

MCA Part-II (Choice Based Credit System)

(Under Faculty of Science)

To be implemented from the academic year 2017-2018

Semester – III							
Sr. No.	Subject Code	Subject Title	Internal Marks	External Marks	CP	Workload per Week	
						T	P
1	IT31	Software Engineering	20	80	4	4	-
2	IT32	Java Programming	20	80	4	4	-
3	IT33	Computer Networks	20	80	4	4	-
4	BM31	Management Support System	20	80	4	4	-
5	MT31	Probability and Combinatorics	20	80	4	4	
6	CS31	Communication Skill –II	50		2	2	-
7	IT32L	LAB V (Java Programming)		100	4	-	4
8	IT33L	LAB VI (Open Source Languages)		100	4	-	4
		Total	150	600	30	22	8

Semester – IV							
Sr. No.	Subject Code	Subject Title	Internal Marks	External Marks	CP	Workload per Week	
						T	P
1	IT41	Advance Java	20	80	4	4	-
2	IT42	Data Mining	20	80	4	4	-
3	IT4E	Elective I IT4E.1 Computer Graphics IT4E.2 Cloud Computing IT4E.3 Python Programming IT4E.4 Theory of Computation	20	80	4	4	-
4	BM41	Organizational Behavior	20	80	4	4	
5	BM4E	Elective I BM4E.1 Entrepreneurship Development BM4E.2 Human Resource Management BM4E.3 Supply Chain Management BM4E.4 Performance Evaluation & Computer Centre Management	20	80	4	4	-
6	MP41	Mini Project	50		2	2	
7	IT41L	LAB VII (Advance Java)		100	4	-	4
8	IT42L	LAB VIII (Data Mining)		100	4	-	4
		Total	150	600	30	22	8

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Semester - III

IT31- SOFTWARE ENGINEERING

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit-1: Introduction to Software Engineering -

(15)

Definitions, Characteristics of Software - Software Engineering vs other engineering disciplines – Software Myths – Nature of Software , Software Engineering, A Generic Process Model, The Waterfall Model, Incremental Process Models , Evolutionary Process Models , Concurrent Models , Specialized Process Models , The Formal Methods Model, The Unified Process Personal, Agility Principles , Extreme Programming (XP), Scrum, Selection of Software Process models.

Unit-2: Requirement Engineering-

(15)

Requirements Engineering, Eliciting Requirements, Collaborative requirements Gathering, Quality Function, Deployment, Usage, Scenarios, Elicitation Work Products, – Specification – Analysis modeling. Building the requirements Model, Negotiating Requirements, Validating Requirements, Requirements Modeling Strategies: Flow-Oriented Modeling, Requirements Modeling for Web Apps, SRS

Unit-3 : Software Design:

(15)

The Design Process, Concepts of design, Design Quality, Design Principles, Software design – Abstraction – Modularity – Software architecture – Effective modular design – Cohesion and Coupling – Architectural design and procedural design, The Design Model and elements, Software Architecture, Importance, Architectural Styles, Architectural Design, Assessing Alternative Architectural Designs, using Architectural Styles in Designs, Component Design, Need for structured programming – Coding standards.

Unit-4: Testing Strategies:

(15)

A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Test Strategies for Object-Oriented Software, Test Strategies for WebApps, Unit

testing, Integrations testing, Validation Testing, System Testing, The Art of Debugging, White-Box Testing , Basis Path Testing, Control Structure Testing, Black-Box Testing.

(15)

REFERENCES:

1. Roger S Pressman “Software Engineering : A Practitioner’s Approach “ 7th Edition Mcgraw-Hill
ISBN: 0073375977
2. Ian Sommerville “ Software Engineering” 9th edition Pearson Education ISBN-13: 978-0-13-703515-1
- 3.Hong Zhu “Software Design Methodology”, Elsevier ISBN: 978-81-312-0356-9
- 4.Pankaj Jalote “ An Integrated Approach to Software Engineering” 3rd Edition Narosa Publication ISBN: 81-7319-702-4 pdf down loadable
- 5.Rajib Mall “ Fundamentals of Software Engineering” 3rd edition PHI
- 6.Pfleejer “ Software Engineering- Theory and Practice” 4th edition
- 7.Hans Van Vilet “Software Engineering Principles and Practice” 3rd edition Wiley

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Semester-III

IT32-Java Programming

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit-1: OOPS in JAVA

(15)

Objects and classes, Inheritance, Interfaces, inner classes, Packages. Introduction to Java Utility classes and collection classes - Date, DateFormat and Gregorian Calendar classes. Using ListInterface, ListIterator and LinkedList classes. Set, Iterator, SortedSet, Map interfaces. HashSet class. Using Vector class, stacks, queues, HashTable. Generating random numbers, Property class

Unit-2: Exception Handling and I/O Streams

(15)

Exception Handling: Exception class hierarchy, Exception Vs Error, try, catch, throw, throws, finally, checked Vs unchecked exceptions, creating custom exception classes. Significance of streams, various types of Input & Output streams, accessing the file through streams, object serialization. Random Access File.

Unit-3: Multi Threading and Networking in Java

(15)

Difference between multi tasking and multi threading, Need for multi threading, thread states and priorities, suspending and resuming threads, synchronization between threads. Inter thread communication and dead locks

Client and Server programming, Connection oriented and connectionless architectures, Socket, IP address classes. InetAddress, URL and URLConnection classes.

Unit-4: Applets and Event Handling in Java

(15)

Applet and its life cycle, passing parameters to applets, font, color, image classes.

ImageObserver. Image processing using PixelGrabber and MemoryImageSource classes.

Difference between AWT and Swing. Light weight and heavy weight components. Pluggable Look and Feel. Swing package and its components., layout managers, various components for GUI. Delegation Event Model, different types of events, event handlers, and adapter classes.

References:

1. Java Complete Reference by Patric Norton
2. Java 8 Programming Black Book
3. Core Java Vol. I (Addison- Wesley) Sun Press ISBN – 981-405-861-0
4. Core Java Vol. II (Addison- Wesley) Sun Press ISBN – 981-4058-50-5
5. Java in a Nutshell, By Benjamin J Evans, David Flanagan, O'Reilly Media
6. Thinking in Java, Bruce Eckel,, Addison – Wesley, ISBN: 9814035750
7. Java 2 Programming Black Book by Steven Holzner, Dream Tech Publication
8. A Programmer's Guide to Java SCJP Certification: A Comprehensive Primer By Khalid Azim Mughal, Rolf Rasmussen
9. Inside Java 2 Virtual Machine by Venners Bill, Mcgraw Hill Education
10. Learning Java by Jonathan Knudsen, Patrick Niemeyer, O'Reilly Media.

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MCA-II Semester-III

IT33- Computer Networks

External Marks-80 Internal Marks -20

Theory-04 h/week

UNIT-I

(15)

Data communication-analog and digital signal transmission, Data transmission-serial and parallel transmission, communication and transmission modes (synchronous, asynchronous), error control(forward, backward) error detection(parity, block sum check, CRC), transmission media (twisted pair, coaxial cable, optical fibers), unguided transmission media(radio waves, microwaves, infrared), classification of computer network- geographical spread (LAN,WAN, MAN), topology-(bus, star, ring, mesh, tree), ownership (private, public, VAN), switching-circuit, packet, message and routing, multiplexing-FDM,TDM, concentrator, components of computer networks-files server, workstation, network interface unit, transmission media, hub, repeater, bridge, router, gateway, mode. Case study- Prepare/ present report on network components used in any selected organization/Institute/Company.

UNIT-II

(15)

Data Link Layer: Error detection and control code- Error Control -Hamming Code and CRC Flow Control -Stop and Wait protocol, sliding window protocol, Random Access Protocols - ALOHA – pure and slotted. Network Layer: Store-and-forward packet switching, Services Provided to the Transport Layer, Implementation of Connectionless and Connection Oriented Service, concept of routing, optimality principle, routing algorithms-shortest path, distance vector, link state, hierarchical, broadcast, multicasting. Congestion control & congestion control algorithm.

UNIT-III

(15)

Transport Layer- Introduction, transport service primitives, multiplexing, UDP, TCP . Application Layer-Domain name system (DNS), Telnet, File transfer protocol (FTP), Simple mail transport protocol (SMTP), Hyper text transfer protocol (HTTP), Network file system(NFS).

Unit-IV

(15)

Network Security- Introduction, concept of cryptography, authentication protocols, firewall, virtual private networks (VPN), wireless security, email security, web security- SSL. Case Study – Implementation of LAN, Configuration of various connecting devices.

References:

- 1 Computer Networks Andrew Tanenbaum Pearson Education
- 2 Computer Networks Fundamentals and applications, R S Rajesh, K S Easwarakumar, R Balasubramanian, VIKAS Publishing House Pvt. Ltd.
- 3 Data Communication and Networks James Irvin, David Harle Wiley
- 4 Computer Networks protocols, Standards and Interface Black C. Prentice Hall of India
- 5 Computer Communication Networks William Stalling Prentice Hall of India

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Semester-III

BM31-Management Support System

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit I

(15)

Introduction to Information Systems- Management, Information, Difference between data and Information, Types of Information, Information characteristics, Value of Information, System-Characteristics, Elements, Information systems, Classification of Information System-Operation Support System and Management Support System, Management support system concepts, Information Technology Infrastructure

Unit –II (15)

Management Information System-Definition, Scope, Objectives, Characteristics, Role and Impact of MIS, Applications, Benefits, Success and Failure factors of MIS, Limitations MIS in functional Areas of business-Accounting Information System, Financial Accounting, Geographical Information, Human Resource, Manufacturing, Marketing

Unit-III (15)

Decision Making-Concept, Types of decisions, Levels of decision making, Decision Making and Information systems Decision Support System-Definition, Characteristics, Components of DSS

Business Intelligence-Data Warehousing, Data Acquisition, Data Mining, Business Analytics, and Visualization, Knowledge based Systems-Artificial Intelligence and Expert System, Intelligent Decision Support Systems, Implementing MSS in the E-Business Era

Unit-IV (15)

Executive Support System:- Definition and concept, Scope, Functions of an Executive, Design of Executive Support System, Benefits and limitations, Business Processes and Executive Support System, Office Information Systems ,Case studies based on Information systems

References:

[1]Management Information Systems – Managing the Digital Firm, 9th Edition, K C Laudon, J P Laudon, PHI / Pearson

[2]Management Information Systems – Conceptual Foundations, Structure and Development, 2nd Edition, G B Davis, M H Olson, Tata McGraw Hill

[3]Management Information Systems, 1st Edition, L M Prasad, Usha Prasad, Sultan Chand & Sons

[4]Management Information System, Hitesh Gupta, International Book House PVT. LTD

[5]Management Information Systems, 9th Edition, Terry Lucey

[6]Decision Support Systems and Data Warehouse, B. Ravinath, New Age International Publishers

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Semester-III

MT31- PROBABILITY AND COMBINATORICS

Internal Marks -20

External Marks-80

Theory-04 h/week

UNIT-I: Combinatorial Analysis

(15)

Principles of counting, Permutations of n dissimilar objects taken r at a time (with and without repetitions), Properties, Permutation of n objects not all of which are different, Combination of n objects taken r at a time, Properties, Algorithm to compute number of permutations and combinations, examples on Permutations and Combinations. Binomial coefficients and its applications. Multinomial coefficients. Examples. Pigeonhole principle.

UNIT-II: Probability (15)

Random experiment, sample space and classification of sample spaces, Classical definition of probability, Properties, Empirical definition of probability, Axiomatic definition of probability, Conditional probability, Multiplication law of probability, Baye's theorem, Independence of events, Examples.

UNIT-III: Probability Distributions (15)

Random variable, Probability mass function, Cumulative distribution function, Mathematical expectation, Variance, Definition and properties of Bernoulli, Binomial, Poisson distribution, Probability density function, Cumulative distribution function of a continuous random variable, Mathematical expectation and variance, Definition and properties of Uniform, Exponential and Normal distributions.

UNIT-IV: Testing of Hypothesis (15)

Basic concepts of hypothesis, Level of significance, Critical region, p-value, One sided and two sided tests, Procedure of testing of hypothesis, Large sample tests for mean and proportion, Exact sample tests, Chi-square test for variance, Goodness of fit, Independence of attributes, t-test for mean, equality of two population means and paired t-test. Numerical examples.

References:

- 1)Probability and Statistics with Reliability, Queuing and computer applications: Kishor. S and Trivedi. PHI
- 2)Introduction to Statistical Methods: J. Medhi
- 3)Statistical Analysis for Business and Economics: Chou.Cy.A.Lin.
- 4)A First course in Probability: S. Ross.
- 5) Modern Elementary Statistics: Freund J.E.
- 6)Fundamentals of Mathematical Statistics: Gupta S.C. and Kapur.V.K
- 7)Mathematical Statistics: Kapur.J.N and Saxena.H.C.
- 8)Probability and Statistics in the Engineering and Computer Science: Milton.J.S and Arnold. J.C.
- 9)Introduction to the theory of Statistics: Mood.A.M. Gray bill F.A. and Boes.D.C.

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Semester-III
CS31- Communication Skills - II

Marks:50

Theory-02 h/week

Unit-1

Precise writing:- Importance and Techniques of precise writing. Techniques of Professional Correspondence, Importance of Professional correspondence, (7)

Unit -2

Professional /Business Correspondence correspondence:-Application Letter, Enquiries and replies, Order, complaint and their reply, invitation letters and its reply. Memos , Progress

report, Minutes of meeting, Event reporting, Grammar and Vocabulary for effective technical writing, Use of Tools, Guidelines for technical writing, Publishing (8)

Unit-3

Report writing:- Importance and Techniques of report writing, Investigation Reports , Survey Reports, Inspection Reports; Paragraph writing:- Techniques of paragraph writing. (7)

Unit-4

Etiquettes – Meaning and Need of Etiquettes, Factors influencing Etiquettes. Types of Etiquettes-Social, Personal, Family, Business, Telephone, Emails . (8)

Reference Books: 1.Effective Business Communication Murphy

2 Business English & Communication Cleark

3 Basic Business Communication Robert Ma Archer

4 Business Communication Robert Marcher & Ruth Pearson

5 Esseatials of Business Communication Rajendra Pal & J.S.Korlahalli

6 Basic Business Communication Skills Raymond Lesikar & Marie Flatlety, 10th Edition, Tata McGraw-Hill Edition

7 Business Communication- V.K. Jain & Omprakash Biyani S.Chand k company, N

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Semester-III

IT32L-LAB V (Java Programming)

External Marks-100

Practical -04 h/week

Practical V (Practical Based on Java Programming)

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MCA-II Semester-III

IT33L-Lab VI Open Source Languages

External Marks-100

Pract-04 h/week

UNIT - I

Introduction of PHP, Embedding PHP with HTML, Enhancing further, PHP Language Basics: Using variable in PHP, understanding Data types, operator and expressions. Making decisions: simple decision with if statements, switch, ternary operator, do..while loop, for statement, break, loop skip iteration, nested loop, Function: calling functions, working with variable functions, own functions references, recursive functions.

Arrays: creating and accessing array elements, looping through arrays, multidimensional array, manipulating array Strings: creating and accessing strings, searching strings, replacing text within strings and formatting strings.

UNIT - II

Handling HTML forms with PHP: HTML forms work, capture form data with PHP, multi value fields, web forms with PHP, storing PHP variables in forms, create file upload forms, redirecting PHP.

UNIT - III

Introducing Database and SQL: Deciding how to store data, quick play with MYSQL, connecting to MYSQL from PHP, retrieving data from MYSQL with PHP.

Manipulating MYSQL data with PHP insert, update, delete records- Working with files and directories: understanding files and directories, getting information on files, opening and closing files, reading files and writing files , file permissions, Copying ,renaming and deleting files, working with directories.

UNIT - IV

Advanced PHP Programming

Cookies – What is Cookie, Cookie Syntax, How to Create, Store, Retrieve and Delete Cookie.

PHP File Upload – Create an Upload-File Form, Upload Script and Save Uploaded file, putting restrictions on uploads.

Session – What is Session? Creating, Storing and Destroying Sessions. Classes & Object – OO Concepts, Define Class, Class Attributes, An Object, Creating an Object, Object Properties & Methods, Object constructors and destructors, Static Method, Class Inheritance, Abstract Class, Implement Inheritance.

Reference :

1. Matt Doyle, Beginning PHP 5.3, Wiley India Edition, 2012 .

- 2.PHP6 and MySQL, Steve Suehring, Tim Converse and Joyce Park, Wiley India 2010, Second Edition
- 3.VikramVaswani, PHP: A Beginners guide,TataMcgraw Hill,2009.
- 4.Core PHP Programming” by Atkinson Leon, Suraski Zeev, Pearson Publication
5. Larry Ullman, PHP 6 and MySQL 5,Pearson Education,2008.

Practical VI (Practical Based on above syllabus)

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Semester-IV

IT41: Advance Java

Internal Marks -20

External Marks-80

Theory-04 h/week

UNIT 1

(15)

JDBC:Introducing JDBC, Exploring JDBC Drivers, Exploring the Features of JDBC ,Describing JDBC APIs, Exploring Major Classes and Interfaces, Exploring JDBC Processes ,with the java.sql Package, Working with Transactions.**Java Beans:**Basics of designing **JavaBeans: Creating** Java Bean classes, creating and using properties, using events to communicate with other components. **EJB** : Enterprise Java Beans Architecture of EJB, Implementation and life cycle of Session, Entity and Message Driven Java beans .

UNIT 2

(15)

RMI:Introduction, architecture, defining remote objects, creating stubs and skeleton, object serialization, dynamically loaded classes, RMI activation, registering remote objects, marshaled objects. **CORBA** :concepts, history of CORBA and OMGobject bus, distributed objects, interoper ability of distributed objects, concept of open object bus, a java interface to CORBA, Architectural features, Method Invocations: Static and Dynamic, ORB.creating a basic CORBA server, creating CORBA clients with Java IDL, RMI v/s CORBA,

UNIT 3

(15)

Servlet:Servlet basics, servlet life cycle , Generic and HTTP servlets, The Servlet API, javax.servlet and javax.servlet.http package, session tracking using session and cookies, web deployment descriptor, web.xml. databases. Request dispatching. **JSP(Java Server Pages:** Introduction to JSP, Use of JSP, JSP Architecture, JSP tags, Implicit and Explicit

objects, Request forward, Request –time include ,use of Beans in JSP and their scopes. Introduction to Eclipse IDE.

UNIT 4

(15)

Hibernate: Introduction, Architecture of Hibernate, Exploring HQL, Understanding Hibernate O/R Mapping, Working with Hibernate Implementing O/R Mapping with Hibernate. **Struts:** An introduction to Struts, building a simple struts application. **Spring:** Spring API libraries, Designing spring applications.

References:

1. The Complete Reference : Herbert Schildt-Tata McGraw Hill
2. Java Primer : Balguruswamy
3. Java 2.0 : Ivan Bayross
4. Java developer- Erik Hatcher, Steve Loughran
5. Advanced Java programming- Rajendra Salokhe, Suresh Nalawade- Aruta Publication.
6. A Complete Reference Struts -JamesHomes. Tata McGrawHill Edition.
7. Beginning Spring Framework ,Thomas Van de Velde, Bruce Snyder, Christian DUPUIS, Sing Li, Anne Horton and Naveen Balani. Wrox Publications. Wiley India Pvt Ltd.
8. Beginning Hibernate From Novice to Professional -Dave Minter and Jeff Linwood

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Semester-IV

IT42: Data Mining

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit I

(15)

Data warehouse and OLAP technology: Data warehouse concepts, A multidimensional data model, Data warehouse architecture, From data warehousing to data mining. Introduction: Data mining concepts, Data mining functionalities, classification of data mining systems, Integration of data mining system with a database or data warehouse system, major issues in data mining,

Data Preprocessing: Descriptive data summarization, data cleaning, data integration and transformation, data reduction, data discretization and concept hierarchy generation

Unit II (15)

Classification techniques: Classification: Preliminaries, general approach to solve classification problem, Decision tree induction, Rule-based classifier, Nearest-Neighbor classifier, Bayesian Classifiers, Support Vector Machine.

Unit III (15)

Association analysis: Problem definition, Frequent Itemset Generation, Apriori Principle, apriori algorithm, Maximal Frequent itemset, closed frequent itemset. FP-growth algorithm, Sequential Patterns, Infrequent Patterns.

Unit IV (15)

Cluster analysis: Introduction, Types of Clustering, Types of Clusters. K-means algorithm, Agglomerative Hierarchical Clustering, DBSCAN, Prototype based clustering and Density based clustering, Web Mining: Introduction, Web content Mining, Web structure Mining, WebUsage Mining. Introduction and practical on R and Weka.

Reference books:

- 1) Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson education.
- 2) Data Mining concepts and techniques --- Jiawei Han and Micheline Kamber , Elsevier
- 3) Data Mining: Introductory and Advanced Topics - Margaret H. Dunham, Pearson education
- 4) Hands-On Programming with R, Garrett Golemund
- 5) Beginning R, Dr Mark Gardener
- 6) An Introduction to the WEKA Data Mining, Zdravko Markov, “Ingrid Russell
- 7) Instant Weka How-to, Bostjan Kaluza
- 8) Data Mining: Practical Machine Learning Tools and Techniques, Ian H. Witten, Eibe Frank

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Semester-IV

IT4E.1: Computer Graphics

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit-I

(15)

Introduction to Computer Graphics: Advantages, application and classification of computer graphics, Input/output devices: Trackball, Joysticks, Data Glove, Digitizers, Light pen, Touch panels, Image scanners, Printers and plotters. Logical Input Devices: Locator, Stroke, String, Valuator, Choice and Pick. Video Display Devices: Refresh Cathode-Ray Tubes, Raster-Scan Displays, Random-Scan Displays, Color CRT Monitors, Direct-View Storage Tubes, Flat Panel Displays and Liquid crystal monitors, Raster-Scan Systems: Video Controller, Raster-Scan Display Processor, Random-Scan Systems.

Unit-II

(15)

Line, Circle, Ellipse and Curve generation algorithm, Polygon filling algorithm Windowing and clipping: Window to Viewport transformation, line clipping and polygon clipping, 2D and 3D transformations : 2D basic transformation, other transformation, composite transformation, matrix representation and homogeneous transformation, 3D concepts: Display models, parallel and perspective projections, 3D basic transformation, other transformation & composite transformation.

Unit-III

(15)

Chromatic and achromatic light, properties of light, color lookup tables, Color models: XYZ, RGB, CMY, HSV, HLS, Curve generation: Bezier curve, properties of Bezier curve, Cubic Bezier Curve, B-Spline curves: i) Uniform, Periodic B Spline, ii) Cubic, periodic Bspline, iii) Open, uniform B- Spline iv) Non-uniform B-spline, Beta-Spline: Beta spline continuity conditions, cubic periodic beta spline, matrix Representation, Introduction to fractal (Koch and Hilberts curve)

Basic illumination models: Ambient light, diffuse reflection, specular reflection and its Phong model, shadows and transparency, ray tracing, displaying continuous tone images, halftone pattern and Dithering techniques, aliasing and antialiasing, Phong rendering methods: Constant intensity shading, Gouraud shading, Phong and Fast Phong shading, Visible surface detection methods: Classification of visible surface detection algorithm, Back-face detection, depth-buffer method, A-buffer method and Painter's algorithm.

Reference Books :

1. Computer Graphics --- Donald Hearn and M Pauline Baker, Pearson Education, 2nd Edition.
2. Computer Graphics --- F. S. Hill J R
3. Principles of interactive Computer Graphics --- Newmann Sproul
4. Fundamentals of interactive Computer Graphics --- Foley J D & van Dam
5. Theory and problems of Computer Graphics --- Plastock & Kelly
6. Computer Graphics --- A.P.Godase
7. Computer Graphics : a programming approach -- Steven Harrington
8. Mathematical Elements for Computer Graphics, D. F. Rogers and J. A. Adams, 2nd Edition, McGraw-Hill International Edition.
5. Digital Image Processing, Gonzalez & Woods, Pearson Education, Second edition.
6. Fundamentals of Digital Image Processing, Anil K Jain, PHI

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MCA-II Semester-IV

IT4E.2 Cloud Computing

External Marks-80

Internal Marks -020

Theory-04 h/week

Unit – I: Fundamentals of Cloud Computing (15)

Overview of Cloud Computing, Evolution of Cloud Computing, Types of Clouds, Key Characteristics of Cloud Computing, Intranets and Clouds. Benefits and challenges of cloud computing, Usage scenarios and Applications, Regulatory issues, major players in cloud computing.

Unit – II: Cloud Models & Services (15)

Cloud Models – Benefits of Cloud Models, Public, Private, Hybrid, and Community Clouds
Types of Clouds Services: SaaS, PaaS, IaaS, DaaS, MaaS, CaaS. Service Providers: Google App Engine, Microsoft Azure, Amazon EC2, IBM, Sales Force; Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

Unit – III: Essentials & Collaborating with Cloud (15)

Hardware and Infrastructure – Clients, Security, Network, Services; Accessing Cloud – Platforms, Web Applications, Web APIs, Web Browsers; Cloud Storage – Overview, Cloud Storage Providers; Standards – Application, Client, Infrastructure, Service; Centralizing Email Communications, Collaborating on Calendars, Schedules & Task Management, Event Management, Project Management and Contact Management.

Need for Virtualization – Pros and Cons of Virtualization, Types of Virtualization, System VM, Process VM, Virtual Machine Monitor – Virtual Machine Properties, HLL VM, Hypervisor – VMWare, Virtual Box, Hyper-V; Case Studies on Cloud Data Centres.

Security in Clouds – Cloud security challenges, SaaS as Service Security; Common Standards – Open Cloud Consortium, Distributed Management Task Force, Standards for Application Developers; Standards for Messaging – Standards for Security, End User access to cloud computing, mobile internet devices and the cloud.

Reference Books:

1. Bloor R., Kanfman M., Halper F. Judith Hurwitz “Cloud Computing for Dummies” (Wiley India Edition) 2010, ISBN 978-0-470-48470-8.
2. Barrie Sosinsky, “Cloud Computing Bible, “ Wiley India Pvt. Ltd. 2012
3. George Reese, “Cloud Application Architectures”, Shroff/O’ Reilly, 2009.
4. John W. Rittinghouse & James F. Ransome, “Cloud Computing: Implementation, Management and Security”, CRC Press, 1st Edition, 2009, ISBN 978-1439806807.
5. Antohy T Velte, Toby J. Velte, Robert Elsenpeter, Cloud Computing: “A Practical Approach”, McGraw Hill, 2009. ISBN 978-0-07-068351-8
6. Michael Miller, Cloud Computing: “Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008. ISBN 978-0-7897-3803-5
7. George Reese, “Cloud Application Architecture”, O’Reilly and Associates.

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MCA-II Semester-IV

IT4E.3 Python Programming

External Marks-80

Internal Marks -020

Theory-04 h/week

Unit-I

(15 hrs)

Installing Python, Simple program using Python, Expressions and Values, Variables and Computer Memory, error detection, Multiple line statements, Designing and using functions, functions provided by Python, Tracing function calls in memory model, omitting return statement.

Working with Text: Creating Strings of Characters, Using Special Characters in Strings, Creating a Multiline String , Printing Information, Getting Information from the Keyboard

Unit-II

(15 hrs)

A Boolean Type , Choosing Statements to Execute, Nested If Statements , Remembering the Results of a Boolean Expression Evaluation , A Modular Approach to Program Organization, Importing Modules , Defining Modules, Testing Code Semi automatically Grouping Functions Using Methods: Modules, Classes, and Methods , Calling Methods the Object-Oriented Way, Exploring String Methods, Underscores.

Unit-III

(15hrs)

Storing Collections of Data Using Lists: Storing and Accessing Data in Lists, Modifying Lists, Operations on Lists , Slicing Lists , Aliasing, List Methods , Working with a List of Lists.

Repeating Code Using Loops: Processing Items in a List, Processing Characters in Strings, Looping Over a Range of Numbers, Processing Lists Using Indices , Nesting Loops in Loops, Looping Until a Condition Is Reached, Repetition Based on User Input, Controlling Loops Using Break and Continue Reading and Writing Files: Kinds of files, Opening a File , Techniques for

Reading Files, Files over the Internet, Writing Files, Writing Algorithms That Use the File-Reading Techniques, Multiline Records

Unit-IV

(15hrs)

Storing Data Using Other Collection Types: Storing Data Using Sets, Storing Data Using Tuples, Storing Data Using Dictionaries, Inverting a Dictionary

Creating Graphical User interface: Building a Basic GUI, Models, Views, and Controllers, Customizing the Visual Style Widgets, Object-Oriented GUIs, Regular expressions

Databases: Overview, Creating and Populating, Retrieving Data, Updating and Deleting, Using NULL for Missing Data, Using Joins to Combine Tables, Keys and Constraints, Advanced Features.

References:

1. Practical Programming: An introduction to Computer Science Using Python, second edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf.
2. Python for Informatics: Exploring Information, Charles Severance
3. Learning Python, Fourth Edition, Mark Lutz, O'Reilly publication
4. Introduction to Python for Computational Science and Engineering (A beginner's guide), Hans Fangohr
5. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
6. R. Nageswara Rao, "Core Python Programming", dreamtech

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Semester-IV

IT4E.4 -Theory of Computation

Internal Marks -20

External Marks-80

Theory-04 h/week

UNIT-I

(15)

Basic concepts of Automata Theory: Alphabets, Strings and Languages, Deterministic Finite Automata (DFA), Nondeterministic Finite Automata (NFA), Representation of NFA and DFA using Transition Tables and State Diagrams. NFA with ϵ -transitions, Equivalence of NFA and DFA, Minimization of DFA.

UNIT-II

(15)

Regular Expressions and Languages: Introduction, Definition of regular expression, Kleen's Theorem, Equivalence of regular expression and Finite Automata, Pumping Lemma for regular Languages, Closure properties of Regular Languages, Finite Automata with Output: Moore and Mealy Machine, Equivalence of Moore and Mealy Machines.

UNIT-III

(15)

Context Free Grammars: Definition of Grammar, Classification of Grammars, Chomosky's Hierarchy. Context Free Grammars (CFG) and Context Free Languages (CFL) - Definition, Examples, Parse trees, Ambiguous Grammars, Simplification of Grammars, Normal forms of CFGs: Chomsky Normal Form (CNF) and Greibach Normal Form (GNF), Closure properties of CFLs, Pumping lemma for CFLs.

Push Down Automata (PDA) and Turing Machines: PDA - Definition and Description, Language of PDA, PDA and CFLs, Determinism and Non determinism in PDA, PDA applications. Introduction, Basic Features of a Turing Machine, Language of a Turing Machine, Variants of Turing Machine: Multitapes, Nondeterministic Turing Machine, Universal Turing Machine. Halting problem of Turing Machine.

References:

- 1.Introduction to Automata theory, Languages and Computation, J.E.Hopcraft, R.Motwani, and Ullman. 2nd edition, Pearson Education Asia
- 2.Introduction to languages and the theory of computation, J Martin, 3rd Edition, Tata McGraw Hill
- 3.Elements and Theory of Computation, C Papadimitrou and C. L. Lewis, PHI
- 4.Theory of Computer Science, K.L.P.Mishra, N. Chandrashekharan , PHI.
- 5.Introduction to Computer Theory, Daniel I.A. Cohen, Second Edition, John Wiley.

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Semester-IV

BM41 - Organizational Behaviour

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit 1- Introduction, Definition ,Significance & Overview OB models – inter-disciplinary approach, system approach, contingency approach. Personality- meaning, determinants of personality, development of personality; Perception- Meaning , perception process; Attitude- components of attitude ,types of attitude, Attitude formation; Values:- Types of values;
(15 Hours)

Unit-2 Motivation, concept, theories of motivation. Leadership- styles of leadership, functions of leader; Job stress- sources of stress, Effects of stress, coping strategies of stress
(15 Hours)

Unit 3- Group Foundation of group behavior, types of group, stages of group formation, Group structure,-Conflict-levels of conflict; types of conflict - Interpersonal and Intergroup conflicts
(15 Hours)

Unit 4- Organisational Change,Managing Change-forces for change in organizations forms of change, Resistance to Change. Organization Development: OD techniques. Global approach to O.B. - Issue of culture, managing diversity within and across the culture.
(15 Hours)

References:-

1. Stephan P. Robbins – Organisational Behaviour, Prentice Hall Publication
2. Fred Luthans – Organisational Behaviour, McGraw Hill Publication.
3. Keith Davis – Organisational Behaviour, McGraw Hill Publication
4. Laurie J. Mullins – Management & Organisational Behaviour, Pearson Education.

5. Newstorm and Keith Davis – Human Resource Management, McGraw Hill Publication
6. Organization Behavior- Jit Chandan.
7. Organization Behavior- P. Acquins 8. Organization Behavior – Text, cases- Uma Shekaran

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Semester-IV

BM4E.1 - ENTREPRENEURSHIP DEVELOPMENT

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit 1-Entrepreneurship Development

Concept of Entrepreneurship, Attributes and Characteristics of successful Entrepreneur, Entrepreneur v/s Intrapreneur, Entrepreneur v/s Entrepreneurship, Entrepreneur v/s Manager.

Role of Entrepreneur in Indian economy and developing economies with reference to Self-employment Development, Entrepreneurial Culture. (15 hours)

Unit 2 -Creating Entrepreneurial Venture

Business Planning Process - Environmental Analysis, Identifying Problems & Opportunities, Defining Business Idea- Product, Location & ownership. Stages in starting the new venture.

Initiatives for Project Implementation - Technical, Financial, Marketing, Personnel Feasibility. Estimating and Financing Funds requirement, Venture Capital Funding.

(15 hours)

Unit 3- Promoting Entrepreneurship

Introduction to various incentives, subsidies and grants, Promotion of Export oriented units, Fiscal and Tax concessions. Schemes offered by various commercial banks and financial institutions. Role of DIC in the Entrepreneurship Development – Objectives, District Industries (DIC) and its functioning - Entrepreneurship Training and Development – Objectives, Contents, Methods, Execution. Entrepreneurship Development Programmes. (15 hours)

Unit 4-Women Entrepreneurs in India and Problems of Entrepreneurs

Women Entrepreneurs – Definition, women entrepreneurship environment, challenges in the path of women entrepreneurship, empowerment of women by entrepreneurship, institutions supporting women entrepreneurship in India. Problems of Entrepreneurship- Marketing, Finance, Human Resource, Production, Research and External Problems. (15 hours)

References:

1. Dynamics of Entrepreneurship Development –Vasant Desai
2. Entrepreneurship Development – Dr. P.C.Shejwakar
3. Entrepreneurship – New Venture Creations – David H. Holt
4. Entrepreneurship – Hisrich Peters
5. Project Management – K. Nagarajan
6. Entrepreneurship Development & Small Business Enterprises – Poornima M. Charantimath- Pearson Education.
7. Entrepreneurship – Steven Brandt
8. Entrepreneurship Development – S.S. Khanka

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Semester-IV

BM4E.2 - Human Resource Management

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit 1

Introduction to Human resource management - Definition, Scope, Objectives, Importance, HRM versus Personnel Management, Changing role of Human resource Management, HRM in Indian context. (15 hours)

Unit 2

Procurement and Placement: Concept of HRP, Job Analysis, Job Description, Job Specification, Recruitment: Objective, Factors affecting Recruitment, Sources of Recruitment. Selection: Essential, Process, Placement. (15 hours)

Unit 3

Development and Maintenance of Human Resource: Performance Appraisal: Meaning, Need, Problems of Performance Appraisal, Training and Development: Difference between training and Development, Methods of Training & Development, Wage and Salary administration: Factors affecting wage/ salary, objective of wage and salary administration, Employee Benefits, Principle of employee benefit programme, Employee Service. (15 hours)

Unit 4

Human Resources Information Systems Meaning, concept, objective, Attributes, Need. HRIS Model, Subsystem of HRIS , Pre implementation stage of HRIS, Implementation of HRIS, Benefits of HRIS, Limitations of HRIS,Recent trends in HRIS (15 hours)

Reference Books: , Human Resource Management B.B.Mahapatro,

Human Resource Management Dipak Kumar Bhattacharyya,

Human Resource Management Garry Dessler,

Personnel & Human Resource Management. Edwin Flippo, ,

Personnel Management S. Seetaraman & B. Venkateswara Prasad,

Human Resource Management P.Subba Rao, ,

Human Resource Management VSP Rao

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Semester-IV

BM4E.3 - Supply Chain Management

Internal Marks -20

External Marks-80

Theory-04 h/week

UNIT 1 - Introduction to Supply Chain Management (15)

Concept and definition of Supply Chain, Physical distribution, Logistics and Supply Chain, Concept and evolution of Supply Chain Management, Importance of Supply Chain, Key issues in Supply Chain Management, Enablers of supply chain performance, Challenges in maintaining supply chain in India.

UNIT 2 – Managing Material Flow in Supply Chains (15)

Inventory Management – Introduction, Types of inventory, Inventory related cost, Analysing impact of supply chain redesign on inventory. Transportation – Drivers of transportation decision, Modes of transportation: Choices and their performance measures. Network Planning – Introduction, Network design, Inventory positioning and logistics coordination.

UNIT 3 – Supply Chain Integration (15)

Introduction, Push based supply chain, Pull based supply chain, Push – Pull supply chain, Identifying appropriate supply chain strategy and implementing strategy. Internal and external integration.

UNIT 4 – Information Technology in Supply Chain Management (15)

Enabling supply chain management through IT - IT in supply chain transaction execution, IT in supply chain collaboration and coordination, IT in supply chain decision support, IT in supply chain measurement and reporting. Supply chain management application marketplace. Future trends.

References –

1.Designing and Managing the Supply Chain – David Simchi Levi, Philip Kaminsky, Edith Simchi Levi, Ravi Shankar, Tata McGraw Hill Education Pvt. Ltd.

2.Supply Chain Management – Janat Shah, Pearson Education

3.Exploring the Supply Chain – Upendra Kachru, Excel Books

4.Business Logistics/ Supply Chain Management – Ronald Ballou, Samir Shrivastava, Pearson Education

5.Supply Chain & Logistics Management - Bowersox, Closs & Cooper, Tata McGraw Hill Education

6.Fundamentals of SCM: Twelve drivers of competitive advantage - John Mentzer, Sage Publication

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Semester-IV

**BM4E.4 - PERFORMANCE EVALUATION OF COMPUTER SYSTEM AND
COMPUTER CENTER MANAGEMENT**

Internal Marks -20

External Marks-80

Theory-04 h/week

Unit I

Measures and need of performance evaluation, crude measures of performance evaluation, nature of computer systems, events and their descriptions. Resource contention, Basic parameters and measures of effectiveness. (15)

Unit II

Fundamental relationships and their applications, Little's formula, Mean response time: Pollaczek – Khintchine formula, Generalized Pollaczek – Khintchine formula, Reliable operating environment. Systems with service discriminations: Non Preemptive priority systems, Optimal Priority Assignment, Preemptive resume priority system. (15)

Unit III

Workload modeling and characterization, Executable workload models: Benchmarks, synthetic jobs, Kernels, scripts. Non executable workload models: Instruction mixes, measure of computing power Performance measurement and monitoring: Hardware Monitor, Software Monitor, Firmware and Hybrid monitor. Gantt charts and Keviat charts. (15)

Unit IV

Performance tuning and improvement: General system tuning, Program behavior, execution efficiency, Load balancing and optimization. Database and I/O subsystem performance: File buffering and locality referencing, Models of database reorganisation. (15)

References:-

1. Performance Evaluation of Computer system – By H.C. Kantt
2. Quantitative Analysis of Computer Systems – By Clement H.C. Leung

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Semester-IV

MP41-Mini Project

Internal Marks -50 External Marks-00 Theory-02 h/week

Mini Project

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Semester-IV

IT41L-LAB VII (Advance Java Lab)

External Marks-100

Practical -04 h/week

Practical VII (Practical Based on Advance Java)

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Semester-IV

IT42L-LAB VIII (Data Mining Lab)

External Marks-100

Practical -04 h/week

Practical VIII (Practical Based on Data Mining)