson South western.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section** A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Business Statistics and Analytics

Course Code: 19IMG21C4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: gain knowledge of basic concept / fundamentals of business statistic.
CO2: develop practical understanding of various statistical concepts.
CO3: compute various measures of central tendency, measures of Dispersion, Time Series Analysis, Index Number, Correlation and Regression analysis and their implication on Business performance.
CO4: understand basic concepts of probability and judge probability theoretical distributions
CO5: take managerial decision and applying the Concept of Business Analytics.

UNIT- I

Definition, role and application. Measures of central tendencies and their application. Measures of dispersion: range, quartile deviation, standard deviation, coefficient of variance and mean deviation. Skewness and kurtosis.

UNIT- II

Correlation: meaning and type of correlation - positive correlation, negative correlation, linear and non-linear correlation. Scatter diagram, Karl Pearson's coefficient of correlation, properties of correlation coefficient, probable error of correlation coefficient. Multiple and partial correlation coefficient.
Regression: Meaning and types- simple and multiple regression, linear and non-linear regression, regression lines, and properties of regression.

UNIT- III

Time Series: introduction, objectives and identification of trends – variation in time series, secular variation, cyclical variation, seasonal variation and irregular variation. Methods of estimation of trends- moving average and least square method.
Index number: definition, uses, types, simple aggregate method and weighted aggregate method- Laspeyre's, Paasche's, Fisher's and CPI. Construction of index numbers and their uses.

UNIT- IV

Sampling: meaning and basic sampling concept, sampling and non-sampling errors.
Hypothesis testing: formulation and procedure for testing a hypothesis. Large and small sample test- z, t, F test and ANOVA (one way). Non-parametric test: chi-square test, sign test, Kruskal–Wallis test.
Concept of Business Analytics- Meaning, types and application of Business Analytics.

Recommended Readings:

1. Levin, R.I. and Rubin D.S., Statistics for Management, Pearson Education.
2. Gupta, S.P. and Gupta, M.P., Business Statistics, Sultan Chand and Sons.
3. Sharma, J.K., Business Statistics, Vikas Publication House Pvt. Ltd.
4. Bajpai, Naval, Business Statistics, Pearson Education.
5. Davis and Pecar: Business Statistics using Excel, Oxford University Press.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Operations Management

Course Code: 19IMG21C5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the role of Operations in overall Business Strategy of the firm.
CO2: understand the application of operations management policies and techniques to the service sector as well as manufacturing firms.
CO3: identify and evaluate the key factors and their interdependence of these factors in the design of effective operating systems.
CO4: understand the trends and challenges of Operations Management in the current business environment.
CO5: apply the techniques for effective utilization of operational resources and managing the processes to produce good quality products and services at competitive prices.

UNIT-I

Introduction to operations Management: Objectives, Functions and Scope, types of production systems, operations strategy; Facility Planning, Factors Affecting Plant location and plant layout; Tools and Techniques used for Plant Layout Planning.

UNIT-II

Production Planning and Control Process Planning, Aggregate Production Planning, Capacity Planning: Introduction, Capacity Planning; Product Design, and Development; Project Scheduling, Network Diagrams, Critical Path Method (CPM), Critical Path Method: Problems, Critical Path Method: Problems. Program Evaluation and Review Technique (PERT), Sales forecasting, Forecasting system- Qualitative and Quantitative methods.

UNIT-III

Materials Management - Concepts, Objectives, Functions, Materials Requirement Planning (MRP)-I, Materials Requirement Planning (MRP)-II Purchasing Management - Objectives; Functions; Methods; Procedure Management - Types of Stores; Functions; Coding Methods. Value Analysis - Concepts Inventory Management - Objectives, Factors, Process, Inventory control techniques- ABC, VED, EOQ, SED, FSN analysis. Maintenance Management - Concepts; Objectives; Functions; Types of Maintenance

UNIT- IV

Quality management: Introduction; Meaning, Concept of Quality, Total Quality Management (TQM), Total Productive Maintenance (TPM), Statistical Quality Control (SQC), concept of Six Sigma and its application; Advanced Manufacturing Technologies: Just in Time (JIT), KANBAN System, Enterprise Resource Planning (ERP), TOC, Lean/ Green Manufacturing, WCM etc. and safety concepts.

Recommended Readings:

1. R. Paneerselvam, Production and Operations Management; PHI; New Delhi
2. Mahadevan, B.; Operations Management - Theory and Practice; Pearson Education
3. Bedi, Production and Operations Management, 2/e, Oxford University Press.
4. K. N. Dervitsiotis, Operation Management, McGraw-Hill International Company.
5. Jay Heizer and B. Render, Operation Management, Pearson Education
6. Gaither, Norman and Frazier, Greg; Operations Management; Thomson Learning; New Delhi
7. Krajewski, Lee J. and Ritzman, Larry P.; Operations Management - Processes and Value Chains; Pearson Education

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Computer Fundamentals and Office Automation Tools

Course Code: 19IMG21C6

L-T-P
3-0-1

External Marks: 50
Sessional Marks: 50
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand computer hardware, software and computer applications, computer network, internet and office automation tools in business.
CO2: learn applications of MS Office and Internet in businesses.
CO3: demonstrate the ease to work with MS Word and explain the fundamentals of MS Excel and manipulate various functions and commands;
CO4: elucidate the need of MS PowerPoint, design & templates and manipulate records, creating records and web designing using PPT.
CO5: creating the databases and handling operations on the data using MS Access.

UNIT-I

Introduction to Computers: Characteristics, capabilities, limitations and applications of computers; types of computers; computer hardware, software; block diagram of computer and overview of working; types of computer language; generation of computer languages; functions and types of operating system

UNIT-II

Internet: Internetworking, Concepts, Internet Protocol Addresses, WWW Pages & Browsing, Security, Internet Applications, Analog and Digital Signals, Bandwidth, Network Topology, Packet Transmission, Long Distance communication, E-mail.

UNIT-III

Documentation using MS-Word – Creating and Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features of MS-Word-Mail Merge, Printing

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating and Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts

UNIT-IV

Presentation using MS-PowerPoint: Presentations, Creating Manipulating and Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering Art Objects, Animations and Sounds

Introduction to database: Concept, Characteristics, Objectives, Advantages and limitations, entity, attribute, schema, subschema; Database management using MS-Access.

Recommended Readings:

1. Microsoft Office Complete Reference. BPB Publication.
2. Rajaraman V. (Feb. 2010). Fundamentals of Computers. PHI.
3. Sinha P.K. (2004). Computer Fundamentals. BPB Publication
4. Stultz, Russell A. Learn Microsoft Office. BPB Publication.
5. Taxali, Ravi Kant. (2014). Computer Course windows 7 and Office 2010. India: McGraw Hill Education.
6. Saxena, Computer Applications in Management, Vikas Publication, New Delhi
7. B. Ram, Computer Fundamentals, New Age Publications, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of five short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Business Environment

Course Code: 19IMG21C7

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand relationship between environment and business and applying the environmental analysis techniques in practice
CO2: understand Economic, Socio-Cultural and Technological Environment
CO3: evaluate state policies, Economic legislations and Economic reforms laid by the government

UNIT-I

The concept of Business Environment, significance and nature. Environment Scanning: meaning, nature and scope, the process of environmental scanning, Interaction between internal and external environments, basic philosophies of Capitalism and Socialism with their variants. Concepts of Mixed Economy

UNIT-II

Overview of Political, Socio-cultural, Legal, Technological and Global environment. Recent developments with regard to enactment of business laws. An introduction to MRTP, CCI, FEMA, SEBI Act, Consumer Protection Act; The changing dimensions of these laws and their impact on business

UNIT-III

Current industrialization trends and industrial policy; Economic environment for skill development in start-ups and the MSME sector. Infrastructure development and policy; public sector reforms and performance; public and private partnership; intellectual property regime and the R and D environment; trends in service sector growth; banking reforms and challenges; business opportunities in the rural sector.

UNIT-IV

Globalization trends and challenges; balance of payments trends; environment for foreign trade and investment; exchange rate movements and their impact; India's competitiveness in the world economy; external influences on India's business environment. Policies with regard to foreign trade and investment.

Recommended Readings:

1. Saleem Shaikh "Business Environment", Pearson Education
2. Aswathappa, K., "Essentials of Business Environment", Himalaya Publishing House, New Delhi.
3. Cherunilam, Francis, "Business Environment-Text and Cases", Himalaya Publishing House, New Delhi.
4. Pual, Justin, Business Environment Text and Cases, Tata McGraw Hill, New Delhi
5. Mishra S K and Puri V K - Economic Environment of Business, Himalaya Publishing House, New Delhi.
6. Adhikari M, Economic Environment of Business, Excel Books, New Delhi.
7. Dutt, Ruddra and Sundaram, K.P.M., "Indian Economy", S. Chand and Co. Ltd., New Delhi.
8. Gopal, Namita, "Business Environment", Tata McGraw Hill, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Business Communication Skills

Course Code: 19IMG21D1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: describe the basics of communication and its process, elements and importance.
CO2: understand the various barriers in the communication.
CO3: outline the listening skills and the characteristics of good and poor listeners
CO4: identify the various types of listening, its approaches, and barriers.
CO5: explain the effectiveness of oral communication and its application in-group presentation.

UNIT-I

Business communication: Definition, Nature, Process and classification of communication; Importance of communication in management; barriers to communication, overcoming barriers to communication, effective communication; contemporary issues in communication.

UNIT-II

Communication skills: Listening skills- Listening process, types of listening, barriers to listening, improving listening abilities; presentation skills; communication skills for interviews and Group discussions; Basic interviewing skills- Board room Interview preparation, Expressive behavior, Techniques for removing anxiety, fear and inhibitions.

UNIT-III

Nonverbal communication: Body language, Kinesic communication, proxemic communication, haptic communication, paralinguistic communication, Chromatic communication, chronomatic communication,; Business etiquettes- introduction, etiquettes, exchanging business cards, shaking hands, e mail etiquettes, telephone etiquettes, telemarketing etiquettes, elevator , dressing and grooming etiquettes, dining etiquettes.

UNIT-IV

Written communication: Report writing-process of report writing, structures of business reports, business letter components and layout, types of letters; memos, notices and circulars; agenda and minutes of meeting, preparing curriculum vitae.

Recommended Readings:

1. Kaul, Asha, Business Communication, PHI, New Delhi
2. Chaturvedi, P.D., and Mukesh Chaturvedi, Business Communication, Pearson Education
3. McGrath, E.H., Basic Managerial Skills for All, PHI, New Delhi
4. Sinha, K.K. , Business Communication, Taxman Publication, New Delhi
5. Koneru, Arun, Professional communication, McGraw Hill, New Delhi
6. Mehra, Payal, Business Communication for Managers, Pearson Education.
7. Verma, Shalini, Business Communication: Essential Strategies For Twenty First Century Managers, Vikas Publishing House, Noida
8. Sethi, Flatley, Rentz, Lentz, Pande, Business communication: Connecting A Digital World, McGraw Hill, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Event Management

Course Code: 19IMG21D2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: get familiarity with event management industry.
CO2: organize events successfully.
CO3: position themselves and their services in event management industry.

UNIT-I
Events – Nature, definition and scope, C's of events, designing, interaction and importance; Event marketing tools – various needs addressed by events, focusing and implementing events, advantages and disadvantages of events

UNIT-II
Elements of Events – Event, infrastructure, target audience, organizers, venue, media activities to be carried out; concept of market in events, segmentation and targeting of the market events

UNIT-III
Positioning in events and the concept of event property; events as a product, methods of pricing events, events and promotion, various functions of management in events

UNIT-IV
Strategic alternatives arising from environment, competition and defined objectives; pricing objectives; evaluation of event performance – measuring performance and correcting deviations

Recommended Readings:

1. Lynn Van Der Wagen, Event Management, Pearson Education
2. Shone, Anton and Bryn Parry, Successful Event Management, Cengage Learning India Pvt. Ltd, New Delhi
3. Gaur, S.S. and Saggere, S.V., Event Marketing Management
4. Panwar, J.S., Marketing in the New Era, Sage Publications, 1998
5. Avrich, Barry, Event and Entertainment, Delhi, Vision Books, 1994

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Financial Management

Course Code: 19IMG22C1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: describe about various financial management concepts.
CO2: apply the concept of time value of money.
CO3: categorize and analyze different capital budgeting techniques.
CO4: appraise different project proposals for decision-making.
CO5: estimate cost of capital for long term source of finance.

UNIT-I

Financial management-scope finance functions and its organization, objectives of financial management; time value of money; sources of long term finance.

UNIT-II

Investment decisions importance, difficulties, determining cash flows, methods of capital budgeting; risk analysis (risk adjusted discount rate method and certainty equivalent method); cost of different sources of raising capital; weighted average cost of capital.

UNIT-III

Capital structure decisions-financial and operating leverage; capital structure theories - NI, NOI, traditional and MM theories; determinants of dividend policy and dividend models -Walter, Gordon and MM models.

UNIT-IV

Working Capital- meaning, need, determinants; estimation of working capital need; management of cash, inventory and receivables.

Note: The topic of capital budgeting, management of cash, inventory management, and receivable management will cover theoretical concepts and simple numerical questions.

Recommended Readings:

1. Pandy, I.M., Financial Management, Vikas Publishing House, New Delhi
2. Khan M.Y, and Jain P.K., Financial Management, Tata McGraw Hill, New Delhi
3. Berk, De Marzo, Harford, Fundamental of Corporate Finance, Pearson Education.
4. Chandra, Prasanna, Financial Management, TMH, New Delhi
5. Van Horne, James C., Financial Management and Policy, Pearson Education
6. Brigham and Houston, Fundamentals of Financial Management, Thomson Learning, Bombay.
7. Kishore, R., Financial Management, Taxman's Publishing House, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Marketing Management

Course Code: 19IMG22C2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the marketing concepts and its evolution
CO2: analyze the market based on segmentation, targeting and positioning
CO3: know the consumer behavior and their decision making process
CO4: make decisions on product, price, promotion mix and distribution
CO5: understand the rural markets and the contemporary issues in marketing

UNIT -I

Introduction to marketing: Nature, scope, core concepts, tasks of marketing management, and corporate orientation towards marketplace; marketing environment; marketing research and information system; developing marketing strategy and plan; ethical issues in marketing.

UNIT -II

Understanding consumer and business markets: Consumer buying decision process in consumer and business markets; building customer value, satisfaction and loyalty; managing customer relations; Market segmentation, targeting and positioning approaches to deal with market competition; tools of product differentiation.

UNIT -III

Product and pricing decisions: Product life cycle, product mix and product line decisions, new product development process; branding, packaging and labelling decisions; pricing objectives, determinants of price, pricing methods and strategies.

UNIT -IV

Promotion and distribution decisions: Promotion mix - Advertising and sales promotion; public relations; personal selling; Channels of distribution: functions of intermediaries, channel design decisions, selecting channel members, channel management; wholesaling and retailing.

Contemporary marketing trends and issues: Globalization, consumerism, green marketing, digital marketing; evaluation and control of marketing effort; reasons for and benefits of going international; entry strategies in international marketing.

Recommended Readings:

1. Kotler Philip and Keller; Marketing Management, Pearson Education, New Delhi
2. Kotler, Philip, Kevin Keller, A. Koshy and M. Jha, Marketing Management in South Asian Perspective, Pearson Education, New Delhi
3. Kerin, Hartley, Berkowtz and Rudelius, Marketing, TMH, New Delhi
4. Etzel, Michael J, Marketing: Concepts and Cases, TMH, New Delhi
5. Dhunna, Mukesh, Marketing Management – Text and Cases, Wisedom Publications, New Delhi
6. Capon, Noel and Singh Siddharth; Managing Marketing-An Applied Approach, Wiley Publications, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Human Resource Management

Course Code: 19IMG22C3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: discuss the history and evolution of HRM.
CO2: explain the importance of HRM in the organizations through their roles &responsibilities, challenges etc.
CO3: assess the major HRM functions and processes of HRM planning, job analysis and design, recruitment, selection, training and development, compensation and benefits, and performance appraisal
CO4: identify strategic HR planning and the HRM process to the organization's strategic management and decision making process.
CO5: explain how training helps to improve the employee performance.

UNIT-I

Strategic importance of HRM; objectives of HRM; challenges to HR professionals; role, responsibilities and competencies of HR professionals; HR department operations; human resource planning– objectives and process; human resource information system, contemporary issues in human resource management

UNIT-II

Talent acquisition: recruitment and selection strategies, career planning and management, succession planning, socialization and induction of new employees; training and development, investment in training, training need assessment, designing and administering training programme; executive development programme, evaluation of T& D programme

UNIT-III

Appraising performance: developing and instituting performance appraisal system, assessment and development centers, potential appraisal; rewarding performance: linking rewards to organizational objectives, determine compensation structure, pay for performance and incentive plans, ESOP, executive compensation, designing and administering benefits and services

UNIT-IV

HR in knowledge era: HR in knowledge industry, HR in virtual organizations, HR in mergers and acquisitions, outplacement, outsourcing HR functions, employee leasing, HR audit, international HRM

Recommended Readings:

1. Dessler, Gary, Human Resource Management, Pearson Education
2. Ivanceivich, John M., Human Resource Management , Tata McGraw Hill, New Delhi
3. Gomez. Megia, Luis, David Balkin, and Roberty Cardy, Managing Human Resources, Pearson Education
4. Mathis, Robert, and John Jackson, Human Resource Management, Thomson Learning Inc.
5. Shell, Scott and George Bohlander, Human Resource Management, Thomson Learning Inc.
6. Pattanayak, Biswajert, Human Resource Management, PHI, New Delhi
7. Jyothi P. and D.N.Venkatesh, Human Resource Management, Oxford University Press, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Business Research Methods

Course Code: 19IMG22C4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: acquire knowledge on various kinds of research questions and research designs.
CO2: distinguish between qualitative, quantitative and mixed methods of research
CO2: relate ethical and philosophical considerations
CO3: design a good quantitative purpose statement and good quantitative research
CO4: understand good practices in conducting a qualitative interview and observation.

UNIT-I
Business research; its concept, nature, scope, need and managerial value of business research; components of theory – definitions, concepts, constructs, variables, hypothesis, process of research and structure of research proposal

UNIT-II
Research design – concept and types – exploratory, descriptive, diagnostic and experimental; sampling design; techniques, factors influencing sample size, measurement – concept, measurement scales – types and construction of scales and reliability and validity aspects in measurement

UNIT-III
Methods of data collection – questionnaire/schedule; questionnaire designing, interview and observational methods; data analysis and interpretation, editing, coding, content analysis and tabulation; hypothesis testing – an overview of parametric and non-parametric tests (Analysis of Variance, X test, Wilcoxon Matched – pairs signed – rank test, Mann – Whitney test, Kruskal– Wallis H-test)

UNIT-IV
An overview of dependent and interdependent methods (multiple regression, discriminant analysis, conjoint analysis, factor analysis, cluster analysis); ingredients and constructions of research report; procedure of preparation of reference and bibliography

Recommended Readings:

1. Naval Bajpai, Business Research Methods, Pearson Education
2. Zikmund, Millian G., Business Research Methods, Thomson Learning, Bombay
3. Cooper, Donald R- and Pamels Schindler, Business Research Methods, Tata McGraw Hills, New Delhi
4. Geode, Millian J. and Paul K. Hatl, Methods in Research, McGraw Hills, New Delhi
5. Sekran, Uma, Business Research Method, Miley Education, Singapore
6. Kothari, C.R., Research Methodology

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

IT Infrastructure Management
Course Code: 19IMG22C5

L-T-P
3-0-1

External Marks: 50
Sessional Marks: 50
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: Describe the digital technologies and channels being leveraged by businesses.
CO2: Explain the role of data governance and cloud services in determining the success or failure of a business system.
CO3: Explain the competitive advantage of data management and business intelligence.
CO4: Identify opportunities to apply IT infrastructure to improve business efficiency.
CO5: Explain why IT infrastructure management is a business priority.

UNIT -I
Introduction to IT infrastructure: Data networks and Application Programme Interface (API) – fundamentals, corporate network functions, business uses, wireless and mobile infrastructure, messaging and collaboration technology, data breaches and cyber security challenges, IT risk management, mobile app and cloud security challenges, financial crimes and fraud defenses, sustainability and the triple bottom line approach

Internet technologies and search strategies: Search technology, organic search and search engine optimization, paid search strategies and metrics, semantic web and search

UNIT -II
Information technology in business: Digital technology transforming business processes, competitive advantage and SWOT analysis

Building business capabilities with data governance and cloud services: data governance strategy, enterprise IT architecture, information and decision support systems, data centers and cloud computing, cloud services delivery model

UNIT -III
Data management, Big Data, and Business Intelligence: Data management technologies and techniques, Transaction processing and analytics processing systems, dirty data costs and consequences, data ownership and organizational politics, data life cycle, Big Data analytics, data and text mining, data visualization, enterprise data mashups, digital dashboards, and business intelligence

UNIT -IV
Networked economy: Impact of computer networks on business, elements of networked economy, using IS functions to deal with business risks, privacy, health and ethical issues in networked economy, future of the networked economy.
HTML: Build a simple HTML document, tables, frames, links, adding multimedia documents, home page.

Lab: Web Designing in HTML, Internet Surfing.

Recommended Readings:
1. Turban, Vonino and wood, Information Technology for Management, Wiley Publications, New Delhi.
2. McKeown, Information Technology and the Networked Economy, Thomson Learning
3. Miller, Data and Network Communication, Vikas Publishing House, New Delhi.
4. Hagg, Baltzan & Philips, Business Driven Technology, TMH, N. Delhi.
5. Molly, Using HTML 4, PHI, Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of five short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Entrepreneurship

Course Code: 19IMG22D1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: develop entrepreneurship as a field of study and as a profession.
CO2: understand the creative process of opportunity identification and screening.
CO3: understand the importance of innovation in the creation of sustainable competitive advantage.
CO4: understand techniques to test a business model to ensure its viability.

UNIT-I
Entrepreneurship: Concept, theories, process, factors impacting emergence of entrepreneurship, Growth of entrepreneurship environment in India, Role of entrepreneurship in economic development, Traits of successful entrepreneurs; Managerial vs. entrepreneurial approach, Entrepreneurial promotion in India.

UNIT-II
Starting the venture: Creative thinking, Business idea generation (Business cases on entrepreneurship), Environmental scanning pertaining to business idea: Feasibility study: Market feasibility, Technical/ Feasibility operations, financial feasibility, Project Report.

UNIT-III
Functional Plans: Drawing a business plan, selecting organization type for business, Organization structure and Job designs, Designing financial plan: Investment, Incomes and Expenditure, Banking and Accounts, understanding profitability.

UNIT-IV
Sources of Finance: understanding Financial Framework: Debt Equity Financing, Commercial banks, Venture Capital, Financial institutions supporting entrepreneurs,
Angel investors.
Understanding IPR: Patents, Trademarks, Copy rights, Trade secrets, Licensing, Franchising.

Recommended Readings:

1. Charantimath, Poornima, Entrepreneurship Development & Small Business Enterprises, Pearson Education.
2. Hisrich, Robert D., Michael Peters and Dean Shephered, Entrepreneurship, Tata McGraw Hill, New Delhi
3. Barringer, Brace R., and R. Duane Ireland, Entrepreneurship, Pearson Education.
4. Lall, Madhurima, and Shikha Sahai, Entrepreneurship, Excel Books, New Delhi.
5. Kuratko, Donand and Richard Hodgetts, Entrepreneurship, Cengage Learning India Pvt. Ltd., New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Creativity and Innovation Management

Course Code: 19IMG22D2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand challenges managers face today in managing innovation; from recognizing the need and desire to be creative and innovative, using imagination to add value, developing structures, systems and incentives that encourage and implement innovation.
CO2: understand and evaluate the relationships among individual, group and organizational creativity and learn about the techniques for ideation.
CO3: question the appropriateness of the features of an organization (eg. structure, culture, etc.) with regards to the characteristics of the innovation in the company.
CO4: evaluate the sustainability and robustness of the innovative competences of a company.
CO5: identify the potential for improving knowledge management in an organization and recommend appropriate mechanisms and understand the challenges in managing discontinuous innovation – in spotting emerging changes early and in organizing and acting to deal with them.
CO6: recognize the role of leadership in managing and championing creativity and innovation in companies.
CO7: assess the strengths and weaknesses of a company's innovative capabilities and opportunities and threats in its external environment, conduct innovation specific SWOT analysis and recommend strategies and action plans for an effective innovation management system.

UNIT-I

Introduction to Innovation and Creativity: Importance of innovation in modern society. Components of Creativity, Creativity Process and Techniques for improving creativity process. Mechanism of Thinking. Barriers to creativity. Organization and personal factors to promote creativity Identification of needs and opportunities. Creative thinking, evaluation of ideas. Demonstration of the novelty. Myths surrounding creativity.

UNIT-II

Creativity Tools and Techniques: Lateral Thinking, Enablers and Barriers to Creativity, Creative Personality, Brainstorming, Entrepreneurial Creativity. Characteristics of Creative Groups, Three Components of Individual Creativity. Time Pressure and Creativity. Analyse various methods that enhance creative ability.

UNIT-III

Innovation: Meaning, Characteristics, Purpose/goals of innovation, Sources of innovation, Types of innovation. Differences between invention and innovation. Factors that Favor Incremental Innovation. Sustainability and Innovation. Innovation Management Strategies. Incubation and Innovation: How Business Incubators Work.
Service Innovations. Innovation Timing, Innovation Management Strategies. Managing Innovation Teams, Implementing Innovation Strategies. Formulate methodologies which enhance innovation. The New Product Development Process. Delineate conditions that support successful new product development.

UNIT-IV

Innovative Entrepreneurship: Models, Dimensions, Degrees, Sources, & Measurement of Innovation. Strategic Management of Innovation: Innovation Strategies, Stage-Gate Models, Timing of Entry & Strategy, Core competences & Robustness Knowledge management. Leadership in Managing Creativity & Innovation

Recommended Readings:

1. Khandwalla, N. Pradip (2009). Lifelong Creativity – An Unending Quest, New Delhi: Tata McGraw Hill
2. Drucker, F. Peter (2015). Innovation and Entrepreneurship, UK: Elsevier, John Wiley
3. Christensen, M. Clayton, Raynor, E. Michael (2003). The Innovators Solution, Harvard Business School Press Boston
4. De Bono, Edward (2008). Creativity Workout: Exercises to unlock Your Most Creative Ideas, 2/e; Amorata Press
5. De Bono, Edward (2015). Lateral Thinking: Creativity Step by Step, International Edition; Harper Perennial Publishers.
6. Business Innovation in the 21st Century, Praveen Gupta, S Chand.
7. Entrepreneurship & Innovation Management - An Industry Perspective) by R. Gopal and Pradip Manrekar, Excel Books.
8. Creativity, Innovation and Entrepreneurship by U. Jerinabi and P. Santhi Allied Publishers Pvt. Ltd.

Instructions for External Examiner: The question paper shall be divided in two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Strategic Management

Course Code: 20IMG23C1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the overview of strategic management
CO2: analyze the internal and external environment, formulate strategic intent and understand the different levels of strategy.

UNIT-I

Introduction to Business Policy and Strategic Management: Definition, Concept, Objective and Significance, The levels at which strategy operates, Characteristic of Strategic Management, An Overview: Strategic Management Process, Concept of Strategic Decision Making. Defining strategic intent: Vision, Mission, Business definition, Goals and Objectives.

UNIT-II

Environment Appraisal: Concept and Environmental Sector; PEST Analysis, Organizational Appraisal: Concepts and Capability Factors; Porter's Value Chain Model, Framework for developing Strategic Advantage, SWOT Analysis as a Tool for assessing Organizational Capabilities and Environment Opportunities, Type of Strategies: Corporate Level (Concept of Grand Strategies), Business Level and Functional Level., Guidelines for Crafting Successful Business Strategies. Strategy Analysis and Choice: Corporate Level Strategy Analysis: BCG Matrix and GE 9 cell Matrix, Business Level Strategy Analysis: Life Cycle Analysis, Porter's Five Forces of Industry Analysis, Concept of Strategic Decision Making, Subjective Factors in Strategic Choice and Process of Strategic Choice

UNIT-III

Strategy Implementation: Interrelation Between Strategy Formulation and Implementation, Aspects of Strategy Implementation, An overview of Project, Procedural Implementation, Resource Allocation, Structural Implementation: An overview of: Structural Consideration, Structure for Strategies, Behavioural Implementation: An overview of: Leadership, Corporate Culture, Corporate Politics and Use of Power, Personal Values and Business Ethics, Functional /Operational Implementation: An overview of: Functional Strategies.

UNIT-IV

Strategy Evaluation and Control: An Overview of Strategic Evaluation and Control, Strategic Control and Operational Control, Techniques for Strategic Evaluation and Control, Role of Organizational Systems in Evaluation, McKinsey's 7s Framework.

Recommended Readings:

1. Kazmi, Azhar, "Business Policy and Strategic Management", TMH, New Delhi.
2. Wheelen and Hunger, Strategic Management and Business Policy, Pearson Education.
3. Chandrasekharan: Strategic Management, Oxford University Press.
4. A A Thompson Jr., A J Strickland III, J E Gamble, Crafting and Executing Strategy- The Quest for Competitive Advantage, Tata McGraw Hill.
5. David, Fred R. "Strategic Management-Concept and Cases", Pearson Education
6. Hitt, M.A., Ireland R.D. and Hos Kisson R.D., "Strategic Management Competitiveness and Globalization" Thomson Asia Pvt. Ltd.
7. Pearce II JA and Robinson Jr., R.B., "Strategic Management-Strategy Formulation and Implementation", AITBS Publishers and Distributors, Delhi.
8. Srivastava R.M. "Management Policy and Strategic Management (Concepts, Skills and Practices)", Himalayan Publishing House.
9. Peter F. Drucker, "Managing in a Time of Great Change", Truman Talley Books / Plume Penguin Group

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Corporate Laws

Course Code: 20IMG23C2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: acquire a sound understanding of the legal aspects of the laws affecting businesses
CO2: apply basic legal knowledge to business transactions.
CO3: communicate effectively using standard business and legal terminology
CO4: analyze a given business context using basic understanding of the applicable Acts and develop a suitable operational framework.
CO5: describe current law, rules, and regulations related to settling business disputes

UNIT-I

Law of Contract- Introduction, kinds of contracts, offer and acceptance, consideration, capacity of parties, free consent, legality of object, performance of contracts, discharge of contract, remedies for breach of contract, indemnity and guarantee, bailment and pledge, agency.

UNIT-II

Law of Sale of Goods- Introduction, contract of sale of goods, conditions and warranties, transfer of property, performance of contract of sale, rights of unpaid seller; Law of Partnership- Introduction, formation, rights duties and liabilities of partners, dissolution of partnership firm, limited liability partnership; Law of Negotiable Instruments- Introduction, parties to negotiable instruments presentation, negotiation, dishonour and discharge.

UNIT-III

Nature and Administration of Companies Act 1956- Salient features, meaning and types of companies, formation of company, memorandum of association, articles of association, shares and share capital.

UNIT-IV

Company meetings and proceedings; Managerial remuneration; Power, duties and liabilities of directors; Winding up of company; Qualification and Statutory liabilities of company secretary; Corporate governance.

Recommended Readings:

1. Maheshwari, S.N. and S.K. Maheshwari; A Manual of Business Law, Himalaya Publishing House.
2. Kuchhal M.C., Modern Indian Law, Shree Mahavir Book Depot.
3. Kuchhal M.C., Business Law, Vikas Publishing House, New Delhi.
4. Kapoor, N.D., Elements of Mercantile Law, Sultan Chand and Sons, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Operations Research

Course Code: 20IMG23C3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: apply research techniques in quantitative and qualitative aspects.
CO2: schedule the projects and find the early ways of finishing it.
CO3: develop simulation models.
CO4: minimize the resource allocation for project.
CO5: maximize the productivity with help of least cost techniques.

UNIT-I
Operations Research: Meaning, origin, scope and role in managerial decision making. Linear programming: Meaning, scope and limitations. Formulation of industrial and business problem as linear programming problems. Solution of linear programming problems by graphical and simplex methods. Degeneracy and duality in linear programming problems.

UNIT-II
Transportation Problems: Balanced and unbalanced cases, Initial basic feasible solution of transportation problems by N/W method, least cost entry method and Vogel's approximation method. Optimal solution of transportation problem by MODI and STEPING STONE method. Degeneracy in transportation problem.
Assignment problems including traveling salesman's problem. Special cases in assignment problems: unbalanced problems, maximization objective and multiple optimal solutions.

UNIT-III
PERT/CPM: Difference between PERT and CPM, network construction, calculating EST, EFT, LST, LFT and floats, probability considerations in PERT, time -cost trade-off.
Decision theory: decision making under uncertainty and risk, Bayesian analysis, decision trees.

UNIT-IV
Game theory: meaning and types of games, types of strategies. Solution of games with saddle point and graphical method. Principle of dominance.
Queuing theory: concept, assumptions and applications. Steady state solution of MM1 and MMK models. Poisson distributed arrivals and exponentially distributed service time models. Simulation: meaning, process, advantages, limitations and applications.

Recommended Readings:

1. Paneerselvam, Operations Research, PHI, N. Delhi.
2. Taha, Operations Research: An Introduction, Pearson Education.
3. Vohra, N.D.; Quantitative Techniques in Management; Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. Kapoor, V.K., Operations Research; Sultan Chand and Sons, New Delhi.
5. Sharma, J.K., Operations Research: Theory and Applications, Macmillan India Ltd, New Delhi.
6. Kalavathy, Operations Research, Vikas Publishing House, New Delhi.
7. Natarajan, A.M, Operation Research, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Compensation and Benefits Management

Course Code: 20IMG23GH1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: learn basic compensation concepts and the context of compensation practice.
CO2: understand skills in designing, analyzing and restructuring reward management systems, policies and strategies.
CO3: understand issues related to the compensation of human resources in organizations
CO4: learn implications for strategic compensation and possible employer approaches to managing legally require benefits

UNIT-I

Compensation: concept, objectives, financial and non-financial compensation system. Economic and Behavioural theories of compensation. Compensation structure, job evaluation, approach to compensation management, significance of employee compensation, new trends in compensation management.

UNIT-II

Wage and salary administration: theories of wage determination, types of wages, salary progression, wage boards and pay commissions. Pay for performance plans, incentive scheme: merits, demerits, types of incentive schemes, group incentive plans. Team based compensation: introduction, design of team based compensation.

UNIT-III

Benefits and services: concept, classification of employee benefits, factors influencing benefits, competency based compensation, Executive compensation: introduction, components and executive compensation design. Compensation of special groups, Employee reward system in India.

UNIT-IV

Strategic compensation management: strategic compensation design and policies, Legal framework of compensation, retirement plans, employee welfare and working conditions-statutory and voluntary measures. Taxation issues and employee compensation: tax implications of compensation, compensation and the Income Tax Act.

Recommended Readings:

1. Singh, B.D., "Compensation Reward Management", Excel Books, New Delhi.
2. Bhattacharya, Deepak: Compensation Management, Oxford University Press.
3. Milkovich, George T and Newman J.M., "Compensation", Tata McGraw Hill, New Delhi
4. Henderson, RI., "Compensation Management", Pearson Education.
5. Martocchio, J.J., "Strategic Compensation", Pearson Education.
6. Armstong, M and Murlis H, "Reward Management", Kogan Page, UK.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Organizational Change and Intervention Strategies

Course Code: 20IMG23GH2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: learn about the change facilitators using the knowledge and techniques of behavioral science.
CO2: plan and implement change at the individual group and organizational level.
CO3: understand models and theories of change management.
CO4: understand issues and conditions creating the need for change in modern organizations.

UNIT-I

Organizational Change: The domain of change, concept, change agents, strategic management of change; Managerial approaches for implementing change; Models of organizational change, Kurt Lewin's models of change, Huse's 7 stages model of change.

UNIT-II

Change Management: Change process, facilitating change, dealing with individual and group resistances, Intervention strategies and developing learning organization. Organizational Diagnosis- Meaning and importance, Weisbord's model of organizational diagnosis and Methods of obtaining diagnostic information.

UNIT-III

Organizational Development: An overview, Steps in OD process, General OD Competencies, OD Skills, Values, Assumption and Beliefs in OD; Designing OD Interventions- Interpersonal, Team, Intergroup, Structural and Comprehensive Interventions; Evaluation of Organizational Development Interventions

UNIT-IV

Organizational Culture and Change; Corporate Culture, Types of Culture, Importance, Nature, Formal and Informal Components of Organizational Culture, Designing Cultural Change; Organizational Culture and Leadership; Emerging Trends in Organizational Culture; Ethics of OD Professionals and Future of OD.

Recommended Readings:

1. French, W. H. and Bell, Organization Development, Pearson Education
2. Singh, K., Organization Change and Development, Excel Books
3. Huse, F. E. and Cummings, T. G., Organization Development and Change, West.
4. De Nitish, Alternative Designs of Human Organizations, Sage.
5. Harvey, D.F. and Brown, D.R., An Experiential Approach to Organization Development, Pearson Education

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Human Resource Metrics and Analytics

Course Code: 20IMG23GH3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: relate the importance of using data base reasoning to support the HR decisions
CO2: conduct detailed problem analysis assessment and generate decisions based on evidence rather than opinion.
CO3: understand the usefulness of HRM matrix and analytic at the work place.
CO4: align the people strategy with the business strategy in today's workforce Organization.

UNIT -I

HR Analytics: Evolution of HRIS and HR Analytics. Types and Measures - HR Productivity Metrics and Human Capital Metrics. HR Analytics Maturity Model, CEO/ Managers - HR expectations on Analytics, understanding HR indicators, metrics and data, Data collection, tracking, entry. Relational databases and HR systems.

UNIT-II

E-HRM, Planning and implementing a new HRIS, Security and privacy considerations, Statistical analysis for HR (regression analysis, measures of central tendency) Graphs, tables, spreadsheets, data manipulation (using Excel).

UNIT- III

Benchmarking and best practices, Staffing, Supply and demand forecasting, Total compensation analyses, Cost justification-return on investment, Communicating recommendations.

UNIT -IV

Perspective of analytics in HR, Translator role, resistance to workforce analytics, emerging data sources, workforce analytics function, modelling in HR: descriptive and indicative models for employee retention and turnover.

Recommended Readings:

1. Becker B.E., Huafelid M.A. and Ulrich D. "The HR Scorecard: Linking people, strategy, and performance", Harvard Business Review Press.
2. Nigel Guenole, Jonathan Ferrar, Sheri Feinzig, "The Power of People", Pearson Education
3. Sesil, "Applying Advanced Analytics to HR Management Decisions", 1e, Pearson Education.
4. Soundararajan, "Winning on HR Analytics", Sage Publication.
5. Bhattacharya, "HR Analytics: understanding Theory and Applications", Sage Publication.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Management of Industrial Relations

Course Code: 20IMG23GH4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the conceptual and practical aspects of industrial relation at the micro and macro levels.
CO2: investigate solutions to industrial relation problems based on research and assessment of current practices.
CO3: understand IR institutions such as employers' associations, trade unions and industrial tribunals.
CO4: critically discuss, analyze and evaluate the current and emerging industrial relations and trends.

UNIT-I

Industrial relations-concepts, evolution, significance, perspectives and organization; Anatomy of industrial relations; industrial relations and the state; Trade unions :concept, significance, types, approaches and objectives, Problems of trade unions in India and recommendations of national commission on labour for strengthening of trade unions.

UNIT-II

Collective bargaining: concept, importance and process of bargaining; participative management: Forms of workers' participative management in India; tripartite and bipartite bodies; standing orders and grievance procedure; code of discipline.

UNIT-III

Trade union act-1948, Industrial Disputes Act-1947, Industrial disputes: conciliation, arbitration, adjudication, Payment of wages act-1936, Minimum wages act-1948.

UNIT-IV

Modern and international scenario of industrial relations: Industrial relations and technological change; Industrial relations and HRD; ILO and industrial relations; legal framework of Industrial relations; industrial relations systems in India, UK, USA and Japan.

Recommended Readings:

1. PRN Sinha and I.B Sinha, Industrial Relations, Trade Union and Labor Legislation, Pearson Education.
2. Bhattacharya Dipak Kumar, "Human Resource planning", Excel Books.
3. Srivastava, M.P. "Human Resource Planning: Approaches, Needs, Assessment and Priorities in Manpower Planning", Manak Publications, Pvt. Limited, New Delhi.
4. Belcourt, Monica & J. McBey, Kenneth "Strategic Human Resource Planning", Cengage Learning India.
5. Srivastava, M.P. "Human Resource Planning", Institute of Applied Manpower Research, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Strategic Human Resource Management

Course Code: 20IMG23GH5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand strategic role performed by HR in business organization
CO2: understand the tools and techniques essential as a strategic contribution of HRM to organization growth.
CO3: explore the relationship between management of people and pursuit of an organization's strategic goals and objectives
CO4: understand the alignment of among different HR system and practices and organization outcomes

UNIT-I

Strategic HRM: introduction, components, objectives and evolution of SHRM, difference between traditional HRM and SHRM, Investment perspective of human resource management, challenges in SHRM, barriers to Strategic HR, SHRM approaches: The Indian Context.

UNIT-II

Human Resource Evaluation: concept, approaches, rationale for HR evaluation, linkage between HRM and firm performance, best practices and bundles approach, distinctive HR practices, HR outsourcing and off shoring, human resource planning: an overview, significance, perspectives and objectives of HRP, business strategy and HRP, process of HRP.

UNIT-III

HR systems: staffing systems, reward and compensation systems, employee and career development systems, performance management systems

UNIT-IV

Strategic options: downsizing and restructuring, outsourcing and off shoring, other HR practices/decisions

Recommended Readings:

1. Ekta Sharma, " Strategic Human Resource Management and Development, Pearson Education
2. Jeffrey A. Mello, "Strategic Human Resources Management", Cengage Learning
3. Tanuja Agarwala . "Strategic Human Resources Management", Oxford University Press.
4. Freed R.David, "Strategic Management", Pearson Education.
5. Robert L. Mathis and John H. Jackson. "Human Resource Management", Thomson South Western.
6. K. Prasad, "Strategic Human Resource Management - Text and Cases", MacMillan India Ltd.
7. Charles R.Greer, "Strategic Human Resource Management", Pearson Education
8. Srinivas R.Kandula, "Strategic Human Resource Development", PHI
9. Sharma, Anuradha. "Strategic Human Resource Management: An Indian perspective", Sage Response Books.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Indian Financial System and Financial Markets

Course Code: 20IMG23GF1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the working of financial institutions and markets both individually and as an interlinked system.
CO2: understand the factors affecting interest rates and yield curve and the importance of change in interest rates for all constituents of the financial system
CO3: understand the organization, role, functioning and need for regulation of different types of financial markets and the implications of the same on society.
CO4: critically analyze the pivotal role of banking in a financial system and the reasons for it being among the most tightly regulated industries in the world.
CO5: understand the impediments to financial inclusion and critically evaluate different ways of developing sustainable financial inclusion. Also critically analyze the working of the micro finance industry.

UNIT-I

Financial System- Meanings, components and functions; reforms in Indian Financial System; Money Market and its segments.

UNIT-II

Capital Market- New issue market; Stock Exchange and its functions; trading in stock exchange; NSE; OTCEI; depositories and custodians; Role and Functions of SEBI; New Financial Instruments.

UNIT-III

Commercial Banks; RRBs; Development Banks; NBFCS; EXIM Bank, RBI.

UNIT-IV

LICI; UTI; SIDBI; NABARD; Micro Finance; Financial Inclusion;

Recommended Readings:

1. Suresh, P. and Paul. J., Management of Banking and Financial Services, Pearson Education
2. Khan, M.Y. Indian Financial System, Tata McGraw Hill
3. Clifford, G., Financial Markets, Institutions and Financial Services, PHI.
4. Khan, M.Y. Management of Financial Services, McGraw-Hill.
5. Gordan, E and K. Natrajan, Emerging Scenario of Financial Services. Himalaya Publishing House.
6. Khan, M.Y., Financial Institutions and Market, McGraw Hill.
7. Bhole, L.M., Financial Institutions and Market, McGraw Hill.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Project Management

Course Code: 20IMG23GF2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: identify various investment opportunities and their evaluation
CO2: analytically approach to study the feasibility study of investment decisions
CO3: distinguish the key risks and to know means of finance
CO4: control and review the human aspects of the project

UNIT-I

Capital Investment- need, types, phases of capital budgeting, Generation and Screening of Project Ideas- corporate appraisal, monitoring the environment and identifying investment opportunities, scouting the project ideas and project rating, Market and Demand Analysis, Technical Analysis.

UNIT-II

Financial Estimates and Investment Appraisal Criteria- Estimation of investment, revenue and production cost, working capital requirement, Evaluation techniques of capital investment decisions.

UNIT-III

Project Risk Analysis- types of Risk, Risk adjusted discount rate method, certainty equivalent coefficient method, sensitivity analysis, decision tree analysis. Weighted average cost of capital (WACC) and its relevance in financial decision making, financing of projects, Project Appraisal by Financial institutions.

UNIT-IV

Social Cost Benefit Analysis (SCBA): Rationale for SCBA, UNIDO Approach. Project Management and Review: Forms of project Organization, project planning and control, human aspect of project management, pre-requisite for successful project implementation.

Recommended Readings:

1. Chandra, Prasanna. "Project Planning: Analysis, Selection, Implementation and Review" TMH.
2. Pradeep Pai, Project Management, Pearson Education.
3. Khatua: Project Management and Appraisal, Oxford University Press.
4. Nicholas, "Project Management for Business and Technology: Principles and Practice", Pearson
5. Ghattas, R.G. and McKee, S.L., "Practical Project Management", Pearson Education Asia
6. Pinto, P.K., "Project Management", Pearson Education.
7. K Nagarajan, "Project Management", New Age International Publishers.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50words normally. **Section B** shall comprise 8questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Business Taxation

Course Code: 20IMG23GF3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand rules and regulations of Income Tax Act
CO2: understand computation of Taxable Income under different heads
CO3: understand computation of Tax Liabilities and Tax Planning issues
CO4: identify structure and rates of GST

UNIT-I
Basic Concepts of Income Tax, Residential status and tax incidence, Incomes exempt from tax, Computation of Income under the head Salary and House Property.

UNIT-II
Computation of Income under the head Business and Profession, Capital Gains, Income from Other Sources, Clubbing of income, Set off and Carry forward of Losses.

UNIT-III
General Deductions, Assessment of Individual and Company, Provision with regard to TDS and advance tax, Basic understanding of tax planning and its distinction from tax avoidance and tax evasion.

UNIT-IV
GST: Rationale for GST; features of GST law in India, structure of GST (SGST, CGST, UTGST and IGST); rates of GST, models of GST, GST Council.

Recommended Readings:

1. Singhania, V., K. and Singhania, Monica, Students' Guide to Income Tax, Taxmann
2. Singhania, V., K. and Singhania, Kapil, Direct Taxes Law and practice, Taxmann
3. Singhania, V., K. and Singhania, Monica, Corporate Tax Planning & Business Tax Procedures, Taxmann
4. Narwal, K.,P., and Anushuya, GST in India, DBH Publishers and Distributers
5. Ahuja, G. and Gupta, R., Simplified Approach to Corporate Tax Planning and Management, Bharat Law House Private Limited
6. Srinivas, E. A., Handbook of Corporate Tax Planning, Tata McGraw Hill.
7. Iyengar, A. and C. Sampat, Law of Income Tax, Bharat House.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Investment Management

Course Code: 20IMG23GF4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the environment of investment and risk return framework.
CO2: analyse bonds in terms of valuation, yields and risks as well as build up immunized bond portfolio.
CO3: analyse equity shares using different approaches and models.
CO4: construct, analyse, select and evaluate portfolios along with a deep understanding of Capital market theory and associated models.
CO5: understand and analyse futures and options, use various options trading strategies and critically examine various innovations in derivatives market.

UNIT-I

Investment- Concept, objectives and process of investment management, financial and non-financial forms of investment, various investment avenues, sources of investment information, financial market and Investment Instruments, services of intermediaries in investment management, regulatory framework in financial market.

UNIT-II

Analysis of risk & return, concept of total risk, factors contributing to total risk, systematic and unsystematic risk, default risk, interest rate risk, market risk, management risk, purchasing power risk. Valuation of debt instruments- methods of valuation, risk management in debt market. Valuation of equity- methods of valuation including CAPM and their relevance.

UNIT-III

Fundamental analysis: concept & significance of economic analysis, industry analysis: introduction, need for industry analysis, alternative classification of industry, industry life cycle analysis, economic factors & industry analysis, Company analysis - nature and style of management, key role of financial analysis, ratio analysis. Technical Analysis: line chart, bar chart, points and figures chart, candlestick chart, reversal patterns, continuation patterns, Dow Theory, Elliott wave theory.

UNIT-IV

Portfolio theory- Efficient Market hypothesis (EMH), Random walk theory, Markowitz diversification model, Sharpe single index model, Arbitrage pricing theory. Portfolio building process, tools used by value investors, Portfolio performance evaluation- Sharpe's and Treynor's portfolio performance evaluation, Portfolio revision- Active and passive strategies & formula plans in portfolio revision.

Recommended Readings:

1. Chandra, Prasanna. "Investment Analysis and Portfolio Management", MH
2. Alexander, Sharpe, & Bailley, "Fundamentals of Investment", PHI, New Delhi
3. Bhalla, V K, "Investment Management: Security Analysis and Portfolio Management", Sultan Chand, New Delhi.
4. Reilley & Brown, "Investment Analysis & Portfolio Management", Thomson Learning
5. Fuller, Russell J & Farrell, James L. "Modern Investment & Security Analysis". McGraw Hill, New York.
6. Alexander, Jordan J & Bailey, Jeffrey V. "Investment Analysis & Portfolio Management", Dryden Press, Thomson Learning, Bombay.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Bank Management

Course Code: 20IMG23GF5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After doing this course, students should be able to:

CO1: understand the evolution and current state of the Indian banking industry.
CO2: understand the different services and products offered by banks and the challenges associated with them.
CO3: understand the regulatory structure within which the banking system operates.
CO4: understand and analyse the different risks faced by banks and the risk management mechanism.

UNIT-I
Banking System in India- meaning, functions, and classification of banks, services of bank, reserve requirements, innovative products in banking, bancassurance; Sources of Bank Funds- classification of deposits, performance analysis of banks, CAMELS- an integrated scorecard for banks.

UNIT-II
Uses of Funds- features of bank credit, types of credit, commercial credit and retail credits, principles of lending; Priority sector lending, Risk measurement and management in banks, Asset- liability management in banks, basel guidelines, Banking technology

UNIT-III
Meaning, scope, functions, objectives, structure and role of treasury management. Functions and responsibilities of a treasurer; Role and responsibilities of chief finance officer, tools of treasury management.

UNIT-IV
Integrated treasury, planning and control; Liquidity management- CRR/CCIL/RTGS; Supervision and Control of Treasury Operations; Present Status of Treasury Management in India; Role of Information Technology in Treasury Management.

Recommended Readings-

1. Varshney, P.N, Banking Law and Practice, Sultan Chand and Sons.
2. K.C. Shekhar, Lekshmy Shekhar, Banking Theory and Practice, Vikas Publications.
3. Indian Institute of Banking and Finance, Principles of Banking, Macmillan.
4. Avadhani, V.A. Treasury Management in India, Himalaya Publishing House.
5. Steven M. Bragg, Treasury Management: The Practitioner's Guide.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

E-Commerce and Applications

Course Code: 20IMG23GT1

L-T-P
3-0-1

External Marks: 50
Sessional Marks: 50
Time Allowed: 3 Hours

Course Outcomes
After doing this course, students should be able to:

CO1: understand the concept of E-Commerce & describe the opportunities & challenges offered by E-Commerce
CO2: able to handle electronic payment technology and requirements for internet based payments
CO3: understand the categories of E-Commerce and understand the different applications of E-commerce
CO4: understand and identify security issues of E-Commerce
CO5: understand the concept of WEB Based Business understand the M-Commerce applications

UNIT- I
Technology and Infrastructure for E-Commerce: Framework of E-commerce; Network Infrastructure for E-Commerce – Market Forces Influencing I-way, Network Access Equipment, Public Policy Issues Shaping the I-way; EDI - Applications in Business, Legal, Security and Privacy Issues of EDI; Components of EDI Standards, ASC X12 and EDIFACT.

UNIT-II
E-Commerce and Retailing: Changing Retail Industry Dynamics, Mercantile Models from the Consumer's Perspective, Management Challenges in Online Retailing.
Intranets and Customer Asset Management: Basics of Customer Asset Management, Online Sales Force, Online Customer Service and Support, Technology and Marketing Strategy.

UNIT-III
Intranets and Manufacturing: Integrated Logistics, Agile Manufacturing, Emerging Business Requirements, Manufacturing Information Systems, Intranet-based Manufacturing, and Logistics Management. E-Commerce and Online Publishing: Why Online Publishing, Online Publishing approaches, Advertising and Online Publishing. E-Commerce and Banking: Changing Dynamics in the Banking Industry, Home Banking Implementation Approaches, and Management Issues in Online Banking.

UNIT-IV
Intranets and Corporate Finance: An Introduction, Financial Systems, Financial Intranets, Software Modules in Financial Information Systems, Human Resource Management Systems, Size/Structure of Financial Software Market.

Lab: Each student is required to develop at least one application of e-commerce.

Recommended Readings:

1. Kalakota and Whinston, Electronic Commerce: A Manager's Guide, Pearson Education.
2. Greenstien and Vasarhelyi, Electronic Commerce: Security, Risk Management and Control, Tata McGraw Hill.
3. Dave Chaffey, E-Business and E- Commerce Management, Strategy, Implementation and Practice, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of five short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Data Warehousing and Data Mining

Course Code: 20IMG23GT2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After doing this course, students should be able to:

CO1 identify the scope and necessity of Data Mining and Warehousing for the society.
CO2 describe the designing of Data Warehouse so that it can be able to solve the root problems.
CO3 understand various tools of Data Mining and their techniques to solve the real time problems.
CO4 develop further interest in research and design of new Data Mining techniques.

UNIT-I

Introduction: The Evolution of Data Warehousing the Data Warehouse A Brief History, Today's Development Environment; Principles of Data; Warehousing (Architecture and Design Techniques): Types of Data and their uses conceptual Data, Architecture, Design Techniques, Introduction to the Logical Architecture; Creating the Data Asset: Business Data Warehouse Design, Populating the Data Warehouse, Unlocking the Data Asset for End Users (The Use of Business Information).

UNIT-II

Designing Business Information Warehouse; Populating Business Information Warehouse, User Access to Information, Information, Data in Context. Data Mining Introduction: Motivation, Importance, data mining, kind of data, Functionalities, Interesting Patterns, Classification of data mining systems, Major issues; Data Warehouse and OLAP Technology for Data Mining: Data warehouse, operational database systems and data warehouses, Architecture, Implementation, development of data cube technology, data warehousing to data mining, Data warehouse usage.

UNIT-III

Data Preparation: Preprocess, Data cleaning, Data integration and transformation, Data reduction, Discrete and concept hierarchy generation; Data Mining Primitives: Languages, and System Architecture, graphical user interfaces; Concept Description: Characterization and Comparison, Data generalization and summarization based characterization, Analytical characterization: analysis of attribute relevance, mining class comparisons, Mining descriptive statistical measures in large database.

UNIT-IV

Mining Association Rules in Large Database: Mining single dimensional Boolean association rules from transaction database, Mining multidimensional association rules from database and data warehouses, from associating mining to correlation analysis, Constraint based association mining; Classification and Prediction: Issues, classification by decision tree induction, Bayesian classification, Classification by back propagation; Classification based on concepts from association rule mining; Other classification methods.
Lab: Each student is required to develop at least one data-house.

Recommended Readings:

1 Sam Anahory, Data Warehousing in the Real World, Pearson Education
2 Margaret H. Dunham, Data Mining: Introductory and Advance Topics, Pearson Education.
3. Alex Berson, Stephen Smith, Kurt Threarling; Building Data Mining Applications for CRM TMH
4. Alex Berson, Stephen Smith; Data Warehousing, Data Mining and OLAP, TMH
5. Michael J.A. Berry, Data Mining Techniques: for marketing sales and Customer Support, Gordon Linoff.
6. Han, Jiawei ; Data mining: Concepts and techniques, Harcourt.
7. Pujari, Arun K, Data, Mining Techniques, Hyderabad University Press.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

E-Governance and Framework of ICT

Course Code: 20IMG23GT3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After doing this course, students should be able to:

CO1: Understand the basic functioning of e-government
CO2: Apply the technical and management skills in implementing e-governance projects.
CO3: Analyse and evaluate assessment framework of e-government projects

UNIT-I

Overview of E-Government and E-Governance: Stages of E-Governance, National E-Governance Plan(NeGP), Mission Mode Projects and their implementation status, E-Governance Introduction to E-governance, Role of ICT in e-governance, Need, importance of E-governance, Categories of E-governance, Key Issues of E-Governance, Technology, Policies, Infrastructure, Training, Copyrights Consulting Funds, E-governance Models, Model of Digital Governance, Wider Dissemination Model.

UNIT-II

E governance Models: Critical Flow Model, Interactive-service model/Government to-Citizento- Government Model (G2C2G),Major areas of E-governance Services, Public Grievances: Telephone, Ration card, transportation, Rural services Land Records, Police: FIR registration, Lost and found, Social services: Death, domicile, school certificates, Public information: employment, hospitals, railway, Agricultural sector: Fertilizers, Seeds, Utility payments Electricity, water, telephone, Commercial: income tax, custom duty, excise duty-Governance Infrastructure.

UNIT-III

Phases of e-government: "Brochure ware", Interactive, and Transaction, Five Stages of Electronic Government Development, Statutes affecting e-government development, Human Infrastructural preparedness, Challenges for E-governance.

UNIT-IV

Policies: National Telecom Reforms, National Telecom Policies NTPs, Regulations: Digital Divide and Digital Dividends, Development and rationale of regulation and, deregulation, Role of Telecom Regulatory Agencies - Telecom Regulatory Authority of India (TRAI) and ITU, Information Technology Act (2000), Internet and E-commerce issues: privacy, security, domain names, etc, Wireless: frequency auctions, standards, competition.

Recommended Readings:

1. Vikram Raghavan, (2007). Communication Law in India-Legal Aspects of Telecom, Broadcasting, and Cable Services, 1st Edition, Lexis Nexis Butterworths.
2. D N Gupta, (2008). E Governance A Comprehensive Framework, 1st Edition, Jain Publications
3. Heather E Hudson, (2006). Global Connections - International Telecommunications Infrastructure and Policy, 1st Edition, Wiley Publication.
4. E. Bohlin and S.L. Levin, (2000). Telecommunications Transformation - Technology, Strategy and Policy, 1st Edition, IOS Press.
5. McElroy, (2003).KMCI (Knowledge Management Consortium International) and Butterworth Hienemann, 1st Edition.
6. R. K. Mitra, (2006). E-government: Macro Issues, 1st Edition, GIFT Publishing.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Multimedia and Web Development

Course Code: 20IMG23GT4

L-T-P
3-0-1

External Marks: 50
Sessional Marks: 50
Time Allowed: 3 Hours

Course Outcomes
After doing this course, students should be able to:

CO1: Developed understanding of technical aspect of Multimedia Systems.
CO2: Understand various file formats for audio, video and text media.
CO3: Design interactive multimedia software.
CO4: Apply various networking protocols for multimedia applications.
CO5: To evaluate multimedia application for its optimum performance.
CO6: Design a basic web site using HTML

UNIT-I
Introduction to Multimedia: Multimedia devices, components of multimedia systems, authoring tools, creating multimedia, video-capturing, video on demand.

UNIT-II
Data compression : Need for data compression, non-lossy and lossy compressions for images, color, gray scale and still-video image, video image, and audio compression JPEG standard, MPEG standard, DVI Technology, MIDI, brief survey of speech recognition and generation.

UNIT-III
Data and file format standards, Multimedia applications design: Application classes, types of multimedia systems; Distributed multimedia systems: Components, distributed multimedia databases.

UNIT-IV
Introduction to Web design: Web development process, site types and architectures, navigation theory and practice. Introduction to Page: Page sizes, page types, web design tools; introduction to text: Fonts and text layout, formatting tags, text design issues for the web.
HTML: Structure of HTML document; HTML Tags, inserting images, creating links, tables, forms, and frames

Lab: Each student is required to develop at least one website.

Recommended Readings:

1. Buford, Multimedia Systems, Pearson Education,
2. Vaughan, Multimedia Making IT Work, Tata McGraw Hill,
3. Villamil and Molina, Multimedia: An Introduction, PHI
4. Shuman, Multimedia in Action, Vikas Publishing House
5. Senclair, Multimedia on the PC, BPB Publications
6. Rosch, Multimedia Bible, SAMS Publishing
7. Powell, Web Design: The Complete Reference, Tata McGraw Hill

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of five short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Enterprise Resource Planning

Course Code: 20IMG23GT5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing this course, student will be able to:

CO1: make basic use of Enterprise software, and its role in integrating business functions
CO2: analyse the strategic options for ERP identification and adoption.
CO3: design the ERP implementation strategies.
CO4: create reengineered business processes for successful ERP implementation.

UNIT-I

Introduction: Basic issues, evolution of ERP, advantages, pitfalls, overview of an enterprise; ERP and related technologies: Business process reengineering, management information system, decision support system, executive information system, data warehousing, data mining, supply chain management.

UNIT-II

Manufacturing perspective: CAD/CAM, material requirement planning (MRP-I), bill of material, manufacturing resource planning (MRP-II), distribution requirement planning, JIT approach.

UNIT-III

ERP Modules: Introduction to ERP modules n Finance, Plant maintenance, quality management, materials management.

UNIT-IV

ERP Implementation: ERP lifecycle, vendors, consultants and users, ERP market, future directions in ERP.

Recommended Readings:

1. Leon A., Enterprise Resource Planning, Tata McGraw Hill.
2. Veena Bansal, Enterprise Resource Planning, Pearson Education
3. Ellen Monk, Bret Wagner, Concepts in Enterprise Resource Planning, Cengage Learning.
4. Motiwalla, Thompson, Enterprise Systems for Management, Pearson Education.
5. Wallace and Kremzar, ERP: Making it Happen – The Implementers' Guide to Success
6. with Enterprise Resource Planning, John Wiley and Sons, Inc.
7. Sadagopan, S., ERP: A Managerial perspective. Tata McGraw Hill.
8. Garg, V. K. and Venket Krishna N. K., ERP Concepts and Practice, PHI Publication.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Foreign Exchange Management

Course Code: 20IMG23GI1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand why firms and nations seek out and benefit from international business activities.
CO2: analyze and identify factors that cause exchange rates to change.
CO3: identify the linkages between international financial prices.
CO4: understand the costs and benefits of different monetary systems.
CO5: identify and measure political risk associated with a sovereign nation.

UNIT -I
Nature of foreign exchange: sources of demand for and supply of foreign exchange-the balance of payments (bop) framework; nominal, real and effective exchange rates; determination of rate of exchange, monetary portfolio balance, purchasing power parity approaches; overvalued and undervalued currencies; exchange rate systems.

UNIT -II
General factors of exchange rate fluctuations; the Dornbusch Sticky -price theory of exchange rate volatility; exchange rate overshooting and the J-curve effect; central banking intervention for exchange rate stability; effect of depreciation on trade balance.

UNIT -III
Nature functions and participants of foreign exchange market; spot and forward markets; forward premium; forwards in hedging and arbitrage; methods of quoting exchange rates; cross rates of exchange; arbitrage operations; bid -ask spreads; the Interest Rate Parity Theorem; the Expectation Theory; International Fisher Effect.

UNIT -IV
Currency futures, options and determination of their market value, over-the-counter options; Fisher Black's Optional-Pricing model; currency and interest rate swaps; credit risk of swaps, Euro currency market and its instruments; measuring foreign exchange risk and exposure; basic techniques of exposure management; foreign exchange regulation in India.

Recommended Readings:

1. Giddy I.A.N., Global Financial Markets, AITBS, New Delhi
2. D. Levi Maurice, International Finance, Prentice Hall of India, New Delhi
3. David K. Eiteman, Multinational Business Finance, Pearson Education
4. Roth Paul, Mastering Foreign Exchange and Money Markets, Pitman, London
5. Apte P.G., International Financial Management, Tata McGraw Hill, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

International Business Environment

Course Code: 20IMG23GI2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: learn the nature, scope and structure of International Business.
CO2: understand the influence of various environmental factors on international business operations.
CO3: gain knowledge on Regional Economic Groups

UNIT-I

Introduction to International Business: Importance, nature and scope of International business; Modes of entry into International Business; Internationalization process and managerial implications.
Socio-Cultural environment: significance, religion, language, education, aesthetics, attitudes, culture, customs and practices, cross cultural literacy, managing cultural diversity- dealing with cultural differences, social responsibility of business.

UNIT-II

International Economic Environment: International economic analysis indicators; Economic factors affecting international business operations- economic freedom, economic systems, economic indicators; Assessing economic development, performance and potential; Regional economic integration: Effects of integration, major regional trading groups in Asia and America. International Investment Theory - Theory of capital movements, Market imperfections, Internationalization, Appropriability, Location specific advantage.

UNIT-III

Political and Legal environment: Political environment: Individualism Vs. collectivism, political ideology, political risk; Legal environment: Types of Legal systems, trends in legal system, implications for mangers, legal issues in international business.

UNIT-IV

Technological environment: Impact of technology on society, economy, industry; Need to spend on R and D, implication of technology on MNCs, environmental factors contributing for rise of technology, Nature of technology transfer, stages in transfer process, international technological issues.

Recommended Readings:

1. Daniels, J.D. and H. LEE Radesbaugh,"International Business", Pearson Education.
2. Aswathappa, K. "International Business", Tata McGraw Hill publications, New Delhi.
3. Richard M. Schaffer etal, International Business Law and its Environment, Thomson 2002.
4. John. J Wild, et al, International Business, Pearson Education
5. Michael Zinkata et al, Global Business, The Dryden Press 1988.
6. Darrell Mahoney, International Business, Longman, 1998.
7. Donn Ball and Wendell Mcculloch, International Business, Irwin McGraw Hill 1999.
8. Charles W Hill, International Business, TMH publishing company Ltd.
9. WTO Annual reports, Geneva.
10. Overview of Developments in the International Trading Environments - Annual Report by the Director General WTO, Nov. 22, 2000.
11. Black and Sundaram, "International Business Environment", Prentice Hall of India, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Export Import Management and Documentation

Course Code: 20IMG23GI3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: understand Import/export trade organizations
CO2: understand the procedure of licensing
CO3: understand Export-Import trade regulatory framework in India.
CO4: understand export sales contract and its processing
CO5: understand documents required at the time of export and import.
CO6: understand institutional set up for export promotion and export assistance in India.

UNIT-I

Preliminaries for Export: Meaning of Exports and Imports, Classification of Exports and Imports, Categories of Exporters Strategy and Preparation for Foreign Trade, Identifying Foreign Markets, International Market Selection Process, Methods of Entering International Market, Constraints in Entering Foreign Markets, Export Contract, Force Majeure in Export Contract Exchange Earner's Foreign Currency (EEFC) Account, Prospects for India's Foreign Trade Development, Challenges to India's Foreign Trade Development, Institutional framework for Foreign Trade.

UNIT-II

Export documentation and Export Procedures: Aligned Documentation System (ADS), important documents, Export Procedure, Registration Procedure, Pre-shipment Procedure, Shipment Procedure ,Post- shipment Procedure (Realisation of Export Proceeds),Excise Clearance for Exportable Goods ,Quality Control and Pre-shipment Inspection, Importer Exporter Code (IEC) Number Registration-cum-Membership Certificate (RCMC), Role of Customs House Agents (CHAs), Exchange Rate Fluctuation Risks, Forward Contracts, ISO 9000 Certification, Role of clearing and forwarding agents

UNIT-III

Policy Assistance and Incentives: Incentives and Assistance for Exporters ,Duty Drawback (DBK) Procedure for Claiming Duty Drawback, Exports from India Scheme, Export Promotion Capital Goods (EPCG) Scheme, Towns of Export Excellence (TEE), Deemed Exports, Export Oriented UNIT-s (EOUs), Electronic Hardware Technology Parks (EHTPs), Software Technology Parks (STPs) and Bio-technology Parks, Agri Export Zones (AEZs), Special Economic Zones (SEZs),Benefits Enjoyed by SEZs, Quality Control and Trade Disputes (QCTD) Assistance to States for Developing Export Infrastructure and Allied Activities (ASIDE), Role and Significance of Export Trading Houses and privileges of status holder.

UNIT-IV

Methods of Payments and Export Finance: Conditions for Realisation of Export Proceeds, Factors Affecting Export Payment Term, Methods of Export Payment, Types of Export Finance, Pre-shipment Finance, Features of Post-shipment Finance, Procedure for Obtaining Export Finance, Pre-shipment Finance vs. Post-shipment Finance, Import Procedure Introduction, Categories of Importers, Import Licence, Import Contract, Pre-import Procedure, Legal Dimensions of Import Procedure, Customs Clearance for Imported Goods, Exchange Control Provisions for Imports, Valuation for Customs Duty, Import Incentives under Special Schemes, Import Procurement planning.

Recommended Readings:

1. Jain. S. Khushpat, Jain.V. Apexa, Export-Import Procedure and Documentation, Himalaya Pub. House.
2. Export-Import manual, Nabhi Publication, New Delhi
3. Kapoor,D.C, "Export Management", Vikas Publishing House Pvt. Ltd., New Delhi.
4. Gerald Albaum, International Marketing and Export Management, Pearson Education.
5. Cherunilam, Francis. "International Trade and Export Management", Himalaya Pub. House.
6. Kumar, Asin, "Export -Import Management", Excel Publications. New Delhi
7. Paras Ram, "Export what, where and how" Anupam Publications.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Regional Economic Blocks

Course Code: 20IMG23GI4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: understand the theoretical framework of the theory of economic integration, and
CO2: understand its impact on trade and investment flows among the region and on the global economy.

UNIT-I

Concept, Rationale and objectives of Economic Integration, Levels of economic integration, Impact of Economic Integration, Customs Union: Features, Theory of Customs Union, Partial Equilibrium approach to Customs Union, Assumptions of approach, Effects of Customs Union. General Equilibrium Approach: Lipsey model and Vanek model.

UNIT-II

Regionalism in the World Economy, Economic Integration among developing countries: Rationale, benefits, problems of economic integration, measures to encourage EI among developing countries, Evaluation of RIA's.

UNIT-III

South - South Cooperation: Problems facing the south, Scope of ECDC (Economic cooperation among developing countries), Rationale, SSC (South- South Cooperation): Efforts, progress, problems, India's role in SSC. India and Regional Cooperation, SAARC: Objectives and principles, SAARC nations, potential areas of Cooperation, problems of SAARC nations, SAPTA, INDO - LANKA FTA, INDO - SINGAPORE CECA (Comprehensive Economic Cooperation Agreement).

UNIT-IV

Major Regional Trading Groups: EU; NAFTA; REI in America's: CARICOM, MERCOSUR, CAN; Regional economic integration in ASIA - ASEAN, APEC; Regional economic integration in AFRICA: African Union; BRICS. Commodity agreements and OPEC nations. Role of WTO, WTO provisions on regional integration arrangements.

Recommended Readings:

1. Paul R. Krugman, International Economics, Pearson Education.
2. Jhingan, M.L, International Economics, Vrinda Publications Ltd.
3. Gerber James, International Economics, Pearson Education.
4. Cherunilum, Francis, International Economics, Tata McGraw - Hill
5. Balassa, Bela., Theory of Economic Integration, George Allen and Unwin Ltd.
6. Daniels, J.D. and H. LEE Radesbaugh,"International Business", Pearson Education.
7. Bhalla, V.K., World Economy in 90s: A Portfolio Approach, Anmol Pub. Pvt. Ltd.
8. Dreze, Jean and Sen, Aamrtya, Indian, Development: Selected Regional Perspective, Oxford Univ. Press
9. Jackson, J., The World Trading System, Mass: MIT Press.
10. Krugman, Paul R. and Obstfeld, M., International Economics, Harper Collins Pub.
11. Machlup, F. A., History of Thought on Economic Integration, Macmillan.
12. Trivedi, Sonu, Regional Economic Cooperation and Integration, New Century Publications.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

International Logistics

Course Code: 20IMG23GI5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: develop basic understanding of the ins and outs of exports and imports, types of shipping, international laws related to logistics and transportation of goods, financial processing, and distribution channels.
CO2: learn discussion of terms of trade, insurance, proper packaging procedures and outcomes.
CO3: discuss current practices, issues, and concerns in the field of international logistic operations.
CO4: understand the reason of existence of International Trade.
CO5: apply logistics principles in international business decisions.

UNIT -I
Trends in world trade growth; nature, significance and components of international logistics; creating an export organization; registration and licensing; selecting export products and markets and channels; export costing and pricing procedures incoterms; deciding payment terms; export contracts; deciding currency of payment; export order processing; international logistics infrastructure.

UNIT -II
Arranging pre -shipment finance; export procurement; quality control and pre -shipment inspection; packing and labeling of export consignments; basic procedure and documentation for excise and custom clearance; ADS; Cargo insurance; shipping modes procedures and documentation; role of forwarding agents.

UNIT -III
Arranging post-shipment finance; documentary collection of export bills; UCPDC guidelines; negotiating documents under L/C; managing exchange earners' foreign currency accounts; availing foreign exchange facilities; protecting against adverse movements in exchange rates; role of EXIM Bank; major provisions of FEMA relating to exporters; export credit risk insurance and the role of ECGC.

UNIT -IV
Major export promotion schemes in India; export assistance to export houses; SEZ units, EOUs, EHTP, STP and BTP units; facilities for deemed exports; marketing development assistance; trade information support; role of commodity boards and export promotion councils in trade promotion; facilities for service exports.

Recommended Readings:

1. Paras Ram, Export: What, When, How, Anupam Publications, New Delhi
2. Khurana, P.K., Export Management, Galgotia Publishing, New Delhi
3. Shavaramu, Export Marketing – A Practical Guide for Exporters, Wheeler Publishing, New Delhi
4. Paul R. Murphy, Contemporary Logistics, Pearson Education
5. Govt. of India, An Overview of Customs, Commissionate of Customs and ICDs, New Delhi
6. Govt. of India, Ministry of Commerce and Industry – Handbook of Procedure, Govt. of India, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Digital Marketing

Course Code: 20IMG23GM1

L-T-P
3-0-1

External Marks: 50
Sessional Marks: 50
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: Understand how and why to use digital marketing for multiple goals within a larger marketing and/or media strategy.
CO2: Understand the major digital marketing channels - online advertising: Digital display, video, mobile, search engine, and social media.
CO3: Learn to develop, evaluate, and execute a comprehensive digital marketing strategy and plan.
CO4: Learn how to measure digital marketing efforts and calculate ROI. CO5 Explore the latest digital ad technologies.

UNIT-I

Introduction to Digital Marketing: Digital Marketing, Internet Users, Digital Marketing Strategy, Digital Advertising Market in India, Skills required in Digital Marketing, Digital Marketing Plan. Display Advertising: Concept of Display Advertising, Types of Display Ads, Buying Models, Display Plan, Targeting, What Makes a Good Ad?, Programmatic Digital Advertising, Analytical Tools, YouTube Advertising.

UNIT-II

Search Engine Advertising: benefits of paid Search Advertising, understanding Ad Placement, understanding Ad Ranks, Creating the First Ad Campaign, Enhance Your Ad Campaign, Performance Reports. Social Media Marketing: How to build a Successful Strategy. Facebook Marketing: Facebook for Business, Anatomy of an Ad Campaign, Adverts, Facebook Insights, Other Marketing Tools, Other Essentials.

UNIT-III

LinkedIn Marketing: Why it is Important to have LinkedIn Presence, LinkedIn Strategy, Sales Leads Generation Using LinkedIn, Content Strategy, LinkedIn Analytics, Targeting, Ad Campaign. Twitter Marketing: Getting Started with Twitter, How is Twitter Different?, Building a Content Strategy, Twitter Usage, Twitter Ads, Twitter Analytics, Twitter tools and tips for Marketers. Instagram and Snapchat: Instagram-Content Strategy, Sponsored Ads, Snapchat, Digital Public Relations.

UNIT-IV

Mobile Marketing: Mobile Usage, Mobile Advertising, Mobile Marketing Toolkit, Mobile Marketing Features, Addressing the diversity in India through Mobile, Campaign Development Process, Tracking of Mobile Campaigns. Search Engine Optimisation: Search Engine, Concept of SEO, SEO phases, On Page and Off Page Optimisation, Social Media Reach, Maintenance. Web Analytics: Data Collection, Key Metrics, Making Web Analytics Actionable, Multi-channel attribution, How to connect offline with online, Types of Tracking Codes, Mobile Analytics, Universal Analytics, Competitive Intelligence.

Recommended Readings:

1. Puneet Bhatia, Fundamental of Digital Marketing, Pearson Education
2. Seema Gupta, "Digital Marketing", McGraw Hill Education, New Delhi.
3. Philip Kotler, "Marketing 4.0: Moving from Traditional to Digital", Wiley
4. Ryan Deiss and Russ Henne berry. Digital Marketing for Dummies,
5. Jason, McDonald. Social Media Marketing Workbook: 2018 Edition - How to Use Social Media for Business
6. Miller, The Ultimate Web Marketing Guide, Pearson Education.

Lab: Practical on Social Media marketing

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of five short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Customer Relationship Management

Course Code: 20IMG23GM2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: apply the concept of CRM, the benefits delivered by CRM, the contexts in which it is used, the technologies that are deployed and how it can be implemented.

CO2: implement how CRM practices and technologies enhance the achievement of marketing, sales and service objectives throughout the customer life-cycle stages of customer acquisition, retention and development whilst simultaneously supporting broader organizational goals.

UNIT-I

Introduction – Origin, evolution and concept of CRM, strategic importance of CRM, goals of CRM, types of CRM, CRM Architecture

UNIT-II

Operational CRM – Sales force automation: lead management, contact management, field force automation; enterprise marketing automation: market segmentation, campaign management, customer service and support, contact and call center operations

UNIT-III

Analytical CRM – Managing and sharing customer data: customer information database, ethics and legalities of data use, data warehousing and data mining; types of data analysis – online analytical processing, click stream analysis, collaborative filtering, CRM and business intelligence collaborative CRM

UNIT-IV

CRM Implementation – Establishing CRM performance monitoring, CRM readiness assessment, system, CRM audit, CRM project management, employee engagement in CRM project, CRM budget, key account management, evaluating CRM return on investment

Recommended Readings:

1. Buttle, Francis, Customer Relationship Management – Concept and Tools, Elsevier Butterworth – Heinemann, Oxford, UK
2. Payne, Adrian, Handbook of CRM – Achieving Excellence in Customer Management, Butterworth – Heinemann, Oxford, UK
3. Dyche, Jill, The CRM Handbook – A Business Guide to Customer Relationship Management, Pearson Education, New Delhi
4. Knox, Simon, Stan Maklan, Adrian Payne, Joe Peppard and Lynette Ryal, Customer Relationship Management, Butterworth – Heinemann, Oxford, UK
5. Greenlers, Paul, CRM at the Speed of Light, Tata McGraw Hill Publishing Ltd., New Delhi
6. Anderson, Kristen, and Carol J Kerr, Customer Relationship Management, Tata McGraw Hill

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Services Marketing

Course Code: 20IMG23GM3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the unique challenges inherent in managing and delivering quality services.
CO2: analyse the various components of the "services marketing mix" (the 7 P's).
CO3: to identify the role of employees and customers in service delivery, customer satisfaction, and service recovery;
CO4: develop students' abilities to identify services decision problems, ascertain alternatives, define crucial issues, analyse, make decisions and plan the implementation of these decisions

UNIT I

Introduction to Services: Service and Technology, Goods versus Services, Service Marketing Mix, Gap model of Services, important service industries-Hospitality and Tourism, Transportation, Telecom, Banking and Insurance, Education and Entertainment, Healthcare. Service classification and challenges in Service Business.

UNIT II

Focus on the Customer: Consumer Behaviour in Services, Customer Expectation of Services, and Customer perception of services. Elements in an effective services marketing research programme, Building customer relationship, Relationship development strategies, Reasons of Service failure, Service recovery and strategies.

UNIT III

Aligning Service design and standards: Challenges of Services Innovation and design, new service development process Service Blueprinting, Customer-defined service standards and its types, Physical evidence and types of servicescape, Strategic roles of servicescape

UNIT IV

Delivering and performing services: Employees role in service delivery, Customers role in service delivery, Delivering services through intermediaries and electronic channels, Strategies for matching capacity and demand, Key service communication challenges, Approaches to pricing services, Financial and Economic impact of services.

Recommended Readings:

1. Lovelock, C., Wirtz, J.and Chatterjee, J., Services Marketing. Pearson Education.
2. Zeithaml, V., Bitner, M.J., Gremler, D.D. and Pandit, A., Service Marketing. McGraw Hill.
3. Gopal Das, Essentials of Services Marketing, Pearson Education.
4. Srinivasan, Service marketing: Indian Context, PHI
5. Swartz, T., Iqcobucci, D., Handbook of Service Marketing and Management, Sage Publication

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Consumer Behavior

Course Code: 20IMG23GM4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: gain strategic understanding of the influential and persuasive mechanisms involved in consumer attitude, belief, and behavior change, and will be able to apply this knowledge in addressing specific marketing problems.
CO2: examine the consumer from a managerial perspective and to develop marketing strategies to respond to consumers' changing attitudes and behaviors.
CO3: understand how to anticipate, adapt, and respond to consumer needs by applying the insight from basic consumer behavior concepts to their marketing strategies.
CO4: understand the current and future research technologies for consumer insight and will be able to critically assess how they can be used in strategy formulation.

UNIT-I

Consumer Behavior and consumer research; importance of consumer Behavior; evolution of consumer Behavior; methods of studying consumer Behavior; customer centric organizations; market analysis; market segmentation, marketing mix strategies; value of brands in marketing strategy; customer loyalty and retention strategy; global marketing strategy; global marketing strategy; global advertising effectiveness; consumer decision process model; variables affecting the decision process; types of decision process; factors influencing the extent of problem solving; pre-purchase processes; need recognition; internal and external search; pre-purchase evaluation

UNIT-II

Different types of purchase situations; retailing and the purchase process; determinants of retail success or failure; point -of-purchase materials; consumer logistics; location based retailing; direct marketing consumption Behaviors; consumption experiences; importance of customer satisfaction; factors affecting satisfaction level; demographics and consumer Behavior; economic resources and consumer Behavior; personality and consumer Behavior; personal values; lifestyle motivational conflict and need priorities; motivational intensity; motivating consumer

UNIT-III

Importance of consumer knowledge; types of consumer knowledge; sources of consumer knowledge; benefits of understanding consumer knowledge; consumer beliefs; consumer feelings; consumer attitudes; consumer intentions; culture and its effect on consumer Behavior; changing values and its effect on consumer Behavior; changing values and its effect on marketing; determinants of social class; social class and consumer Behavior; importance of families and households on consumer Behavior; role Behavior and its influence on the decision process; family life cycles; changing roles of women; children and household consumer Behavior

UNIT-IV

Group and personal influences on individuals; reference group and its influence on individuals; transmission of influence through dyadic exchanges; word of mouth and opinion leaders in advertising and marketing strategy; diffusion of innovations; diffusion process; reaching the consumer; gaining consumer's attention; shaping consumer's opinion; opinions change; product's and advertising's role in shaping consumer opinion; cognitive learning; retrieval of information; company's role in helping consumers to remember

Recommended Readings:

1. Schiffman, Leon G. and S. Ramesh Kumar, Consumer Behavior; Pearson Education
2. Jagdish Sheth, Consumer Behavior: A Digital Native, Pearson Education.
3. Blackwell, Roger, Miniard, Paul and Engel, James; Consumer Behavior; Thomson Learning; New Delhi 4.Loudon, David J. and Dellabitta, Albert; Consumer Behavior; Tata McGraw Hill; New Delhi.
5. Soloman, Michael R.; Consumer Behavior – Buying, Having and Being; Pearson Education
6. Nair, Suja R.; Consumer Behavior in Indian Perspective; Himalaya Publishing House; New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Retail Management

Course Code: 20IMG23GM5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: understand the concepts of effective retailing
CO2: know the recent trends in retailing in India
CO3: understand various retail formats and will understand the retail customers

UNIT-I

Introduction to Retail- Evolution of Retail, Organised vs. Unorganised retailing, Retail Mix, theories of retail development, Types of Retailers; Careers in Retailing; understanding Consumers.

UNIT-II

Retail Locations- Planned and Unplanned, Retail Site Location- Site Characteristics, Trade Area Characteristics, Location and Site Evaluation; Store Layout and Design; Space Management; Visual Merchandising; Atmospherics.

UNIT-III

Managing Merchandise - Merchandise Planning, Process, Forecasting Sales, Developing Assortment Plans, National Brands and Private Labels; Retail Pricing- Setting Retail Prices, Price Adjustments, Pricing Strategies; Retail Communication Mix.

UNIT-IV

Information and Supply Chain Management- Information Flows, Logistics, Distribution Centre. Contemporary issues in Retail- Significance of retail as an industry, Retail scenario at International and National Level, Technology in Retailing, Multi-channel Retailing, E-Retailing: Future of e-retailing, Challenges for traditional retail and e-retail, FDI in Retail.

Recommended Readings:

1. Pradhan, S., Retailing Management Text and Cases, McGraw Hill Education, New Delhi
2. Berman, Barry and Evans, Joel, R., Retail Management; A Strategic Approach; Pearson Education.
3. Levy, Micheal, Weitz, Barton, A. & Pandit, Ajay, Retailing Management, Tata McGraw Hill, New Delhi
4. Gibson G. Vedamani, Retail Management, Pearson Education.
5. Newman, Andrew, J. and Cullen, Peter, Retailing: Environment and Operations, Vikas Publishing House; New Delhi.
6. Gilbert, David, Retail Marketing Management, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Project Management

Course Code: 20IMG23GO1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: explain the importance, scope and functions of project management in successful project and understand the life cycle of any given project

CO2: prepare estimation of guidelines for time, costs and resources required for project management by applying different methods

CO3: demonstrate the scheduling resources and reducing project duration

CO4: define role and responsibilities of the project manager, planning, organizing, controlling, skills of the project manager

UNIT-I

Project Analysis: Meaning, Overview, Capital Budgeting and Strategic Issues, Generation and Screening of Project Ideas.

UNIT-II

Feasibility Reports: Market and Demand Analysis; Technical Analysis; Financial Analysis; Analysis of Project Risk; Risk specific to individual firm and Market Risk; Decision under risk and Risk Analysis in Practice.

UNIT-III

Social Cost and Benefit Analysis: UNIDO approach and L-M Approach; Multiple Projects and Constraints, Financing of Projects, Sources of Risk capital, Recent development in India.

UNIT-IV

Project Management: Project Planning and Control, Human aspects of Project Management; Project Review and Administrative Aspects; Problem of Time and Cost Overrun.

Recommended Readings:

1. Chandra, Prasanna, Projects: Preparation, Appraisal, Budgeting and Implementation, Tata McGraw Hill.
2. Pradeep Pai, Project Management, Pearson Education.
3. Dhankar, Raj S., Financial Management of Public Sector Undertakings, Westville.
4. Little I.M.D. and J.A. Mirrlees, Project Appraisal and Planning for Developing Countries, Heinemann Educational Book.
5. OCED Manual of Industrial Project Analysis in Developing Countries- Methodology and Case Studies, OCED, Paris.
6. Planning Commission, Guidelines for Preparation of Feasibility reports of Industrial Projects, Controller of Publication.
7. UNIDO Guide to Practical Project Appraisal, United Nations.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Total Quality Management

Course Code: 20IMG23GO2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: conceptualize Total Quality.
CO2: closely link management of quality with that of reliability and maintainability for total product assurance.
CO3: describe the Concept of Total Quality and its evolution.

UNIT-I

Basics Concepts of Quality: Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership - Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

UNIT-II

TQM Principles: Customer satisfaction - Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement - Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement - Juran Trilogy, PDCA Cycle, 5S, Kaizen, Supplier Partnership - Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures - Basic Concepts, Strategy, Performance Measure.

UNIT-III

Statistical Process Control: The seven tools of quality, Statistical Fundamentals - Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

UNIT-IV

TQM Tools: Benchmarking - Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) - House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) - Concept, Improvement Needs. Quality System: Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System - Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 - Concept, Requirements and Benefits.

Recommended Readings:

1. Besterfield Dale H, Quality Control, Pearson Education.
2. Charantimath, P., Total Quality Management, Pearson Education.
3. Bedi, Quality Management, Oxford University Press.
4. Juran J. M. and Gryna, Jr. F.M., Quality Planning and Analysis, TMH, New Delhi
5. Ronald G Day, Quality Function Deployment, TMH, New Delhi..
6. Evan J.R., Total Quality Management, Excel Book, New Delhi.
7. Hansan B.L. andGhare, P.M. Quality Control and Application, PHI.
8. Hagan, Management of Quality, Oxford University Press.
9. Juran J M and Frank M Gryna, Quality Planning andAnalysing, TMH, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Supply Chain and Logistics Management

Course Code: 20IMG23GO3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: explain concept and definitions of Supply Chain.
CO2: identify role of Supply Chain as a value driver - Integrative Management, Responsiveness, Financial Sophistication
CO3: appreciate the impact of globalization and technological revolution in Supply Chain management.
CO4: explain Customer Value, Customer satisfaction and CRM

UNIT-I
Understanding the Supply Chain: Define Supply Chain, Objective of a Supply Chain, Importance of Supply Chain Decisions, Decision Phases in a Supply Chain, Process View of a Supply Chain, Competitive and Supply Chain Strategies, Achieving Strategic Fit, Expanding Strategic Scope, logistics as integral part of SCM, components of logistics

UNIT-II
Designing the supply chain network: role of distribution, factors influencing distribution, design options, e-business and its impact , distribution networks in practice, network design in the supply chain, role of network, factors affecting the network design decisions, modelling for supply chain, designing and planning transportation networks: Role of transportation, modes and their performance, transportation infrastructure and policies design options and their trade-offs, tailored transportation.

UNIT-III
Purchasing and Vendor management: Centralized and decentralized purchasing, functions of purchase department and purchase policies, single vendor concept, management of stores, accounting for materials. Inventory Management: Concept, various costs associated with inventory, various EOQ models, buffer stock (trade-off between stock out / working capital cost),lead time reduction, re-order point / re-order level fixation, exercises , ABC, SDE / VED Analysis, Just-In-Time and Kanban System of Inventory management.

UNIT-IV
Decision-support systems for supply chain management: Introduction, the challenges of modelling structure of decision support systems, input data, analytical tools, presentation tools, supply chain decision: support systems. Recent Issues in SCM: Role of Computer / IT in Supply Chain Management, CRM vs. SCM, Benchmarking concept, Features and Implementation, Outsourcing-basic concept, Value Addition in SCM-concept of demand chain management.

Recommended Readings:.

1. Chopra, S. Peter Meindl, Kalra, D.V. "Supply Chain Management Strategy, Planning and Operation", Pearson Ed.
2. Shah, J. "Supply Chain Management", Pearson Education
3. Sharma: Supply Chain Management, Oxford University Press
4. Donald J Bowersox, Dand J Closs, M Bixby Coluper, "Supply Chain Logistics Management", TMH
5. Sahay B.S. "Supply Chain Management", Macmillan, New Delhi.
6. Agarwal D.K. "A Text Book of Logistics and Supply chain management", Macmillan, New Delhi.
7. Raghuram G. "Logistics and Supply Chain Management", Macmillan, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Service Operations Management

Course Code: **20IMG23GO4**

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand decision making in planning, design, delivery, quality, and maintenance and scheduling of service operations.
CO2: describe the role of service quality and supply chain in emerging service economy of India.

UNIT-I

Matrix of Service Characteristics: Challenges in Operations Management of Services: Aggregate Capacity Planning for Services; Facility Location and layout for Services

UNIT-II

Job Design - Safety and Physical Environment; Effect of Automation; Operations Standards and Work Measurement;

UNIT-III

Measurement and Control of Quality of Services; Dynamics of Service Deliver) System; Scheduling for Services Personnel and Vehicles; Waiting - Line analysis;

UNIT-IV

Distribution of Services; Product-Support Services; Maintenance of Services; Inventory Control for Services: Case Studies on Professional Services.

Recommended Readings:

1. Robert Johnston, Service Operation Management, Pearson Education.
2. Collier David A., Service Management Operating Decisions. Englewood Cliffs, Prentice Hall Inc.
3. Fitzsimmons, James A and Sullivan, Robert S., Service Operations Management... McGraw-Hill.
4. Sharma, J K., Service Operations Management, Anmol Publications.
5. Heskett, James L. et al., Service Breakthroughs - Changing the Rules of the Game, Free Press.
6. Murdiek, R G. et al., Service Operations Management, Allyn and Bacon.
7. Voss, C. et al., Operations Management in Service Industries and the Public Sector, Chichester, Wiley.
8. Bowmen David E. et al., Service Management Effectiveness: Balancing Strategy, Organization and Human Resources, Operations and Marketing, Jossey Bass.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Research and Development Management

Course Code: **20IMG23GO5**

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the different types of Research and Developmental environment
CO2: appreciate the procurement procedure for effective Research and Development management

UNIT-I
Survey of Emerging Technologies - Environment Analysis; Project Proposals; R and D Management: Management of knowledge workers.

UNIT-II
R and D environment; Management of High value Instruments Test Facilities, Workshops etc., Identification of partners/contractors for Rand D Projects; R and D Budget.

UNIT-III
Technology Scanning: Procurement Procedure; Material Management Policy; Discard Policies and Procedure; Contract Management; Procurement and Utilization of Capital Equipment; Test Equipment.

UNIT-IV
Test Facilities; Sharing of resources with other Institution - Sponsored Resources; Development Tools.

Recommended Readings:

1. Cetron, Marvin J. and Goldhar, Joel D (ed.), The Science of Managing Organised Technology, Gordon and Research, Science Publications.
2. Jain, R K. and Triandis, H C., Management of Research and Development Organizations; Managing the Unmanageable, Wiley.
3. McLeod, Tom. The Management of Research, Development and Design in Industry, Gower.
4. Meredith, Jack R. & Mantel, Samuel J., Project Management a Managerial Approach, Wiley.
5. NTIS, The Management of Government R and D Projects; the effects of the contractual requirement to use specific management techniques, University of Texas.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Legal Institutional Dynamics

Course Code: **20IMG23GP1**

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: know about the features of Indian Constitution
CO2: understand about the structure of our parliament
CO3: develop deeper understanding of the federal structure of Indian
CO4: understand about Indian Judicial System
CO5: get insights about the State and Local Government in India

UNIT I
Features of Indian Constitution: Salient Features and sources of Indian Constitution - The Preamble and its significance - Citizenship - Fundamental Rights and its limitations - Fundamental Duties and its implications - Directive Principles of State Policy and Welfare State

UNIT II
Union Government: Parliament: The President; Vice President - Lok Sabha and the Speaker - Rajya Sabha and the Chairman - The Prime Minister, Cabinet and the Council of Ministers - Elections, Powers and Functions - Emergency Provisions

UNIT III
State and Local Government: Governor - Chief Minister and Council of Ministers - Legislative Assembly and Speaker; Legislative Council and Chairperson - Elections, Powers and Functions - Panchayati Raj Institutions (PRI) - 73rdAmendment Act - 11thSchedule - PESA Act - Urban Local Government Institutions (ULGI) - 74th Amendment Act - 12th Schedule

UNIT IV
The Judiciary: Supreme Court, High Courts: Powers, Functions and Jurisdictions - Judicial Review - Judicial Activism - Public Interest Litigation (PIL) - Types of Writs

Recommended Readings:

1. Basu, Durga Das, (2002), Introduction to the Constitution of India, New Delhi: Wadhwa and Company Law Publishers.
2. Basu, Durga Das, (2008), Commentary on the Constitution of India, New Delhi: Wadhwa and Company Law Publishers.
3. Datar, Arvind P, (2010), Datar Commentary on Constitution of India (3 vols.), Nagpur: LexisNexis Butterworths Wadhwa.
4. Jain, M.P. (2010), Indian Constitutional Law 6thEdition (2 vols.), Nagpur: LexisNexis Butterworths Wadhwa.
5. Johari, J.C. (1995), The Constitution of India - A Politico-Legal Study, New Delhi: Sterling Publishers Private Limited.
6. Kashyap, Subhash, (2005), Our Constitution, New Delhi: National Book Trust.
7. Pylee, M.V. (2007), An Introduction to the Constitution of India, New Delhi: Vikas Publishing House Pvt.Ltd.
8. Pylee, M.V. (2008), India's Constitution, New Delhi: Vikas Publishing House Pvt. Ltd.
9. Shukla, V.N. (2003), Constitution of India, Lucknow: Eastern Book Company.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Development Economics

Course Code: **20IMG23GP2**

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: demonstrate familiarity with some central themes and issues of economic development
CO2: analyze empirical evidence on the patterns of economic development
CO3: demonstrate the understanding of the difference between growth and development and the measurement of inequality
CO4: understand the theories of development

UNIT-I

Economic Development: Meaning of economic growth and development, Factors determining economic growth and development; Measuring Development: Income Measures, Basic Needs Approach, PQLI and HDI and Capabilities Approach; Importance of agriculture and industry in economic development,

UNIT-II

Poverty and Inequality: Measurement, Impact and Policy options, relationship between poverty/inequality and economic development; Development Gap: concepts and measurement; land reform and its effects on productivity and development.

UNIT- III

Theories of Development: classical theory of development, Karl Marx's theory of development - theory of social change, capitalist development; Growth Models: Harrod and Domar Model, Neo Classical Growth Models, Endogenous Growth Model, Lewis Model; Amartya Sen vs Bhagwati debate on growth, Poverty and Distribution, Mahalanobis Model.

UNIT-IV

Environment and Sustainable Development: Defining sustainability for renewable resources; a brief history of environmental change; common-pool resources; environmental externalities and state regulation of the environment; economic activity and climate change.

Recommended Readings:

1. Michael P. Todaro, Stephen C. Smith, Economic Development, Pearson Education.
2. Mukherjee, A. and Chakrabarti S., Development Economics: A Critical Perspective, PHI india
3. Debraj Ray, Development Economics, Oxford University Press.
4. H.L. Ahuja, Development Economics, S. Chand Publication.
5. Chakravarti, S., Alternative Approaches to the Theory of Economic Growth, Oxford Univ. Press, Delhi.
6. Alfred W. Stonier, Douglas C. Hague, A Textbook of Economic Theory, Pearson Education.
7. Behrman, S. and T.N. Srinivasan, Handbook of Development Economics, Elsevier

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Right to Information Act

Course Code: **20IMG23GP3**

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: develop understanding about the Right to Information Act 2005
CO2: understand the functioning of various authorities under the Act
CO3: defend their rights by meaningful use of RTI Act
CO4: know about the obligations of public authorities
CO5: understand the practical applicability of the Right to Information Act, 2005

UNIT-I
Introduction of Right to Information Act 2005: History, Background, Objectives, Preamble of Right to Information Act 2005, Obligation of Public Authorities (Section 3 to 11), Right to Information as Constitutional rights: Protection of Article 19(1) (a), Right to privacy, Contempt of Court, Public Interest vis-à-vis Information; Right to Information Regime in India: a Tool in the hands of the Citizens

UNIT-II
The Central Information Commission: Constitutions, Eligibility criteria and Process of Appointment, Term of office and Condition of Service, Removal of Informational Commissioner; The State Information Commission: Constitutions, Eligibility criteria and Process of Appointment, Term of office and Condition of Service, Removal of Informational Commissioner

UNIT-III
Power and Function: Information Commission, Appeal and Penalties under Right to Information Act 2005; Breach of Confidentiality and Privacy: The Indian perspective an 'offence' under the Indian Information Technologies Act 2000; Using the RTI Act to get "Information"- The Filing of the Request for obtaining Information.

UNIT-IV
Public Authority vis-à-vis Right to Information Act 2005: Origin, History, Public Authority, right to Information, Breach of Duty to disclose by Public Authority; Right to Information and E-Governance: Electronic Information Dissemination, need for regulation, Jurisdiction in Cyberspace: Problem and perspective; Success Stories and Case Studies.

Recommended Readings:

1. The Right to Information Act Book, By Shruti Desai
2. The Right to Information Act,2005 By Dheera Khanawal and Krishna K. Khanawal
3. The Right to Information :Law-Policy-Practice By Rodney D Ryder
4. Handbook on The Right to Information Act By P.K. Das
5. Treaties on The Right to Information Act 2005 By Dr. Hiraj Kumar (2007)

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of five short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Public Finance Administration

Course Code: **20IMG23GP4**

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the meaning of public finance and its importance
CO2: know about the various committees regarding public finance
CO3: get knowledge about the Indian tax system, sources of revenue and its relation with economic growth
CO4: develop understanding about the financial issues in a federal set up
CO5: understand the fiscal policy and public financial administration

UNIT-I
Public Finance: Nature, Definition, Scope of Public Finance, Role of Public Finance in Economic Development and Principles of Maximum Social Advantage; Impact, shifting, incidence and effects of taxation; Parliamentary Financial Committees- Estimates Committee, Public Accounts Committee, Committee on Public Undertakings, Standing Committee for scrutiny of demands for grants.

UNIT-II
Sources of Revenue: taxes, loans, grants and aid - meaning and types, canons of taxation, problem of justice in taxes, incidence of taxation, taxable capacity, Impact of taxation and tax evasion characteristics of Indian tax system, defects and steps of reform; Public Expenditure: Meaning, Classification and Cannons of Public Expenditure, Effects of Public expenditure on- Production, Distribution and Economic Growth

UNIT-III
Public Debt: Meaning, Need, Sources and repayment, Effects of Public debt on - Money Supply, Economic Growth and Economic Stability; Federal Finance: Financial Issues in a Federal set up, Finance Commission, Principles of efficient division of financial resources between Central and States, Problems of financial imbalances and measures for adjustments.

UNIT-IV
Fiscal Policy: Meaning, Objectives of Fiscal Policy, role of fiscal policy in controlling inflation and stagnation, Fiscal Responsibility and Budget Management Act; Budgets: Meaning, Classification of Budgets, Fiscal Deficit, Deficit financing and deficit budget.

Recommended Readings:

1. H.L. Bhatia, Public Finance, Vikas Publication
2. R.A. Musgrave and P.B. Musgrave, Public finance in Theory and Practice, McGraw-Hill
3. J. Gruber, Public Finance and Public Policy, Macmillan Learning.
4. Hugh Dalton, Principles of Public Finance, Allied Publishers.
5. S.K. Singh, Public Finance in Theory and Practice, S. Chand Publishing.
6. M. Govinda Rao and Tapas Sen, Financial Federalism in India, McMillan, Delhi
7. Public Finance in Theory and Practice; Hollwy Ulbrich; Thomson - South Western, 2007.
8. Managing Government Expenditure; Salvatore Schiavo-Campo and Danial Tomasi : Asian Development Bank, 1999.
9. Constitution of India, Central Government Budget, Economic Survey, Various Reports of Finance Commission, Various Reports of Expenditure Reforms Commission.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Risk and Disaster Management

Course Code: 20IMG23GP5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the disaster phenomenon, its different contextual aspects and impacts
CO2: understand the process of disasters and related management aspects
CO3: know about importance of community involvement in disaster management
CO4: develop a deep understanding of disaster resilience, risk mitigation, and recovery policies
CO5: understand the role and use of media in disaster management

UNIT-I

Disaster Contexts: Meaning, Characteristics and Types of Disasters - Indian Society and its Vulnerability to Disasters - Hazards and Vulnerability factors - Risk assessment: Seismic Zones, Richter Scale and other measures - Impact of disasters on socio-economic development: Social, Economic, Political and Psychological - Food, Water, Shelter, Hygiene, Health, Education, Agriculture, Cattle wealth, Employment, Financial distress, Electricity, Infrastructure facilities, Transportation, Industry, Environment, Disorganising in the family, Governmental process, system and services - Impact of Disasters on population: Gender, Children, Aged, Poor, Differently abled, Shelter less, Coastal population, Tribal population.

UNIT-II

Disaster Management - Process and Institutions: Evolution of Disaster Management in India - Disaster Management Act, 2005 - Organization for Disaster Management at various levels - National Disaster Management Authority at National, State, District and Local Level - Role of National Institute of Disaster Management, State level institutions - Process: Disaster Preparedness, Prevention, Mitigation, and Rehabilitation - Capacity Building of the stakeholders - Institutional and Legal Mechanisms - Advocacy and Public awareness - Preparation of Prevention and Mitigation Strategies, Role of Media in Disaster Management.

UNIT III

Community-based Disaster Management: Community Based Disaster Management: Scope and Significance - Disaster Management Planning at Village Level - Mapping of the Area and Resources - Preparatory Exercises at the local level - Capacity building sessions: Mock Drills; Emergency Response and recovery; First Aid - Emergency Reconstruction; Temporary Relief and Rehabilitation.

UNIT IV

Disaster Preparedness and Risk Reduction: Disaster Preparedness and Risk Reduction: Scope and Significance - Eco Disaster Risk Reduction - Role of Local Governments in Disaster Preparedness and Risk Reduction - Analysis of functions by the Local Governments - Empowering Local Governments in Disaster Preparedness and Risk Reduction - Community Based Approach - Disaster Preparedness Measures: Constitution of Core team/ Task force - Village Disaster Management Plan - Capacity building of elected members, officials and community - Use of GIS data for disaster-specific information.

Recommended Readings:

1. Goel, S. L.(2009), Disaster Administration - Theory and Practice, Deep and Deep, New Delhi, 2009. Goel, S.L. (2010), Management of Natural Disasters, Deep and Deep, New Delhi, 2010.
2. Singh, Tej (Ed.). (2006), Disaster Management - Approaches and Strategies, Akansha Publishing House, New Delhi.
3. Kaur, Anu, et. al. (Eds.), Disasters in India - Studies of Grim Reality, Rawat Publications, Jaipur, 2005. Disaster Management and Panchayati Raj Institutions - PRIA, New Delhi, 2007.
4. Kafle, Shesh Kanta and Zubair Murshed. (2006), Community-Based Disaster Risk Management For Local Authorities, Asian Disaster Preparedness Center Through Its Partnerships For Disaster Reduction
5. Southeast Asia, Bangkok, Thailand.
6. Government of India. (2015). Best Practices in Panchayats on Livelihoods and Natural Resource Management, New Delhi: Ministry of Panchayati Raj.

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Business Analytics

Course Code: 20IMG23GB1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: think critically in making decisions based on data and deep analytics.
CO2: use technical skills in predicative and prescriptive modeling to support business decision-making.
CO3: translate data into clear and actionable insights.

UNIT-I
Business analytics: introduction, types of analytics, characteristics of analytics, business analytics, and business intelligence; business analytics process and its relationship with decision making process; Advantage of business analytics: informed decisions, developing distinct capability, creating competitive advantage, key attributes of analytical competitors.

UNIT-II
Analytical methods and models: Descriptive analytics-overview of its tools and techniques, role in business analytics process and its importance in business decision making; Predictive analytics-nature and type of modelling, basics of data mining and machine learning environment, role in business analytics process and its importance in strategic decision making; Prescriptive analytics: basics of its tools and modelling, role in business analytics process.

UNIT-III
Business analytics in action: applicability and importance of business analytics in different areas- financial analytics, human resource analytics, marketing analytics, health care analytics, supply chain analytics, sport analytics and analytics for Government and non-profit organization.

UNIT-IV
Developing analytics: statistician, data scientist and data engineer and their key features, skills required for analytics, big data and its analyst, important analytics software, major companies providing analytical solutions, job opportunities in business analytics.

Recommended Readings:

1. James R. Evans, Business Analytics, Pearson Education.
2. Davenport, H., Harris J.G. (2007), Competing on Analytics: The New Science of Winning, Harvard Business Review Press.
3. Davenport H., Harris J.G. and Morison R. (2010). Analytics at Work: Smarter Decisions, Better Results, Harvard Business Review Press.
4. Schniederjans M.J., Schniederjans D.G. and Starkey C.M. (2014). Business Analytics Principles, Concepts, and Applications with SAS: What, Why, and How, FT Press Analytics.
5. Provost F., Fawcett T. (2013). Data Science for Business: What you need to know about data mining and data-analytic thinking, O'Reilly Media.
6. Siegel E. (2013). Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die, Wiley.
7. Fitz-enz J. and Mattox J. (2014).Predictive Analytics for Human Resources, Wiley and SAS Business Series.
8. Maisel L. and Gokins G. (2014). Predictive Business Analytics: Forward Looking Capabilities to Improve Business Performance, Wiley.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Fundamentals of Data Mining

Course Code: 20IMG23GB2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: describe the concept of Data Mining & its attributes
CO2: apply the concept of data mining components and techniques in designing data mining systems.
CO3: solve basic Statistical calculations on Data
CO4: describe the aspect of data pre-processing
CO5: explain the concept of Data Cleaning & Integration

UNIT-I
Introduction to Data Mining: basic concepts in data mining, machine learning, scientific methods, theoretical basis of data mining process, data measurement, exploratory data analysis, data visualization, measurement of data similarity and dissimilarity.

UNIT-II
Data Pre-processing: overview, data cleaning, data integration, data reduction, data transformation and data discretization; Data Warehouse and Online Analytics Processing: data warehouse, data cube and OLAP, data warehouse design and usage; Data Cube Technology- data cube computation, and its methods.

UNIT-III
Principles of Data Mining: predictive modelling- classification and regression, model fitting as optimization, evaluation of predictive performance, over fitting, regularization; clustering and pattern detection.

UNIT-IV
Text Mining: information retrieval and search, text classification, unsupervised learning; Web Data Analysis: Web data- collection and interpretation, analysing user browsing Behaviour, learning from click through data, predictive modelling and online advertising, link analysis and the PageRank algorithm. Social Network Analysis: descriptive analysis of social networks, network embedding and latent space models, network data over time: dynamics and event-based networks link prediction.

Recommended Readings:

1. Han J., Kamber M., Pei J. Data Mining: Concepts and Techniques, The Morgan Kaufmann Series in Data Management Systems.
2. Pang-Ning Tan, Introduction to Data Mining, Pearson Education.
3. Provost F. Data Science for Business: What you need to know about data mining and data-analytic thinking. O'Reilly Media.
4. Miner G. and Nisbet R. Handbook of Statistical Analysis and Data Mining Applications. Academic Press.
5. Ledolter J. Data Mining and Business Analytics with R .Wiley.
6. Witten I.H. and Frank E. Data Mining: Practical Machine Learning Tools and Techniques, The Morgan Kaufmann Series in Data Management Systems.
7. Dean J. Big Data, Data Mining, and Machine Learning: Value Creation for Business Leaders and Practitioners .Wiley and SAS Business Series.
8. Abu-Mostafa Y.S. and Magdon-Ismail M. Learning from Data.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Fundamentals of Econometrics

Course Code: 20IMG23GB3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
On successful complete of this course, the students should be able to:

CO1: provide knowledge about the scope of econometrics
CO2: prove economic theories mathematically
CO3: analyses how to maximise profit of the firms and industries
CO4: understand about the interrelationship between different sectors in an economy
CO5: understand the cost benefit analysis
CO6: understand the decision making process in industries

UNIT-I
Nature, scope and methodology of econometrics; Simple Linear Regression Model: Assumptions, Procedures and properties of OLS estimator, Co-efficient of determination, Tests of significance, Maximum Likelihood Method

UNIT-II
Multiple Linear Regression Analysis: Method of least squares, Properties of OLS estimator, Test of significance of regression co-efficient, R2 and adjusted R2; Econometric Problems: Multicollinearity, Autocorrelation and Hetroscedasticity.

UNIT-III
Dummy variables-Nature and uses, Regression on dummy variables, Regression on Dummy Dependent Variable-The basic idea of the Linear Probability Model (LPM), Probit and Logit Models. Dynamic Econometric Models: Koyck distributed lag model, the adaptive expectation model, and the partial adjustment model.

UNIT-IV
Simultaneous Equation Models: Structural, Reduced and final forms, Identification-Order and rank conditions, Methods for estimating the simultaneous models-Basic idea of Indirect Least Square (ILS) and Two Stage Least Square (2SLS) methods. Seemingly Unrelated Regressions (SUR), SUR versus OLS.

Recommended Readings:

1. Greene, William H., Econometric Analysis, Pearson Education.
2. A.H Studenmund, Using Econometrics, Pearson Education.
3. Johnston, J., Econometric Methods, McGraw -Hill.
4. Gujrati, Damodor N., Basic Econometrics, McGraw-Hill.
5. Stock J. H. and Watson M.W. Introduction to Econometrics, Pearson Education.
6. Koutsoyiannnis, A., Theory of Econometrics, Harper and Row.
7. Kmenta, J., Theory of Econometrics, Macmilan.
8. Maddala, G.S., Introduction to Econometrics, Macmillan.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Predictive Business Analytics

Course Code: 20IMG23GB4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
On successful complete of this course, the students should be able to:

CO1: analyse current and historical facts to make predictions about future, or otherwise unknown, events.
CO2: understand and exploit patterns in historical and transactional data
CO3: identify risks and opportunities.

UNIT-I
Introduction to Predictive Analytics: overview, business intelligence, predictive analytics in relation to business intelligence, statistics, data mining; Big data, importance in decision making; Setting up problem-CRISP-DM, business understanding, Defining data, target variable and measures of success for predictive modelling; Methodology of predictive modelling.

UNIT-II
Prediction Methods: Linear Regression- best subset selection, forward selection, backward selection, step-wise regression, Cp mallows and adjusted R-square criteria; k-Nearest Neighbours (k-NN); Regression Trees- CART,CHAID; Neural Nets- architecture of neural nets, neurons, input layer, hidden layers, output layer.

UNIT-III
Classification Methods: the naïve rule, Naïve-Bayes classifier, K-Nearest neighbours, Classification Trees, Neural Nets, Logistic Regression.

UNIT-IV
Non-supervised Learning: Association Rules- support and confidence, the apriori algorithm, the selection of strong rules; Cluster Analysis- hierarchical methods, optimization and the k-means algorithm, similarity measures, other distance measures. Ensemble Methods: Nelson and Granger-Ramanathan methods for continuous targets, Majority voting for categorical targets, Bagging, Boosting.

Recommended Readings:

1. Miller Thomas W. Modelling Techniques in Predictive Analytics with Python and R, Pearson Education.
2. Maisel L. and Cokins G. Predictive Business Analytics: Forward Looking Capabilities to Improve Business Performance. Wiley.
3. Marketing Data Science: Modelling Technique in Predictive Analytics with R and Python, Pearson Education.
4. Siegel E. Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die. Wiley.
5. Bartlett R. A Practitioner's Guide to Business Analytics: Using Data Analysis Tools to Improve Your Organization's Decision Making and Strategy .McGraw-Hill Education.
6. Fitz-enz J. and Mattox II J. Predictive Analytics for Human Resources. Wiley.
7. Abbot D. Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst; Wiley.
8. Dean J. Big Data, Data Mining, and Machine Learning: Value Creation for Business Leaders and Practitioners .Wiley and SAS Business Series.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Time Series Econometrics

Course Code: 20IMG23GB5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
At the end of course student will be able to:

CO1: understand the basics of time series data.
CO2: understand the stationary time series models.
CO3: perform forecasting with time series data.
CO4: apply time series techniques to state space models, ARCH and GARCH, multivariate time series.

UNIT-I
Business Forecasting: Business forecasting and planning, Common time series patterns, Types of forecasting methods, Statistical fundamentals for evaluating forecasting.

UNIT-II
Univariate Smoothing Methods: Moving average, weighted moving average, Exponential smoothing, Seasonal indexes, Trend-seasonal and Holt-Winters smoothing.

UNIT-III
Stationary Time Series Models: Stochastic process, Stationarity, Modelling AR, MA, ARM processes, Deterministic and stochastic trends, unit roots, Testing unit roots – Dickey and Fuller, Phillips and Perron tests.

UNIT-IV
Multivariate Models: Intervention analysis, Transfer function models, VAR analysis –Estimation, Identification and the Impulse response function. Long run Models: Cointegration – Eagle-Granger Methodology, Johanson approach, Error correction models, Granger Causality, Exogeniety, Modelling Volatility: ARCH, GARCH, and ARCH-M and EGARCH models.

Recommended Readings:

1. John. E. Hanke, Business Forecasting, Pearson Education.
2. Delurgio Stephen A., Forecasting Principles and Applications, McGraw-Hill.
3. Patterson K.,An Introduction to Applied Econometrics, Palgrave.
4. Enders Walter, Applied Econometrics Time Series, John Wiley.
5. Diehold Francis X., Elements of Forecasting, South Western, Thomson.
6. Spyros G. Makridakis, Steven C. Wheelwright and Rob J. Hyndman, Forecasting Methods and Application, John Wiley.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Agri-Business Environment and Policy
Course Code: 20IMG23GA1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
At the end of course student will be able to:

CO1: understand the role of agriculture in development process
CO2: understand the importance of agricultural finance in modern agriculture and inter linkage of agricultural credit and other input markets and product markets.
CO3: demonstrate production and processing trends in exports and imports of major agricultural commodities.
CO4: understand the marketing policy of agricultural commodities.

UNIT - I
Role of agriculture in Indian economy, Problems and policy changes relating to farm supplies, farm production, Agro processing, agricultural marketing, agricultural finance in the country.

UNIT - II
Impact of globalization on agribusiness sector, Structure of agriculture, Linkages among sub-sectors of the agribusiness sector, Economic reforms and Indian agriculture.

UNIT - III
Agribusiness- concepts and approach, evaluation of systems, Emerging trends in production, processing, marketing and exports, Policy controls and regulations relating to the industrial sector with specific reference to agro-industries.

UNIT - IV
Agribusiness policies-concept and formulation, new dimensions in Agri-business environment and policy. Agricultural price and marketing policies, distribution system and other policies.

Recommended Readings:

1. Adhikary, M. 1986. Economics Environment of Business. S. Chand and Sons.
2. Aswathappa, K. 1997. Essentials of Business Environment. Himalaya Publ.
3. Saleem Shaikh, Business Environment, Pearson Education.
4. Francis Cherunilam. 2003. Business Environment. Himalaya Publ.
5. Kulkarni. B. D. 1996. Economic Analysis and Business Policy.
6. Khan, M. Y. and Jain, P. K. 1997. Financial Management.
7. Chandra, P. 1997. Financial Management.
8. Shete, N. B. 2000. Financing Agri-Business.
9. Deshpande, R.S. and Arora, S., 2010, Agrarian crisis and farmer suicides. Sage Publications, Delhi.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Food Technology and Process Management
Course Code: 20IMG23GA2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
At the end of course student will be able to:

CO1: understand the hazards during processing, storage, handling and distribution
CO2: analysis various costs involved in food processing organizations
CO3: understand Laws and regulations related to food industry

UNIT - I
Present status of food industry in India, organization in food industry. Introduction to operations of food industry, Deteriorative factors and hazards during processing, storage, handling and distribution.

UNIT - II
Basic principles of food processing, food preservation by manipulation, Application of energy, radiations, chemicals and biotechnological agents, Packaging of foods, Analysis of costs in food organization.

UNIT - III
Risk management: Laws and regulations related to food industry and food production and marketing, quality management, Prevention of food adulteration, ISO standards.

UNIT - IV
Case studies on project formulation, milk and dairy products, cereal milling, oil-seed and pulse milling, oil and fat processing, Case studies on sugarcane milling, honey production, baking, confectionery, Case studies on processing of fruits- fruit jam, jellies etc., Case studies on fruits and vegetable storage and handling, Case studies on vegetables processing-tomato ketchup etc., Case studies on egg, poultry, fish, meat handling and processing.

Recommended Readings:

1. Acharya, S. S. and Aggarwal, N. L. 2004. Agricultural Marketing in India. Oxford and IBH.
2. Early, R.1995. Guide to Quality Management Systems for Food Industries. Blackie.
3. Jelen, P. 1985. Introduction to Food Processing. Reston Publishing.
4. Potly, V.H. and Mulky, M. J. 1993. Food Processing. Oxford and IBH.
5. Krammer A and Twigg BA. 1973. Quality Control in Food Industry, Vol. I, II, AVI Publ.
6. Ramaswamy H and Marcotte M. 2006. Food Processing: Principles and Applications. Taylor and Francis.
7. Verma L.R. and Joshi V.K. 2000. Post-Harvest Technology of Fruits and Vegetables. Indus Publ.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Agri-Business Management
Course Code: 20IMG23GA3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

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

CO1: understand the basic concepts like Nature and scope of Agri-business, Importance of Agri-business Management, difference between farm and non-farm sectors, demand for agri-products and its determining factors Supply of agri-products and its determinants.
CO2: understand how different principles like value CACP quality & price – cost of production- fixed and variable costs-Gross margins- comparative advantage supplementary enterprises- Laws of returns-measurement of agricultural cost A,B,C methods.
CO3: understand emerging agro processing industries like Management and processing of Sugar industry, Dairy processing, Cotton textiles, Oil Seeds processing- Sericulture, Horticulture, and floriculture processing, medicinal plants. Problems and prospects of Agro, processing industries in India.
CO4: understand and explore new trends like ITC e-choupal, contract farming, precision farming, and logistics in agri-products in India

UNIT - I
Nature, scope and characteristics business management, Role of farm business management, Farm management decisions; farm management problems, Principles of farm management decisions.

UNIT - II
Principle of variable proportion and cost principle, Principle of factor substitution, Law of equi-marginal returns, opportunity cost principle.

UNIT - III
Tools of farm management and farm business analysis, Farm planning and budgeting, Farm records and accounts, types and problems in farm records and accounts, net worth statement, farm efficiency measures.

UNIT - IV
Management of farm resources – land, labor, capital, farm machinery, farm building, Risk and uncertainty in farming, Sources of uncertainty in farming, Management strategy to counteract uncertainty, Decision making process in farm business management under risks and uncertainty.

Recommended Readings:

1. Heady, E. O and Jensen, H. 1960. Farm Management Economics. Prentice Hall.
2. Johl, S. S and Kapoor, T. R. 1973. Fundamentals of Farm Business Management. Kalyani Publ.
3. Kahlon, A. S and Singh, K. 1992. Economics of Farm Management in India. Allied Publ.
4. Panda, S. C. 2007. Farm Management and Agricultural Marketing. Kalyani Publ.
5. Dhondyal. S. P. Farm Management.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Agri-Business Entrepreneurship
Course Code: 20IMG23GA4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

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

CO1: Understand the development of entrepreneurship as a field of study and as a profession.
CO2: Understand the creative process of opportunity identification and screening.
CO3: Understand the importance of innovation in the creation of sustainable competitive advantage.
CO4: Use business models, pro-forma statements and cash flow projections to understand venture processes.
CO5: Use a number of techniques to test a business model to ensure its viability.
CO6: Describe a new business in a well-written venture plan.
CO7: Understand the reasons for a choice of legal formation.
CO8: Identify with the role of an entrepreneur in developing a new venture

UNIT – I
Agripreneurship – Concept, characteristics, Approaches, Theories, Need for enterprises development. Traits/Qualities of entrepreneur, Entrepreneur behavior, skills; Entrepreneurship, Strategies for making decision, Classification of Entrepreneurs, Entrepreneur vs. Professional Managers.

UNIT – II
Entrepreneurial Process and Structure, Barriers to Enterprise, Sources of Innovative Opportunities, Marketing Research; Business Environment – Micro Environment, Macro Environment, Venture Feasibility – Technical, Marketing, Financial Feasibility, Starting new business or buy firms. Entrepreneurship in Agricultural Sector.

UNIT – III
Business strategy - concept - long term and short term focus; Business organization; Sources of Finance, Venture capital financing - concept, purpose and schemes, Capital Markets, Government Policies and Regulations for Agribusiness.

UNIT – IV
Business Plan – Sources of Product, Pre-Feasibility Study, Criteria for selection of product, Ownership and Capital, Growth Strategies in business – Market penetration, Market expansion, Product Expansion, Diversification, Acquisition, Steps in Product launch.

Recommended Readings:

1. Dandekar, V. M. and Sharma, V. K., 2016, Agri-Business and Entrepreneurship Development. Manglam Publications, New Delhi.
2. P. Charantimath, Entrepreneurship Development and Small Business Enterprises, Pearson Education.
3. Desai, V., 2006, Entrepreneurship Development, Project formulation, Appraisal and Financing for Small Industry. Himalaya Publications, New Delhi.
4. Hisrich, R. D. and Peters, M. P., 2002, Entrepreneurship, Tata McGraw Hill.
5. Kaplan, J. M. and Warren, A. C., 2013, Patterns of Entrepreneurship Management, John Wiley and Sons; 4th revised edition.
6. Nandan, H., 2007, Fundamentals of Entrepreneurship Management, Prentice Hall.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Agri-Supply Chain Management
Course Code: 20IMG23GA5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

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

CO1: understand supply chain operations and logistics strategies.
CO2: understand the supply chain operations & logistics planning.
CO3: identify the risk in supply chain operations and managing that risk.
CO4: understand the effective management of supply chain operations and logistics.

UNIT - I
Supply chain- changing business environment, SCM- present need, and conceptual model of supply chain management. Evolution of SCM, SCM approach, and traditional agri. supply chain management approach, modern supply chain management approach, elements in SCM.

UNIT - II
Demand management in supply chain- types of demand, demand planning and forecasting. Operations management in supply chain, basic principles of manufacturing management. Procurement management in agri-supply chain purchasing cycle, types of purchases, contract/corporate farming. Classification of purchases of goods or services, traditional inventory management. Material requirements planning, Just in Time (JIT), Vendor Managed Inventory (VMI).

UNIT - III
Logistics management- history and evolution of logistics. Elements of logistics, management, distribution management. Distribution strategies, pool distribution. Transportation management, fleet management, service innovation. Warehousing, packaging for logistics, Third-Party Logistics (TPL/3PL), GPS technology.

UNIT - IV
Concept of information technology- IT application in SCM. Advanced planning and scheduling, SCM in electronic business. Role of knowledge in SCM, performance measurement and controls in agri-supply chain management. Benchmarking- introduction, concept and forms of benchmarking.

Recommended Readings:

1. Janat Shah, Supply Chain Management: Text and Cases, Pearson Education.
2. Sunil Chopra, Supply Chain Management, Pearson Education
3. Monczka, R, Trent R. and Handfield, R. 2002. Purchasing and Supply Chain Management. Thomson Asia.
4. Van Weele, A. J. 2000. Purchasing and Supply Chain Management Analysis, Planning and Practice. Vikas Publ. House

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

B2B Marketing

Course Code: 20IMG24C1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: describe the applications, challenges and the dynamic environment of B2B marketing, including the unique nature of organizational buying behaviour.
CO2: design strategies and structures to effectively serve the B2B market.
CO3: apply a systematic approach to problem solving and decision making in business marketing organizations through the use of case studies.
CO4: develop a business marketing plan for a real local company that mainly targets business customers

UNIT-I

Market Opportunity Identification-Analysis and Evaluation, Introduction to B2B Marketing. Customer Analysis: Purchase process, Buying Teams, Business Buying and the Individual Manager, the effect of IT on purchase Behaviour. Customer Relationship Management Strategies for Business Markets: Relationship theories and variables, Business Marketing as Network Analysis and Management.

UNIT-II

Assessing Market Opportunities, Environmental changes impacting Supply Chain Power, Strategic Market Planning: The purpose of strategy, approaches to strategy, Business Marketing Strategy.

UNIT-III

Managing Products for Business Markets, Managing Business Marketing Channels, Pricing: Costs, customers and Competitors, Pricing strategy and organization, Relational Aspects of Business-to-business pricing, Bid pricing, Key Account Management.

UNIT-IV

Business Marketing Communication: Integrated Communication strategy, Relationship communication: Direct Marketing, Personal Selling, Relationship Communication Process, and Coordinating Relationship Communication. B2B Branding.

Recommended Readings:

1. Ross Brennan, Louise Canning and Raymond McDowell, "Business-to-Business Marketing", Sage Publications.
2. James. C. Anderson, Business Marketing Management (B2B): understanding, Creating, and Delivering Value, Pearson Education.
3. Robert Vitale, Business to Business Marketing, Pearson Education.
4. John M. Coe. "The Fundamentals of Business-to-Business Sales and Marketing", McGraw Hill Education, New Delhi.
5. Dwyer Robert F, Tanner F. John. Business marketing- Connecting Strategy, Relationships, and learning. McGraw Hill Irwin.
6. Hutt, M.D., and Speh, T.W. Business Marketing Management: B2B, Loose-Leaf with Mindtap. Boston: Cengage

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

CSR and Business Ethics

Course Code: 20IMG24C2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

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

CO1: analyze the impact of environmental issues on business.
CO2: understand the social responsibilities of business.
CO3: evaluate the effects on a firm's costs of meeting its ethical, social and environmental responsibilities.
CO4: learn about various standards and codes related to business
CO5: understand Basic concepts of Business Ethics understand Values, Norms and Beliefs
CO6: analyze the Role of values for managers
CO7: understand Ethical Codes understand Corporate Social Responsibility Analyze CSR initiatives
CO8: understand Ethical issues in employer – employee relation

UNIT I

Indian Ethos: Meaning of Bharat, relevance of Indian ethos, role of Indian ethos in managerial practices; Sources of Indian Ethos in Management: Vedas, Ramayana, Bible, Quran, Kautilya's Arthashastra, Ethics vs. Ethos; Indian Management v/s Western Management

UNIT II

Modern Approach towards Indian Ethos : Introduction, Indian Management Thoughts, Holistic Approach to Management; Sadhana −In Management context, The Tatwas in Indian Ethos; Management Thoughts and Practice: Harmony with Environment, Dharma, Swadharma and Detachment, Holistic approach to Personality, Managerial Purusharth Karma yoga and enlightened leadership

UNIT III

Learning and Education System in India: Learning concept, Gurukul System of Learning, The beginning of modern education system, Achievements of the Indian education system; Law of Karma, Law of creation, law of humility, law of growth, law of responsibility

UNIT IV

Human Values: Meaning, significance, Vedic literature and values, formation of values, Aristotle's view on value inculcation, Objectives of value-based system, Interrelation of Values and Skills, Values and the workplace, Value-based Human response management, Need of value-based holistic management, Value-driven management, Indian culture and wisdom, The ethical and spiritual values and Methods of heart and mind purification

Recommended Readings:

1. Agarwal, T. and Chandorkar, N., Indian Ethos in Management, Himalaya Publishing House
2. Nandgopal, R. and Sankar, R.N.A., Indian Ethos and Values in Management, Tata McGraw Hill Education
3. A.C Fernando, Business Ethics, Pearson Education.
4. Ganjre, A.K., Pawar, P. and Laxman R., Indian Ethos - Modern Management Mantra, Himalaya Publishing House
5. Bansal, I., Management Concept in ancient India psycho-philosophic thought and their significance in present day organization, Jaipur, Narayan Publication
6. Sharma. S., Management in New Age: Western Windows Eastern Doors Management, New Age International

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Business Negotiations and Employee Relations

Course Code: 20IMG24GH1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand employee relation and negotiations imperatives in the changed business environment.
CO2: distinguish the employee rights and obligations according to the scope of employment.
CO3: analyze negotiations and employee relation in organization.
CO4: describe, appreciate and explain the actions taken on different stages of negotiations in organization.

UNIT-I

Negotiation Fundamentals: Nature of negotiations and conflicts; distributive and integrative negotiation; negotiation strategy and Planning: Unilateral vs. Bilateral Strategies, negotiation process, negotiation contexts: relationships in negotiations; forms of relationships.

UNIT-II

Individual differences: Personality and negotiations, Individual Differences: gender and negotiations, negotiation across cultures: International and cross cultural negotiations, resolving differences: Managing negotiation impasses, resolving impasses; Ethics in negotiation.

UNIT-III

Employee Relation Management: Meaning, Scope, Objectives and Factors of Employee Relation Management, Difference between Industrial relation and Employee relation; Paradigm Shift from Industrial Relations to Employee Relations: The Employee-Employer relations. Employee Relations in a strategic Framework, Employee Relations at the Workplace: Principles, Structures, Functions, Policies and Process, The Future of Employee Relations.

UNIT-IV

Employee Remuneration and Rewards: Terminology about Remuneration; Basic wages and salary Administration; Need, Principles; Elements for a sound Wage and Salary administration; Factors affecting wage and Salary Levels, Salary Differentials: Functions, Factors of Salary Differentials. Models of Remuneration: Hay Model of Total Rewards, Towards Perrin Model of Total Rewards. Types of Rewards: Intrinsic and Extrinsic Rewards, Financial and Non- Financial Rewards, Performance Based Vs. Membership Based Rewards. Role of Rewards System.

Recommended Readings:

1. P.N Singh, Employee Relations Management, Pearson Education.
2. Sinha, P.R.N., Sinha, Indu Bala and Seema Priyadarshini Shekar, "Industrial Relations, Trade Unions and Labour Legislation", Pearson Education
3. Rao V S P, "Human Resource Management- Text and Cases", Excel Books.
4. Ghosh and Nandan." Industrial relations and labour laws", McGraw Hill Education
5. Mamoria and Mamoria. "Dynamic of Industrial Relations in India", Himalaya Pub. House, New Delhi.
6. Venkatratnam: Industrial Relations, Oxford University Press
7. Singh, B.D. "Industrial Relations", Excel Publications, New Delhi
8. Ramaswamy E.A. "The Strategic Management of Industrial Relations", Oxford University Press.
9. Verma, Pramod."Management of Industrial Relations - Reading and Cases", Oxford and IBH Publication.
10. Monappa, Arun (2002). Industrial Relations. Tata McGraw Hill
11. Singh, B.D. "Industrial Relations", Excel Publications, New Delhi

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Training and Development

Course Code: 20IMG24GH2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand the role of training systems and processes in organization.
CO2: describe the psychology of the learning process on which training is based.
CO3 evaluate the value of the training once completed from the individual employee and the organization's viewpoint.
CO4: assess design, access and implement various methods, techniques and sources of training.

UNIT I

Training - concept and rationale, training system and processes, trends in training, KSA'S- Types; Aligning training with strategy; Role of stakeholders in training programme; Training needs assessment - organizational analysis, operational analysis, person analysis.

UNIT II

Learning Theories: Reinforcement theory, Social learning theory, Goal theory, Need theory, Expectancy theory, Adult learning theory and Information processing theory. Learning process, Factors influencing the learning process, Participants learning styles; Considerations in designing effective training programs - Selecting and preparing the training site, choosing trainers.

UNIT III

Training Methods: Presentation methods - Lecture and Audio visual techniques; Hands on methods- OJT, simulations, case studies, business games, role plays, Behaviour modelling; Group building methods: Adventure learning, team building, action learning; Evaluation of training - need for evaluation, criteria and approaches; return on investment in training.

UNIT IV

Special issues in training and employee development: Training issues resulting from the external environment- Legal issues, cross cultural preparation, managing work force diversity, school- to- work transition; Internal needs of the company - Life-long learning, Melting the Glass ceiling, joint union management programs, Succession planning, Developing managers with dysfunctional Behaviours. Management development: Characteristics of managers, Management development implications, Sources of knowledge/ skill acquisition, Training for executive -level management.

Recommended Readings:

1. Noe, A Raymond, and Kodwani, D Amitabh, Employee Training and Development, McGraw Hill Education
2. Blanchard, P Nick, and James W. Thacker, Effective Training - Systems, Strategies, and Practices, Pearson Education.
3. Agochia, Devendra, Every Trainer's Handbook, New Delhi; Sage Publications
4. Desimone, R. L., Werner, J. M. and Harris, D. M. "Human Resource Development", Thomson Learning Press.
5. Sahu, R.K., Training for Development, Excel Books, New Delhi
6. Goldstein, Training in Organization, Thomson Learning, Bombay
7. McGrath, Training for Life and Leadership in Industry, Prentice Hall of India, New Delhi
8. Jack J. Phillips, Hand book of Training Evaluation and Measurement Methods, Rutledge

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Managing Interpersonal and Group Processes

Course Code: 20IMG24GH3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: develop deeper understanding of the interpersonal and group processes in organizations.
CO2: examine and develop process facilitation skills through experience-based methods of learning.
CO3: grasp over the variety of skills that support work relationship in organizations.

UNIT-I
Group dynamics: types of groups, group properties, roles, norms, status and size, stages of group development and change; Group cohesiveness: factors contributing to group cohesiveness, Influence processes- power and politics in groups.

UNIT-II
Interpersonal communication: Uncertainty reduction theory, Social exchange theory, Cognitive dissonance theory; Interpersonal awareness and feedback process- Transactional Analysis; Interpersonal trust; Competition and cooperation.

UNIT-III
Group decision making: The Vroom Yetton Model, Techniques of group decision making, Advantages and disadvantages of group decision making; Group synergy; Team building.

UNIT-IV
Inter-group relation and conflict: nature and types of conflicts, causes of conflicts and remedial measures of group conflicts, Role of Negotiation in group conflicts; distributive and integrative negotiation, third party negotiation; Fundamental interpersonal relations orientation (FIRO-B).

Recommended Readings:

1. Robbins, S.P., Organizational Behavior, Pearson Education.
2. Chandan, J S, Organizational Behavior, Vikas Publication.
3. David A. Whetten, Development Management Skills, Pearson Education.
4. P.S James, Organizational Behavior, Pearson Education.
5. Mainiero, L A and Tromley C L., Developing Managerial Skills in OB, Prentice Hall of India,
6. Moore, M D., Inside Organizations: understanding the Human Dimensions, Sage.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

International Human Resource Management

Course Code: 20IMG24GH4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand strategic perspective of HRM in an organization.
CO2: understand the cultural and related Behavioural variables in HRM of International Organization.
CO3: understand forecasting, acquisition and management of human resources in an effective manner.

UNIT-I
IHRM- Introduction, differences between domestic and international Human Resource approaches of International Human Resource Management, Challenges in international labour market, Linking HR strategies to International expansion strategies, multiculturalism: nature of culture, cultural dimensions, managing across cultures: strategies, cross cultural differences and similarities.

UNIT-II
International environment: political, legal and technological; Recruitment and Selection - Staffing policies, approaches, Selection criteria, recent trends in international staffing, Performance management of international employees, issues in managing performance in the international context.

UNIT-III
HRM in cross border mergers and acquisitions. Training in international management: training strategies, expatriate training, types of training programmes and emerging trends in training for competitive advantage. International Compensation: objectives, theories, components and compensation package.

UNIT-IV
International industrial relations - nature, approaches and strategic issues before employers, employees and government. Cross cultural communication and negotiation: communication process, barriers, effectiveness and managing cross cultural negotiation. Repatriation: challenges, benefits, process and managing repatriation.

Recommended Readings:

1. Tony Edwards, International Human Resource Management, Pearson Education.
2. Luthans and Doh, "International Management: culture, strategy and Behaviour", Tata McGraw Hill, New Delhi.
3. Tayeb, International Human Resource Management, Oxford University Press.
4. Helen Deresky, "International Management: managing across borders and cultures, Pearson Education.
5. Budhwar, Pawan. "Managing Resources in Asia-Pacific". Rutledge Taylor and Francis Publication
6. Paul Sparrow., Chris Brewster and Hillary Harris. "Globalizing Human Resource Management", Rutledge Taylor and Francis Publication
7. Hofstede, G., Cultures Consequence: International Differences in Work Related Values, Sage.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Performance Management Systems

Course Code: 20IMG24GH5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the importance of performance management in business organizations.
CO2: understand the concept, importance, process and implementation of performance management systems in organizations

UNIT-I
Introduction to Performance Management, Performance Appraisal to Performance Management, Concept and Perspectives of Performance Management, Definitions of Performance Management, Characteristics of Performance Management, Objectives of Performance Management Principles of Performance Management, Importance of Performance Management, Benefits of Performance Management Determinants of Job Performance.

UNIT-II
Performance Management Process: Performance Management Process, Performance Planning, Meaning of Performance Planning, Characteristics of Performance Planning, Objectives of Performance Planning, Importance of Performance Planning, Methodologies of Performance Planning, Process of Performance Planning, Barriers to Performance Planning, Overview of Competency Mapping, Competency Defined, Competency Mapping Defined, Methods of Competency Mapping.

UNIT-III
Performance Appraisal: Meaning of Performance Appraisal, Performance Appraisal Defined, Characteristics of Performance Appraisal, Objectives of Performance Appraisal, Importance of Performance Appraisal, Principles of Appraising Performance, Process of Performance Appraisal, Approaches to Performance Appraisal, Methods of Performance Appraisal, Common Rating Errors, Advantages and Disadvantages of Performance Appraisal Elements of Good Performance Appraisal System.

UNIT-IV
Performance management and employee development: Personal Development plans, 360 degree feedback as a developmental tool, performance management and reward systems: performance linked remuneration system, performance linked career planning and promotion policy, Performance Counselling, Ethics in Performance Management, Ethics Defined, Principles of Ethical Performance Management, Ethical Issues and Dilemmas in Performance Management

Recommended Readings:

1. Rao, T.V. "Performance Management and Appraisal Systems", Response Bank, New Delhi.
2. Dipak Bhattacharya, Performance Management: System and Strategies, Pearson Education.
3. Kandula, Srinivas, "Performance Management", PHI, New Delhi.
4. Cardy, Robert L. "Performance Management: Concepts, Skills and Exercise", PHI, New Delhi.
5. Aguinis, Herman, "Performance Management", Pearson Education.
6. Kohli, Performance Management, Oxford University Press.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Insurance and Risk Management

Course Code: 20IMG24GF1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: outline the concepts of Insurance and its operations.
CO2: apply different procedures as to insurance activities.
CO3: learn to measure risk and return.
CO3: find the relationship between risk and return.
CO4: explain the various risk control measures available
CO5: suggest ways to finance risk

UNIT-I

Insurance-Concept, Nature, Classification-Life and Non-life, Functions, Importance and Principles of Insurance; IRDA Act 1999 - Organization, guidelines for life and Non-life insurance.

UNIT-II

Life Insurance -Concept; Public and Pvt. Sector companies in India - their products, schemes and plans; LIC Act 1956-An overview. General Insurance - Concept, Types; Public and Pvt. Sector companies in India - their products, schemes and plans. Motor Insurance and Health Insurance in India.

UNIT-III

Bases and mechanism for Insurance Premium calculation; Distribution channel in Insurance-Introduction, Individual Agents-Appointment, functions, code of conduct and remuneration; Claims settlement in Life Insurance and General Insurance.

UNIT-IV

Risk and its Management: Objectives of Risk Management, Risk Identification and Measurement, Risk Pooling Arrangements and Diversifications, Process of Risk Management.
Risk Management and Shareholder's Wealth. Risk Pricing. Process of Risk Control, Loss Prevention, Techniques of Risk Retention and Reduction.

Recommended Readings:

1. Nalini Prave Tripathy, Prabir Pal, 'Insurance theory and practice' TMH 2007.
2. George E. Rejda, Principles of Risk Management and Insurance, Pearson Education.
2. K.P. Singh, B.S.Bodla and M.C. Garg. Insurance Management, Deep and Deep Publications, Delhi.
3. M.N. Mishra, Insurance, Vikas Publication.
4. Harrington and Mehaus : Risk Management and Insurance, Tata McGraw Hills
5. George Rejda: Principles of Risk Management and Insurance

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Management of Financial Services

Course Code: 20IMG24GF2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: describe operational, business, financial and traditional risk.
CO2: distinguish among various financial intermediaries and markets.

UNIT-I
Financial Services – Silent features, scope and problems; regulatory and theoretical frame work of leasing; Merchant Banking and its services.

UNIT-II
Credit Rating Agencies – Objectives, functions, importance, rating methodologies and benchmarks, factoring and forfeiting- meaning, types and mechanism.

UNIT-III
Housing Finance – Evolution and Role, Housing Finance Institutions and types of loans, issues and future outlook, role of NHB in housing finance; Investor Protection Fund- objectives and grievances redressal mechanism under investor protection fund; Securitisation – concept, mode, mechanism and securitisation in India.

UNIT-IV
Venture capital- meaning and role, venture capital investment process, stages of venture capital financial and exit routs for venture capitalist; Private Equity – meaning, working and types; Mutual Funds- concepts, organization and types of mutual fund schemes.

Recommended Readings:

1. Suresh, P. and Paul. J., Management of Banking and Financial Services, Pearson.
2. Khan, M.Y. Management of Financial Services, McGraw-Hill.
3. Gordan, E and K. Natrajan, Emerging Scenario of Financial Services. Himalaya Publishing House.
4. B.V. Pathak, Indian Financial System, Pearson Education.
5. Bhole, L.M., "Financial Institutions and Markets", Tata McGraw Hill, New Delhi.
6. Machiraju, H.R. Indian Financial System", Vikas Publishing House.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Financial and Commodity Derivatives

Course Code: 20IMG24GF3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: construct models for pricing of financial derivatives
CO2: price simple financial derivatives with risk neutral valuation
CO3: present financial models and pricing of financial instruments

UNIT-I
Concept and type of derivatives; Participants - hedgers, speculators, arbitragers and scalpers; uses of derivatives; types of orders; derivative markets in India- current trends and future prospects.

UNIT-II
Fundamentals of futures and forwards - concept of futures; trading mechanics; basics of stock index future; interest rate futures; currency futures (basics); use of futures for hedging;; difference between forward and future contracts; clearing process.

UNIT-III
Types of options, trading strategies involving options; option pricing - black scholes option pricing model; Fundamental of swaps - introduction to swaps; interest rate swaps; currency swaps; mechanics of swap interest rate swap and currency swaps; swap pricing

UNIT-IV
Introduction to Commodity Derivatives: Cereals, metals and energy products; History and Contemporary issues of Indian derivative markets; Future of Commodity Derivatives in India.

Recommended Readings:

1. Hull, John C., Options, Futures, and Other Derivatives, Pearson Education.
2. Chance, Don M., An Introduction to Derivatives and Risk Management, Harcourt College Publishing
3. Robert A Strong, Derivatives: An Introduction, Thomson Learning, Bombay
4. Redhead, Financial Derivatives : An Introduction to Future/Forward, Options and Swaps, Prentice Hall of India, New Delhi
5. Gupta, S.L., Financial Derivatives. PHI
6. Aman Chugh and Divik Maheshwari, Financial Derivatives, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

International Financial Management

Course Code: 20IMG24GF14

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: demonstrate the understanding of international financial theory and applications pertaining to, e.g. exchange rate determinants, foreign exchange exposure, foreign direct investment, interest rate parity, and the balance of payment.
CO2: develop a frame of reference through which to identify, evaluate and solve problems pertaining to international finance.
CO3: examine risk relating to exchange rate fluctuations and develop strategies to deal with them.

UNIT-I
An overview of international financial management; international monetary and financial systems, IBRD and development banks; finance function in a multination firms; international flow of funds

UNIT-II
International working capital management: international cash management; international receivable management, managing short term assets and liabilities; international capital money markets; euro dollar and currency market; financial market instruments - GDRs, ADRs, Euro issues, CP and ECB

UNIT-III
International and multinational capital budgeting, cost of capital and capital structure decisions; dividend policy of multinational firm

UNIT-IV
Developments in foreign exchange markets; exchange rate determination; measuring and managing various risks and exposure; country risk analysis; taxation in multinational firms; nature functions and participants of foreign exchange market; foreign exchange regulation in India.

Recommended Readings:

1. T. Siddaiah, International Financial Management, Pearson Education.
2. Madura Jeft, International Financial Management: Thomson Learning
2. Sharan, V., International Financial Management, PHI, New Delhi
3. Allen Shapiro, Multinational Financial Management, PHI, New Delhi
4. Levi, Maurice D., International Finance, McGraw Hill
5. Apte, P.G., International Financial Management. Tata McGraw Hill

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Financial Decisions Analysis

Course Code: 20IMG24GF5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: describe the basic concepts in operational finance
CO2: apply the decision analysis techniques and tools to various phases of financial processes.
CO3: apply suitable models and methods to decision making situations
CO4: solve financial decision problems through the use of quantitative and qualitative analysis techniques

UNIT-I
An overview of international financial management; international monetary and financial systems, IBRD and development banks; finance function in a multination firms; international flow of funds

UNIT-II
International working capital management: international cash management; international receivable management, managing short term assets and liabilities; international capital money markets; euro dollar and currency market; financial market instruments - GDRs, ADRs, Euro issues, CP and ECB

UNIT-III
International and multinational capital budgeting, cost of capital and capital structure decisions; dividend policy of multinational firm

UNIT-IV
Decision with the help of activity based costing, theory of constants and target costing; An overview of Balance Score Card.

Recommended Readings:

1. T. Siddaiah, International Financial Management, Pearson Education.
2 Madura Jeft International Financial Management: Thomson Learning
3. Sharan, V., International Financial Management, PHI, New Delhi
4. Allen Shapiro, Multinational Financial Management, PHI, New Delhi
5. Apte, P.G., International Financial Management. Tata McGraw Hill
6. Drury,Colin, Management Accounting and Control, Thomson Learning
7. Horngren, Datar Foster, Cost Accounting, Pearson Education
8. Hansen and Mowen, Cost Management, Thomson Learning

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Knowledge Management

Course Code: 20IMG24GT1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand Knowledge Management and its application in business
CO2: clearly characterize types of knowledge and structure of knowledge management solutions
CO3: analyze and evaluate organizational impacts of KM, factors influencing KM

UNIT-I
Basic concept of knowledge, intelligence and experience; data, information and knowledge; types of knowledge, implications of knowledge management, Knowledge management lifecycle.

UNIT-II
Knowledge creation; capturing tacit information, expert evaluation, fuzzy reasoning, interviews, onsite observations, brainstorming, protocol analysis, consensus decision making, Nominal Group Technique, Delphi method, Concept mapping, black boarding; Knowledge codification.

UNIT-III
Quality Assurance; Knowledge testing, Logical testing, User acceptance testing; Knowledge system deployment, User training and deployment; post implementation review.

UNIT-IV
Knowledge transfer: prerequisites, methods and strategies; Role of internet in knowledge transfer, overview of data visualization, data mining, knowledge management portals, Ethical, legal and managerial issues in knowledge management

Recommended Readings:

1. EM Awad and HM Ghaziri, Knowledge Management, Pearson Education.
2. Hislop, Knowledge Management, Oxford University, Press, Delhi.
3. Shukla and Srinivasan, Designing Knowledge Management Architecture, Sage, New Delhi
4. Warier, Knowledge Management, Vikas, New Delhi
5. H.C. Mruthyunjaya, Knowledge Management, PHI Learning Private Limited, New Delhi.
6. S. Debowski, Knowledge Management, Wiley India, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Information Security and Cyber Laws

Course Code: 20IMG24GT2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
On Completion of the course, the students will be able to

CO1: describe the concepts of Cybercrime and Information security.
CO2: analyse Cybercrime in Mobile and Wireless Devices.
CO3: apply security techniques for a given scenario.
CO4: analyse various Cyber Forensic algorithms.
CO5: implement various modules for cyber security applications.

UNIT-I
Overview of basic concepts of security: Confidentiality, Integrity and Availability; Security threats, Information security principles, operational and human issues in information and network security; Security policies: types, development and management

UNIT-II
Authentication, Access control mechanism, Physical security control, Operations security, Cryptography: basic concepts, symmetric and asymmetric cryptography; Key management, Firewalls, Intrusion detection, malware detection

UNIT-III
Legal Issues in information and communication technology, cyber-crime and IT Act 2000, Legal resources against Hacking, Cyber fraud, defamation and abuse, pornography and other IT offences; Contracts in cyber world and Jurisdiction

UNIT-IV
Cybersquatting, legal and other innovative moves against cybersquatting, Copyright and protection of contents; Software piracy; E-Commerce Taxation, Protection of Cyber consumers in India

Recommended Readings:

1. Mark Merkow and James Breithaupt, Information Security: Principles and Practices, Pearson Education.
2. Vivek Sood, Cyber Law Simplified, Tata McGraw Hill, New Delhi
3. Matt Bishop, Introduction to Computer Security, 1/e, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Systems Analysis and Design

Course Code: 20IMG24GT3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

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

CO1: understand the basic principles of systems analysis and design.
CO2: understand the role systems analyst in system design.
CO3: draw data dictionary, Pseudo code, Structured English, Data Flow Diagram

UNIT-I
Concept of system, Business Information System, types of business information systems, overview of system development methodologies, role of systems analyst, CASE tools for systems analyst; feasibility study - economic, organizational and cultural, technological, schedule and resource.

UNIT-II
System Development Life Cycle : Preliminary investigation - Information System Projects, evaluation of system requests, major steps in preliminary investigation; Systems Analysis - fact finding techniques, documentation, data flow diagrams, data dictionary; cost benefit analysis.

UNIT-III
Systems Design : User interface design, input and output design, data design; Systems Implementation: Application development, quality assurance, structured application development - structure charts, cohesion, coupling, testing, program, system, operations, user documentation; Installation - Training, system changeover.

UNIT-IV
Designing Distributed and Internet Systems: designing distributed systems - designing systems for LANs, for client / server architecture; designing internet systems - internet design fundamentals, design issues related to site management, managing online data.

Recommended Readings:

1. Kendall and Kendall, System Analysis and Design, Pearson Education.
2 Shelly, Cashman, Rosenblatt, System Analysis and Design, Cengage Learning.
3. Satzinger, System Analysis and Design, Cengage Learning.
4. Hawryszkiewyez, I T. Introduction to Systems Analysis and Design, PHI.
5. Whitten, J L. System Analysis and Design Methods, Galgotia.
6. Awad, Elias M., Systems Analysis and Design, Prentice Hall of India.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Programming in Visual Basic

Course Code: 20IMG24GT4

L-T-P
3-0-1

External Marks: 50
Sessional Marks: 50
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: learn different type of client server architectures and introduction to VB6 tool and its related objects.
CO2: learn the various programming constructs, syntax of various controls used in VB.
CO3: learn various ways to access data (like data control, DAO) in VB, how to deal with errors and exceptions in VB, and some other interfaces like MDI.
CO4: learn the concepts of COM, ActiveX Controls, how to make Data Reports and Crystal Reports and usage of VB script.

UNIT-I
Client Server Basics: Discover Client-Server and Other Computing Architectures, understand File Server versus Client -Server Database Deployment, Learn about the Two Tier Versus Three Tire Client-Server Model. Visual Basic Building Blocks and Default Controls: Forms, Using Controls, Exploring Properties, Methods and Events, Introduction to Intrinsic Controls, Working With Text, Working With Choices, Special Purpose Controls. VB Advance Controls: Events, Menu bar, Popup Menus, Tool bar, Message Box, Input Box, Built-in Dialog Boxes, Creating MDI, Working with Menus.

UNIT-II
VB Programming Fundamentals and Variables: Introduction to Variables, Variable Declaration. Arrays, Introduction to Constants and Option Explicit Statement, Assignment Statements, Working With Math Operations, Strings, Formatting Functions. Controlling And Managing Program: All Control Statement, Loops, Error Trapping, Working with Procedures, Functions, Windows Common controls, control arrays.

UNIT-III
Visual Basic and databases: understanding the Data Controls, Introduction to DAO, Working with Record sets, Record Pointer, Filter, Sorts and Manipulation of Records. Remote And ActiveX data Objects: Working with ODBC, Remote Data Objects and Remote data Control, Introducing ADO, ADO Data Control, Using Data Grid Control and ActiveX Data Objects.

UNIT-IV
COM and ActiveX Components: COM, Creating, Testing, Compiling, Enhancing and User Drawn ActiveX Controls, Building Class Modules, ActiveX DLL. Client-Server Development Tools: Data Reports and Crystal Reports, Packaging a Standard EXE Project.

Recommended Readings:

1. McBride, P.K. Programming in Visual Basic, BPB Publ.
2. Holzner Steven: Visual Basic Programming, IDG Books India Ltd

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of five short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

E-Business Information Systems Management

Course Code: 20IMG24GT5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: demonstrate advanced knowledge of technical and business issues related to E-Business and E-Commerce.
CO2: work in a virtual team environment, developing high-level business requirements

UNIT-I
Basics of E-Business, E-Business Strategy: Planning to Action, E-Business Design, and E-Procurement.
System Development Environment: Types of Information Systems; System Development Life Cycle; System Analyst – Role, Responsibility, Analytical Skills; Managing Information systems Project

UNIT-II
Information Systems Planning: Identifying and Selecting Systems Development Projects; Initiating and Planning Systems Development Projects.

UNIT-III
Information Systems Analysis: Determining System Requirements; Structuring System Process Requirements; Structuring System Logic Requirements; Structuring System Data Requirements.

UNIT-IV
Information Systems Implementation and Maintenance: System Implementation, Software Application Testing, Installation, Documenting the System, Training and Supporting Users, Organizational Issues in Systems Implementation; Maintaining Information Systems.

Recommended Readings:

1. Hoffer, Jeffrey A., et al., Modern Systems Analysis and Design, Pearson Education.
2. Laudon Kenneth and Laudon Jane, Management Information System, Pearson
3. O'Brien James A., Management Information Systems, Tata McGraw Hill.
4. Alter, Steven, Information Systems: The Foundation of E-Business, Pearson Education.
5. Kumar Muneesh, Business Information Systems, Vikas Publishing House.
6. Dewitz, Sandra D., System Analysis and Design and the Transition to Objects, McGraw- Hill.
7. Robertson James and Suzanne, Complete System Analysis, Volume I and II, Dorset House Publishing.
8. Sahil Raj, Management Information System, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

International Marketing Management

Course Code: 20IMG24GI1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: analyze international marketing, its opportunities and promotional policies of the governments to augment trade.

CO2: gain in-depth knowledge on Export – procedure & documentation, product planning and policy, Pricing, Distribution, Promotion and Financing

UNIT-I

Introduction: Basic Concepts of International Marketing, Definition and Dimensions of International Markets, Differences between Domestic and International Marketing, Benefits of International Marketing, EPRG Framework in International Marketing.

UNIT-II

Environment of International Business: Introduction, Political and Legal Environment, Cultural Environment, Financial and Monetary Environment. Indian Foreign Trade: Indian Trade Policy, Recent Transit in India's Foreign Trade, Export Assistance, Institutional Infrastructure for Export Promotion in India, EXIM Policy of India.

UNIT-III

Product Decisions: Product planning for global markets; Standardization vs. Product adaptation; New product development; Management of international brands; Packaging and labelling; Provision of sales related services. Pricing Decisions: Environmental influences on pricing decisions; International pricing policies and strategies. Promotion Decisions: Complexities and issues; International advertising, personal selling, sales promotion and public relations.

UNIT-IV

Distribution Channels and Logistics: Functional and types of channels; Channel selection decisions; Selection of foreign distributors/agents and managing relations with them; International logistics decisions. Overseas Market research, Marketing Plan for Exports, New Techniques in International Marketing, International Sub-Contracting, Joint Ventures, Multinationals Exports Finance, Risk Export Documents and Procedures.

Recommended Readings:

1. Gautam Dutta, Global Marketing, Pearson Education.
2. Mahapata, S N. Global Marketing Management: A Strategic Approach, Galgotia Publishing Company, New Delhi.
3. Cateora, Philip R. , John L. Graham and Salwan, Prashant. "International Marketing", TMH, New Delhi.
4. Keegan, Warren J., "Global Marketing Management", Pearson Education.
5. Srinivasan, R. "International Marketing", Prentice Hall of India, New Delhi
6. Rathore and Rathore, "International Marketing", Himalaya Publishing, New Delhi
7. Onkvisit, Sak and John J. Shaw, "International Marketing: Analysis and Strategy", Prentice Hall, New Delhi.
8. Hollensen and Banerjee, "Global Marketing", Pearson Education.
9. Chernnilam, Francis. "International Marketing", Himalaya Publishing House, New Delhi.
10. Czinkota, M.R., "International Marketing", Dryden Press, Boston.
11. Fayerweather, John, "International Marketing", Prentice Hall, New Delhi
12. Jain, S.C. "International Marketing", CBS Publications, New Delhi
13. Doole, J. and Lowe, R. "International Marketing Strategy", Thomson Press.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Cross Cultural and Global Management

Course Code: 20IMG24GI2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: demonstrate relevant knowledge, skills, and abilities when presented with cross-cultural management problems in multinational organizations.
CO2: demonstrate understanding and respect for culture difference.
CO3: apply theoretical frameworks in analyzing culture and related management problems.
CO4: provide critical and creative solutions for cross-cultural management problems.
CO5: prepare and present structured presentations and reports.

UNIT - I

Human and Cultural Variables in Global Organizations; Cross Cultural Differences and Managerial Implications, Complexities of international firms, staffing policy, Process of recruitment and training.

UNIT - II

Cross Cultural Research Methodologies and Hofstede's Study, Structural evolution of Global Organizations; Cross Cultural Leadership and Decision Making.

UNIT - III

Cross Cultural Communication and Negotiation, Human Resource Management in Global Organizations, Management of industrial relations.

UNIT - IV

Ethics and social responsibility in international business, Western and Eastern Management thoughts in the Indian Context, Management of cultural diversity.

Recommended Readings:

1. Adler, N J., International Dimensions of Organizational Behaviour, Kent Publishing.
2. Bartlett, C and Ghoshal, S., Transnational Management: Text, Cases and Readings in Cross Border Management, Irwin.
3. Marie- Joelle Browaeys, understanding Cross-Culture Management, Pearson Education.
4. Dowling. P J., International Dimensions of Human Resource Management, Wadsworth.
5. Hofstede, G., Cultures Consequence: International Differences in Work Related Values, Sage.
6. Marcie, D and Puffer, M., Management International: Cases, Exercises and Readings, West Publishing.
7. Mead, R., International Management: Cross Cultural Dimensions, Blackwell, Camb., Mass.
8. Mendenhall, M., Global Management, Massachusetts, Blackwell.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

International Business Laws

Course Code: 20IMG24GI3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: understand with the fundamental concepts and nature of International Business Laws
CO2: understand the fundamental Concept of GATT/WTO
CO3: Practice on the Identifying ethical dilemmas and resolving them

UNIT-I

Legal Framework of International Business: Nature and complexities; Major laws and their implications to business; International business contract- legal provisions; Payment terms; International sales agreements; Rights and duties of agents and distributors; Contract of Affreightment (carriage of goods by sea, air and overland).

UNIT-II

Enforcement and Settlement: Enforcement of contracts and dispute settlement; International commercial arbitration.

Regulatory Framework of WTO: Basic principles and charter of WTO; Provisions of WTO relating to preferential treatment of developing countries, custom valuation and dispute settlement; Implications of GATS, TRIPs and TRIMs.

UNIT-III

Regulations and Treaties relating to Technology Transfer: Licensing; Franchising, joint ventures, patents and trademarks; Regulatory framework relating to commerce.

UNIT-IV

Indian laws and regulations governing international transactions; Taxation of foreign income; foreign investments; setting up offices and branches abroad.

Recommended Readings:

1. Daniels, John, Ernest W. Ogram and Lee H. Redebungh: International Business. Environments and Operations, Pearson Education.
2. GATT/WTO, various publications.
3. Journal of World Trade Law.
4. Kapoor ND; Commercial Law; Sultan Chand and Co., New Delhi.
5. Lew, Julton D. M. and Clive Standbrook: (eds.), International Trade Law and Practice, Euromoney Publications, London.
6. Ministry of Commerce, (Govt. of India) Handbook of Import- Export Procedures.
7. Motiwal OP, Awasthi HIC: International Trade –the law and practice; Bhowmik and Company, New Delhi.
8. Patrick, H., International Business Agreements, Gower Publishing Co. Pvt.
9. Rao, S., Joint Ventures, Vikas Publication, New Delhi
10. Schmothoff C.R., Export Trade- The Law and Practice of International Trade

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Management of Multinational Corporations

Course Code: 20IMG24GI4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

At the end of the course students will be able to:

CO1: understand the functioning of MNCs, global companies, transnational companies.
CO2: understand a variety issues that are encountered by every professional in discharging professional duties.
CO3: become sensitive in the contemporary world to fulfil the professional obligations effectively.

UNIT-I

A conceptual background of MNC's: Defining MNC's, characteristics, types, growth and evolution of MNC's. A theoretical perspective: Internalisation theory, Oligopoly theory, Tariff jumping hypothesis, Obsolescing bargain theory. The three models of internalisation strategy. Comparative Management: Importance and scope; Approaches of comparative management; management styles and practices in US, Japan, China, Korea, India.

UNIT-II

Strategy and MNC's: The role of strategy, Transferring core competencies, Realizing location economies, Realising experience curve economies, Pressures for cost reductions. Local responsiveness, Multinational strategy, International strategy and Global strategy. Modes of entry and strategic alliances. Organizational structure: Vertical and horizontal differentiation. Control and co-ordination in MNC's.

UNIT-III

Marketing management in MNC's: Product, price, distribution and communication strategy. Operations management in MNC's: Where to manufacture: Country factors, technology factors, customization and cost efficiency, locating manufacturing facilities. Transfer of knowledge from home country to host country: parent subsidiary relationship, new product development. Human resource management in MNC's: HR policies in MNC's, types of staffing policy, employing expatriates in MNC's, Labour relations in MNC's. Financial management in MNC's: Double taxation relief, provisions of Indian Income Tax Act for double taxation, Transfer pricing.

UNIT-IV:

Ethics and social responsibility in MNC's: Stakeholders expectations, Environmental management in MNC's, dealing with corruption and bribery, Marketing issues, Human rights violation by MNC's. Emerging issues in MNC's: Challenges of globalisation towards transnational companies, Enterprise risk management in MNC's. Indian MNC's: Strategic issues for Indian MNC's- Evolution of Indian companies, moving up the value curve, overcoming the liabilities of Indianness, Role of Government.

Recommended Readings:

1. Helen Deresky, International Management, Pearson Education.
2. Hodgetts, "International Management", Tata McGraw Hill, New Delhi.
3. Nagandhi, Anant.R, "International Management", Prentice Hall of India Ltd., New Delhi.
4. Koontz and Whelrich, "Management: The Global Perspective", Tata McGraw Hill, New Delhi.
5. Adhikary, Manab. "Global Business Management", Macmillan, New Delhi.
6. Thakur, Manab, Gene E. Burton, and B.N. Srivastava, "International Management: Concepts and Cases", Tata McGraw Hill, New Delhi.
7. Christoppher Bartlett and Sumantra Ghoshal, "Transnational Management: Text and Cases", Tata McGraw Hill, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

International Trade Theory and Practice

Course Code: 20IMG24GI5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: define the concept of International Business environment.
CO2: evaluate the models & theories of international trade.
CO3: describe the concept of country risk analysis and responsibilities of International trade.
CO4: analyze the economic crisis of developing countries.

UNIT-I

Evolution of International Trade: Introduction, Interdependence of Countries, Internal Trade vs. International Trade, Classical Theory of International Trade Theory of Absolute Cost, The Ricardian Theory of Comparative Costs, Gains from International Trade, Comparative Costs Doctrine Expressed in Terms of Money, Evaluation of the Classical Theory of International Trade, General Equilibrium Theory of International Trade, Exchange Rate Mechanism and International Trade, A Complex Model of Ohlin, Criticisms of the Modern Theory of International Trade, Superiority of the Modern Theory of International Trade, Porter's National Competitive Advantage Theory, Product Life Cycle Theory.

UNIT-II

Regional Economic Groupings: Concept of Trade Barriers ,Objectives of Trade Barriers, Types of Tariff Trade Barriers ,Types of Non-tariff Trade Barriers ,Tariff Trade Barriers vs. Non-tariff Trade Barriers, Effects of Trade Barriers, Concept of Regional Economic Groups , Types of Regional Economic Groups , Positive Effects of Regional Economic Groups, Negative Effects of Regional Economic Group, Major Trade Blocs ,Free trade vs. protection, economic effects of tariff, tariff retaliation, anti-dumping/countervailing duties; export subsidies;

UNIT-III

FDI and MNCs: Concept of Multinational Corporations (MNCs), Merits of MNCs, Demerits of MNCs, MNCs in India, Concept of Foreign Direct Investment (FDI), Role and Functions of FDI in Developing Countries, Factors Influencing FDI, FDI Operations in India, FDI Policy in India , Make in India, Foreign Investment Promotion Board (FIPB), Foreign Investment Promotion Council (FIPC), Indian Joint ventures abroad; Project and consultancy exports, Policy on foreign collaborations and counter trade arrangements.

UNIT-IV

India's Foreign Trade: Introduction, Significance or Merits of Foreign Trade, Demerits of Foreign Trade, Growth of India's Foreign Trade, Direction of India's Exports, Direction of India's Imports, Major Exports (Commodities) of India, Major Imports (Commodities) of India, Major Exports (Services) of India India's Share in World Trade and FTP 2015-2020, Prospects for India's Foreign Trade Development, Challenges to India's Foreign Trade Development.

Recommended Readings:

1. Paul R. Krugman, International Trade: Theory and Policy, Pearson Education.
2. Export-Import Procedure and Documentation, Jain. S. Khushpat, Jain.V. Apexa, Himalaya Publishing House.
3. B Gupta, R.K. "Anti-dumping and Countervailing Measures", Sage Publications, New Delhi.
4. Verma, M.L. "International Trade", Commonwealth Publishers, Delhi.
5. Varsheny R.L. and B. Bhattacharya, "International Marketing Management", Sultan Chand and Sons, Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Integrated Marketing Communication

Course Code: 20IMG24GM1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand various marketing cues
CO2: create an communication campaign for marketing purpose
CO3: understand various kind of media to be utilized in marketing communication
CO4: find out solution of communication needs

UNIT-I
Introduction – Concept of marketing communication, marketing communication mix, factor affecting marketing communication mix, drivers of integrated marketing mix; models of marketing communication – Blade Box Model, AIDAS model, Lavidge Steiner model, DAGMAR model, PCB model; marketing communication planning process

UNIT-II
Managing the Marketing Communication Process – Analysis of promotional opportunities, concepts of segmentation and target marketing, promotional strategy of formulation and competitive positioning, determination of promotional objectives, deciding promotional appropriation, integrating marketing communication programme, commissioning and contracting external resources

UNIT-III
Advertising and Media Planning – Advertising plan, creative strategy, advertising appeal, creative formats, stages of creative strategy – idea generation, copy writing, layout, copy testing and diagnosis; media planning – traditional and contemporary media; media objectives – reach, frequency, cost etc.; media strategy, media scheduling, media planning models, key issues in advertising – comparative advertising, web advertising; advertising agency – functions and types, outdoor advertising

UNIT-IV
Wider Issues and Dimensions – Sales promotions, personal selling, direct marketing, public relations, publicity and corporate advertising, unconventional promotional media, marketing communication budgeting, measuring promotional performance, global marketing communication, legal and ethical issues in integrated marketing communication

Recommended Readings:

1. Shah, Kruti and Alan D'Souza, Advertising and Promotion – An IMC Perspective, Tata McGraw Hill, New Delhi
2. Belch, George and Belch, Michael; Advertising and Promotion, Tata McGraw Hill, New Delhi
3. Moriarty, Sandra and Wells, William. Advertising and IMC, Pearson Education.
4. Jethwaney, Jaishree and Jain, Shruti; Advertising Management; Oxford University, New Delhi
5. Kenneth E. Clow, Integrated Advertising, Promotion and Marketing Communications, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Marketing Research

Course Code: 20IMG24GM2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: explain the meaning & role of Marketing Research
CO2: formulate the hypotheses using exploratory research techniques like literature survey, experience survey & analysis of cases.
CO3: design questionnaires & observation forms for different marketing research situations
CO4: explain the Scaling techniques.
CO5: explain the experimentation in Marketing Research and interpretation of data.

UNIT-I
Introduction to Marketing Research: Importance, Nature and Scope of Marketing Research, Types of Marketing Research; Introduction to Marketing Research Industry; Marketing Intelligence: Marketing Information Systems, Decision Support Systems

UNIT-II
Marketing Research Process: Problem Identification and Definition; Research Designs; Exploratory: Qualitative Research; Descriptive: Survey and Observation; Data Collection: Primary and Secondary Data; Questionnaire Design.

UNIT-III
Attitude Measurement and Scaling Techniques - Introduction to Measurement Scales, Sampling Plan: Universe, Sample Frame and Sampling unit, Sampling Techniques, Sampling and Non-sampling errors, Sample size determination.

UNIT-IV
Data Analysis: Univariate, Bivariate and Multivariate Data Analysis; Report Writing; Market Research Applications: Product Research, Advertising Research, Sales and Market Research; International Marketing Research.

Recommended Readings:

1. Malhotra N., K. & Dash S., Marketing Research: An Applied Orientation, Pearson.
2. Churchill, Lacobucci & Israel, Marketing Research: A South Asian Perspective, Cengage Learning
3. Donald S. Tull & Del I. Hawkins, Marketing Research: Measurement and Method, Prentice Hall.
4. Boyd. H.W. , Westfall, R., & Starsh, S.F., Marketing Research: Text and Cases, Richard D. Irwin, Boston
5. Chisnall, P. M., The Essence of Marketing Research, Prentice Hall, New Delhi.
6. Churchill, Gilbert A., Basic Marketing Research, Dryden Press, Boston.
7. Beri, G., Marketing Research, Tata McGraw Hill, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Product and Brand Management

Course Code: 20IMG24GM3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand applications of new product management, planning and policy techniques, essentials of branding and approaches to effective branding strategy.
CO2: understand the important issues in planning and evaluating product and brand strategies.
CO3: understand contemporary issues in product and branding development and sustainability.

UNIT-I
Branding terminology, basic branding concepts- brand awareness, brand personality, brand image, brand identity, brand loyalty, brand equity, major branding decisions: selecting a brand name, brand extension decision, family versus individual brand names, multiple branding, private versus national branding, importance of branding

UNIT II
Branding challenges and opportunities, concept of brand equity, sources and benefits of brand equity, customer based Brand equity, designing marketing programme to build brand equity, measurement of brand equity, Strategic brand management process, concept of Brand positioning and repositioning, Identifying and establishing brand positioning and values.

UNIT III
Planning and implementing brand marketing programmes, designing marketing programs, measuring and interpreting brand performance, Legal aspects of Branding, Copyright, Trademarks and IPR, designing and implementing branding strategies; Brand building and communication, E- Branding, handling brand name changes

UNIT IV
New products and brand extension, evaluating brand extension opportunities, reinforcing brands, revitalising brands, managing brands over geographic boundaries and market segments, rationale for going international, global marketing programs- advantage and disadvantage, standardisation versus customisation, global brand strategy. Branding in rural marketing, branding in specific sectors: retail, industrial, service brands

Recommended Readings:

1. Kevin lane Keller, Strategic Brand Management, Pearson Education.
2. David A Aaker, Managing Brand Equity, New York, Free Press.
3. Don Cowley, understanding brands, Kogan page
4. J.N. Kapferer, Strategic Brand Management, Free Press.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Sales and Distribution Management

Course Code: 20IMG24GM4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the concepts of sales and distribution management.
CO2: appreciate various facets of job of sales manager.
CO3: make and implement decisions for sales and distribution management.
CO4: build knowledge, understanding, and skills in Sales and Distribution management.
CO5: develop and implement Sales and Channel management strategies.
CO6: analyze decision alternatives and criteria in the context of realistic problem situations in Sales and Channel management.

UNIT-I
Sales Management: Role of Sales Management in Marketing, Nature and Responsibilities of Sales Management, Modern Roles and Required Skills for Sales Managers. Theories of Selling. Sales Planning: Importance, approaches and process of sales planning; Sales forecasting; Sales budgeting. Sales Organization: Purpose, principles and process of setting up a sales organization; Sales organizational structures; Field sales organization; determining size of sales force.

UNIT-II
Territory Management: Need, procedure for setting up sales territories; Time management; Routing. Sales Quotas: Purpose, types of quotas, administration of sales quotas. Managing the Sales-force: Recruitment, selection, training, compensation, motivating and leading the sales-force; Sales meetings and contests.

UNIT-III
Control Process: Analysis of sales, costs and profitability; Management of sales expenses; evaluating sales force performance; Ethical issues in sales management.

UNIT-IV
Distribution Channels: Role of Distribution Channels, Number of Channels, Factors Affecting Choice of Distribution Channel, Channel Behaviour and Organization, Channel Design Decision; Channel Management Decisions; Distribution Intensity; Partnering Channel Relationship.

Recommended Readings:

1. Still, Cundiff, Govoni and Sandeep Puri, Sales and Distribution Management, Pearson Education.
2. Anderson R, Professional Sales Management, Englewood Cliff, New Jersey, Prentice Hall, India.
3. Spiro, Rosann L., Gregory A. Rich, and William J. Stanton, Management of a Sales Force, McGraw-Hill Irwin, Boston.
4. Dalrymple, Douglas J., and William L., Sales Management: Concepts and Cases, New York, NY: Wiley
5. Panda, T. K., Sahadev , S., Sales And Distribution Management, Oxford Publishing, India
6. Hughes, G. David, Daryl McKee, Charles H. Singler, Sales Management: A Career Path Approach, Cincinnati, OH: South-Western College Publishing
7. Peppers, D. and Rogers, M., 'The short way to long-term relationships'. Sales and Marketing Management

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Industrial Marketing

Course Code: 20IMG24GM5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: compare the differences and similarities between challenges faced in Consumer Marketing and industrial marketing.
CO2: recommend appropriate Segmentation, Targeting and positioning strategy for an industrial brand.
CO3: forecast demand and develop the Marketing Plan for an industrial product.
CO4: apply buying behavior concepts to design industrial products & services, set prices and distribution and logistics strategies to achieve the Marketing Objective.
CO5: design Marketing Mix for industrial services to achieve planned marketing objective

UNIT-I

Industrial Marketing: concept, nature and scope of industrial marketing; Difference between industrial and consumer marketing; Economics of industrial demand; understanding industrial markets and environment: Types of industrial customers, Classification of industrial products, Marketing implications for different customers and different product types, Purchase practices of industrial customers, Environmental analysis in industrial marketing.

UNIT-II

Organisational Buying and Buyer behaviour: Buyer motives, Phases in industrial buying decision process, Types of buying situations, Interpersonal Dynamics of industrial buying behaviour, Buyer-Seller relationship, Models of industrial buying behaviour, Industrial Marketing Research process; Industrial market segmentation, target marketing and positioning.

UNIT-III

Product Strategy: Meaning and Concept of an industrial product, Determinants of product mix, Industrial Product Life Cycle and strategies, New product development process; Marketing strategies for product related services and pure services; Industrial pricing decisions: Factors influencing pricing decisions, Pricing strategies, Pricing methods.

UNIT-IV

Industrial distribution channels and marketing logistics: Distinctive nature of industrial distribution channels, Factors affecting the nature of industrial channels, Role of intermediaries, Types of industrial intermediaries, Channel design decisions, Role of logistics and customer services in industrial marketing, Major components/Major decision areas of logistics, Total cost approach; Industrial marketing communication: Role of personal selling and direct marketing in industrial marketing, Personal selling process, Importance of advertising, and sales promotion in industrial marketing, Sales force management, Strategic planning, Implementing and Controlling in industrial marketing.

Recommended Readings:

1. Reeder, Robert R. Industrial Marketing: Analysis, Planning and Control. Englewood Cliffs. New Jersey, Prentice Hall Inc.
2. Havalder, Krishna K., Industrial Marketing, TMH, New Delhi
3. Brennan, R, Canning, L & McDowell, R, Business to Business Marketing, Sage Publications Ltd.,
5. Hill, Richard, etc. Industrial Marketing, Homewood Illinois, Richard D. Irwin.
6. Webster, F E. Industrial Marketing Strategy, New York, John Wiley.
7. Ghosh, P.K, Industrial Marketing, Oxford University Press.
8. Mukerjee, Industrial marketing, Excel Books India

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Transportation Management
Course Code: 20IMG24GO1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: appreciate the role of Transportation and Warehouse Management
CO2: explain essentials of statutory requirements related to Logistics Management
CO3: explain transport infrastructure and trade requirements in Logistics Management

UNIT-I
Growth of Urbanization and Problems of Transportation: Transport- Challenges and Limitations; Government Activities in Transportation; Functions of Transport Accessibility/Connectivity, Mobility Inter relations of Transport Economic cost and trade, Geography and technology, Social, cultural and recreational development of Information and Communication Technology

UNIT-II
Transportation Systems - Planning, Operation and Management Trip Generation and Distribution: Load Planning: Transportation Modes and their Selection; Land Use theory; Physical Theories, Economic Theories Utility Maximization; Choice Theory, Logit Model, Gravity Model, Generalized Cost; Elements of Traffic Flow, Generalized Car Following Theory, Green shields Theory

UNIT-III
Early transport and trade, Development of Sea ports, canal transport and the railways, Road building and motorization, Development of airports and air transport; Transport Networks,
Features of networks – nodes and links, Multimodalism and choice in transport, Supply chain, Inter modalism, Transport Infrastructure

UNIT-IV
Sequential Travel Demand Forecasting Models: Future Developments in Transportation; Motor Vehicle Act 1988 and its Impact on Urban Transport System: Emission Norms.

Recommended Readings:

1. Baerwal, J E., Transportation and Traffic Engineering Handbook. Englewood Cliffs, Prentice Hall Inc.
2. Khisty and lall, Transportation: An Introduction, Pearson Education.
3. Bell, G. et al., The Business of Transport. Plymouth, McDonald and Evans.
4. Dickey, J W., Metropolitan Transportation Planning, Tata McGraw Hill.
5. Grey, G E. and Hole, L A., Public Transportation Planning: Operations and Management;
6. Englewood Cliffs, Prentice Hall Inc.
7. Gupta, M P., Metropolitan Transportation System, National.
8. Papacostas. C S., Transportation Engineering and Planning, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Technology Management
Course Code: 20IMG24GO2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: appreciate the role of technology, innovation and new product management in both corporate and public sector.
CO2: emphasize on strategic aspects of decision making involved in process and technology choices, investment options, level of technology.

UNIT I
Introduction: Definition and Characteristics of Technology, Market Based and Resource Based view, Concept and significance of management of technology, Dynamics of Technological Change: Forms of technological change, Process of Technological Change; Innovation: Components of Innovation, Innovation Dynamics at the Firm Level, recent developments in Technological environment - Globalization, Time Compression, Technology integration, Induced and Autonomous changes in the Technological environment, Competitive advantages through new technologies.

UNIT II
Technology supply and Research and Development Management**:** Sources of technology, Process of new product development; managing hi-tech products: Strategy to avoid product failure in market. Principles and Process of Product Development; Managing Rand D Organization –issues and recent trends, Linkage between technology, development and competition, management of Intellectual Property Rights in context of technology management, strategic issues in managing IPR

UNIT III
Technological Forecasting: Meaning, significance of Technology forecasting, techniques of Technology forecasting: Exploratory and normative technique; Process and application of techniques like Delphi, Growth Curves, S- curve, Pearl Curve, Gompertz curve: Relevance Tree, Morphological Analysis, Mission Flow Diagram

UNIT IV
Meaning and Importance of Technology Intelligence; Technology Strategy: Meaning and Key
Principles Underlying Technology Strategy, framework for formulating technology strategy Technology Strategy Types; Linkage of technology strategy with business strategy, Issues in technology strategy

Recommended Readings:

1. Narayanan, V. K., Managing Technology and Innovation for Competitive Advantage, Pearson Education.
2. Trott, Innovation Management and New Product Development, Pearson Education.
3. Khalli, T., Management of Technology, McGraw-Hill
4. Betz. F., Strategic Technology Management, McGraw-Hill
5. Lowell W. S., Managing Technology – The Strategic View, McGraw Hill.
6. Schilling Strategic Management of Technological Innovation, McGraw-Hill

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Warehouse Management and Inventory Control
Course Code: 20IMG24GO3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the basic concepts and various functions of Warehouse and Inventory control.
CO2: understand various types of warehouses and Inventory and their advantages.
CO3: identify material storage systems and material handling equipment.
CO4: understand Inventory management and classification of various types of Inventories.
CO5: understand the importance of IT in Warehousing.

UNIT I
Warehouse management: meaning and significance; warehouse organization: requisitions and replenishment of materials, receipt and inspection of materials, issue of materials, stocktaking, discrepancies and their resolution, control of tools, surplus, and scrap materials, storage and handling practices of materials

UNIT II
Computerization of warehouse activities, performance evaluation of stores activities, iso standards and warehouse activities, warehouse location, layout, and facilities planning, warehouse security, safety, and maintenance

UNIT III
Inventory Management: inventory concepts, pressures for low inventory, pressures for high inventory, types of inventory – seasonal, decoupling, cyclic, pipeline, safety stock; inventory costs; inventory control systems: issues in the P and Q systems of inventory control; The Basic Economic Order Quantity Model, Production Quantity Model, Quantity Discounts, Reorder Point, Safety Stocks, Service Level, Order quantity for periodic inventory system, Order quantity with variable demand

UNIT IV
Just-In-Time: Principles of just-in-time, Core logic of JIT, Main features for stocks, Achieving just-in-time operations, and other effects of JIT, Benefits and disadvantages of JIT, Comparison with other methods of inventory management. KANBAN as a control tool. Vendor managed inventory; Make or Buy Decisions: Factors influencing Make Or Buy Decisions-cost, quality, capacity core v/s noncore, management strategy. Evaluation of performance of Materials function: cost, delivery, quality, inventory turnover ratio methodology of evaluation, Use of ratios and analysis like FSN: Fast slow, Nonmoving, HML-High Medium, Low, XYZ. Materials Management in JIT Environment

Recommended Readings:

1. Saxena, J.P., Warehouse Management and Inventory Control**,** Vikas Publication
2. Bose, C., Inventory Management, PHI
3. Mahadevan, B., Operations Management: Theory and Practice, Pearson Education.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Sourcing Management
Course Code: 20IMG24GO4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: apply the basic concepts of Sourcing.
CO2: discuss each stage of Sourcing process.
CO3: explain factors driving the need to source and types of Sourcing.

UNIT I
Introduction to Global Sourcing, Trends in Global Sourcing, Supply Management-Strategic Sourcing, Negotiation process, Methods of sourcing, Performance Measurement and Evaluation (Concepts and Metalcraft Case), Sourcing Risk Management identifying, assessing, and controlling risk

UNIT II
Supplier Evaluation and Selection, locate, develop, qualify, and employ suppliers, Master supply agreement, Analytical Tools in Sourcing (Total Cost of Ownership (Wire Harness case), Pricing Analyses (Plastic Shield case), score card method, supplier research and market analysis

UNIT III
Analytical Tools in Sourcing (Foreign Exchange Currency Management, Learning Curve, Quantity Discount Models-Integrative Pacific Systems Case (Sourcing Risk, Supplier Financial Analysis)-Electronic Sourcing, solicitation method

UNIT IV
Understanding the environment, concept of sustainability, green sourcing, global and national standards, major sustainability issues, cultural diversity and sourcing process, operational alignment with sourcing strategy.

Recommended Readings:

1. Sunil Chopra, Supply Chain Management, Pearson Education.
2. Fred Sollish MS, John Semanik: Strategic Global sourcing, Wiley
3. Daniel Senft: International Sourcing, Springer.
4. Shah, J. "Supply Chain Management", Pearson Publication
5. Donald J Bowersox, Dand J Closs, M Bixby Coluper, "Supply Chain and Logistics Management", TMH
6. Sahay B.S."Supply Chain Management", Macmillan, New Delhi.
7. Agarwal D.K. "A Text Book of Logistics and Supply chain management", Macmillan, New Delhi.
8. Raghuram G. "Logistics and Supply Chain Management", Macmillan, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Supply Chain Analytics

Course Code: 20IMG24GO5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: cope with ever increasing amounts of data and information generated in all kinds of formats and representations, both internally and externally of supply chain.

CO2: acquire more knowledge of their customers, of their economic environment and of their own internal operations

CO3: take full advantage of available data for making smarter decisions, for creating value, and for making better use of resources in Supply chain management

CO4: support business insights and to move to fact-based management by relying on data and on supply chain analytics.

UNIT-I

Warehousing Decisions: Mathematical Programming Models, P-Median Methods, Guided LP Approach, Balmer-Wolfe Method, Greedy Drop Heuristics, Dynamic Location Models, Space Determination and Layout Methods

UNIT-II

Inventory Management: Inventory aggregation Models, Dynamic Lot sizing Methods, Multi-Echelon Inventory models, Aggregate Inventory system and LIMIT

UNIT-III

Transportation Network Models, Notion of Graphs, Minimal Spanning Tree, Shortest Path Algorithms, Maximal Flow Problems, Multistage Trans-shipment and Transportation Problems, Set covering and Set Partitioning Problems, Traveling Salesman Algorithms, Advanced Vehicle Routing Problem Heuristics, Scheduling Algorithms-Deficit function Approach and Linking Algorithms

UNIT-IV

Analytic Hierarchy Process, Data Envelopment Analysis, Risk Analysis in Supply Chain, Measuring transit risks, supply risks, delivering risks, Risk pooling strategies, Fuzzy Logic and Techniques-Application in SCM

Recommended Readings:

1. Sunil Chopra and Peter Meindel. Supply Chain Management: Strategy, Planning, and Operation, Pearson Education.
2. Jeremy F. Shapiro. Modeling the Supply Chain. Duxbury Thomson Learning
3. D. Simchi-Levi, P. Kaminsky, E. Simchi-Levi, and Ravi Shankar, Designing and Managing the Supply Chain concepts, Strategies and Case studies, Third Edition, Tata McGraw Hill, New Delhi
4. D. Simchi-Levi, P. Kaminsky, E. Simchi-Levi, Managing the supply chain: the definitive guide for the business professional. McGraw-Hill.
5. Sridhar Tayur, Ram Ganeshan, Michael Magazine (editors). Quantitative Models for Supply Chain Management. Kluwer Academic Publishers
6. Hyndman, R. J., and Athanasopoulos, G., Forecasting: principles and practice, Online Open Access Textbooks, https://www .otexts.org/fpp
7. James, G., Witten, D., Hastie, T., and Tibshirani, R., An introduction to statistical learning: with application in R, New York: Springer
8. Makridakis, S., Wheelwright, S. C., and Hyndman, R. J., Forecasting methods and applications. John Wiley and Sons.
9. Janat Shah, Supply Chain Management, Pearson Education.
10. Nahmias, S., Production and operations analysis, McGraw-Hill/Irwin, Sixth Edition.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal mark

Public Policy Evaluation
Course Code: 20IMG24GP1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: analysis practical problems of government, communities and regions
CO2: sense alternative approaches to the examination of public policy and of their respective strengths and limits.
CO3: understand complexity of policy evaluation in terms of mixes of values, interests, competing orientations, and other factors
CO4: develop critical thinking about public policy issues and the ability to conduct professional analyses

UNIT-I
Policy Evaluation: Introduction, concept of Policy Evaluation, evaluation types: Performance appraisal, Audit, Result evaluation, Impact assessment; functions of evaluation; criteria for evaluation; issues of the acceptability of evaluation results; problems in evaluation policy; constraints of public policy evaluation.

UNIT-II
Approaches to policy evaluation and policy impact: Introduction, Evaluation as rational analysis, Evaluation as a tool of HRM, Multiplist approach, Design approach, Negotiation approach, evaluating impact

UNIT-III
Criteria for evaluation: Efficiency, Effectiveness, Adequacy, Equity, Responsiveness; Evaluating Policy: Building framework for policy analysis, Evaluation Research, Cost-Benefit Analysis, Funding for policy analysis, Policy monitoring: Techniques for monitoring-Technical performance, time performance, cost performance.

UNIT-IV
Ethics and Public Policy, Policy performance: Evaluating Impact, -Purpose of impact assessment, Methods of impact assessment; Evaluating Agencies; Globalization of National policy-making: impact of global events on national policy agenda.

Recommended Readings:

1. R.K. Sapru, Public policy: Formulation, Implementation and Evaluation, Sterling Publisher Private Limited, New Delhi.
2. PrabirKumar De, Public Policy and Systems, Pearson Education, New Delhi.
3. R.K. Sapru, Public policy: Art and craft of policy analysis, PHI Learning Private Limited, New Delhi.
4. Stuart S. Nagel, Handbook of Public Policy Evaluation, Sage Publications, New Delhi.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Social Campaign Promotion

Course Code: 20IMG24GP2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the need for social marketing
CO2: understand of social campaigns and its importance
CO3: understand about the promotional aspects of social campaigns
CO4: understand about the social media for positive and social purposes
CO5: understand about the financial aspects of social campaigns.

UNIT-I
Social Marketing: Concept, Scope, and Comparison with Commercial Marketing, Approaches to influence public Behaviour; Social Marketing Planning Process; Elements of Campaign; Introduction to social entrepreneurship, funding for social endeavours.

UNIT-II
Social Marketing Environment: Campaign Focus and purpose, Mapping the Internal and External Environments; Establishing Target Audiences: Target Marketing.

UNIT-III
Setting Campaign Objectives and Goals: Behaviour Objective, Knowledge Objective, Belief Objective; Social Marketing Strategies: Product in social marketing, Price of a social marketing product.

UNIT-IV
Promotional Strategies: Types of Media Channels, Choosing Media Vehicles, Timings and Factors Influencing media strategies; Plan Evaluation and Monitoring: Outcome measures, Process Measures; Establishing Budgets and finding Funding Sources.

Recommended Readings:

1. Philip Kotler, Ned Roberto, Nancy Lee, "Social Marketing: Improving the quality of life", Sage Publication.
2. Nancy R. Lee, Philip Kotler, "Social Marketing; Influencing Behaviour for Good", Sage Publication.
3. Philip Kotler, Eduardo L. Roberto, Ned Roberto, "Social marketing: strategies for changing public Behaviour" Free Press.
4. R. Kraig Lefebvre, "Social Marketing and Social Change", Wiley.
5. Hong Cheng, Philip Kotler, Nancy R. Lee, "Social Marketing for Public Health: Global Trend and Success Stories", Jones and Bartlett Publishers, LLC

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Sustainable Development

Course Code: 20IMG24GP3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: comprehend the meaning of sustainable development.
CO2: understand the international and long-term dimensions of sustainable development.
CO4: understand methods in the field of sustainable development
CO5: relate to evaluate various sustainability discourse and their assumptions from different actors' perspectives

UNIT I

Meaning and Scope, Corporate Social Responsibility and Corporate Sustainability, Sustainability Terminologies and Meanings, Why is Sustainability an Imperative, Sustainability Case Studies, Triple Bottom Line (TBL)

UNIT II

Corporate Sustainability Reporting Frameworks, Global Reporting Initiative Guidelines, National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business, International Standards, Sustainability Indices, Principles of Responsible Investment, Challenges in Mainstreaming Sustainability Reporting, Sustainability Reporting Case Studies.

UNIT III

Legal Framework, Conventions, Treaties on Environmental and Social Aspects, Principle of Absolute Liability. UN Conference on Human Environment, UN Environment Programme, Brundtland Commission, UN Conference on Environment and Development, Rio Declaration on Environment and Development, Statement of Forest Principles, UN Framework Convention on Climate Change, Convention on Biological Diversity, Kyoto Protocol, Bali Roadmap, UNIT-ed Nations Conference on Sustainable, Development (Rio+20), Millennium Development Goals, International Labour Organization, Environmental Protection in India, Ecomark

UNIT IV

Contemporary Developments - Integrated Reporting, Rule in Rylands v. Fletcher, Applicability of Rylands Doctrine in India, Industrial Disasters, Hazardous or inherently dangerous industry, Departure from Rylands v. Fletcher, Water Pollution, Corporate Manslaughter and Corporate Homicide Act 2007, UK.

Recommended Readings:

1. Valesquez, Business Ethics: Concepts and Cases, Pearson Education.
2. A.C Fernando, Business Ethics, Pearson Education
3. John F. Steiner and George A. Steiner, Business, Government, and Society: A Management Perspective, Text and Cases, 2012, McGraw Hill, New Delhi.
4. Andrew Crane and Dirk Matten, Business Ethics: Managing Corporate Citizenship and Sustainability in The Age of Globalization, Oxford University Press, UK.
5. Allenby, B R 1993, Industrial Ecology, New York, Prentice Hall.
6. Hand Book of Sustainable Development, 2nd Edn, Cheltenham, UK, Edward Elgar
7. Boatright, J R, 2012, Ethics and the Conduct of Business, Pearson Education.
8. Brown, M T, 2005, Corporate Integrity: Rethinking Organizational Ethics and Leadership, Cambridge: Cambridge University Press.
9. Crane, A. Matten D. and Moon, J, 2008, Corporation and Citizenship, Cambridge: Cambridge Univ. Press.
10. Crane, A . 2000, Marketing, morality and natural environment, London, Routledge.
11. Parkinson, J.E. 1993, Corporate power and responsibility, Oxford University Press
12. Part, A. 2009, Hijacking sustainability, Cambridge, MA, MIT Press
13. Yaziji, M. and Doh J. 2009, NGO and Corporations: Conflict and Collaboration, Cambridge: Cambridge University Press.
14. Zadek, S. Pruzan, P. and Evans, R. (eds) 1997, Building Corporate Accountability, Emerging Practices In Social And Ethical Accounting, Auditing And Reporting, London, Earthscan.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Rural Development

Course Code: 20IMG24GP4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: critically analyze with regard to shifts of rural development
CO2: understand implications on the livelihoods of the poor and schemes to empower them
CO3: understand the prospects and problems of rural development in India
CO4: understand Panchayati Raj system in India
CO5: understand of working of institutions for rural development and management

UNIT I

Introduction: Rural Development: Concept, Elements, Importance and Scope - Approaches: Sectoral Approach, Area Approach, Target Group Approach, Participatory Approach, Integrated Approach - Strategies of Rural Development- Rural Management: Scope and Significance of Rural Management - Economic perspectives of Rural Development: Lack of access to assets, Micro finance, Capital market - Sectoral Issues in Rural development: Agriculture, Industries, Land Reforms

UNIT II

Institutions for Rural Development and Management: Structure, Functions and Role in Rural Development National level Institutions: NITI Aayog, Ministry of Rural Development, Ministry of Panchayati Raj, NIRD, CAPART and NABARD; State Level Institutions: State Planning Board, State Institute of Rural Development and Kerala Institute of Local Administration - District and Other Level Institutions: District Planning Committee; Panchayati Raj Institutions - Community Based Institutions - Scientific inputs and support from the Institutions like ICAR, ISRO, CSIR Institutes etc.

UNIT III

Rural Development Information System (RDIS): Management Information System - Impact of MIS on organization - RDIS: RD professionals" responsibility in phase of RDIS development - RDIS Planning and RDIS Implementation - Emerging Trends in RDIS

UNIT IV

Major Development and Welfare Programmes - Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGA) – Schemes for self-employment of the rural poor, Schemes for Housing to the rural poor- Rural Health Mission Schemes - Sanitation Programme - Drinking water supply programme - Backward Region Grant Fund (BRGF) - Pradhan Mantri Grameen Sadak Yojana (PMGSY) - Integrated Wasteland Development Programme (IWDP) - Provisions of Urban Amenities in Rural Areas (PURA) - PPP/ CSR Initiatives in Rural Development

Recommended Readings:

1. Prasad, B.K.(2003), Rural Development: Concept, Approach and Strategy, New Delhi: Sarup and Sons.
2. Singh, Katar. (2009). Rural Development - Principles, Policies and management, New Delhi: Sage.
3. Srivastava, Madhuri and Alok Kumar Singh (Eds.) (2008), Rural development in India: Approaches, strategies, and programmes, New Delhi: Deep and Deep Publications.
4. Sundaram, Satya. (2002), Rural Development Mumbai: Himalaya.
5. Government of India. (2012), Greening Rural Development in India, New Delhi: Ministry of Rural Development and UNDP.
6. Singh, Katar and R S Pundir. (2000), Co-operatives and Rural Development in India, IRMA. India Rural Development Report 2013-14, Hyderabad: Orient Blackswan.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Indian Social and Political System

Course Code: 20IMG24GP5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand decipher the workings of the Indian constitution and political system
CO2: explain the basic ideas and concepts of political science
CO3: identify sociological institutions
CO4: develop an understanding of the relationship between individual and the society
CO5: understand structure of societies

UNIT-I

Significance of the Indian Model of Political System; Nationalist Movement - Socio-economic and philosophical foundation of Indian Constitution; Fundamental rights - Directive principle of state policy; Federalism and Centre-State Relations. Prime Minister - Cabinet and Parliament; Judiciary and Judicial Review; Role of Civil Services - Role of Caste; Religion, Language and Regionalism - Concept of Dominant Caste - Morris Jone's- Three Idioms of Indian Politics

UNIT-II

Political Science- Politics, Political Philosophy, Political Thought, Political Theory, Political Science-Approaches, Debates and Trends, Relationship with Social sciences.

UNIT-III

Sociology: Nature, Scope and Significance; Relationship with History, Economics, Political science, Anthropology and Psychology; Basic Concepts: Society, Community, Association, Social structure, Status and Role, Norms and values. Indian Social Institutions: Kinship, Family, Marriage; Caste and its Changing Dimensions.

UNIT-IV

Societies: Types and Characteristics- Tribal, Rural, Urban, Industrial and Post-Industrial; Processes of Social Change: Characteristic Features of Industrialization, Modernization, Globalization; Social Stratification: Concept and Bases; Forms- Caste, Class, Power and Gender; Social Issues and Problems: Secularism and Religious Minorities, Inequality of Caste, Divorce; Problems of Aged, Corruption

Recommended Readings:

1. Himanshu Roy, Indian Political System, Pearson Education.
2. Ahuja, Ram (2001): Indian Social System, New Delhi: Rawat Publication
3. Fulcher and Scott (2003: Sociology, New York: Oxford University Press.
4. Rajni Kothari, Politics in India, Orient Longman Private Limited, New Delhi
5. Ahuja, Ram (2000): Social Problems in India, New Delhi: Rawat Publications
6. N.D. Arora, Political science, Tata McGraw Hill.
7. Bottomore, T.B. (1972): Sociology: A Guide to Problems and Literature, Bombay: George Allen and Unwin (India).
8. Fulcher and Scott (2003: Sociology, New York: Oxford University Press
9. Inkeles, Alex (1987): What is Sociology? New Delhi: Prentice-Hall of India
10. Ahuja, Ram (1997): Society in India: Concept, Theories and Recent Trends, Jaipur: Rawat Publication

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Economics of Business Strategy

Course Code: 20IMG24GB1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: use principles of economics and microeconomic theory to analyze strategic issues faced by managers as strategists in modern business enterprises.
CO2: appreciate the inherent strengths and limitations of using economic theory in managing a business.
CO3: have an understanding through use of economic theory as to why business follows particular strategic decisions in different industries.
CO4: demonstrate the ability to articulate and assess problems based on the modelling framework used in the course to appreciate a strategy/structure relation.

UNIT-I
Theory of the Firm: Its rationale, Objectives, Boundary, Change in boundary (Mergers and acquisitions), Resource Based view of Firm, Firm as the source of Profit, Vertical Integration and Conglomerate diversification, Internationalization.

UNIT-II
Architecture: Internal and external architecture, designing and management of architecture, Evaluation of performance, corporate Governance, Reputation, Knowledge, Rent Generation and Management.

UNIT-III
Competitive Sustainability: Origin of Competitive Advantage, Creative Destruction, Innovation, Growth, Changing Product Portfolio, entrepreneurship etc.

UNIT-IV
Public Policy: Regulation and Privatization, Competition law, Competition Commission of India.

Recommended Readings:
1. Andreu Mas- Colell, Michael D. Whinston & Jerry R. Green, Microeconomic Theory, Oxford University Press.
2. Trimorthy C. G. Fisher& Robert G. Waschik, Managerial Economics: A Game Theoretic Approach, Routeledge.
3. Paul Milgram & John Roberts, Economics, Organization & Management, Prentice Hall.
4. D.N. Sengupta & Anandya Sen., Economics of Business Policy, Oxford University Press.
5. Steven E Landsberg, Price Theory & Application, Dryden.
6. Walter Nicholson, Microeconomic Theory, Thomson.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Applied Multivariate Analysis

Course Code: 20IMG24GB2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand multivariate data structure, multinomial and multivariate normal distribution
CO2: apply Multivariate analysis of variance (MANOVA) of one and two- way classified data.

UNIT-I
Multivariate Analysis: Concept, the variate, Measurement scales, Measurement error, Methodology of Model Building. Multivariate Analysis of Variance: One independent variable at two levels and one dependent variable, two-group MANOVA, Multiple-group MANOVA, MANOVA for two independent variables or factors. Repeated Measure Analysis of Variance: Between-subject and within-subject factors and designs, univariate and multivariate approaches to repeated measure analysis.

UNIT-II
Principal Components Analysis: Geometry of principal components analysis, analytical approach, issues relating to the use of principal components analysis, use of principal components scores. Factor Analysis: Basic concepts and terminology of factor, objectives of factor analysis, geometric view of factor analysis, factor analysis techniques-principal components factoring (PCF), principal axis factoring, and factor analysis versus principal components analysis, factor rotation, and factor scores.

UNIT-III
Discriminant Analysis: Geometric view, analytical approach, classification methods, Fisher's linear discriminant, Mahalanobis distance. Canonical Correlation: Geometry of canonical correlation, analytical approach, canonical variates and the canonical correlation, statistical significance tests for the canonical correlations, interpretation of the canonical variates, practical significance of the canonical correlation.
Cluster Analysis: Hierarchical clustering, Non-hierarchical Clustering.

UNIT-IV
Structural Equation Modeling: Path Analysis, Confirmatory Factor Analysis, Structured Means Models.

Recommended Readings:

1. Tabachnick, Using Multivariate Statistics, Pearson Education.
2. Structural Equation Modeling: Path Analysis, Confirmatory Factor Analysis, Structured Means Models.
3. Tinsley, Harward E and Brown Stered D., Handbook of Applied Multivariate Statistical and Mathematical Modelling, Academic Press.
4. Morrison D F., Multivariate Statistical Analysis, McGraw Hill.
5. Overall J E and Klett C., Applied Multivariate Analysis, McGraw Hill.
6. Hair, Anderson, Tatham and Black. Multivariate Data Analysis, Pearson Education.
7. Nargundlar, R., Marketing Research, Tata McGraw Hill.
8. Johnson Richard A and Wichern Dean W., Applied Multivariate Statistical Analysis, Pearson Education

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Information Economics and its Applications

Course Code: 20IMG24GB3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes

After completing the course students would be able to:

CO1: understand Supply and Demand. Equilibrium Analysis. Marginal Analysis. Positive and Normative Questions

CO2: understand Market Structure--Perfect Competition, Monopoly, and selling environments.

UNIT-I

Introduction to Information Economics; The Principal Agent**:** Hidden actions (Moral hazard) problem, hidden information problems, monopolistic screening.

UNIT-II

Adverse Selection**:** Concept, lemons problem, probable solutions. Signalling: Separating and Pooling equilibrium, Insurance market, cheap talk.

UNIT-III

Screening: Second degree price discrimination, Screening in Competitive Insurance Market, Monopoly screening in insurance Market

UNIT-IV

Introduction to Mechanism design**:** Basic concepts, revelation principle, truthful implementation. Applications of mechanism design to bargaining and auctions**:** Bidding behaviour in the four standard auctions: First price sealed bid, second price sealed bid, Dutch auction, English auction. Revenue equivalence theorem; Applications to Finance**:** Credit market rationing.

Recommended Readings:

1. Mas Collel Whinston and Green, Microeconomic Theory (MWG), Oxford University Press.
2. Hart, O., and Holmstrom, B., "The Theory of Contracts." In T. Bewley (ed.), Advances in Economic Theory Fifth World Congress, Cambridge University Press.
3. Varian, Microeconomic Analysis. W. W. Norton and Company; 3rd edition (1992).
4. Akerlof, G. "The market for lemons: Qualitative uncertainty and the market mechanism" Quarterly Journal of Economics 84, 3, 488 – 500. (1970)
5. Spence, A. M. "Job Market Signalling." Quarterly Journal of Economics 87 (1973).
6. Grossman, S. (1981), "The Informational Role of Warranties and Private Disclosure about Product Quality" Journal of Law and Economics, Vol. 24, No. 3.
7. Freixas and Rochet, Microeconomics of Banking. The MIT Press; second edition (2008).

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Mathematical Statistics

Course Code: 20IMG24GB4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: perform estimation techniques to capture information from data and into their analysis.
CO2: use MOM, MLE, MVUE to do parameter estimation and inference.
CO3: use Chi-squared test to evaluate the homogeneity of populations.
CO4: use Chi-squared test to evaluate the independence of categorical variables.
CO5: use Chi-squared test to evaluate the goodness-of-fit of data to a specified distribution.

UNIT-I
Probability and Measure: Sigma fields and measures; measurable functions and distributions, integration of Borel function. Random Variables and Distributions: General properties – Distribution and probability densities, moments, moment generating and characteristic functions.

UNIT-II
Probability Distribution: Discrete random variables and their distributors- Binomial probability distribution, Geometric probability distribution and Poisson probability distribution and, their moments and moments generating functions; Continuous random variables and their probability distributors- Uniform probability distribution, Normal probability distribution, Gamma probability distribution, Beta probability distribution; Basic idea about multivariate probability distributors; sampling distributors and Central limit theorem.

UNIT-III
Estimation and Hypothesis Testing: Point estimators, confidence intervals, properties of point estimators; Hypothesis testing, elements of statistical test large sample test, small sample hypothesis testing for μ and $\mu 1 - \mu 2$, Power of test, Likelihood ratio tests

UNIT-IV
Statistical Analysis: Analysis of variance ; Analysis of Categorical Data-Chi-square test, Non-parametric statistic-Sign test, Wilcoxon, Signed Rank test, Mann – Whitney U test, Kruskal-Wallis test.

Recommended Readings:

1. Robert V. Hogg, Introduction to Mathematical Statistics, Pearson Education.
2 Wackerly, Mendenhall and Scheaffer, Mathematical Statistics with Applications, Duxbury, Thomson Learning.
3. Ross, S.M. Introduction to Probability Models, Pearson Education.
4. Kyburg Henry, Probability Theory, Prentice Hall.
5. Mittelhammer, R.C. Mathematical Statistics for Economics and Business. Springer.
6. Shao Jun, Mathematical Statistics, Springer.
7. Capinki M. and KOPP E., Measure Integral and Probability, Springer.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Market Microstructure

Course Code: 20IMG24GB5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand problem of Economic Organization, Organizational Objectives, and Transaction cost analysis.
CO2: understand the mechanism of price for coordination and motivation
CO3: understand the employment and compensation problems

UNIT-I
Economic Organization and Efficiency: Concept and rationale of organization, Organization and Efficiency, The problem of Economic Organization, Organizational Objectives, and Transaction cost analysis.

UNIT-II
Use of Price for coordination and Motivation, Neoclassical Model and theories of Organization, Market failure and Organization; Coordination: Market and Management, Price and coordination, management, Decentralization and the means of coordination.

UNIT-III
Bounded Rationality and Private Information, Motivation: Contracts, Information, and Incentives, Moral Hazard and Performance Incentives, Moral hazard in Organization, Controlling Moral Hazard.

UNIT-IV
Employment Policy and Human Resource Management, Internal Labour Market, Critique of Classical Theories of Employment, Job Assignments and Promotions, Compensation and Motivation: Implicit Incentive Pay, Performance Evaluation, Job Design, Incentive Pay for Groups.

Recommended Readings:

1. Paul Milgrom and John Roberts, Economics, Organization and Management, Prentice Hall.
2. Luis M.B. Cabral, Industrial Organization, Jaico Publishing House.
3. Sengupta,D.N. and Anadiya Sen, Economics of Business Policy, Oxford University Press.
4. Luis M.B. Cabral, Introduction to Industrial Organization, Cambridge Mass: The MIT Press.
5. Carlton, D. W. and J.M. Perloff, Modern Industrial Organization, Warper Collins.
6. Caves, R.E., Multinational Enterprise and Economic Analysis, Cambridge University Press.

Instructions for External Examiner: The question paper shall be divided in two sections. **Section A** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section B** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

Agricultural Input Marketing and Post-Harvest Management
Course Code: 20IMG24GA1

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the concept of different types of post-harvest practices for value addition
CO2: visualize the post-harvest problems likely to be confronted
CO3: know the tricks of the trade and how to increase the longevity of the produce
CO4: understand different marketing concept and marketing system in context of agricultural inputs;
CO5: understand proper handling technologies of important cereals, pulses, oilseeds, fruits and vegetables and their postharvest management.

UNIT – I
Agricultural input marketing – meaning and importance; Management of distribution channels for agricultural input marketing; Agricultural Inputs and their types – farm and nonfarm, role of cooperative, public and private sectors in agri- input marketing, Seed- Importance of seed input; Types of seeds- hybrid, high yielding and quality seeds; Demand and supply of seeds; Seed marketing channels, pricing, export import of seeds; Role of National Seed Corporation and State Seed Corporation.

UNIT – II
Chemical Fertilizers- Production, export-import, supply of chemical fertilizers, Demand/consumption, Prices and pricing policy; subsidy on fertilizers; marketing system – marketing channels, problems in distribution, Role of IFFCO and KRIBCO in fertilizer marketing.

UNIT – III
Plant Protection Chemicals- Production, export/import, consumption, marketing system – marketing channels; Farm Machinery- Production, supply, demand, Marketing and distribution channels of farm machines, Agro-industries Corporation and marketing of farm machines / implements/Equipment.

UNIT – IV
Importance and scope of post-harvest management of major cereals, pulses, oilseeds, fruits and vegetables in Indian Economy; Production and utilization of major cereals, pulses, oilseeds, fruits and vegetables; Present status of food industry in India and emerging scenario; Factors affecting post-harvest losses, Problems in marketing of processed foods, Government Policy, BIS standards for various processed products, Quality standards for domestic and international trade.

Recommended Readings:

1. Pradeep Kashya, Rural Marketing, Pearson Education.
2. Acharya, S. S. and Agarwal, N. L., 2011. Agricultural Marketing in India. 4th Ed. Oxford and IBH.
3. Broadway A. C. and Broadway, A. A., 2003, A Text Book of Agri-Business Management. Kalyani.
4. Singh, A. K. and Pandey, S., 2005. Rural Marketing. New Age.
5. Singh Sukhpal, 2004, Rural Marketing- Focus on Agricultural Inputs. Vikas Publ. House.
6. Chakraverty, A., 1995, Post-harvest Technology of Cereals, Pulses and Oilseeds, Oxford and IBH.
7. Verma, L. R. and Joshi, V. K., 2000, Post-Harvest Technology of Fruits and Vegetables, Vols. I-II. Indus Publ.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Livestock Business Management
Course Code: 20IMG24GA2

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the livestock business in India
CO2: specify marketable livestock commodities
CO3: understand marketing channels of livestock and livestock products

UNIT I
Livestock business- concepts, nature and scope; production, consumption, trade in livestock in India, Livestock contributions to national economy.

UNIT II
Livestock produce and products. Components, characteristic of small business. Marketable livestock commodities. Marketing of livestock, and perishable and non-perishable livestock products.

UNIT III
Market opportunities - marketing channels of livestock and livestock products, organized/unorganized markets and cattle fairs. Overview of Livestock Programme.

UNIT IV
Import and export of animal and animal products. International Agreements/Regulations (WTO and General Agreement on Trade and Tariff-GATT) for marketing/trade of live animals and products, MFPO, BIS Standards for meat products, National and international specifications and standards. Visit to livestock farms.

Recommended Readings:

1. Acharya, S. S. and Agarwal, N. L., 2011. Agricultural Marketing in India. 4th Ed. Oxford and IBH.
2. Safiullah, M. A., Selvam, S. and Prema, N., 2000, Livestock Economics, Business Management and Marketing, Tamil Nadu Veterinary and Animal Sciences University, Chennai.
3. Swatland, H. and Compbell, T., 2004, Meat Cuts and Muscle Foods, Nottingham Univ. Press.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Agri-Business Financial Management
Course Code: 20IMG24GA3

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand scope of financial management; classification & credit need in changing agriculture scenario
CO2: understand factors affecting capital structure
CO3: analyze need for working capital in agribusiness
CO4: understand the functioning of cooperative credit institutions, commercial banks, regional rural banks

UNIT-I
Importance, need and scope of financial management; classification and credit need in changing agriculture scenario; finance functions, investment financing; balance sheet, income statement, cash flow statement for agribusiness.

UNIT II
Financial planning and control - assessment of financial requirement of an agribusiness unit; leverage – concept of leverage. Financial and operating leverage; factors affecting capital structure, features of an optimal capital structure.

UNIT III
Working capital management - concept and components of working capital, need for working capital in agribusiness, management of cash and accounts receivables, and inventory for agribusiness.

UNIT IV
Capital budgeting - steps and concept of capital budgeting, appraisal criteria - payback period, average rate of return, net present value, benefit cost ratio and internal rate of return. Agri-business financing system in India - functioning of cooperative credit institutions, commercial banks, regional rural banks, NABARD, Agro- industries Corporation, etc. in agribusiness financing.

Recommended Readings:

1. Chandra P. 2000. Financial Management. Tata McGraw Hill.
2. Khan MY and Jain PK. 2004. Management Accounting. Tata McGraw Hill.
3. Vanhorne and Dhamija, Financial Management and Policy, Pearson Education.
4. Nefson AG and Murrey WG. 1988. Agricultural Finance. Kalyani Publ.
5. Pandey f M. 1997. Financial Management. Vikas Publ. House.
6. Rais, A., 2012, Agriculture, Rural Banking and Micro Finance in India. New Century Publ.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Agri-Cultural Marketing Management
Course Code: 20IMG24GA4

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the types of markets and marketing.
CO2: understand grading and standardization of agricultural products.
CO3: understand and apply the knowledge about agricultural marketing in promotion and distribution of agricultural products.
CO4: understand and evaluate the knowledge of students in agricultural marketing, role of credit agencies in India.

UNIT - I
Agricultural marketing, agricultural marketing and economic development. Agricultural market structure, components and dynamics of market structure. Marketing strategy, formulation of marketing strategy. Agribusiness marketing environment, design of marketing mix, market segmentation and targeting. Determinants of consumer's behavior.

UNIT - II
Product management, product management process and decisions. New product development- significance and classification of new product. Stages and estimation of demand of new product, product life cycle. Pricing policies and practices for agribusiness - determinants of price, objectives of pricing policies and pricing methods.

UNIT - III
Logistics- concepts, factors affecting logistics, objectives of logistics management, activities of logistics function order, processing, packaging, transport management inventory, warehousing etc.

UNIT - IV
Promotional management, advertising, planning and execution. Sales promotion, grading and standardization. Distribution management- storage and warehousing, transportation. Management for agricultural products. Marketing agencies/intermediaries, roles and functions of marketing agencies.

Recommended Readings:

1. Kotler, P and Keller, Marketing Management, Pearson Education.
2. Acharya, S. S. and Agarwal, N.L. 2004. Agricultural Marketing in India. 4th Ed. Oxford and IBH.
3. Kohls, R. L and Uhl, J. N. 2005. Marketing of Agricultural Products. 9th Ed. Prentice Hall.
4. Krishnamacharyulu, C and Ramakrishan, L. 2002. Rural Marketing. Pearson Edu.
5. Ramaswamy, V. S and Nanakumari, S. 2002. Marketing Management. 2nd Ed. Mac Millan India.
6. Beri, G.C. Marketing Management, Tata McGraw Hill Publishing Company Ltd, New Delhi.
7. Saxena, R. 2002. Marketing Management. McGraw Hill.
8. Christopher, M. L. Logistics and Supply Chain management.
9. Gupta, S. L. 1999. Marketing Management
10. Mishra, M. N. 1999. Marketing Management.
11. Rajannair, N. 1999. Marketing Management.
12. Ramaswamy. V. S. 1999. Marketing Management.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

International Agri-Business Trade
Course Code: 20IMG24GA5

L-T-P
3-1-0

External Marks: 80
Sessional Marks: 20
Time Allowed: 3 Hours

Course Outcomes
After completing the course students would be able to:

CO1: understand the various facets of international business management in the field of agriculture trade.
CO2: understand various policies and practices of International agri-business Management.

UNIT - I
International trade – basic concepts, Importance of foreign trade for developing economy; absolute and comparative advantage, foreign trade of India. WTO and its implications for Indian economy in general and agriculture sector in particular.

UNIT - II
TRIPS, TRIMS quotas, anti-dumping duties, quantitative and qualitative restrictions, tariff and non-tariff measures, trade liberalization, subsidies, green and red boxes, issues for negotiations in future in WTO; Countervailing Duty Measures and carbon trade, SPS Agreement. Regional economic groupings.

UNIT - III
Composition of India's foreign trade policy; India's balance of payments; inter regional Vs international trade; tariffs and trade control; exchange rate; the foreign trade multiplier. Export promotion institutions with special emphasis on EPCs and commodity boards, MPEDA, APEDA and service institutes. Role of ECGC in insurance.

UNIT - IV
Foreign demand, supply side analysis, opportunity cost, trade and factor prices, implications for developing countries, export procedures and documentations. International marketing - market entry methods, international product planning, pricing, promotion, distribution, problems of exporters, legal dimensions of international marketing.

Recommended Readings:

1. Anant, K., Sundaram and Stewart, B. J., The International Business: Text and cases, Pearson Education.
2. Bhalla V. K., 1993, International Economy- Liberalization Process. Anmol, New Delhi.
3. Cherunilam, F., 2010, International Business- Text and Cases. PHI.
4. Economic Survey of India (various issues), Ministry of Finance, GOI.
5. Eiteman, D. K. and Stopnehill, A. L., 1986, Multinational Business Finance. Addition Wesley, New York.
6. Paul, J.,2013, International Business. PHI.
7. Subba Rao, P., 2008, International Business Text and Cases..HPH.
8. Woods, M., 2001, International Business. Palgrave.

Instructions for External Examiner:
The question paper shall be divided into two sections. Section A shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. Section B shall comprise 8 questions (2questions from each unit).The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

Department of Computer Science & Applications

NORMS FOR ADMISSION TO REGULAR MCA 2-YEAR PROGRAMME AS PER THE LATEST GUIDELINES OF AICTE 2020-21 With effect from the Session 2020-21

Eligibility for Admission to MCA 2-year Programme:

a) Passed BCA/B.Sc.(Hons.) Computer Science/ B.E. or B.Tech.(CSE/IT)/ B.Voc.(Software Development/IT) or an equivalent degree with having at least 50% marks (45% for SC/ST candidates of Haryana only) in aggregate.

Or

b) Passed B.Sc/ B.Com/ B.A with Mathematics at 10+2 level or at Graduation level with having at least 50% marks(45% for SC/ST candidates of Haryana only) in aggregate, along with the students admitted with this eligibility will have to simultaneously undertake additional ***Bridge Course** as prescribed by the University during the first semester.

Note: * It is compulsory for each student to pass out Bridge Course (three additional theory papers and one practical as prescribed in scheme of examination of Bridge Course) as per University norms during the 1st year of MCA-2 year course and the degree will be awarded after the completion of Bridge Course. However, these papers under Bridge Course will be taught only in the 1st semester of the course.

SCHEME OF EXAMINATIONS AND SYLLABUS
MASTER OF COMPUTER APPLICATIONS 2- YEAR REGULAR PROGRAMME
With effect from the Session 2020-21

Scheme of Examinations and Syllabus
for
Bridge Course to Regular MCA 2- year programme
With effect from the Session 2020-21

Programme Specific Outcomes:
The students upon completion of bridge course will be able to:

PSO1: To scale up the knowledge and understanding to be able to continue MCA 2-year programme.
PSO2: Apply knowledge of computing fundamentals for understanding problems that may be solved using computers.
PSO3: Analyze scenarios that require integrated solutions using one or more Programming Languages.
PSO4: Create basic computing skills to undertake more specialized courses offering emerging technologies with ease.
PSO5: Advance their career in the domain of computer science by acquiring higher order skills.

Course Code	Course Name	External Marks	Internal Marks	Total	Credits
20BCC11C1	Computer Fundamentals and Programming in C	80	20	100	4:0:0
20BCC11C2	C++ and Data Structures	80	20	100	4:0:0
20BCC11C3	Visual Basic & Database Systems	80	20	100	4:0:0
20BCC11CL1	Software Lab based on 20BCC11C1, 20BCC11C2 & 20BCC11C3	80	20	100	0:0:4
Total credits					16

Note: It is compulsory for each student to pass out Bridge Course (three additional theory papers and one software lab as prescribed in scheme of examination of Bridge Course) as per University norms during the 1st year of MCA-2 year course and the degree will be awarded after the completion of Bridge Course. However, these papers under Bridge Course will be taught only in the 1st semester of the course.

Scheme of Examinations and Syllabus
for
MCA 2- year programme
With effect from the Session 2020-21

Programme Specific Outcomes:

The students upon completion of Regular **MCA 2-year Programme** will be able:

PSO1 To apply knowledge of computing fundamentals, computing specialization and domain knowledge for the abstraction and conceptualization of computing models from defined problems and requirements.

PSO2 To have the ability to understand and analyze a given real-world problem and propose feasible computing solutions. Also analyze customer requirements, create high level design, implement and document robust and reliable software systems.

PSO3 To transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.

PSO4 To use the latest technologies like IoT, AI, Machine Learning, Big Data Analytics, Cyber Security and modern hardware and software tools necessary for innovative software solutions and to possess leadership and managerial skills with best professional ethical practices and social concern

PSO5 To master fundamental project management skills, concepts and techniques, set attainable objectives and ensure positive results, meeting scope, time and budget constraints

PSO6 To recognize the need for self-motivation to engage in lifelong learning, the social, professional, cultural and ethical issues involved in the use of computer technology and give them due consideration in developing software systems

PSO7 To assess the need for innovation and initiate the process through entrepreneurship or otherwise and to work collaboratively as a member or leader in multidisciplinary teams

PSO8 To select their career after acquiring necessary eligibility requirement and the skill-set.

MCA First Year
With effect from the Session 2021-22
Semester-I

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
20MCA21C1	Object Oriented Programming Using JAVA	80	20	100	4:0:0
20MCA21C2	Compiler Design	80	20	100	4:0:0
20MCA21C3	Computer Graphics & Multimedia	80	20	100	4:0:0
20MCA21C4	Digital Design & Computer Architecture	80	20	100	4:0:0
20MCA21C5	Advanced Data Structures Using C++/Java	80	20	100	4:0:0
20MCA21CL1	Software Lab -1 Based on 20MCA21C1, 20MCA21C2 & 20MCA21C3	100*	----	100	0:0:3
20MCA21CL2	Software Lab -2 Based on 20MCA21C4 & 20MCA21C5	100*	----	100	0:0:3
Total					**Credits 26**

Semester-II

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
20MCA22C1	Advanced Object Technology	80	20	100	4:0:0
20MCA22C2	Advanced Database Systems & Data Warehouse	80	20	100	4:0:0
20MCA22C3	Operating Systems & Shell Programming	80	20	100	4:0:0
	Elective-I				
20MCA22DA1/	i) Theory of Computation	80	20	100	4:0:0
20MCA22DA2/	ii) Computer Networks & Distributed Systems	80	20	100	4:0:0
20MCA22DA3/	iii) Web Technologies	80	20	100	4:0:0
	Elective-II				
20MCA22DB1/	i) Cloud Computing	80	20	100	4:0:0
20MCA22DB2/	ii) Software Engineering	80	20	100	4:0:0
20MCA22DB3/	iii) Advanced Computer Architecture & Quantum Computing	80	20	100	4:0:0
20MCA22CL1	Software Lab-3 Based on 20MCA22C1 & Elective I and/or II	100*	----	100	0:0:3
20MCA22CL2	Software Lab-4 Based on 20MCA22C2 & 20MCA22C3	100*	----	100	0:0:3
20MCA22C4	Industry Internship/ Project-I	100**	----	100	0:3:0
Total					**Credits 29**
	Foundation Elective (O)				
	To be chosen from the pool of Foundation Electives provided by the university.				**2**

Total Credits= 31 Credits

*20 marks out of 100 will be based on the attendance, evaluation/assessment of the candidate in Test(s) and Assignment(s) during the semester, which will be forwarded by the Head of Dept./Director to the Examiner(s). Further, both practical exams of a semester may be conducted on the same day in 2 sittings each maximum of 3 hours.

**20 marks out of 100 will be based on evaluation/assessment of the candidate by the internal supervisor.

MCA Second Year

With effect from the Session 2021-22

Semester-III

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
21MCA23C1	Data Mining & Big Data Analytics	80	20	100	4:0:0
21MCA23C2	Artificial Intelligence & Computational Intelligence	80	20	100	4:0:0
21MCA23C3	Android Mobile Application Development	80	20	100	4:0:0
	Elective-I				
21MCA23DA1/	i) Computer Vision	80	20	100	4:0:0
21MCA23DA2/	ii) Software Testing & Quality Assurance	80	20	100	4:0:0
21MCA23DA3/	iii) Mixed Reality & Wearable Computing	80	20	100	4:0:0
	Elective-II				
21MCA23DB1/	i) Network Programming	80	20	100	4:0:0
21MCA23DB2/	ii) Natural Language Processing & Speech Recognition	80	20	100	4:0:0
21MCA23DB3/	iii) Bioinformatics Computing	80	20	100	4:0:0
21MCA23CL1	Software Lab-5 Based on 21MCA23C1&21MCA23C3	100*	----	100	0:0:3
21MCA23CL2	Software Lab-6 Based on 21MCA23C2, Elective I & II	100*	----	100	0:0:3
Total					**Credits 26**
	Open Elective (O)				
	To be chosen from the pool of Open Electives provided by the University (excluding the open elective prepared by the Department of Comp Sc. & Appls.)				**3**

Total Credits= 29 Credits

*20 marks out of 100 will be based on the attendance, evaluation/assessment of the candidate in Test(s) and Assignment(s) during the semester, which will be forwarded by the Head of Dept./Director to the Examiner(s). Further, both practical exams of a semester may be conducted on the same day in 2 sittings each maximum of 3 hours.

Semester-IV

Paper Code	Course	External Marks	Internal Marks	Total Marks	Credits
21MCA24C1	Advanced Software Engineering	80	20	100	4:0:0
21MCA24C2	IoT & Sensor Networks	80	20	100	4:0:0
21MCA24C3	Web Development Using .NET Framework	80	20	100	4:0:0
	Elective-I				
21MCA24DA1/	i) Cyber Security & Blockchain Technology	80	20	100	4:0:0
21MCA24DA2/	ii) Edge and Fog Computing	80	20	100	4:0:0
21MCA24DA3/	iii)High Speed Networks	80	20	100	4:0:0
	Elective-II				
21MCA24DB1/	i) Machine Learning & Python Programming	80	20	100	4:0:0
21MCA24DB2/	ii) Web Development Using PHP	80	20	100	4:0:0
21MCA24DB3/	iii) Neural Networks & Deep Learning	80	20	100	4:0:0
21MCA24CL1	Software Lab-7 Based on 21MCA24C1, 21MCA24C2 & Elective-II	100*	----	100	0:0:3
21MCA24CL2	Software Lab-8 Based on 21MCA24C3 & Elective-I	100*	----	100	0:0:3
21MCA24C4	Industry Internship/ Project-II	100**	----	100	0:3:0
Total					**Credits 29**
	Grand Total of 2 Years' Credits				**Credits 115**

*20 marks out of 100 will be based on the attendance, evaluation/assessment of the candidate in Test(s) and Assignment(s) during the semester, which will be forwarded by the Head of Dept./Director to the Examiner(s). Further, both practical exams of a semester may be conducted on the same day in 2 sittings each maximum of 3 hours.

**20 marks out of 100 will be based on evaluation/assessment of the candidate by the Internal Supervisor.

Syllabus for Bridge Course (MCA 2-Year Programme)

20BCC11C1: COMPUTER FUNDAMENTALS AND PROGRAMMING IN C

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand computer basics and role of operating system.

CO2: Learn about concept of computer network, Internet and social impacts of IT.

CO3: Gain understanding of PC Software Tools – Word, Excel and Power-Point.

CO4: Design an algorithm and draw flowchart for simple problems.

CO5: Develop C programs implementing all features of C.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Computer Fundamentals: Concept of data and information, Historical evolution of computers, Block Diagram of Computer and working, Characteristics, Classification of Computers, Advantages and Limitations of Computer, Applications of Computer, I/O Devices, Memory and Storage Devices; **Computer Software:** System and Application Software.

Operating System: Characteristics, bootstrapping, types of Operating System, Operating System as resource manager. **Programming Languages**: Machine, Assembly, High Level Language, 4GL. Language Translator, System Utilities- Editor, Linker, Loader, File Manager.

Computer Network Concepts: Definition, Types of Network, Topology, Protocols, Intranet, Extranet, Internet, WWW, Search Engine, Web Browsers, Services of Internet. IT and Social Impacts of IT: Positive and Negative Impacts, Computer Crimes, Viruses and their remedial solutions.

UNIT-II

MS-Word: Introduction, Windows Interface, Customizing the Word Application, Document Views, Basic Formatting in MS Word, Advanced Formatting, Navigating through a Word Document, Performing a Mail Merge, A Quick Look at Macros, Printing Documents, Print Preview

MS-Excel: Introduction, Workbook, Worksheet, Formatting in excel, Advanced formatting in Excel, Working with formulas, Printing worksheets

MS-PowerPoint: Introduction, Creating a Presentation, Basic Formatting in PowerPoint, Advanced Formatting, Using Templates, Inserting charts, Inserting tables, Printing presentations.

UNIT-III

Problem Solving: Problem Identification, Analysis, Algorithms, Flowcharts, Pseudo codes, Decision Tables, Program Coding, Program Testing and Execution.

C Programming Fundamentals: Basic Concepts, Structure of a C program, Operators & Expressions; Library Functions, Decision making using if…else, Else If Ladder; Switch, break, Continue and Goto statements, Control Statements: Looping using while, do…while, for statements, Nested loops.

Arrays & Functions: Declaration and Initialization, Multidimensional Arrays, String: Operations of Strings, Functions: Defining & Accessing User defined functions, Function Prototype, Passing Arguments, Passing array as argument, Recursion, Use of Library Functions, Macro vs. Functions.

UNIT-IV

Pointers: Declarations, Operations on Pointers, Passing to a function, Pointers & Arrays, Array of Pointers, Array accessing through pointers, Pointer to functions, Function returning pointers, Dynamic Memory Allocations.

Structures and Union: Defining and Initializing Structure, Array within Structure, Array of Structure, Nesting of Structure, Pointer to Structure, Passing structure and its pointer to Functions, Unions: Introduction to Unions and its Utilities.

File Handling: Opening and closing file in C, Create, Read and Write data to a file, Modes of Files, Operations on file using C Library Functions, Working with Command Line Arguments, Program Debugging and types of errors.

Suggested Readings:

1. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
2. Kenneth. A.: C problem solving and programming, Prentice Hall.
3. Gottfried, B.: Theory and problems of Programming in C, Schaum Series.
4. Gill, Nasib Singh: Handbook of Computers, Khanna Books Publishing Co., New Delhi.
5. Sanders, D.: Computers Today, Tata McGraw-Hill.
6. Rajender Singh Chhillar: Application of IT to Business, Ramesh Publishers, Jaipur.
7. Cooper, Mullish: The spirit of C, An Introduction to Modern Programming, Jaico Publ. House, New Delhi.
8. Kernighan & Ritchie: The C Programming Language, PHI.
9. Gottfried, B.: Theory and problems of Programming in C, Schaum Series.
10. E. Balaguruswamy: Programming in C, Tata McGraw Hill.
11. H. Schildt: C-The Complete Reference, Tata McGraw Hill.
12. Y. Kanetkar: Let us C, BPB Publication
13. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20BCC11C2: C++ AND DATA STRUCTURES

Course Outcomes:
By the end of the course the students will be able to:
CO1: Understand concept of object oriented programming and its features.
CO2: Gain insights about C++ features and access specifiers.
CO3: Able to understand importance of polymorphism and inheritance.
CO4: Learn to analyze algorithms on basis of their performance.
CO5: Ability to use stack, queue and linked list data structures.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to OOP: Concept of OOP, Procedural vs. Object oriented programming, Characteristics of OOP: Objects, classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, and Message Passing.

C++ Programming: Data-types, Variables, Static Variables, Operators in C++, Arrays, Strings, Structure, Functions, Recursion, Control Statements.

Access Specifies: Private, Public and Protected, Member functions of the class, Constructor and Destructor, Parameterized Constructor, Copy Constructors.

UNIT-II

Inheritance: Reusability, Types of Inheritance: Single inheritance, Multiple, Multilevel, Hybrid Inheritance, Public, Private, and Protected Derivations.

Polymorphism: Function Overloading, Static Class Members, Static Member Functions, Friend Functions.

Operator Overloading: Unary and Binary Operator Overloading, Abstract class, Virtual function, pure virtual function, Overloading vs. Overriding.

Memory management: new, delete, object Creation at Run Time. **Exception handling:** Throwing, Catching, and Re-throwing an exception.

UNIT-III

Design and Analysis of Algorithm: Algorithm definition, comparison of algorithms. Top down and bottom up approaches to Algorithm design.

Introduction to Data Structures: Concept of Data Structure, Types of Data Structure: Primitive and non–primitive.

Arrays: Single and Multidimensional arrays. Address calculation using column and row major ordering. Various Operations on arrays. Applications of arrays.

Sorting: Selection sort, Insertion sort, Bubble sort, Quick sort, merge sort, Radix sort. Searching: Sequential and binary search, Indexed search, Hashing Schemes. Comparison of time complexity.

UNIT-IV

Stacks and Queues: Representation of stacks and queues using arrays and linked-list. Applications of stacks: Conversion from infix to postfix and prefix expressions, Evaluation of postfix expression using stacks.

Linked list: Singly linked list; operations on list, Linked stacks and queues. Polynomial representation and manipulation using linked lists. Circular linked lists, Doubly linked lists.

Applications of Stack, Queue and Linked List data structures.

Suggested Readings:

1. Herbert Schildt: C++ - The Complete Reference, Tata McGraw Hill Publications
2. E. Balaguruswamy: C++, Tata McGraw Hill Publications.
3. E. Balaguruswamy: Object Oriented Programming and C++, TMH.
4. Shah & Thakker: Programming in C++, ISTE/EXCEL.
5. Johnston: C++ Programming Today, PHI.
6. Olshevsky: Revolutionary Guide to Object Oriented Programming Using C++, SPD/WROX.
7. R.Rajaram: Object Oriented Programming and C++, New Age International.
8. Samanta: Object Oriented Programming with C++ & JAVA, PHI.
9. Subburaj: Object-Oriented Programming with C++, VIKAS Publishing House.
10. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20BCC11C3: VISUAL BASIC & DATABASE SYSTEMS

Course Outcomes:

By the end of the course the students will be able to:

CO1: Design, create, build, and debug Visual Basic applications & explore Visual Basic IDE.

CO2: Implement syntax rules of different constructs/components in Visual Basic programs & connectivity with database.

CO3: Understand the concepts of database & its models.

CO4: Comprehend the concept of relational model and different forms of Normalization.

CO5: Get the knowledge of Transaction Management and concurrency control.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to Visual Basic: VB IDE, An overview of VB project types, VB as event-driven & object-based language, Default Controls in Tool Box: Label Box, Text Box, Command Button, List Box, Combo Box, Picture & Image Box, Shape box, Timer, Option button, Check Box & Frames. Exploring Project Properties.

Programming with VB: Variables, Constants, Data types, Variable Scope, Arithmetic operations, String Operations, Built-in functions, I/O in VB, Branching & Looping statements, Procedures, Arrays, Collection.

UNIT-II

Working with Forms: Working with multiple forms; Loading, Showing and Hiding forms; Creating Forms at Run Time, Drag and Drop operation, MDI form, Arranging MDI Child Windows, Coordinating Data between MDI Child Forms.

Dialog Boxes and Menu: Using Common Dialog Box; Adding Menu, Modifying and Deleting Menu Items, Creating Submenus.

VB & Databases: The Data Controls and Data-Bound Controls; Using DAO, RDO, ADO.

UNIT –III

Database Management System: Introduction, Database System Applications, History of Database Systems, Database System Vs. File Processing System, View of Data, Data Abstraction, Instances and Schemas. DBMS Environment, Database languages, Database Models. **Database design and ER Model**: Physical, Conceptual and Logical Database design, ER Modelling, Conceptual design with ER Model

Relational Model: Introduction to the Relational Model, Integrity Constraint Over relations, Enforcing Integrity constraints, Querying relational data, View: Introduction to Views, Destroying / altering Views. **Relational Algebra and Calculus:** Relational Algebra & its operations, Relational calculus & its types, Power of Algebra and calculus.

Lab Problem(s): ***Creation and Querying relational data with SQL***

UNIT-IV

Normalization: Schema Refinement, Problems caused by redundancy, Decomposition & its properties; Normalization: FIRST, SECOND, THIRD Normal forms, BCNF, Multivalued Dependencies, Join Dependencies.

Transaction Management & Concurrency Control: ACID properties, Transactions and Schedules, Concurrent execution of transaction, Serializability and Recoverability, Lock based Concurrency control, Lock Management, Lock Conversion, Dealing with deadlocks, Concurrency without Locking

Suggested Readings:

1. Steven Holzner: Visual Basic 6 Programming: Black Book,Dreamtech PRESS.
2. EvangelosPetroutsos: Mastering Visual Baisc 6,BPB.
3. Julia Case Bradley & Anita C.:Millspaugh Programming in Visual Basic 6.0,Tata McGraw-Hill.
4. Michael Halvorson,:Step by Step Microsoft Visual Basic 6.0 Professional,PHI.
5. Scott Warner:Teach Yourself Visual basic 6, Tata McGraw-Hill Edition.
6. Elmasri & Navathe:Fundamentals of Database Systems,5th edition, Pearson Education.
7. Thomas Connolly, Carolyn Begg: Database Systems, Pearson Education.
8. C. J. Date: An Introduction to Database Systems, 8th edition, Addison Wesley N. Delhi.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20BCC11CL1: Software Lab

(Based on 20BCC11C1, 20BCC11C2 & 20BCC11C3)

Course Outcomes:

By the end of the course the students will be able to:

CO1: To gain understanding of PC Software Tools – Word, Excel and Power-Point etc..

CO2: To understand the concepts of algorithm, flowchart and C language and Develop C programs implementing all features of C.

CO3: To understand the concept of object oriented programming and implementation of features using C++ language.

CO4: To implement different data structures and Learn to analyze algorithms on basis of their performance.

CO5: To design, create, build, and debug Visual Basic applications & to learn creation and querying relational data using SQL.

SYLLABUS FOR MCA 2-YEAR PROGRAMME

MCA FIRST YEAR

20MCA21C1: OBJECT ORIENTED PROGRAMMING USING JAVA

Course Outcomes:
By the end of the course the students will be able to:
CO1: Use the characteristics of Java language in a program. Use variables and data types in program development.

CO2: Identify and implement arrays, String and Selection Statements.

CO3: Write Java programs using object-oriented programming techniques including classes, objects, methods, instance variables, interface.

CO4: Design and implementation programs of Exception handling, Packages.

CO5: Design and implementation programs of Multithreading Programming, Window based programs.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction: Genesis and Evolution of Java Language, Internet & Java, Byte-code, its Features, Java Program Structure and Java's Class Library, Data Types, Variables, and Operators, Operator Precedence; Selection Statements, Scope of Variable, Iterative Statement; Defining Classes & Methods, Creating Objects of a Class, Defining and Using a Class, Automatic Garbage Collection.

Arrays and Strings: Arrays, Arrays of Characters, String Handling Using String Class, Operations on String Handling Using, String Buffer Class.

UNIT-II

Classes and Inheritance: Using Existing Classes, Class Inheritance, Choosing Base Class, Multiple Levels of Inheritance, Abstraction through Abstract Classes, Using Final Modifier.

Packages: Understanding Packages, Defining a Package, Packaging up Your Classes, Adding Classes from a Package to Your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages.

Interface Fundamentals: Creating an Interface, Implementing an Interface, Using Interface References, Implementing Multiple Interfaces, Constants in Interfaces, Interfaces can be extended, Nested Interfaces, Final Thoughts on Interfaces.

UNIT-III

Exception Handling: The concept of Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions.

Multithreading Programming: The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities, Synchronization.

Input/Output in Java: I/O Basic, Byte and Character Structures, I/O Classes, Reading Console Input Writing Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File, Stream Benefits.

UNIT-IV

Applets in Java: Applet Basics, Applet Architecture, Applet Life Cycle, Simple Applet Display Methods, The HTML APPLET Tag Passing Parameters to Applets.

Working with Windows: AWT Classes, Window Fundamentals, Working with Frame, Creating a Frame Window in an Applet; Displaying Information within a Window.

Working with Graphics and Text: Working with Graphics, Working with Color, Setting the Paint Mode, Working with Fonts, Managing Text Output; Using Font Metrics, Exploring Text and Graphics, Working with AWT Controls, Layout Managers and Menus.

Suggested Readings:

1. The Complete Reference JAVA, TMH Publication.
2. Beginning JAVA, Ivor Horton, WROX Public.
3. JAVA 2 UNLEASHED, Tech Media Publications.
4. JAVA 2(1.3) API Documentations.
5. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA21C2: COMPILER DESIGN

Course Outcomes:

By the end of the course the students will be able to:

CO1: Elaborate concepts compilation process and apply in various fields of computer languages.

CO2: Explain the lexical and syntactical analysis phase of compilation.

CO3: Solve theoretical problems related to parsers and develop parsers.

CO4: Evaluate codes for generation of intermediate code and apply possible code optimizations.

CO5: Design and develop system programs as well as for compilers for varying needs.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Evolution of Systems Programming: Introduction to System programs, Overview of Assemblers, Loaders, Linkers, Macros, Compilers. **System Software Tools:** Variety of software tools, Text editors, Interpreters and program generators, Debug Monitor, System Programming environment.

Loader Schemes: Compile and Go Loader, general loader schemes, Absolute Loader, Subroutine linkage, Reallocating Loader, Direct Linkage Loader, Binders, Linking loader, overlays.

UNIT-II

Compiler: Phases of Compiler, Compiler writing tools, Lexical Analysis, Finite Automata, Regular Expression, From a Regular expression to an NFA, NFA to DFA, Design of Lexical Analyzer. Syntax Analyzer, CFG, Role of the Parser, CFG, Top Down Parsing, Recursive Descent parsing, predictive Parsers, Bottom up Parsing, Shift reduce, Operator Precedence parsers, LR Parsers.

UNIT-III

Intermediate Code: Syntax directed definitions, Evaluation Orders of Syntax directed definitions; Intermediate Languages: Intermediate code generation, Syntax trees, Construction of Syntax trees, Three Address Code, Types and Declarations, Translation of Expressions, Type Checking, Postfix form. Symbol table: Contents of Symbol table, Data Structures for Symbol table; Runtime Storage Administration.

UNIT-IV

Code Optimization and Code Generation: Principal sources of optimization, loop optimization, DAG - Optimization of Basic Blocks, Global Data Flow Analysis – Efficient Data Flow Algorithm. Code Generation: Issues in code generation, Design of a simple Code Generator, Register allocation and Assignment, Peephole optimization.

System & Compiler programming: Developing system programs using C for basic OS commands apart from developing programs for lexical analysis, token counts, symbol table generator, memory storage requirement evaluator for identifiers for one or multiple declarative statements.

Suggested Readings:

1. Donovan: Systems Programming, Tata McGraw Hill.
2. Dhamdhere: System Software, Tata McGraw Hill.
3. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman: Compilers Principles, Techniques and Tools, Addison Wesley.
4. Alfred V.Aho and Jeffrey D.Ullman: Principles of Compiler Design, Addison Wesley.
5. William M. Waite, Gerhard Goos: Compiler Construction.
6. Joseph Rodrix: Compiler Design With C/C++, Kindle Book, ASIN: B0727Q9NBK.
7. Torben Ægidius Mogensen: Basics of Compiler Design, ISBN 978-87-993154-0-6.
8. Bergmann, Seth D.: Compiler Design: Theory, Tools, and Examples.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA21C3: COMPUTER GRAPHICS & MULITMEDIA

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand basic of computer graphics, display devices and graphics standards.

CO2: Learn about graphics primitives and their importance.

CO3: Understand 2D transformations and representation of 3D objects.

CO4: Learn about 3D transformations, hidden surfaces and color models.

CO5: Understand about multimedia authoring and create a multimedia project using Flash/Blender multimedia software.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Basics of Computer Graphics: Computer Graphics, Classification, Applications of computer graphics, Display devices, Random and Raster scan systems, Graphics input devices, Graphics software and standards.

Graphics Primitives: Points, lines, circles and ellipses as primitives, scan conversion algorithms for primitives, Fill area primitives including scan-line polygon filling, inside-outside test, boundary and flood-fill, character generation, line attributes, area-fill attributes, character attributers.

UNIT-II

2D Transformation and Viewing: Transformations (translation, rotation, scaling), matrix representation, homogeneous coordinates, composite transformations, reflection and shearing, viewing pipeline and coordinates system, window-to-viewport transformation, clipping including point clipping, line clipping (Cohen-Sutherland, Liang- Bersky, NLN), polygon clipping.

3D Concepts and Object Representation: 3D display methods, polygon surfaces, tables, equations, meshes, curved lies and surfaces, quadric surfaces, spline representation, cubic spline interpolation methods, Bazier curves and surfaces, B-spline curves and surfaces.

UNIT-III

3D Transformation and Viewing: 3D scaling, rotation and translation, composite transformation, viewing pipeline and coordinates, parallel and perspective transformation, view volume and general (parallel and perspective) projection transformations. **Modelling:** Wireframe and Solid.

Hidden Surfaces: Visible surface detection concepts, Back-face detection, Depth Buffer method, Illumination, Light sources, Illumination methods (ambient, diffuse reflection, specular reflection). **Color models:** properties of light, XYZ, RGB, YIQ and CMY color models. **Shading:** Flat, Gouraud and Phong.

UNIT-IV

Multimedia Basics: Concepts of Multimedia, Multimedia applications, Multimedia system architecture, Evolving technologies for multimedia, Defining objects for multimedia systems, Multimedia data interface standards, Multimedia databases. **Compression and decompression:** Data and file format standards, Multimedia I/O technologies, Digital voice and audio, Video image and animation, Full motion video, Storage and retrieval technologies.

Multimedia Authoring: Concept of Multimedia Authoring, Hypermedia messaging, Mobile messaging, Hypermedia message component, Creating hypermedia message, Integrated multimedia message standards, Integrated document management, Distributed multimedia systems.

Case Study (FLASH/ BLENDER): Drawing Basic Shapes, Modeling, Shading & Textures, Creating a multimedia project.

Suggested Readings:

1. Donald Hearn and M.Pauline Baker: Computer Graphics, PHI Publications
2. Plastock : Theory & Problem of Computer Graphics, Schaum Series.
3. Foley & Van Dam: Fundamentals of Interactive Computer Graphics, Addison-Wesley.
4. Newman : Principles of Interactive Computer Graphics, McGraw Hill.
5. Tosijasu, L.K. : Computer Graphics, Springer-Verlag.
6. S Gokul: Multimedia Magic, BPB Publication.
7. Bufford: Multimedia Systems, Addison Wesley.
8. Jeffcoate : Multimedia in Practice, Prentice-Hall.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA21C4: DIGITAL DESIGN & COMPUTER ARCHITECTURE

Course Outcomes:

By the end of the course the students will be able to:

CO1: Implement digital functions in the form a digital logic and perform binary arithmetic operations

CO2: Identify and implement commonly used sequential and combinational circuits

CO3: Basic computer design and developing 8086/8088 A/L programs for small applications

CO4: Implement CPU design and Input/Output organization

CO5: Understand advanced computer architectural aspects and parallel designs

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Number System: Binary, Octal, Hexadecimal and Decimal, 1's and 2's Complements, Inter-conversion of numbers. Codes: Weighted and Non-weighted codes, BCD Codes, Gray codes, Self-complementing codes, Error-Detecting/Correcting codes, Alphanumeric Codes, Hamming Codes, Floating Point Numbers. Binary Arithmetic: Binary Addition and Subtraction, 2's Complement Arithmetic, Booth Coding, Binary Multiplication.

Logic Design: Logic Gates, Truth Tables, Boolean Algebra, Boolean Expressions-Variables and Literals, Boolean Expressions–Equivalent and Complement, Theorems of Boolean Algebra, Simplification Techniques, SOPs & POSs Boolean Expressions.

UNIT-II

Combinational Circuits: Combinational Logic, Arithmetic Circuits– Adder and Subtractor, BCD Adder, Code Converters, Magnitude Comparator, Parity Generators/Checkers, Multiplexers, Demultiplexers, Decoders, Encoders.

Sequential Circuits: Latches, R S Flip Flop, Level Triggered and Edge Triggered Flip Flops, JK Flip-Flop, Master-Slave Flip Flops, T Flip-Flop, D Flip-Flops.

Registers and Counters: Controlled Buffer Registers, Shift Registers, Applications of Shift-registers; Ripple Counter, Synchronous Counter, Modulus Counter, Binary Ripple Counters, Up/Down Counters, Decade and BCD Counters.

UNIT-III

Basic Computer Design: Computer Instructions and types, Instruction Set, Instruction Cycle, Instruction Formats, Addressing Modes, Computer Registers, Bus System, Register Transfer Language terminology.

Programming in 8086/8088 Assembly Language: A/L program structure, segments, registers, instructions, macros, A/L directives.

CPU Design: CPU Registers, Micro-operations and its types, Design of ALU. Control Unit Design- Microprograms, Control Unit of a basic computer–Timing and Control; Hardwired and Micro-programmed controlled unit. Architectures -RISC, CISC, Scalar, Superscalar and pipelined architectures.

UNIT-IV

Input/Output Organization: Peripheral Devices, Input-output Interface, Asynchronous Data Transfer, Mode of Transfer, Priority Interrupt, Direct Memory Access, Input-output Processor, Serial Communication.

Advance Architecture: Introduction to parallel processing– Pipelining, Parallel Computer structures, Architectural classification. Pipelining & Vector processing; Instruction and Arithmetic pipelines, Principles of designing pipelined processors, Structures for array processors: SIMD Array processor, SIMD Interconnection networks. Parallel Processing Applications.

Suggested Readings:

1. Mano,M.M.:Digital Logic and Computer Design, Prentice-Hall of India.
2. Gill Nasib Singh and Dixit J.B: Digital Design and Computer Organisation, University Science Press (Laxmi Publications),New Delhi.
3. Stallings,William: Computer Organisation &Architecture.
4. Mano,M.M.:Digital Design, Prentice-Hall of India.
5. Anand Kumar:Fundamentals of Digital Circuits, PHI.
6. Kai Hwang: Advanced Computer Architecture, McGraw Hill International
7. Mano,M.M.:Computer System Architecture, Prentice-Hall of India.
8. Tokheim:Digital Electronics, TMH.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

20MCA21C5: ADVANCED DATA STRUCTURES USING C++/JAVA

Course Outcomes:

By the end of the course the students will be able to:

CO1: To learn about analyzing and designing algorithms to solve a problem and learn to find the asymptotic efficiency of an algorithm.

CO2: To study about binary tree and its applications.

CO3: To learn advanced data structures such as balanced search trees and heap hash operations.

CO4: To learn about graphs & its algorithms such as

CO5: To study various graph processing algorithms and Algorithm Design techniques

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-1

The Role of Algorithms in computing: Analyzing Algorithms, Time and Space Analysis of Algorithms, Big-Oh and Theta Notations, Average, Best and Worst case analysis. Designing Algorithms, Growth of functions. Asymptotic Notations, Divide and Conquer, Recurrences, Maximum sub-array problem, Stressan's Method, Substitution method, Recurrence tree method, The Master method, Floors and Ceilings.

UNIT-II

Trees : Binary tree traversal methods: Pre-order, In-order, Post-ordered traversal. Recursive Algorithms. Traversal methods. Representation of trees and its applications: Binary tree representation of a general tree. Conversion of forest into tree. Threaded binary trees. Binary search tree: Height balanced (AVL) tree, B-trees, Splay tree. Heap: Heap operations, Binomial heaps, Fibonacci heaps, Skew heaps, heap set.

UNIT-III

Graphs & Algorithms: Representation, Type of Graphs, Paths and Circuits: Euler Graphs, Hamiltonian Paths & Circuits; Cut-sets, Connectivity and Separability, Planar Graphs, Isomorphism, Graph Coloring, Covering and Partitioning, , Depth-and breadth-first traversals, Minimum Spanning Tree: Prim's and Kruskal's algorithms, Shortest-path Algorithms: Dijkstra's and Floyd's algorithm, Topological sort, Maxflow: Ford-Fulkerson algorithm, max flow –min cut.

UNIT-IV

Dynamic Programming: Backtracking Algorithms, Design Methodologies, Travelling salesperson problem, 0/1 Knapsack problem, multistage graphs, All Pair Shortest Path, 8-Queens problem Advanced String Matching Algorithms: Naïve string matching algorithm, Robin-Karp algorithm, string matching with finite automata, Knuth-Morris-Pratt algorithm.

P, NP and Approximation Algorithms: Basic Concepts, Non Deterministic algorithms, NP

Complete and NP-hard classes, NP complete Problems.

Implementation of above mentioned data structures & algorithms through C++/Java programming.

Suggested Readings

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest: Introduction to Algorithms, PHI Learning Pvt. Ltd.
2. Gilles Brassard, Paul Bratley: Fundamentals of Algorithms, PHI Learning Pvt. Ltd, 2011.
3. Hubbard JR: Schaum's Outline of Data Structures with C++, Tata McGraw Hills, New Delhi.
4. R. Sedgewick: Algorithms in C++, Pearson Education Asia.
5. Y.Langsam, M.J.Augenstein and A.M.Tanenbaum: Data Structures Using C and C++, Prentice Hall of India.
6. R.Kruse, C.L.Tonodo and B.Leung: Data Structures and Program Design in C, Pearson Education. New Delhi
7. G.L. Heileman: Data Structutes: Algorithms and Object Oriented Programming, Tata McGraw Hill, New Delhi
8. E. Horowitz, Sahni and D. Mehta: Fundamentals of Data Structures in C++, Galgotia Publication, New Delhi.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

20MCA21CL1: Software Lab -1
(Based on 20MCA21C1,20MCA21C2 & 20MCA21C3)

Course Outcomes:

By the end of the course the students will be able to:

CO1: To learn the concepts of JAVA and implementation of features in real-life applications.

CO2: To understand the concepts of handling of exceptions, Multithreading and Window based Programming using JAVA.

CO3: To analyze lexical and analysis phases of compilation and design & development of system program for varying needs

CO4: To implement graphical primitive algorithms, clipping algorithms and to apply graphical transformations.

CO5: To implement animation graphics with motion and to draw real-time behavior of objects like digital/analog clock, etc.

20MCA21CL2: Software Lab -2
(Based on 20MCA21C4 & 20MCA21C5)

Course Outcomes:

By the end of the course the students will be able to:

CO1: To understand general syntax, semantics and programming models of 8086/8088 assembly language.

CO2: To understand the general structure and deal with different input & output functions, interrupts and services in context of assembly language.

CO3: To attain better understanding of analysis and design of algorithms to solve variety of problems.

CO4: To understand different kinds of data structures and implement advanced data structures using C++/JAVA languages.

CO5: To implement operations on various advanced data structures & to analyze various graph processing algorithms and Algorithm Design techniques

SEMESTER-II

20MCA22C1: ADVANCED OBJECT TECHNOLOGY

Course Outcomes:

By the end of the course the students will be able to:

CO1: Explain the use of DHTML and XML in data exchange.

CO2: Analyze and use various AWT controls and event handling for development of a Applet.

CO3: Use of Swing components for the web application development.

CO4: Develop applications using Servlets, parameter passing and concept of session maintenance.

CO5: Design and develop basic JSP applications.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script. XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Review of Applets, Class, Event Handling, AWT Programming.

UNIT-II

Introduction to Swing, Differences between AWT Controls & Swing Controls, JApplet, Swing Button: JButton, JToggleButton, CheckBoxes, Radio Button, JComboBox, Text Boxes etc., Icons, Labels, JTabbed Pains, JScroll Pains, JList, JTrees, JTables Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Developing a Home page using Applet & Swing.

UNIT-III

Introduction to Servlets: Lifecycle of a Servlet, The Servlet API, The javax. Servlet Package, Reading Servlet parameters, Reading Initialization parameters; The javax.servlet HTTP package, Handling Http Request & Responses, Security Issues Introduction to JSP, Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

UNIT-IV

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing

Session and Application Data – Memory Usage Considerations Introduction to struts framework, RMI, CGI programming.

Suggested Readings:

1. Dietel and Nieto: Internet and World Wide Web – How to program?, PHI/Pearson Education Asia.
2. Patrick Naughton and Herbert Schildt: The Complete Reference Java, Tata McGraw-Hill.
3. Hans Bergstan: Java Server Pages.
4. Bill Siggelkow, S P D O'Reilly: Jakarta Struts, Cookbook.
5. Murach: Murach's beginning JAVA JDK 5, SPD.
6. Wang-Thomson: An Introduction to Web Design and Programming.
7. Knuckles: Web Applications Technologies Concepts- John Wiley.
8. Sebesta: Programming world wide web, Pearson.
9. Building Web Applications-NIIT,PHI.
10. Bai/Ekedaw-Thomas: Web Warrior Guide to Web Programmming.
11. Jon Duckett: Beginning Web Programming, WROX.
12. Pekowsky, Java Server Pages, Pearson.
13. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA22C2: ADVANCED DATABASE SYSTEMS & DATAWAREHOUSE

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand the difference between ER and EER model.

CO2: Understand the concepts of OODBMS and ORDBMS.

CO3: Know about parallel and distributed database and Client-Server architecture.

CO4: Understand Emerging database based on the types of data.

CO5: Know about the concepts of data warehouse, its types, architecture and schema.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to Advance Database Systems: Overview of advance database systems, their importance and Applications; **EER Model -**The ER model revisited, EER model: Super classes, Subclasses, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Category.

Object Model: Overview of Object-Oriented concepts, Object identity, Object structure, Type constructors, Encapsulation of operations, Methods, and Persistence, Type hierarchies and Inheritance, Complex objects, Schema design for OODBMS, OQL, Persistent Programming language, OODBMS architectures and storage issues, Transaction and concurrency control.

Object Relational Database and Information Retrieval: Database design for an ORDBMS – Nested relations and collections; Storage and access methods, Query processing and Optimization, Advance Querying: User define data types, manipulating objects table, object views; Information Retrieval & ways to retrieve information.

UNIT - II

Parallel Database: Architectures for parallel databases, Inter and Intra Query parallelism, Inter and Intra Query operations, Parallelizing individual operations, Sorting, Joins, Pipelining.

Distributed Database: Architectures for Distributed Database, Data Fragmentation, Replication, and Allocation Techniques for Distributed Database Design, Query processing in Distributed Databases; Concurrency Control and Recovery in Distributed Databases.

Overview of Client Server Architectures: Centralized and Client-Server architectures, Server architectures.

UNIT-III

Enhanced Data Models for Advanced Applications: Active database- syntax and semantics (DB2, Oracle), applications, design principles for active rules, Temporal database

concepts, Spatial databases, Deductive databases.

Emerging Database Technologies: Mobile databases, Multimedia Databases, Geographic Information systems (GIS); XML and Internet Databases: Structured, Semi-structured and Unstructured Data, Introduction to web databases and XML, Structure of XML data.

UNIT – IV

Data Warehouse and OLAP Technology: Need for data warehouse, Definition, Goals of data Warehouse, Challenges faced during Warehouse Construction, Advantages, Types of Warehouse: Data Mart, Virtual Warehouse and Enterprise Warehouse; Components of Warehouse: Fact data, Dimension data, Fact table and Dimension table, Designing fact tables; Pre-requisite Phases: Extract, Transform and load process; Warehouse Schema: star, snowflake and galaxy schemas; OLTP vs OLAP, Strengths of OLAP, Applications of OLAP.

Multidimensional data models: Data Cubes & Data Cuboids, Lattice; OLAP operations: Advantages, Types: Roll up, Drill down, Pivot, Slice & Dice operations, Applications; OLAP Server: Need, Types: ROLAP, MOLAP and HOLAP, Features; Data Warehouse Implementation, Introduction to Efficient computation of data cubes.

Suggested Readings:

1. Elmasri and Navathe: Fundamentals of Database Systems, Pearson Education.
2. Korth, Silberchatz, Sudarshan: Database System Concepts, McGraw-Hill.
3. Raghu Ramakrishnan, Johannes Gehrke: Database Management Systems, McGraw-Hill
4. Peter Rob and Coronel: Database Systems, Design, Implementation and Management, Thomson Learning.
5. C.J.Date, Longman: Introduction to Database Systems, Pearson Education Thomas Connolly, Carolyn Begg: Database Systems, Pearson Education
6. W.H.Inmon: Building Data Ware House, John Wiley & Sons.
7. S . Anahory and D.Murray: Data warehousing, Pearson Education, ASIA.
8. Jiawei Han & Micheline Kamber: Data Mining - Concepts & Techniques: Harcourt India PVT Ltd. (Morgan Kaufmann Publishers).
9. Michall Corey, M.Abbey, I Azramson & Ben Taub: Oracle 8i Building Data Ware Housing, TMH.
10. A.K. Pujari: Data Mining Techniques, University Press.
11. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA22C3: OPERATING SYSTEMS & SHELL PROGRAMMING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand basic concepts of Operating Systems and their structure.
CO2: Learn about concept of processes and process scheduling.
CO3 Understand about interprocess communication and role of semaphores.
CO4: Learn in detail about Deadlock, memory management and I/O management.
CO5: Understand Linux basics and Shell programming.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Operating System Basics: Evolution, Objectives & Functions, Characteristics; Classification of Operating Systems, OS Services, System Calls, OS Structures, Concept of Virtual Machine.

Process Concepts: Definition, Process Relationship, Process states, Process State transitions, Process Control Block ,Context switching – Threads – Concept of multithreads , Benefits of threads – Types of threads.

Process Scheduling: Definition, Scheduling objectives, Types of Schedulers, Scheduling criteria. **Scheduling Algorithms:** Preemptive and Non-preemptive, FCFS–SJF–RR, **Multiprocessor scheduling:** Types, Performance evaluation of the scheduling.

UNIT-II

Interprocess Communication: Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem.

Deadlocks - System Model, Deadlock Principles, Deadlock Characterization, Methods for Handling Deadlocks Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

UNIT-III

Memory Management: Basic Memory Management, Logical and Physical address map, Memory allocation, Fragmentation and Compaction, Paging and its disadvantages, Virtual Memory, Locality of reference, Page Fault, Working Set , Demand paging concept, Page Replacement policies.

Input/Output Management: I/O devices, Device controllers , Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage Structure: Disk structure, Disk scheduling algorithms.

File Management: File concept, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods.

UNIT-IV

Linux Basics: Genesis of Linux, Architecture of Linux, Features of Linux, Introduction to vi editor, Linux commands. Linux Shells: Role, Types- Bourne Shell (sh), C Shell (csh), Korn Shell (ksh), Bourne Again Shell (bash).

Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text Processing utilities and backup utilities.

Shell programming (With bash): Introduction, shell responsibilities, pipes and Redirection, Running a shell scripts, The shell as a programming language, Shell meta characters, File name substitution, Shell variables, Command substitution, Shell commands, The environment, Quoting, Test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

Suggested Readings:

1. Silberschatz & Galvin: Operating System Concept, Wiley.
2. Milan Milenkovic: Operating Systems, Tata McGraw – Hill.
3. William Stallings: Operating Systems, PHI.
4. Yashawant Kanetkar: Unix Shell Programming, BPB.
5. Behrouz A. Forouzan, Richard F. Gilberg: Unix and shell Programming, Thomson
6. A.S. Tanenbaum: Modern Operating Systems, Pearson/PHI.
7. Dhamdhere: Operating Systems, Tata McGraw Hill.
8. Robert Love: Linux System Programming, O'Reilly, SPD.
9. Jason Cannon: Linux For Beginners,
10. William Shotts: T he Linux Command Line : A Complete Introduction.
11. Daniel J. Barrett: Linux Pocket Guide : Essential Commands
12. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

20MCA22DA1: THEORY OF COMPUTATION

Course Outcomes:

By the end of the course the students will be able to:

CO1: Analyze and design finite automata, formal languages, and grammars.
CO2: Understand the basic concepts of DFA and NDFA.
CO3: Construct context free grammar for various languages.
CO4: Understand Turning Machine and recursive language.
CO5: Gain understanding about tractable and non-tractable problems.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Review of Mathematical Terms and Theory: Basic Mathematical Notations And Set Theory, Logic Functions And Relations, Language Definitions, Mathematical Inductions and Recursive Definitions.

Finite Automata: Introduction, Alphabets, Strings and Languages, Kleen-closure; Deterministic Finite Automata (DFA) and Nondeterministic Finite Automata (NFA) -Formal definition, simpler notations (state transition diagram, transition table), Regular and Non-Regular Languages, Equivalence of NDFA & DFA, NDFA to DFA conversion, DFA minimization using Myhill-Nerode Theorem, Applications of Finite Automata, Finite automata with output (Moore and Mealy machines) and inter-conversion.

UNIT-II

Context Free Grammar: Introduction to CFG, CFG and Known Languages, Unions Concatenations and *'S Notations and CFL, Derivations of Trees and Ambiguity, Unambiguous CFG and Algebraic Expressions, Normal Forms and Simplified Forms.

Formal Grammar: Definition, Chomsky hierarchy of grammars, Construction of Context free, derivation, parse tree, ambiguity in grammars, Removal of null and unit production, Normal forms- CNF & GNF.

Pushdown Automata: Introduction to PDA, Types of PDA, Designing of PDA, CFG Corresponding to PDA, Introduction to CFL, Intersections and Complements of CFL, Decisions Problems and CFL, Equivalence of Pushdown Automata and CFL, Pumping Lemma for CFL, Applications.

UNIT-III

Turing Machines: Model of Computation and Church Turning Thesis, Definition of Turing Machine, Tm and Language Acceptors, Variations of Tm, Non- Deterministic Tm, Universal Tm, Tm & computers.

Recursive Language: Introduction, Enumerable and Language, Recursive and Non Recursive Enumerable, their properties.

PCP: Introduction to undecidability, undecidable problems about TMs, Post correspondence problem (PCP), Modified PCP.

UNIT-IV

Computation Functions, Measuring, Classifications and Complexity: Primitive Recursive Functions, Halting Problem, Recursive Predicates and Some Bounded Operations, Unbounded Minimizations and μ-Recursive Functions, Godel Numbering, Computable Functions and μ-Recursive, Numerical Functions.

Tractable and Intractable Problems: Growth Rate and Functions, Time and Speed Complexity, Complexity Classes, Tractable and Possibly Intractable Problems, P And NP Completeness, Reduction Of Time, Cook's Theorem, NP-Complete Problems.

Suggested Readings:

1. John C. Martin: Introduction to Language and theory of Computation, Mcgraw Hill.
2. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman: Introduction to Automata Theory Languages and Computation, Pearson Education
3. K. L. P Mishra, N. Chandrashekaran: Theory of Computer Science-Automata Languages and Computation, Prentice Hall of India, India.
4. K.Krithivasan and R.Rama: Introduction to Formal Languages, Automata Theory and Computation; Pearson Education.
5. Harry R. Lewis and Christos H. Papadimitriou: Elements of the Theory of Computation, Second Edition, Prentice-Hall of India Pvt. Ltd
6. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA22DA2: COMPUTER NETWORKS & DISTRIBUTED SYSTEMS

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand basic concepts data communication and computer networks.
CO2: Gain understanding about OSI model and TCP/IP.
CO3: Develop understanding about working of different layers of TCP/IP and OSI model.
CO4: Understand about concept Distributed Systems and Synchronization.
CO5: Learn about replication management, fault tolerance and security in Distributed Systems.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Data Communication: Introduction to data communication; analog and digital signals; asynchronous and synchronous transmission; data encoding and modulation techniques, broadband and base band transmission, multiplexing, transmission medium.

Network Classification: Wired Network, Wireless Network, Internetworking Devices.

Network Reference Models: Layered architectures, protocol hierarchies, interface and services: ISO- OSI reference model, TCP/IP reference model; internet protocol stacks.

UNIT-II

Data Link Layer Functions and Protocols: Framing, error-control, flow-control; sliding window protocol; HDLC, Error detection and correction, Data link layer of internet.

Medium Access Sub-layer: CSMA/CD protocol, IEEE standards for LAN and MAN, X.25, frame relay, Narrowband and Broadband ISDN, Asynchronous Transfer Modes.

Network Functions & Protocols: Switching mechanism and its various types, routing and congestion control, Internetworking-TCP/IP, IP Packet, IP address, IPv6

Transport Layer: Design issues, Connection management (UDP, TCP and their Frame Format); **Application Layer:** File Transfer, Access and Management, E-Mail, Virtual Terminal, Public Network.

UNIT-III

Introduction to Distributed Systems: Introduction, Design Goals, Types of Distributed systems, System Architecture and Fundamental models, Middleware, Threads, Virtualization, Client-server model, multiple servers, proxy servers and caches, peer processes, code migration.

Communication Fundamentals: Basic concepts, Remote Procedure Call, Message Oriented Communication, Stream Oriented Communication, Multicast Communication**.**

Synchronization: Clock synchronization, Logical clocks, Mutual exclusion algorithms: centralized, decentralized, distributed and token ring algorithms, election algorithms.

UNIT-IV

Replication Management: Need for replication, Consistency models, Consistency protocols, Replica management.

Fault Tolerance: Basic concepts and failure models, Process resilience, Reliable client-server and group communication, Distributed commit recovery mechanisms.

Security in Distributed Systems: Secure channels, Access control, Security management, Cryptographic algorithms; Digital signatures; certificates, firewalls.

Naming: Flat naming, Structured naming, Name space and Resolution, Attribute- based naming, Directory services, LDAP, Decentralized implementations.

Case Studies: Needham-Schroeder, Kerberos, SSL.

Suggested Readings:

1. A.S. Tanenbaum: Computer Networks, Prentice-Hall of India.
2. W. Tomasi: Introduction to Data Communications and Networking, Pearson Education.
3. P.C. Gupta: Data Communications and Computer Networks, Prentice-Hall of India.
4. Behrouz Forouzan and S.C. Fegan: Data Communications and Networking, McGraw Hill.
5. L. L. Peterson and B. S. Davie: Computer Networks: A Systems Approach, Morgan Kaufmann.
6. William Stallings: Data and Computer Communications, Pearson Education.
7. George Coulouris, Jean Dollimore, Tim Kindberg: Distributed Systems-Concepts and Design, Pearson Education
8. Andrew S. Tanenbaum, Marten Van Steen: Distributed Systems-Principles & Paradigms, Pearson Education.
9. A. D. Kshemkalyani and M. Singhal: Distributed Algorithms: Principles, Algorithms, and Systems.
10. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA22DA3: WEB TECHNOLOGIES

Course Outcomes:
By the end of the course the students will be able to:
CO1: Understand web concepts and Markup Languages.
CO2: Learn client-side and server-side programming.
CO3: Learn to represent web data and XML document handling.
CO4: Understand AJAX and relevance.
CO5: Learn about web services and their development.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Web Essentials: Clients, Servers, and Communication. Basic Internet Protocols, W3C, HTTP, Web Clients & Web Servers.

Markup languages-XHTML: Introduction to HTML, basics of XTHML, HTML elements, HTML tags, lists, tables, frames, forms, defining XHTML's abstract syntax, defining HTML documents.
CSS style sheets: Introduction, CSS core syntax, text properties, CSS box model, normal flow box layout, other properties like list, tables, DHTML, XML, XML documents & vocabulary, XML versions & declarations, Introduction to WML.

UNIT-II

Client-Side Programming: The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

Host Objects: Browsers and the Document Object Model (DOM), Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window.

Server-Side Programming: Concept of server-side programming, Java Servlets revisited-Architecture -Overview-A Servlet-Generating Dynamic Content-Life Cycle- Parameter Data-Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency- Databases and Java Servlets.

UNIT-III

Separating Programming and Presentation: JSP Technology revisited - JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm-Databases and JSP. Representing Web Data: XML-Documents and Vocabularies-Versions and Declaration-Namespaces- DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents-Selecting XML Data: XPATH-Template based Transformations: XSLT-Displaying XML Documents in Browsers.

UNIT-IV

AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods.

Web Services: JAX-RPC-Concepts-Writing a Java Web Service-Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-Communicating Object Data: SOAP Related Technologies-Software Installation-Storing Java Objects as Files.

Suggested Readings:

1. Jackson: Web Technologies: A Computer Science Perspective, Pearson Education India.
2. Roger S Pressman, David Lowe: Web Engineering: A Practitioner's Approach, TMH.
3. Achyut Godbole,Atul Kahate: Web Technologies, McGraw-Hill Education.
4. Uttam K Roy: Web Technologies, Oxford University Press.
5. Chris Bates: Web Programming, Wiley.
6. Gertel Keppel, Birgit Proll, Siegfried Reich, Werner R.: Web Engineering, John Wiley& Sons Inc.
7. Berner's LEE, Godel and Turing: Thinking on the Web, John Wiley & Sons Inc.
8. Paul S.Wang Sanda S. Katila: An Introduction to Web Design Plus Programming, Thomson.
9. Robert W.Sebesta: Programming the World Wide Web, Third Edition, Pearson Education.
10. Thomas A.Powell: The Complete Reference HTML & XHTML, Fourth Edition, Tata McGraw Hill.
11. Abders Moller and Michael Schwartzbach: An Introduction to XML and Web Technologies, Addison Wesley.
12. Joel Sklar: Principles of Web Design, Thomson.
13. Joel Sklar: Web Design, Cengage Learning
14. Web Technologies: Black Book, Dreamtech Press
15. Raj Kamal: Internet and Web Technologies, Tata McGraw Hill.
16. Ralph Moseley and M. T. Savaliya: Developing Web Applications, Wiley-India.
17. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA22DB1: CLOUD COMPUTING

Course Outcomes:
By the end of the course the students will be able to:
CO1: Understand the various cloud computing service models.
CO2: To use various Cloud Services.
CO3: Perform service management in cloud computing.
CO4: Understand various security concepts in cloud computing.
CO5: Understand cloud functionality on the basis of various case-studies.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Cloud Computing Fundamentals: Definition of Cloud Computing: Defining a cloud, Evolution of Cloud Computing cloud types-NIST model, cloud cube model, Deployment models, Service models, Cloud Reference model, Characteristics of Cloud, Cloud Computing Benefits and Limitations, Cloud Architecture: Introduction on Infrastructure, platforms, virtual appliances, communication protocols; Cloud computing vs. Cluster computing vs. Grid computing; Applications: Technologies and Process required when deploying Web services; Deploying a web service from inside and Outside of a Cloud. Services and Applications by Types: IaaS, PaaS, SaaS, IDaaS, and CaaS.

UNIT II

Virtualization: Objectives, Benefits of Virtualization, Emulation, Virtualization for Enterprise, VMware, Server Virtualization, Data Storage Virtualization, Load balancing and Virtualization, Improving Performance through Load Balancing, Hypervisors, Machine Imaging, Porting of applications in the cloud. Concept of Software-Defined Networking (**SDN**), Network-Function Virtualization (**NFV**) and Virtual Network Functions (**VNF**).

Use of Platforms in Cloud Computing: Concepts of Platform as a Service, Use of PaaS application frameworks; Use of Google, Amazon and Microsoft Web Services. Cloud vendors and Service Management: Amazon cloud, AWS Overview, Installation of AWS, Google app engine, Azure cloud, Salesforce.

UNIT - III

Cloud Management: Features of Network management system, Monitoring of an entire cloud computing deployment stack, lifecycle management of cloud services(six stages of lifecycle)

Service Management in Cloud Computing: Service Oriented Architecture: concepts of message-based transactions, Protocol stack for an SOA architecture, Event driven SOA, Enterprise Service bus, Service Catalogs, Service Level Agreements (SLAs), Managing Data: Looking at Data, Scalability & Cloud Services, Database & Data Stores in Cloud , Large Scale Data Processing.

UNIT - IV

Cloud Security Concepts: Cloud security challenges, Cloud security approaches: encryption, tokenization/ obfuscation, cloud security alliance standards, cloud security models and related patterns, Cloud security in mainstream vendor solutions, Mainstream Cloud security offerings: security assessment, secure Cloud architecture design, Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Security Mapping, Identity Management.

Case Study on Open Source & Commercial Clouds: Eucalyptus, Microsoft Azure, Amazon EC2.

Suggested Readings:

1. Cloud Computing : A Practical Approach by Anthony T. Velte Toby J. Velte, Robert Elsenpeter, The McGraw-Hill.
2. Cloud Computing: SaaS, PaaS, IaaS, Virtualization and more. by Dr. Kris Jamsa.
3. Tim Mather, SubraKumaraswamy, ShahedLatif: Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, O'ReillyMedia Inc.
4. Cloud Computing Bible, Barrie Sosinsky, Wiley-India.
5. Jason Venner,Pro: Hadoop,Apress.
6. Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley.
7. Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012.
8. Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley-India.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

20MCA22DB2: SOFTWARE ENGINEERING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand basic concept of Software Engineering and the phases in a software project.

CO2: Comprehend fundamental concepts of requirements engineering and SRS document.

CO3: Know about software design process and design methodologies.

CO4: Learn various software testing level and software project management activities.

CO5: Learn software maintenance types and software configuration management activities.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction: Software and its Characteristics, Evolving Role of Software, Software Product, Software Processes, Software Crisis, 'Software Engineering' Evolution, Principles of Software Engineering, Programming-in-the-small vs. Programming-in-the-large, Software Components, Software Engineering Processes.

Software Life Cycle (SLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models, Object Oriented Models and other latest Models.

Software Requirements: Functional and Non-Functional, User requirements, System requirements. Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management.

UNIT-II

Software Design: Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Flow Charts, Coupling and Cohesion Measures; **Design Strategies:** Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design, User Interface Design, Programming practices and Coding standards.

Software Testing: Introduction, Verification vs. Validation, Software Reliability, Levels of Testing, Structural Testing (White Box Testing), Functional Testing (Black Box Testing).

UNIT-III

Software Quality: Attributes, Software Quality Assurance – plans & activities; Software Documentation.

Software Project Management: Project Management activities, Project Estimation, Project planning, Project scheduling.

Software Risk Management: Reactive versus Proactive Risk Strategies, Risk management activities; Software Risks (Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation), Risks Monitoring and Management.

Software Measurement and Metrics: Process Metrics, Project metrics, Estimation – LOC, Halstead's Software Science, Function Point (FP), Cyclomatic Complexity Measures; Software Project Estimation Models- Empirical, Putnam, COCOMO I & II.

UNIT-IV

Software Maintenance: Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance; Software Re- Engineering, Reverse Engineering, Software Documentation.

Software Configuration Management: SCM Activities, Change Control Process, Software Version Control; Software Reuse, Software Evolution.

CASE Computer Aided Software Engineering (CASE), CASE Tools.

Suggested Readings:

1. Rogers Pressman: Software Engineering, TMH.
2. Gill, Nasib Singh: Software Engineering, Khanna Book Publishing Co.(P) Ltd, New Delhi
3. Jalote, Pankaj: An Integrated Approach to Software Engineering, Narosa Publications.
4. Chhillar Rajender Singh: Software Engineering: Testing, Faults, Metrics, Excel Books, New Delhi.
5. Ghezzi, Carlo: Fundaments of Software Engineering, PHI.
6. Fairley, R.E.: Software Engineering Concepts, McGraw-Hill.
7. Lewis, T.G.: Software Engineering, McGraw-Hill..
8. Shere: Software Engineering & Management, Prentice Hall.
9. Deutsch, Willis: Software Quality Engineering: A Total Technical and Management Approach, Prentice Hall.
10. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA22DB3: ADVANCED COMPUTER ARCHITECTURE & QUANTUM COMPUTING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand the principles of computer architecture, parallel computers and performance aspects.

CO2: Understand the program flow mechanisms, interconnect architectures and memory hierarchy design.

CO3: Understand multiprocessor and multicomputer architectures.

CO4: Comprehend concept of quantum computing and its essence.

CO5: Understand quantum search algorithms and quantum computing applications.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Evolution of Computer Architecture: Introduction of computer architecture, Elements of Modern Computers, Evolution of Computer Architectures, Classification of parallel computers, System attributes to performance.

Program and Network Properties: Conditions of Parallelism - data and resource dependences, Bernstein's conditions, hardware and software parallelism. Program Flow Mechanisms - control flow versus data flow, data flow architecture, demand driven mechanisms, comparison of flow mechanisms.

UNIT – II

System Interconnect Architectures: Network properties and routing, Static connection Networks –Linear Array, Ring & Chordal Ring, Barrel Shifter, Fat Tree, Mesh & Torus, Systolic Arrays, Hypercubes; Dynamic connection Networks – Digital Buses, Switch modules, MINs, Omega-, Baseline-, Crossbar-Network.

Memory Hierarchy Design: Memory hierarchy, Inclusion, coherence & locality; memory capacity planning; Virtual Memory technology – Models, TLB, Paging and Segmentation; Cache Memory Organization - Cache basics & cache performance, cache addressing models & mapping, multilevel cache hierarchies, interleaved memory.

UNIT – III

Multiprocessor and Multicomputer Architectures: Multiprocessor System Interconnects – Hierarchical bus systems, Crossbar Switch and Multiport memory, Multistage and Combining networks; Symmetric shared memory architectures, distributed shared memory architectures, Cache coherence problem, Snoopy cache coherence protocol, directory-based protocols; Multicomputer Generations, Message passing mechanisms – message routing schemes, deadlock and virtual channels, flow control strategies, multicast routing algorithms.

UNIT – IV

Overview of Quantum Computing: Qubits, quantum gates, Hilbert spaces, Dirac's notation, Quantum Superposition and Entanglement, Classical computing vs. Quantum computing, Postulates of quantum mechanics, Quantum circuits, quantum parallelism, Quantum circuits, universal gates, Quantum Fourier transform, Shor's factoring algorithm, order finding and periodicity, Grover's quantum search algorithm, Quantum error correcting codes, Quantum cryptography, Applications of Quantum Computing.

Suggested Readings:

1. Kai Hwang & Naresh Jotwani: Advanced Computer Architecture; McGraw-Hill.
2. Kai Hwang: Advanced computer architecture; TMH.
3. D.Sima, T.Fountain, P.Kasuk: Advanced Computer Architecture-A Design space Approach, Addison Wesley.
4. M.J Flynn: Computer Architecture, Pipelined and Parallel Processor Design; Narosa Publishing.
5. D. A. Patterson and J. L. Hennessey: Computer organization and design, Morgan Kaufmann
6. J.P.Hayes: Computer Architecture and Organization, MGH.
7. Harvey G. Cragon: Memory System and Pipelined processors, Narosa Publication.
8. V.Rajaraman & C.S.R.Murthy: Parallel computer: Architecture & Programming, PHI.
9. Carl Hamacher, Zvonko Vranesic, Safwat Zaky: Computer Organization, 5th Edition, MGH.
10. Kai Hwang and Zu: Scalable Parallel computing, MGH.
11. P. Kaye, R. Laflamme, and M. Mosca: An Introduction to Quantum Computing. Oxford.
12. M. A. Nielsen and I. L. Chuang: Quantum Computation and Quantum Information, Cambridge University Press.
13. N.David: Quantum Computer Science: An Introduction.
14. Riley Tipton Perry: Quantum Computing from the Ground Up, World Scientific Publishing Ltd.
15. Scott Aaronson: Quantum Computing since Democritus, Cambridge.
16. P. Kok, B. Lovett: Introduction to Optical Quantum Information Processing, Cambridge.
17. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

20MCA22CL1: Software Lab -3
(Based on 20MCA22C1 & Elective I and/or II)

Course Outcomes:

By the end of the course the students will be able to:

CO1: Use of DHTML and XML in data exchange, use of various AWT controls & event handling for development of Applets.

CO2: Use of Swing components for the web application development.

CO3: Application development using Servlets and develop basic JSP applications.

CO4: To construct context free grammar for various languages and to get understanding about tractable and non-tractable problems/ Learn about replication management, fault tolerance and security in Distributed Systems/ Understand web concepts and Markup languages, Learn client-side and server-side programming and development of web application using web services.

CO5: To attain good understanding about clouds and its types/ use of CASE tools/ computer architecture and quantum computing.

20MCA22CL2: Software Lab -4
(Based on 20MCA22C2 & 20MCA22C3)

Course Outcomes:

By the end of the course the students will be able to:

CO1: To implement the concepts of advance databases using SQL and MySQL.

CO2: To create and execute trigger, cursor and procedure using PL/SQL.

CO3: To understand the Linux environment for working in Multiuser and Multitasking environment.

CO4: To learn about working in different types of shells available in Linux environment.

CO5: To work with different utilities provided by Linux environment: Process, System, File and Security for performing shell programming.

Industry Internship/Project-I
Paper Code: 20MCA22C4

Max Marks: 100

- **Industry Internship/Project** will be assigned to each student before the commencement of MCA 1st semester examinations and each student will be required to carry out Industry Internship/Project during summer break and the successive MCA 2nd semester, and the student will free to showcase his/her innovation/creativity in developing a software solution/App to meet out live/realistic requirement(s) using any type of software development tools/ languages/ technologies in view of the ongoing Software Industry trends.

- Each student will be assigned a Faculty Member as Supervisor for Industry Internship/Project by Head of the Department/Director/Principal.

- Each supervisor will be guiding/supervising/mentoring/supporting as well as tracking the progress of the student on the assigned **Industry Internship/Project.**

- Each student will be required to submit required number of Industry Internship/Project Report to the Department/Institute/College as stipulated by the University.

MCA SECOND YEAR
SEMESTER-III

21MCA23C1: DATA MINING & BIG DATA ANALYTICS

Course Outcomes:
By the end of the course the students will be able to:
CO1: Understand Data Mining Systems and Pattern Analysis.
CO2: Understand Classification and Clustering techniques.
CO3: Identify Big Data and relevance of Big Data Analytics.
CO4: Understand Map Reduce and its features.
CO5: Understand Hadoop and Hadoop Eco-System.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Data Mining Concepts: Introduction to Data Mining Systems, Knowledge Discovery Process, Data Mining Techniques, Issues, Applications, Data Objects and Attribute types, Statistical description of data; Data Pre-processing – Cleaning, Integration, Reduction, Transformation and Discretization; Data Visualization, Data similarity and dissimilarity measures.

Frequent Pattern Analysis: Mining Frequent Patterns, Associations and Correlations; Mining Methods- Pattern Evaluation Method, Pattern Mining in Multilevel; Multi-Dimensional Space – Constraint Based Frequent Pattern Mining; Classification using Frequent Patterns.

UNIT-II

Classification and Clustering: Decision Tree Induction, Bayesian Classification, Rule Based Classification, Classification by Back Propagation, Support Vector Machines, Lazy Learners, Model Evaluation and Selection, Techniques to improve Classification Accuracy. Clustering Techniques: Cluster analysis, Partitioning Methods - Hierarchical Methods, Density Based Methods, Grid Based Methods; Evaluation of clustering, Clustering high dimensional data, Clustering with constraints, Outlier analysis-outlier detection methods.

WEKA Tool: Introduction to Datasets, WEKA sample Datasets, Data Mining Using WEKA tool.

UNIT-III

Overview of Big Data and Hadoop: Types of Digital Data, Overview of Big Data, Challenges of Big Data, Modern Data Analytic Tools, Big Data Analytics and Applications;

Overview and History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Environment.

HDFS: Concepts of Hadoop Data File System, Design of HDFS, Command Line Interface, Hadoop file system interfaces, Data flow; Hadoop I/O: Compression and Serialization.

UNIT - IV

Map Reduce: Introduction, Map Reduce Features, How Map Reduce Works, Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats.

Hadoop Eco System: Pig - Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases. Hive: Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions. Hbase: HBasics, Concepts, Clients, Example, Hbase Versus RDBMS. Big SQL: Introduction.

Data Analytics with R: Introduction of R and Big R, Collaborative Filtering, Big Data Analyticswith Big R.

Suggested Readings:

1. Jiawei Han & Micheline Kamber: Data Mining - Concepts & Techniques, Harcourt India PVT Ltd. (Morgan Kaufmann Publishers).
2. I.H. Whiffen: Data Mining, Practical Machine Learning tools & techniques with Java (Morgan Kanffmen)
3. A.K. Pujari: Data Mining Techniques, University Press.
4. Pieter Adriaans Dolf Zant inge: Data Mining, Addition Wesley.
5. David Hand, Heikki Mannila, and Padhraic Smyth: Principles of Data Mining, PHI Publication.
6. Michael Berthold, David J. Hand: Intelligent Data Analysis, Springer.
7. Tom White: Hadoop- The Definitive Guide, Third Edition, O'reilly Media.
8. Seema Acharya, Subhasini Chellappan: Big Data Analytics, Wiley.
9. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos: Understanding BigData: Analytics for Enterprise Class Hadoop and Streaming Data, Mc Graw Hill publishing.
10. Anand Rajaraman and Jeffrey David Ullman: Mining of Massive Datasets, Cambridge University Press.
11. Bill Franks: Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streamswith Advanced Analytics, John Wiley &Sons.
12. Glenn J. Myatt: Making Sense of Data, John Wiley & Sons.
13. Pete Warden: Big Data Glossary, O'Reilly.
14. Zikopoulos, Paul, Chris Eaton: Understanding Big Data- Analytics for Enterprise Class Hadoop and Streaming Data, Tata McGraw Hill Publications.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA23C2: ARTIFICIAL INTELLIGENCE & COMPUTATIONAL INTELLIGENCE

Course Outcomes:

By the end of the course the students will be able to:

CO1: Learn the concept of Artificial intelligence, problem solving and searching process.
CO2: Understand the concept of Expert system with its architecture and life cycle.
CO3: Understand the concepts of knowledge, Knowledge acquisition and various levels and schemes for knowledge representation.
CO4: Learn the concepts of computational intelligence evolutionary computation and neural networks.
CO5: Handle the uncertainty in knowledge using fuzzy logic and understand concepts of fuzzy logic.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to Artificial Intelligence: Definition, history and applications of AI; Problem solving: Defining the problem as state space search, Production System, Problem characteristics; Search techniques: Brute Force and Heuristic Search.

Expert System: Definition, role of knowledge, architecture and life cycle of Expert System.

UNIT-II

Knowledge &Its Representation: Types of knowledge, Knowledge acquisition and its techniques, Knowledge engineering, Cognitive behavior; Knowledge representation: Level of representation; Knowledge representation schemes: Formal logic, Inference Engine, Semantic net, Frame, Scripts.

Perception: Sensing, Speech recognition, Vision, Action.

UNIT-III

Computational Intelligence: Introduction to Computational Intelligence, Biological and Artificial Neural **N**etwork (ANN), artificial neural network models; learning in artificial neural networks; neural network and its applications.

Evolutionary Computation: Fundamentals of evolutionary computation, Design and Analysis of Genetic Algorithms, Evolutionary Strategies, comparison of GA and traditional search methods. Genetic Operators and Parameters, Genetic Algorithms in Problem Solving; Optimization: Particle Swarm Optimization, Ant Colony Optimization, Artificial Immune Systems; Other Algorithms: Harmony Search, Honey-Bee Optimization, Memetic Algorithms, Co-Evolution, Multi-Objective Optimization, Tabu Search, Constraint Handling.

UNIT-IV

Fuzzy Systems: Crisp sets, Fuzzy sets: Basic types and concepts, characteristics and significance of paradigm shift, Representation of fuzzy sets, Operations, membership functions, Classical relations and fuzzy relations, fuzzyfication, defuzzyfication, fuzzy reasoning, fuzzy inference systems, fuzzy control system, fuzzy clustering, applications of fuzzy systems. Neuro-fuzzy systems, neuro-fuzzy modeling; neuro-fuzzy control.

Applications: Pattern Recognition, Image Processing, Biological Sequence Alignment and Drug Design, Robotics and Sensors, Information Retrieval Systems, Share Market Analysis, Natural Language Processing.

Suggested Readings:

1. Rich Elaine and Knight Kevin : Artificial Intelligence, Tata McGraw Hill .
2. M. Mitchell: An Introduction to Genetic Algorithms, Prentice-Hall.
3. J.S.R.Jang, C.T.Sun and E.Mizutani: Neuro-Fuzzy and Soft Computing, PHI, Pearson Education.
4. Timothy J.Ross: Fuzzy Logic with Engineering Applications, McGraw-Hill.
5. Davis E.Goldberg: Genetic Algorithms: Search, Optimization and Machine Learning, Addison Wesley.
6. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA23C3: ANDROID MOBILE APPLICATION DEVELOPMENT

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand concepts of android application development process

CO2: Analyze algorithms for use in MVC model of development

CO3: Handle databases in Android applications.

CO4: Synthesize location and mapping related user interfaces in android applications.

CO5: Understand Playing and Recording of Audio and Video in application.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction: Mobile Applications, Characteristics and Benefits, Application Model, Infrastructure and Managing Resources, Mobile Software Engineering, Frameworks and Tools, Mobile devices Profiles.

Application Design: Memory Management, Design patterns for limited memory, Work flow for Application Development, Techniques for composing Applications, Dynamic Linking, Plug-ins and rules of thumb for using DLLs, Concurrency and Resource Management.

UNIT-II

Google Android: Introduction, JDK & ADK, Android Application Architecture, Traditional Programming Model and Android, Activities, Intents, Tasks, Services.

Android Framework: GUI and MVC Architecture, Fragments and Multi-platform development, Creating Widgets: Layouts, Shadows, Gradients; Applications with multiple screens.

Development: Intents and Services, Storing and Retrieving data, Graphics and Multimedia, Telephony, Location based services, Packaging and Deployment.

UNIT-III

Android Applications: Working with Android, Various life cycles for applications, Building an User Interface: Blank UI, Folding and Unfolding a scalable UI, Making Activity, Fragment, Multiple layouts; Content Provider, Location and Mapping: location based services, Mapping, Google Maps activity, Working with Map View and Map Activity; Sensors and Near Field Communication; Native libraries and headers, Building client server applications.

UNIT-IV

Using Google Maps, GPS and Wi-Fi Integration, Android Notification, Audio manager, Bluetooth; Camera and Sensor integration, Sending SMS, Phone Calls. Runtime Environment for Applications, Callbacks and Override in application, Concurrency, Serialization, Application Signing, API keys for Google Maps, Publishing Android Application; Introduction to Flutter, Android features, UI, implementation.

Suggested Readings:

1. Zigurd Mednieks, Laird Dornin, G, BlakeMeike and Masumi Nakamura: Programming Android, O'Reilly Publications.
2. Wei-Meng Lee: Beginning iPhone SDK Programming with Objective-C, Wiley India Ltd.
3. James C.S: Android Application development, CENGAGE Learning.
4. Gargenta M., Nakamura M.: Learning Android, O'Reilly Publications.
5. Reto Meier: Professional Android 2 Application Development, WROX Publication-Wiley-India.
6. James Edward: J2ME: The Complete Reference, James Edward – Publication.
7. Chris Haseman: Android Essentials, Apress Publication.
8. Mark L Murphy: Beginning Android - Wiley India Pvt Ltd.
9. Sayed Y Hashimi and Satya Komatineni: Pro Android – Wiley India Pvt Ltd.
10. Lauren Darcey, Shane Conder: Android Wireless Application Development, 2nd edition –Pearson Education.
11. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA23DA1: COMPUTER VISION

Course Outcomes:

By the end of the course the students will be able to:

CO1: Implement fundamental image processing techniques required for computer vision.

CO2: Perform shape analysis and implement boundary tracking techniques.

CO3: Apply Hough Transform for line, circle, and ellipse detections.

CO4: Apply 3D vision techniques and implement motion related techniques.

CO5: Develop applications using computer vision techniques.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Image Processing Foundations: Review of image processing techniques – classical filtering operations – thresholding techniques – edge detection techniques – corner and interest point detection – mathematical morphology – texture.

Shapes and Regions: Binary shape analysis – connectedness – object labeling and counting – size filtering – distance functions – skeletons and thinning – deformable shape analysis – boundary tracking procedures – active contours – shape models and shape recognition – centroidal profiles – handling occlusion – boundary length measures – boundary descriptors – chain codes – Fourier descriptors – region descriptors – moments.

UNIT - II

Hough Transform: Line detection – Hough Transform (HT) for line detection – foot-of-normal method – line localization – line fitting – RANSAC for straight line detection – HT based circular object detection – accurate center location – speed problem – ellipse detection – Case study: Human Iris location – hole detection – Generalized Hough Transform (GHT) – spatial matched filtering – GHT for ellipse detection – object location – GHT for feature collation.

UNIT - III

3D Vision and Motion: Methods for 3D vision – projection schemes – shape from shading – photometric stereo – shape from texture – shape from focus – active range finding – surface representations – point-based representation – volumetric representations – 3D object recognition – 3D reconstruction – introduction to motion – triangulation – bundle adjustment – translational alignment – parametric motion – spline-based motion – optical flow – layered motion.

UNIT - IV

Applications: Application: Photo album – Face detection – Face recognition – Eigen faces – Active appearance and 3D shape models of faces; Application: Surveillance – foreground-

background separation – particle filters – Chamfer matching, tracking, and occlusion – combining views from multiple cameras – human gait analysis; Application: In-vehicle vision system: locating roadway – road markings – identifying road signs – locating pedestrians.

Suggested Readings:

1. D. L. Baggio et al.: Mastering OpenCV with Practical Computer Vision Projects‖, Packt Publishing.
2. E. R. Davies: Computer & Machine Vision‖, Fourth Edition, Academic Press.
3. Jan Erik Solem: Programming Computer Vision with Python: Tools and algorithms for analyzing images, O'Reilly Media.
4. Mark Nixon and Alberto S. Aquado: Feature Extraction & Image Processing for Computer Vision‖, Third Edition, Academic Press.
5. R. Szeliski: Computer Vision: Algorithms and Applications‖, Springer.
6. Simon J. D. Prince: Computer Vision: Models, Learning, and Inference‖, Cambridge University Press.
7. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA23DA2: SOFTWARE TESTING & QUALITY ASSURANCE

Course Outcomes:

By the end of the course the students will be able to:

CO1: Knowledge of various Software Testing techniques.

CO2: Apply Software Testing Strategies and Metrics for Software testing.

CO3: Implement Object Oriented Testing strategies.

CO4: Use of Software Quality Assurance.

CO5: Implement Quality management standards and methods.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Testing Strategy and Environment: Minimizing Risks, Writing a Policy for Software Testing, Economics of Testing, Testing-an organizational issue, Management Support for Software Testing, Building a Structured Approach to Software Testing, Developing a Test Strategy Building Software Testing Process: Software Testing Guidelines, workbench concept, Customizing the Software Testing Process, Process Preparation checklist - Software Testing Techniques: Dynamic Testing – Black Box testing techniques, White Box testing techniques, Static testing, Validation Activities, Regression testing.

UNIT-II

Software Testing Strategies: Approach, Issues; integration, incremental, System, alpha, Beta testing etc; Comparative evaluation of techniques: Testing tools; Dynamic analysis tools, test data generators, Debuggers, test drivers etc.

Technical Metrics for Software: Quality Factors, framework; Metrics for analysis, design, testing source code.

UNIT-III

Object Oriented Testing: Introduction to Object Oriented testing, Path Testing, State Based Testing, Class Testing, Testing Web Applications: Web testing, Functional Testing, User interface Testing, Usability Testing, Configuration and Compatibility Testing, Security Testing, Performance Testing, Database testing, Post Deployment Testing.

Rational Rose Software: Introduction, Features, Various types of software testing using Rational Rose.

UNIT-IV

Software Quality Assurance and Standards: Software Quality, Software QualityChallenges, Software Quality factors. Software Quality Assurance: concept, components, importance and essence; FTR, structured walk through technique etc. Software Quality Management Standards, Management and its role in Software Quality Assurance, Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI.

Suggested Readings:

1. Meyers, G.: The art of Software Testing, Wiley-Inter-Science.
2. Deutsch, Willis: Software Quality Engineering: A Total Technical and Management Approach, Prentice Hall.
3. Pressman : Software Engineering, TMH.
4. Gill, Nasib Singh: Software Engineering : Reliability, Testing and Quality Assurance, Khanna Book Publishing Co.(P) Ltd, N. Delhi
5. Ghazzi, Carlo: Fundaments of Software Engineering, PHI.
6. Chhillar Rajender Singh: Software Engineering: Testing, Faults, Metrics, Excel Books, New Delhi.
7. Jalote, Pankaj: An Integrated Approach to Software Engineering, Narosa Publications.
8. Doug Bell, Ian Murrey, John Pugh: Software Engineering-A Programming Approach, Prentice Hall.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and good books may be added from time to time.

21MCA23DA3: MIXED REALITY & WEARABLE COMPUTING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Knowledge of wearable computing

CO2: Understanding of various devices used in wearable computing

CO3: Understand the hardware and software requirements of wearable computing

CO4: Understand the cybernetics and humanistic intelligence

CO5: Knowledge of Internet of Everything

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction: History, Creative Coding Platforms, Open Source Platforms, PIC, Arduino, Sketch, Raspberry Pi, Iterative coding methodology. Python Programming - Mobile phones and similar devices, Arm Devices, Basic Electronics (circuit theory, measurements, parts identification)

Sensors and Software: Understanding Processing Code Structure, variables and flow control, Interfacing to the Real World.

UNIT-II

Software &Hardware Frameworks: Software-Open Frameworks as our IDE (C/C++) - Arduino Language (C/C++), Hardware- Desktop / Laptop / Raspberry Pi - How to approach a programming problem? Representing "reality" with computers. Digital vs. Analog circuits, audio, communication, etc. Analog to Digital Conversion (ADC) - Digital to Analog Conversion (DAC)– Microcontrollers - Communication – Serial & Parallel - Hardware to Hardware Communication - I2C/IIC (Inter-Integrated Circuit) - SPI (Serial Peripheral Interface) – Serial UART Communication.

UNIT-III

Cybernetics and Humanistic Intelligence Wearables: Augmented Reality – Mixed Reality. AR versus VR - IoT and Wearables: Smart Cites and Wearable Computing as a form of urban design - Advanced I/O – open Frameworks: Live Network feeds (push and pull) - Data persistence (saving data and preferences) - Database interface (MySQL, SQLite, XML, PHP/Web) - Arduino: Wired/Wireless Networking (hardware vs. USB proxy) - Software serial (RS-232).

UNIT-IV

Internet of Everything: Humanistic Intelligence; Wearable Computing and IoT (Internet of Things), Overview of Mobile and Wearable Computing, Augmented Reality, and Internet of Things. The fundamental axes of the Wearables + IoT + AR space - Free-roaming AR:

Wearable Computing, Wireless, Sensing, and Meta sensing with light bulbs Phenomenal Augmented Reality: Real world physical phenomena as the fundamental basis of mobile and wearable AR.

Suggested Readings :

1. Woodrow Barfield : Fundamentals of Wearable Computers and Augmented Reality, Second Edition.
2. Omesh Tickoo, Ravi Iyer : Making Sense of Sensors: End-to-End Algorithms and Infrastructure Design.
3. Josha Noble : Programming Interactivity, Second Edition.
4. Raspberry Pi: Getting Started with Python, second edition, 2016
5. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and good books may be added from time to time.

21MCA23DB1: NETWORK PROGRAMMING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand TCP/IP and Network Architecture.

CO2: Creating sockets and socket implementation.

CO3: Windows Socket API and their programming.

CO4: Web programming and implementing security.

CO5: Performing client side programming and server side programming.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT- I

Introduction: Overview of UNIX OS, Environment of a UNIX process, Process control, Process relationships Signals, Interprocess Communication, Overview of TCP/IP, Network architecture, UUCP, XNS, IPX/SPX for LANs, TCP & IP headers, IPv4 & v6 address structures.

Socket Programming: Creating sockets, Posix data type, Socket addresses, Assigning address to a socket, Java socket programming, Thread programming, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions, elementary socket system calls – socket, connect, bind, listen, accept, fork, exec, close, TCP ports (ephemeral, reserved), Berkeley Sockets: I/O asynchronous & multiplexing models, select & poll functions, signal & fcntl functions, socket implementation (client & server programs), UNIX domain protocols.

UNIT- II

APIs & Winsock Programming: Windows socket API, window socket & blocking I/O model, blocking sockets, blocking functions, timeouts for blocking I/O, API overview, Different APIs & their programming technique, DLL & new API's, DLL issues, Java Beans.

UNIT- III

Web Programming & Security: Java network programming, packages, RMI, Overview of Javascript, WAP architecture & WAP services, Web databases, Component technology, CORBA concept, CORBA architecture, CGI programming, Firewall & security technique, Cryptography, Digital Signature.

UNIT- IV

Client Server Programming: Client side programming:- Creating sockets, implementing generic network client, Parsing data using string Tokenizer, Retrieving file from an HTTP server, Retrieving web documents by using the URL class. Server side programming:- Steps for creating server, Accepting connection from browsers, creating an HTTP server, Adding multithreading to an HTTP server.

Suggested Readings:

1. W.Richard Stevens: Advanced Programming in the UNIX Environment, Addison Wesley.
2. W. Stevens, Bill Fenner, Andrew Rudoff: UNIX Network Programming -Volume 1 (The Sockets Networking API), Pearson Education/Prentice-Hall International.
3. Meeta Gandhi,Tilak Shetty and Rajiv Shah: The 'C' Odyssey Unix –The open Boundless C, BPB Publications.
4. Steven.W.R: UNIX Network Programming (Volume I& II), PHI.
5. Bobb Quinn and Dave Schutes: Window Socket Programming by
6. Davis.R.: Windows Network Programming, Addison Wesley.
7. Baner .P.: Network Programming With Windows Socket, Prentice Hall.
8. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA23DB2: NATURAL LANGUAGE PROCESSING & SPEECH RECOGNITION

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand Natural Language Processing, Probabilistic model of defining language and techniques.

CO2: Applying Hidden Markov model and Speech Recognition.

CO3: Application of context free grammar and language parsing.

CO4: Implement probabilistic and language parsing.

CO5: Differentiation of semantic and discourse in terms of NLP.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Introduction to Natural Language Processing: NLP tasks in syntax, semantics, and pragmatics. Applications such as information extraction, question answering, and machine translation. The problem of ambiguity.

Regular Expressions: Regular Expressions, Automata, Similarity Computation: Regular Expressions, patterns, FA, Formal Language, NFSA, Regular Language and FSAs, Raw Text Extraction and Tokenization, Extracting Terms from Tokens, Vector Space Representation and Normalization, Similarity Computation in Text.

Morphology and Finite-State Transducers: Inflection, Derivational Morphology, Finite-State Morphological Parsing, The Lexicon and Morphotactics, Morphological Parsing with Finite State Transducers, Combining FST Lexicon and Rules, Lexicon-free FSTs: The Porter Stemmer, Human Morphological Processing.

UNIT - II

Matrix Factorization and Topic Modeling: Introduction, Singular Value Decomposition, Nonnegative Matrix Factorization, Probabilistic Latent Semantic Analysis, Latent Dirichlet Allocation

Computational Phonology and Text-to-Speech: Speech Sounds and Phonetic Transcription, The Phoneme and Phonological Rules, Phonological Rules and Transducers, Advanced Issues in Computational Phonology, Machine Learning of Phonological Rules, Mapping Text to Phones for TTS, Prosody in TTS .

Probabilistic Models of Pronunciation and Spelling: Dealing with Spelling Errors, Spelling Error Patterns, Detecting NonWord Errors, Probabilistic Models, Applying the Bayesian method to spelling, Minimum Edit Distance, English Pronunciation Variation, The Bayesian method, Pronunciation in Humans.

N-gram Language Models: The role of language models. Simple N-gram models. Estimating parameters and smoothing. Evaluating language models. Smoothing, Backoff, Deleted Interpolation, N-grams for Spelling and Pronunciation, Entropy.

UNIT - III

HMMs and Speech Recognition: Speech Recognition Architecture, Overview of Hidden Markov Models, The Viterbi Algorithm Revisited, Advanced Methods for Decoding, Acoustic Processing of Speech, Computing Acoustic Probabilities, Training a Speech Recognizer, Waveform Generation for Speech Synthesis, Human Speech Recognition.
Word Classes and Part-of-Speech Tagging: Tagsets for English, Part of Speech Tagging, Rule-based Part-of-speech Tagging, Stochastic Part-of-speech Tagging, Transformation-Based Taggin.
Context-Free Grammars for English: Context-Free Rules and Trees, Sentence-Level Constructions, The Noun Phrase, Coordination, Agreement and The Verb Phrase and Sub-categorization, Auxiliaries, Spoken Language Syntax, Grammar Equivalence & Normal Form, Finite State & Context-Free Grammars, Grammars & Human Processing.

UNIT - IV

Parsing with Context-Free Grammars and Features and Unification: Parsing as Search, A Basic Top-down Parser, The Earley Algorithm, Finite-State Parsing Methods, Feature Structures, Unification of Feature Structures, Features Structures in the Grammar, Implementing Unification, Parsing with Unification Constraints, Types and Inheritance
Lexicalized and Probabilistic Parsing: Probabilistic Context-Free Grammars, Problems with PCFGs, Probabilistic Lexicalized CFGs, Dependency Grammars, Human Parsing, The Chomsky Hierarchy, How to tell if a language isn't regular, Natural Language Context-Free or not, Complexity and Human Processing.
Representing Meaning and Semantic Analysis: Computational Desiderata for Representations, Meaning Structure of Language, First Order Predicate Calculus, Some Linguistically Relevant Concepts, Alternative Approaches to Meaning, Syntax-Driven Semantic Analysis, Attachments for a Fragment of English, Integrating Semantic Analysis into the Earley Parser, Idioms and Compositionality, Robust Semantic Analysis
Text Sequence Modeling and Deep Learning: Statistical Language Models, Kernel Methods, Word-Context Matrix Factorization Models, Neural Language Models, Recurrent Neural Networks.

Suggested Readings:

1. Daniel Jurafsky and James H.Martin: Speech and Language Processing(2nd Edition),Prentice Hall:2 edition,2008.
2. Charu C.Aggarwal: Machine Learning for Text Springer,2018 edition
3. Christopher D.Manning and Hinrich Schuetze: Foundations of Statistical Natural Language Processing MIT press.
4. Steven Bird,Ewan Klein and Edward Loper: Natural Language Processing with Python,O'Reilly Media.
5. Roland R.Hausser: Foundations of Computational Linguistics:HumanComputer Communication in Natural Language,Paperback,MIT press..
6. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA23DB3: BIOINFORMATICS COMPUTING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand bioinformatics computing and the need for Bioinformatics technologies.
CO2: Exposed to biomedical data analysis.
CO3: Be familiar with the modeling techniques.
CO4: Exposed to Pattern Matching and Visualization.
CO5: Learn microarray analysis.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction: Bioinformatics computing, Bioinformatics technologies, Structural bioinformatics, Data format and processing, Secondary resources and applications, Role of Structural bioinformatics, Biological Data Integration System.

Data Warehousing and Mining in Bioinformatics: Bioinformatics data, Data warehousing architecture, data quality, Biomedical data analysis, DNA data analysis, Protein data analysis, Machine learning, Neural network architecture and applications in bioinformatics.

UNIT – II

Modelling for Bioinformatics: Hidden Markov modelling for biological data analysis, Sequence identification, Sequence classification, Multiple alignment generation, Comparative modelling, Protein modelling, Genomic modelling, Probabilistic modelling, Bayesian networks, Boolean networks, Molecular modelling, Computer programs for molecular modelling.

UNIT – III

Pattern Matching and Visualization: Gene regulation, motif recognition, motif detection, strategies for motif detection; Visualization – Fractal analysis, DNA walk models – one dimension, two dimension, higher dimension; Game representation of Biological sequences – DNA, Protein, Amino acid sequences.

UNIT – IV

Microarray Analysis: Microarray technology for genome expression study, image analysis for data extraction, pre-processing, segmentation, gridding, spot extraction, normalization, filtering, cluster analysis, gene network analysis; Compared Evaluation of Scientific Data Management Systems – Cost Matrix – Evaluation model - Benchmark – Tradeoffs.

Suggested Readings:

1. Yi-Ping Phoebe Chen (Ed): BioInformatics Technologies, Springer Verlag.
2. Bryan Bergeron: Bio Informatics Computing, Pearson Education.
3. Arthur M Lesk: Introduction to Bioinformatics, Oxford University Press

4. Stanley I. Letovsky: Bioinformatics: Databases and Systems.
5. SorinDraghici: Bioinformatics Databases- Design, Implementation, and Usage, Chapman & Hall/ CRC Mathematical Biology & Medicine.
6. Arthur M.Lesk: Database Annotation in Molecular Biology- Principles and Practices.
7. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA23CL1: Software lab -5
(Based on 21MCA23C1& 21MCA23C3)

Course Outcomes:

By the end of the Course, the students will be able

CO1: To learn the concepts of Data Mining, Big Data and Android environment for developing Mobile Applications.

CO2: To Pre process the given Data set by detecting and correcting various Data problems.

CO3: To work with Hadoop: A Data Analytics tool and will get an exposure to R Tool for handling Big Data

CO4: To understand playing and recording of Audio and Video in Mobile applications.

CO5: To synthesize location and mapping related User Interfaces in Android Applications.

21MCA23CL2: Software lab -6
(Based on 21MCA23C2, Elective I & II)

Course Outcomes:

By the end of the Course, the students will be able

CO1: To create the knowledge base and to access the data with AI programming language.

CO2: Implementation of various optimization algorithms using MATLAB.

CO3: Implementation of different applications of Computational Intelligence.

CO4: To understand concepts related to Wearable Computing and humanistic intelligence/ Implement fundamental Image processing techniques required for Computer Vision/ Generation & optimization of test cases using Rational Rose.

CO5: To understand the concept of Network Programming and their implementation/To understand Natural language processing and implementing probabilistic and language parsing./ To implement the concepts of data analysis, pattern matching and Drug design using Machine learning.

SEMESTER-IV

21MCA24C1: ADVANCED SOFTWARE ENGINEERING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Learn about the emerging software engineering practices and their suitability.

CO2: Understand the concept of cleanroom software development and engineering web applications

CO3: Acquire understanding about agile software development and significance.

CO4: Understand the concept of scrum and agile requirements.

CO5: Learn about DevOps and its relevance in current scenario.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Emerging Software Engineering Practices: Aspect Oriented Software Development, Agile Methods, Security Engineering, Client/Server Software Engineering, Software Engineering Aspects of Programming Languages. **Cleanroom Software Engineering:** Approach, functional specification, design and testing.

Component-Based Software Engineering: Software Component and its Elements, Component Models - Concepts and Principles, COTS Myths, CBSE process, domain engineering, component-based development, classifying and retrieving components, and economics of CBSE.

Engineering Web Applications: Web-based applications and their attributes, Web Engineering process, framework for Web Engineering, formulating, analysing web-based systems, design and testing for web-based applications.

UNIT-II

Agile Software Development: Basics and Fundamentals of Agile Process Methods, Values of Agile, Principles of Agile, stakeholders, Challenges.

Agile and Scrum Principles: Agile Manifesto, Twelve Practices of Extreme Programming (XP), Scrum Practices, Applying Scrum. Need of scrum, working of scrum, advanced Scrum Applications, Scrum and the Organization, scrum values.

Agile Requirements: User Stories, Backlog Management. **Agile Architecture:** Feature Driven Development. **Agile Risk Management:** Risk and Quality Assurance, Agile Tools.

Agile Testing: Agile Testing Techniques, Test-Driven Development, User Acceptance Test.

UNIT-III

Agile Management: Agile Metrics and Measurements, Agile approach to estimating and project variables, Agile Measurement. **Agile Control:** the 7 control parameters. Agile approach to Risk, Agile approach to Configuration Management, Atern Principles, Atern Philosophy, Rationale for using Atern, Refactoring, Continuous integration, Automated Build Tools.

Scaling Agile for Large Projects: Scrum of Scrums, Team collaborations, Scrum, Estimate a Scrum Project, Track Scrum Projects, Communication in Scrum Projects, Best Practices to Manage Scrum.

UNIT-IV

DevOps: History of DevOps, DevOps vs Agile, Advantages and Disadvantages of DevOps, DevOps Stakeholders, Architecture, Components and features of DevOps, SDLC models of DevOps, Workflow and Principles of DevOps, DevOps tools, DevOps automation and automation tools, Pipeline and Methodology , Azure DevOps, AWS DevOps.

Laboratory Work: Exploring the tools related to Agile Development and DevOps, and developing small projects using this technology.

Suggested Readings:

1. Roger S. Pressman: Software Engineering a Practitioners Approach, McGraw-Hill, Latest Edition.
2. Robert C. Martin: Agile Software Development, Principles, Patterns, and Practices Alan Apt Series.
3. Cohen Mike: Succeeding with Agile : Software Development Using Scrum, Pearson.
4. Software Engineering for Embedded Systems: Methods, Practical Techniques, and Applications, Robert Oshana, Mark Kraeling, Newnes Publisher.
5. Kristin Runyan: Introduction to Agile Methods Sondra Ashmore, Addison-Wesley.
6. Pekka Abrahams, OutiSalo, Jussi Ronkainen and Juhani Warsta: Agile Software Development Methods: Review and Analysis.
7. Jim Highsmith, Agile Project Management: Creating Innovative Products, Second Edition, Addison-Wesley Professional.
8. James A. Crowder, Agile Project Management: Managing for Success, Shelli Friess, Springer.
9. Andrew Stellman, Jennifer Greene, Learning Agile: Understanding Scrum, XP, Lean, and Kanban, O Reilly
10. Sricharan Vadapalli, DevOps: Continuous Delivery, Integration, and Deployment with DevOp, Packt.
11. Janet Gregory, Lisa Crispin, More Agile Testing: Learning Journeys for the Whole Team, Addison Wesley.
12. http://agilemanifesto.org/
13. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA24C2: IoT & SENSOR NETWORKS

Course Outcomes:

By the end of the course the students will be able to:

CO1: To understand the concepts of IoT and its applications.

CO2: Describe the OSI Model for the IoT/M2M Systems.

CO3: Understand the architecture and design principles for IoT.

CO4: Learn the programming for IoT Applications.

CO5: Identify the communication protocols which best suits the WSNs.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

IoT Overview: Introduction to Internet of Things, IoT Applications, IoT Conceptual Framework, IoT Architectural View, Technology Behind IoT, Sources of IoT, M2M communication, Examples of IoT. Modified OSI Model for the IoT/M2M Systems, data enrichment, data consolidation and device management at IoT/M2M Gateway, web communication protocols used by connected IoT/M2M devices, Message communication protocols (CoAP-SMS, CoAPMQ, MQTT,XMPP) for IoT/M2M devices.

Architecture and Design Principles for IoT: Internet connectivity, Internet-based communication,IPv4, IPv6,6LoWPAN protocol, IP Addressing in the IoT, Application layer protocols: HTTP, HTTPS,FTP,TELNET and ports.

UNIT-II

Data Collection, Storage and Computing using a Cloud Platform: Introduction, Cloud computing paradigm for data collection, storage and computing, Cloud service models, IoT Cloud- based data collection, storage and computing services using Nimbits.

Prototyping and Designing Software for IoT Applications: Introduction, Prototyping Embedded device software, Programming Embedded Device Arduino Platform using IDE, Reading data from sensors and devices, Devices, Gateways, Internet and Web/Cloud services software development.

Programming MQTT clients and MQTT server.

IoT Security: Introduction to IoT privacy and security, Vulnerabilities, Security requirementsand threat analysis, IoT Security Tomography and layered attacker model.

UNIT-III

Wireless Sensor Networks: Overview of WSNs, Challenges for Wireless Sensor Networks, Enabling Technologies for Wireless Sensor Networks.

Architectures: Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes, Operating Systems and Execution Environments, Network Architecture-Sensor Network Scenarios, Optimization Goals and Figures of Merit, Design principles for WSNs, Service interfaces of WSNs, Gateway Concepts.

UNIT-IV

Communication Protocols: Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC, The Mediation Device Protocol, Wakeup Radio Concepts, Contention based protocols (CSMA,PAMAS), Schedule based protocols (LEACH, SMACS, TRAMA) Address and Name Management in WSNs, Assignment of MAC Addresses, Routing Protocols- Energy-Efficient Routing, Geographic Routing, Hierarchical Networks by Clustering.

Suggested Readings:

1. Raj Kamal: Internet of Things-Architecture and design principles, McGraw Hill Education.
2. Holger Karl & Andreas Willig: Protocols And Architectures for Wireless Sensor Networks , John Wiley.
3. Feng Zhao & Leonidas J. Guibas: Wireless Sensor Networks- An Information Processing Approach, Elsevier.
4. Kazem Sohraby, Daniel Minoli, & Taieb Znati: Wireless Sensor NetworksTechnology, Protocols, And Applications, John Wiley.
5. Anna Hac, Wireless Sensor Network Designs, John Wiley.
6. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle: From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, Academic Press.
7. Peter Waher, Learning Internet of Things, PACKT publishing, BIRMINGHAM – MUMBAI
8. Bernd Scholz-Reiter, Florian Michahelles: Architecting the Internet of Things, Springer.
9. Daniel Minoli: Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications, Willy Publications
10. C.S Raghavendra, Krishna M.Sivalingam, Taiebznati: Wireless Sensor Networks, Springer Science.
11. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA24C3: WEB DEVELOPMENT USING .NET FRAMEWORK

Course Outcomes:
By the end of the course the students will be able to:
CO1: Understand Web development and Visual Studio environment.
CO2: Understand important concepts of .NET Framework and Deployment.
CO3: Design, Develop and Create Applications with C#.
CO4: Develop, implement, and demonstrate Component Services, Threading, Remoting, Windows services.
CO5: Access Database using ADO.NET and use ASP.NET for Application Development and Secure Web Services.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Overview of Web Development: Introduction, .NET Overview, Assemblies (monolithic vs. component-based applications), Execution Model, Client-Side vs. Server-Side Programming, Web Technologies, Development Environment Setup, IIS, SQL Server and Visual Studio.
Introduction to .NET Framework: Microsoft .NET Platform, Design, Goals and Overview, .NET Architecture, Console, Environment, IL, JIT, .NET framework Class library (System, Collections, I/O, Networking, Threading, Transactions, Exceptions), Common Language Runtime, CLR Execution, Common Type System, Common Language Specification, Managed and Unmanaged code.

C# Programming: Introduction to C#, program structure; Variables and Data types: Initialization of Variables, Variable Scope, Constants, Value Types and Reference Types, CTS Types. Operators. Conditional Statements, Loops. Arrays. Strings. S**tructures:** Defining Structs, Creating Structs, Creating Enums

UNIT-II

Object Oriented Programming -Objects and Classes, Methods and Properties, Constructors and Destructors. **Inheritance**: Introduction**,** Types of Inheritance**,** Implementation versus Interface Inheritance, Multiple Inheritance.

Polymorphism: Abstract Classes Implementing Polymorphism by Method Overloading & Method Overriding.

Interfaces: Defining and Implementing Interfaces, Derived Interfaces, Accessing Interfaces, Overriding Interfaces.

Exception Handling: Exception Classes, Standard Exceptions, User Defined Exceptions. **Delegates, Events and Attributes.**

UNIT-III

Building Windows Based Applications: Standard Controls - Components, Forms, Menus and Dialogues, Validating user inputs.

Databases and Data Access Using ADO.NET: Overview of ADO.NET, Accessing Data, Using Dataset Objects and Updating Data Binding, Viewing, and Filtering Data, Connecting with the Database.

UNIT-IV

ASP.NET: Introduction to ASP.NET, Configuring ASP.NET Applications, Programming Model.

ASP.NET Frameworks-Code Behind, Page Directives, Page Events, Post Back.

ASP.NET Controls: Basic Web Server Controls, Data List Web Server Controls**,** Web Server Controls: Calendar Control, Ad rotator Control, Validation Controls, Grid View Controls. **Performing Data Access:** Data bound Controls, List Controls, Tabular & Hierarchical Data bound Controls, Data source Controls.

State Management, Web Services: View State, Session, Cookies, Application, Hidden Field; Authentication & Authorization; Developing Secure Web Services.

Suggested Readings:

1. Jeffrey Richter, Francesco Balena: Applied .Net Framework Programming in MS VB.Net, TMH Publication.
2. Herbert Schildt: Complete Reference C#, TMH Publication.
3. Michael Halvorsan: Microsoft Visual Basic.NET step by step, PHI Publication.
4. G.Andew Duthie: Microsoft ASP.Net With C#.Net step by step, PHI Publication.
5. Daniel Geron: Programming for Beginners: This Book Includes: SQL, C++, C#, Arduino Programming, Daniel Geron.
6. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

21MCA24DA1: CYBER SECURITY & BLOCKCHAIN TECHNOLOGY

Course Outcomes:

By the end of the course the students will be able to:

CO1: Become familiar with the concepts of cyber threats, cyber crime, cyber security and understand the vulnerability scanning.
CO2: Understand network defence tools and web application tools.
CO3: To learn about cyber crime, hacking attacks and cyber laws.
CO4: Understand the concepts of blockchain technology & its need and cryptocurrency.
CO5: Comprehend the applications of blockchain technology.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Introduction to Cyber Security: Overview of Cyber Security, Internet Governance – Challenges and Constraints; Cyber Threats: Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage; Need for a Comprehensive Cyber Security Policy.

Introduction to Vulnerability Scanning: Overview of vulnerability scanning, Open Port/Service Identification, Banner/Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit.

Network Vulnerability Scanning: Netcat, Socat; understanding Port and Services tools - Datapipe, Fpipe, WinRelay; Network Reconnaissance – Nmap, THC-Amap and System tools, Network Sniffers and Injection tools – Tcpdump and Windump, Wireshark, Ettercap, Hping, Kismet.

UNIT - II

Network Defense Tools: Firewalls and Packet Filters - Firewall Basics, Packet Filter Vs Firewall; Network Address Translation (NAT) and Port Forwarding; Basics of Virtual Private Networks, Linux Firewall, Windows Firewall.

Web Application Tools: Scanning for web vulnerabilities tools- Nikto, W3af; HTTP utilities - Curl, OpenSSL; and Stunnel, Application Inspection tools – Zed Attack Proxy, Sqlmap. DVWA, Webgoat; Password Cracking and Brute-Force Tools – John the Ripper, L0htcrack, Pwdump, HTCHydra.

UNIT - III

Cyber Crimes and Law: Introduction to Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Digital Forensics, Realms of the Cyber world, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000.

Cyber Crime Investigation: Firewalls and Packet Filters, password Cracking, Keyloggers and Spyware, Virus and Warms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks.

UNIT - IV

Blockchain Technology: Cryptography - Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof; **Blockchain Overview:** Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.

Cryptocurrency: History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin.

Blockchain Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.

Suggested Readings:

1. Mike Shema: Anti-Hacker Tool Kit, McGraw Hill
2. Nina Godbole and Sunit Belpure: Cyber Security Understanding Cyber Crimes, ComputerForensics and Legal Perspectives, Wiley.
3. Achyut S.Godbole: Data Communication and Networking, McGraw –Hill Education New Delhi.
4. Forouzan: Data Communication and Networking (Global Edition) 5/e, McGraw Hill Education India.
5. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder: Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press.
6. Wattenhofer: The Science of the Blockchain.
7. Antonopoulos: Mastering Bitcoin - Unlocking Digital Cryptocurrencies.
8. Satoshi Nakamoto: Bitcoin: A Peer-to-Peer Electronic Cash System
9. Forouzan, B.A.: Cryptography & Network Security. Tata McGraw-Hill Education.
10. Kahate, A. Cryptography and Network Security. McGraw-Hill Higher Ed.
11. Peter Szor , The Art of Computer Virus Research and Defense, Symantec Press.
12. Markus Jakobsson and Zulfikar Ramzan, Crimeware, Understanding New Attacks and Defenses, Symantec Press, 2008, ISBN: 978-0-321-50195-0.
13. S. Shukla, M. Dhawan, S. Sharma, S. Venkatesan, 'Blockchain Technology: Cryptocurrency and Applications', Oxford University Press, 2019.
14. Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', CSI Publishing Platform, 2017.
15. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

21MCA24DA2: EDGE AND FOG COMPUTING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Become familiar with the concepts of Fog Computing and its characteristics.

CO2: Understand Fog computing services, its components and Fog protocols.

CO3: Understand privacy-preserving computation in Fog computing.

CO4: Comprehend self-aware fog computing and cyber physical systems.

CO5: Understand leveraging fog computing in Healthcare IoT and other important Case Studies.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Evolution of Edge and Fog Computing: Introduction to Edge Computing, Cloud Computing analytics pipeline, Cloud databases, Coordination of Cloud Services, Geo-Distributed Computing, Edge Architectures, Edge Computing Applications. Concept of Fog Computing, Background and Motivation, Definition, Pros and Cons, Myths of Fog Computing, Characteristics, Issues, Application Scenarios, Fog Computing Services, Fog Computing Components; Fog Computing vs Edge Computing vs Cloud Computing, Fog Resource Estimation and its challenges, Software architecture.

UNIT - II

Fog Protocols: Fog Protocol, Fog Kit, Proximity Detection Protocols- DDS/RTPS computing protocols

Fog Computing in Support of Hierarchical Emergent Behaviors: Introduction – Fog Computing – Hierarchical Emergent Behaviors, A Fresh Approach for ULSS - Two Autonomous Vehicles Primitives Case Study.

Privacy-Preserving Computation in Fog Computing: Introduction, Block Chain, Multi-Party Computation, Multi-Party Computation and Block Chain.

UNIT - III

Self-aware Fog Computing in Private and Secure Sphere: Cloud, Fog and Mist Computing Networks, Self-aware Data Processing.

Urban IoT Edge Analytics: Design challenges, Edge-assisted Architecture, Information Acquisition and Compression, Content-aware wireless networking, Information availability.

Cyber-Physical Energy Systems over Fog Computing: Power Grid and Energy Management, Energy Management Methodologies, Cyber-Physical Energy Systems,

Internet-of-Things and Fog Computing, Control-as-a-Service, Residential Cyber-Physical Energy System.

UNIT - IV

Leveraging Fog Computing for Healthcare IoT: Introduction: Healthcare Services in the Fog Layer, Data management, Event Management, Resource Efficiency, Device management, Personalization, Privacy and Security, System Architecture of Healthcare IoT.

Case Studies: Wind Farm - Smart Traffic Light System, Wearable Sensing Devices, Wearable Event Device, Wearable System, Demonstrations, Post Application Example, Event Applications Example, Health monitoring – Patient Safety monitoring and training support – Smart house.

Suggested Readings:

1. Amir M. Rahmani ,PasiLiljeberg, Preden, Axel Jantsch: Fog Computing in the Internet of Things - Intelligence at the Edge‖, Springer International Publishing, 2018.
2. Amir Vahid Dastjerdi and Rajkumar Buyya: Fog Computing: Helping the Internet of Things Realize its Potential‖, University of Melbourne.
3. Zaigham Mahmood*:* Fog Computing: Concepts, Frameworks and Technologies, Kindle Edition.
4. Rahmani, A., Liljeberg, P., Preden, J.-S., Jantsch, A. (Eds.): Fog Computing in the Internet of Things - Intelligence at the Edge.
5. Assad Abbas, Samee U. Khan, Albert Y. Zomaya: Fog Computing – Theory and Practice, John Wiley & Sons, 2020.
6. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time

21MCA24DA3: HIGH SPEED NETWORKS

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand high-speed networks and their relevance.

CO2: Learn about network performance evaluation and their analysis.

CO3: Understand ATM traffic management and integrated services.

CO4: Learn about protocols for QoS.

CO5: Understand Internet routing and analysis.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Frame Relay Network: Introduction, Packet-Switching Networks, Frame Relay Networks; **Asynchronous Transfer Mode:** ATM Protocol Architecture and Logical Connection, ATM Cells, ATM Service Categories, ATM Adaption Layer; **High Speed LANs:** Fast Ethernet LAN, Gigabit Ethernet, ATM LAN, Network Attached Storage (NAS), Wireless LAN and Wi-Fi, LAN Interoperability.

UNIT - II

Network Performance Evaluation Models: Introduction, Overview of Probability and Stochastic Processes, Queuing Analysis, Self-Similarity Network Traffic.

Congestion Management: Congestion – An Overview, Effects of Congestion, Congestion Control, Traffic Management, Frame Relay Congestion Control, Flow Control Techniques, Error Control Techniques; TCP Traffic and Congestion Control: TCP Flow control, TCP Congestion Control, Performance of TCP over ATM.

UNIT - III

ATM Traffic and Congestion Control: ATM Traffic and Congestion Control, Traffic Management Framework, ABR Traffic Management, GFR Traffic Management; **Integrated Services:** Integrated Service (IntServ) Model, Flow and Service Description, Queuing Discipline, Integrated Services in IP-ATM Networks; **Differentiated Services:** Differentiated Service Architecture, Scalability of DiffServ, DiffServ Functional Elements, Per-Hop Behavior (PHB), Models of DiffServ.

UNIT - IV

Protocols for Quality of Service (QoS) Support: Multicasting, Multicast Transport Protocol (MTP), Resource Reservation Protocol (RSVP), Real-Time Transport Protocol (RTP), Multiprotocol Label Switching (MPLS), Subnet Bandwidth Management (SBM), QoS Architectures, QoS Support for Multicast; **Internet Routing Basics and Design:** Basics of Graph Theory, Internet Routing Principles, Analysis of Shortest Route, Intra-Domain Routing Protocol, Border Gateway Protocol, Inter-Domain Routing Protocol (IDRP).

Suggested Readings:

1. Kaven Pahlavan and Prashant Krishnamoorthy: Principles of Wireless Network, Prentice Hall of India.
2. Adrian Farrel: The Internet And Its Protocols, Elsevier Publications.
3. Larry L. Peterson and Bruce S.Davie: Computer Networks, Elsevier Publications.
4. William Stallings: High-Speed Networks and Internets, Performance and Quality of Service, Pearson Publications.
5. Behrouz A. Forouzan: Data Communications and Networking, Fourth Edition, McGraw Hill.
6. B Muthukumaran: Introduction to High Performance Networks, Mcgraw-Hill
7. Douglas E. Comer: Internetworking with TCP/IP Volume – I, Principles, Protocols, and Architectures, Fourth Edition, Pearson Education.
8. Mahbub Hassan, Raj Jain: High Performance TCP/IP Networking, Concepts, Issues, and Solutions, Pearson Education.
9. Andrew S. Tanenbaum: Computer Networks, PHI.
10. James F. Kurose, Keith W. Ross: Computer Networking, A Top-Down Approach Featuring the Internet, Pearson Education.
11. Any other book(s)covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA24DB1: MACHINE LEARNING & PYTHON PROGRAMMING

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand the basic concept of Machine learning.

CO2: Understand supervised, unsupervised and reinforcement learning.

CO3: Familiar with Python environment, data types, operators used in Python.

CO4: Compare and contrast Python with other programming languages and Learn the use of control structures and functions in Python.

CO5: To understand the concepts of modules, packages, 2D & 3D visualization, database and concepts relating machine learning using Python

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Machine Learning: Introduction, various learning paradigms, perspective and issues, Version spaces, finite and infinite hypothesis spaces, PAC learning, Learning versus Designing, Training versus Testing, Predictive and descriptive tasks.

Supervised Learning: Decision trees- ID3, classification and regression trees; Regression-linear regression, Multiple linear regression, logistic Regression; Support Vector Machines-linear and non-linear, kernel functions, K-nearest neighbors.

UNIT - II

Ensemble Learning: Model combination Schemes, Voting, Error-correcting output codes; Bagging: Random Forest Trees; Boosting: Adaboost, Stacking.

Unsupervised Learning: Introduction to Clustering, Hierarchical: AGNES, DIANA; Partitional: K-means clustering, K-mode clustering, Expectation Maximization, Dimensionality Reduction, Feature Selection, PCA, factor analysis, manifold learning.

Reinforcement Learning: Value iteration; policy iteration; TD learning; Q learning; actor-critic

UNIT-III

Introduction to Python: History and Origin of Python Language, Features, Python, Two modes of using Python interpreter, variable and data types, operator and their precedence, Python string & slicing, Python lists, mutable and immutable types, Input from keyboard. Loops and Iterations, Functions, Strings & Lists.

Modules and Packages: Python Modules and Packages, Different ways to import Packages, File Input/Output ,The pickle module, Formatted Printing, Exception Handling.

Arrays and Matrices: The NumPy Module, Creating Arrays and Matrices, Copying, Arithmetic Operations, Cross product & Dot product , Saving and Restoring, Matrix inversion, Vectorized Functions.

UNIT-IV

2D & 3D Data Visualization: The Matplotlib Module, Multiple plots, Polar plots, Pie Charts, Plotting mathematical functions, Sine function and friends, Parametric plots, Astroid, Ellipse, Spirals of Archimedes and Fermat, Polar Rose, Power Series & Fourier Series, 2D plot using colors, Fractals, Meshgrids, 3D Plots, Surface Plots & Line Plots, Wire-frame Plots, Mayavi, 3D visualization; Files and Streams:File modes and permissions, Reading & Writing data from a file, Redirecting output streams to files, Working with directories, CSV files and Data Files.

Python and Databases: ODBC and Python, Working with database in MySQL.

Machine Learning: Getting started, Mean, median, Mode, Deviation, percentile, Data distribution, Scatter plot, Regression

Suggested Readings:

1. Ethem Alpaydin: Introduction to Machine Learning, MIT Press, PHI, 3rd Edition 2014.
2. M. Gopal: Applied Machine Learning, TMH.
3. Tom Mitchell: Machine Learning, McGraw Hill.
4. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar: Foundations of Machine Learning, MIT Press, 2012.
5. Vinod Chandra and Anand Harindra: Artificial Intelligence and Machine Learning, PHI.
6. E. Alpaydin: Introduction to Machine Learning, Prentice Hall of India.
7. Ethem Alpaydin: Introduction to Machine Learning, PHI learning.
8. Pooja Sharma: Programming in Python", BPB Publications, 2017.
9. R. Nageswara Rao: Core Python Programming, Dreamtech.
10. Langley: Elements of Machine Learning, Morgan Kaufmann.
11. Hans Fangohr: Introduction to Python for Computational Science and Engineering(A beginner's guide).
12. Timothy A. Budd: Exploring Python, McGraw Hill Education
13. Mark Lutz: Learning Python 4th Edition, O'Reilly Publication
14. Jason Bell: Machine Learning: Hands-On for developers and Technical Professionals Wiley Publication, 2015
15. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA24DB2: WEB DEVELOPMENT USING PHP

Course Outcomes:

By the end of the course the students will be able to:

CO1: Understand regular expressions including modifiers, operators, and meta characters.
CO2: Create PHP programs that use various PHP library functions, and that manipulate files and directories.
CO3: Analyze and solve various database tasks using the PHP language.
CO4: Analyze and solve common Web application tasks by writing PHP programs.
CO5: Formulate, design and create PHP control structures, including selection and iterative structures

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to PHP: Evolution of PHP & its comparison with other web programming languages, Interfaces to External systems, Hardware and Software requirements.

Basic PHP Development: PHP Scripting, Working of PHP scripts, Basic PHP syntax, PHP data types, Operators, Variable manipulation, Dynamic variables, Variable scope, and Accessing variable with the global statement Static vs. Dynamic Optimization, Google Caffeine.

Control Statements: if( ) and else if( ) condition Statement, The switch statement, Using while ( ) Loop, The do while statement, Using the for ( ) Loop, Breaking out of loops, Nesting loops.

UNIT-II

String & Arrays: Formatting String for Presentation, Formatting String for Storage, Joining and Splitting String, Comparing String, Matching and replace Substring. Arrays: Anatomy of an Array, Creating index based and Associative array, Accessing array Elements, Looping with Index based array, Looping with associative array using each( ) and foreach( ) loops, Library functions.

Functions: Function definition, Creation, Returning values, User-defined functions, Dynamic function, Function calls with the static statement, default arguments, passing arguments to a function by value.

UNIT-III

Forms: Working with Forms, Super global variables, Super global array, Importing user input, Accessing user input, Handling Html Form With PHP, Using hidden fields, Redirecting the user.

Working with File and Directories: Understanding file & directory, Opening and closing a file, Copying ; renaming and deleting a file, Working with directories, Building a text editor, File Uploading & Downloading.

Generating Images with PHP: Basics computer Graphics, Creating Image, Manipulating

Image , Using text in Image.

Object Oriented concept using PHP: Classes, Objects, Polymorphism, Inheritance, Interface, Abstraction, Constructor, Destructor.

UNIT-IV

PHP with MySQL: Creating Connection, Selecting Database, Perform Database (query), Use returned data, close connections, file handling in PHP – reading and writing from and to FILE.

Advance PHP Techniques: Introduction about FTP/SMTP server, Math functions, File upload, File Download, E-mail with PHP, PHP configuration file, Error tackling and debugging.

PHP Project Development: Exposure of Requirements analysis of a Project and its development.

Suggested Readings:

1. Matt Doyle: Beginning PHP 5.3, Willey Publishing.
2. Steve Suehring, JavaScript Step by Step, Microsoft Press, PHI.
3. Harwani: Developing Web Applications in PHP and AJAX, McGraw Hill
4. P.J. Deitel & H.M. Deitel: Internet and World Wide Web- How to Program, Pearson.
5. Web Technologies, Black Book, Dreamtech Press.
6. Steven Holzner: PHP- The Complete Reference, Tata McGraw Hill.
7. Kevin Tetroi: Programming PHP, O' Reilly
8. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA24DB3: NEURAL NETWORKS & DEEP LEARNING

Course Outcomes:

By the end of the course the students will be able to:

CO1: To cover the fundamentals of neural networks and deep learning.

CO2: To cover advanced topics such as recurrent neural networks, long short term memory cells.

CO3: To understand Recurrent neural network, convolutional neural network and theorem for Generative models.

CO4: To implement programming assignments related to neural network's topics.

CO5: To understand the concept of Deep reinforcement learning.

Max. Marks: 100 (80+20) **Time: 3Hrs**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-1

Introduction: Biological neuron, Idea of Computational units, McCulloch-Pitts unit and Thresholding logic, Linear Perceptron, Perceptron Learning algorithm, Linear separability; Convergence theorem for Perceptron Learning algorithm.

Feedforward Networks: Empirical Risk Minimization, Regularizing a deep network, model exploration and hyper parameter tuning.

Deep Learning: Historical context and motivation for deep learning, Basic Supervised classification task, Optimizing logistic classifier using gradient descent, Stochastic gradient descent, Momentum, and adaptive sub-gradient method.

UNIT-II

Deep Neural Networks: Difficulty of training deep neural networks, Greedy layerwise training.

Better Training of Neural Networks: Newer optimization methods for neural networks (Adagrad, Adadelta, rmsprop, adam, NAG), second order methods for training, Saddle point problem in Neural network, Regularization methods.

Recurrent Neural Network: Bidirectional RNNs, Encoder-Decoder sequence to sequence architecture, Backpropagation through time, Long Short Term Memory (LSTM), Gated Recurrent Units, Bidirectional LSTMs, Deep Recurrent networks.

UNIT-III

Convolutional Neural Networks: Basics of convolutional neural networks, stacking, striding and pooling, Applications such as image and text classification, LeNet, AlexNet.

Generative Models: Restrictive Boltzmann Machines (RBMs), Introduction to MCMC and Gibbs Sampling, Gradient computations in RBMs, Deep Boltzmann Machines.

Recent Trends: Varitional Autoencoders (Undercomplete autoencoders, regularized autoencoders, sparse autoencoders, denoising autoencoders), Representational power, layer, size and depth of autoencoders, Stochastic encoders and decoders, Generative Adversarial Networks, Multi-Task Deep Learning, Multi-view Deep learning.

UNIT-IV

Deep Reinforcement Learning: Basic concepts of Deep Reinforcement Learning (DRL), DRL process and RL approaches, Algorithms of DRL(Value Learning, Policy Learning),Q-Learning algorithm and its implementation, Digging deeper into Q function, Deep Q Learning algorithm and its implementation with Tensorflow,Deep Q-Network, DRL Applications. Policy optimization: Introduction to policy-based methods, Policy Gradient; Model based RL, Recent Advances and Applications.

Suggested Readings:

1. Ian Goodfellow: Deep Learning, MIT Press.
2. Jeff Heaton: Deep Learning and Neural Networks, Heaton Research Inc.
3. Mindy L Hall: Deep Learning, VDM Verlag.
4. Li Deng, Dong Yu: Deep Learning: Methods and Applications (Foundations and Trends in Signal Processing), Now Publishers Inc.
5. Richard S. Sutton and Andrew G. Barto: Reinforcement Learning: An Introduction, Second Edition, MIT Press.
6. Wiering, Marco, and Martijn Van Otterlo: Reinforcement learning - Adaptation, Learning, and Optimization.
7. Russell, Stuart J., and Peter Norvig: Artificial Intelligence: AModern Approach, Pearson Education Limited.
8. Goodfellow, Ian, Yoshua Bengio, and Aaron Courville: Deep learning, MIT Press.
9. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

21MCA24CL1: Software lab -7
(Based on 21MCA24C1, 21MCA24C2 & Elective-II)

Course Outcomes:
By the end of the Course, the students will be able:
CO1: To learn about Scrum, Agile and DevOps as Software Engineering Tools in current scenario and development of projects using them.
CO2: To understand the concepts of IoT and programming with MQTT clients and MQTT server for IoT Applications for all possible domains.
CO3: To work in Python environment while using packages, 2D-3D visualization related to Machine Learning.
CO4: To create PHP programs by implementing PHP controls, library functions and other related concepts.
CO5: To understand Neural Network concepts, Deep reinforcement learning and their implementation.

21MCA24CL2: Software lab -8
(Based on 21MCA24C3 & Elective-I)

Course Outcomes:
By the end of the Course, the students will be able:
CO1: To understand Web development and Visual studio environment for designing and developing Web applications.
CO2: To design, develop and create applications using C# language.
CO3: Familiar with various concepts related to Cyber security and will be able to comprehend the applications of Block chain technology.
CO4: To understand and comprehend concepts related to Edge and Fog computing and its usage in real life applications.
CO5: To understand and apply different concepts of Block chain technology.

Industry Internship/Project-II
Paper Code: 21MCA24C4

Max Marks: 100

- **Industry Internship/Project** will be assigned to each student before the commencement of MCA 3rd semester examinations and each student will be required to carry out Industry Internship/Project during summer break and the successive MCA 4th semester, and the student will free to showcase his/her innovation/creativity in developing a software solution/App to meet out live/realistic requirement(s) using any type of software development tools/ languages/ technologies in view of the ongoing Software Industry trends.

- Each student will be assigned preferably the same Faculty Member as Supervisor by Head of the Department/Director/Principal for Industry Internship/Project, who had supervised the student for **Industry Internship/Project-I.**

- Each supervisor will be guiding/supervising/mentoring/supporting as well as tracking the progress of the student on the assigned project.

- Each student will be required to submit required number of Industry Internship/Project Report to the Department/Institute/College as stipulated by the University.