K.L.N. COLLEGE OF ENGINEERING
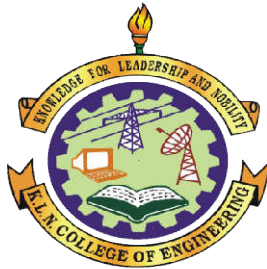
Pottapalayam-630612, Sivagangai District

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Estd: 1994

CURRICULA & SYLLABI

I to IV Semesters

REGULATIONS 2020

For Post Graduate Program

M.C.A - MASTER OF COMPUTER APPLICATIONS

CHOICE BASED CREDIT SYSTEM

(For the students admitted from the academic year 2020-2021 onwards)

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM

(An Autonomous Institution, Affiliated to Anna University, Chennai)

VISION OF THE INSTITUTION

To become a Centre of Excellence in Technical Education and Research in producing Competent and Ethical professionals to the society

MISSION OF THE INSTITUTION

To impart Value and Need based curriculum to the students with enriched skill development in the field of Engineering, Technology, Management and Entrepreneurship and to nurture their character with social concern and to pursue their career in the areas of Research and Industry.

VISION OF THE DEPARTMENT

To create innovative pedagogy with the source of knowledge in the successive development of Computer Technology in current trends

MISSION OF THE DEPARTMENT

To produce technically skillful, competent, employable, software professionals and researchers with social responsibilities and ethical values

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM

(An Autonomous Institution, Affiliated to Anna University, Chennai)

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: To prepare the students for the future challenges in the field of computer applications byproviding strong technical foundations

PEO 2: To provide students various computing skills like analysis, design, coding for the development of innovative software products to excel in their profession.

PEO 3: To motivate the students to exhibit continuous improvement in their professional careerthrough lifelong learning with societal ethics

PEO 4: To motivate the students to function effectively in multi disciplinary teams, in variousdomains for the benefit of society

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: Enables a student to implement a high performing system by selecting appropriate datamodel, Architecture and Platform

PSO 2: Enable the students to design and develop application software for real time systems byintegrating various system based components

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM
(An Autonomous Institution, Affiliated to Anna University, Chennai)

PROGRAM OUTCOMES (POs)

The Graduate Attributes for MCA programme are as follows:

PO1: **Computational Knowledge:** Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

PO2: Problem Analysis: Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics,computing sciences, and relevant domain disciplines.

PO3: Design /Development of Solutions: Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex Computing problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of t h e information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

PO6: Professional Ethics: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

PO7: Life-long Learning: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

PO8: Project management and finance: Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader ina team, to manage projects and in multidisciplinary environments.

PO9: Communication Efficacy: Communicate effectively with the computing community, and withsociety at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PO10: Societal and Environmental Concern: Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.

PO11: Individual and Team Work: Function effectively as an individual and as a member or leaderin diverse teams and in multidisciplinary environments.

PO12: Innovation and Entrepreneurship: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM
(An Autonomous Institution, Affiliated to Anna University, Chennai)

REGULATIONS 2020
For Post Graduate Program
Master of Computer Applications
CHOICE BASED CREDIT SYSTEM

CATEGORY OF COURSES

i.   **FOUNDATION COURSES (FC)** may include Mathematics or other basic courses

ii. **PROFESSIONAL CORE (PC)** courses include the core courses

relevant to the chosen specialization/branch.

iii. **PROFESSIONAL ELECTIVES (PE)** courses include the elective

courses relevant to the chosen specialization/ branch.

iv. **EMPLOYABILITY ENHANCEMENT COURSES (EEC)** includes

Project Work and/or Internship, Seminar, Professional Practices,

Summer Project, Case Study and Industrial / Practical Training.

v.   **AUDIT COURSES (AC)** include courses which develop desired attitude.

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM
(An Autonomous Institution, Affiliated to Anna University, Chennai)

REGULATIONS 2020
CHOICE BASED CREDIT SYSTEM
MASTER OF COMPUTER APPLICATIONS (FULL TIME)
CURRICULA AND SYLLABI
I TO IV SEMESTERS

SEMESTER I

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20MC101	Mathematical Foundations for Computer Applications	FC	4	3	1	0	4
2	20MC102	Database Management Systems	PC	3	3	0	0	3
3	20MC103	Computer Organization	PC	3	3	0	0	3
4	20MC104	Operating Systems	PC	3	3	0	0	3
5	20MC105	Programming in Java	PC	4	3	1	0	4
6	20RM101	Research methodology and IPR	PC	2	2	0	0	2
7		Audit Course – 1	AC	2	2	0	0	0
PRACTICAL								
8	20MC1L1	Java Programming Laboratory	PC	4	0	0	4	2
9	20MC1L2	DBMS Laboratory	PC	4	0	0	4	2
10	20MC1L3	Communication Skills Laboratory	EEC	3	1	0	2	2
TOTAL				32	20	2	10	25

Bridge Courses (BC) - First Semester

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
Bridge Courses								
1	20MCBC1	Fundamentals of Computers	BC	2	2	0	0	0
2	20MCBC2	Programming in C	BC	2	2	0	0	0
3	20MCBC3	Introduction to Internet	BC	2	2	0	0	0

SEMESTER II

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY									
1	20MC201	Computer Networks	PC	3	3	0	0	3
2	20MC202	Software Engineering	PC	3	3	0	0	3
3	20MC203	Python Programming	PC	4	3	1	0	4
4	20MC204	Data Structures and Algorithms	PC	4	3	1	0	4
5		Professional Elective – I	PE	3	3	0	0	3
6		Professional Elective – II	PE	3	3	0	0	3
7		Audit Course – 2	AC	2	2	0	0	0
PRACTICAL									
8	20MC2L1	Data Structures and Algorithms Laboratory	PC	4	0	0	4	2
9	20MC2L2	Python Programming Laboratory	PC	4	0	0	4	2
10	20MC2L3	Web Programming Laboratory	PC	4	0	0	4	2
11	20MC2L4	Mini Project	EEC	4	0	0	4	2
TOTAL				38	20	2	16	28

Bridge Courses (BC) - Second Semester

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
Bridge Courses									
1	20MCBC4	Object Oriented Programming in C++	BC	2	2	0	0	0
2	20MCBC5	System Analysis and Design	BC	2	2	0	0	0
3	20MCBC6	Computer Graphics and Multimedia Systems	BC	2	2	0	0	0

SEMESTER III

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1	20MC301	Web Application Development	PC	4	3	1	0	4
2	20MC302	Mobile Computing	PC	3	3	0	0	3
3	20MC303	Cloud and Big Data Analytics	PC	4	3	1	0	4
4	20MC304	Software Project Management	PC	3	3	0	0	3
5		Professional Elective – III	PE	3	3	0	0	3
6		Professional Elective – IV	PE	3	3	0	0	3
PRACTICAL								
7	20MC3L1	Application Development Laboratory	PC	4	0	0	4	2
8	20MC3L2	Cloud and Big Data Laboratory	PC	4	0	0	4	2
		TOTAL		**28**	**18**	**2**	**8**	**24**

SEMESTER IV

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
PRACTICAL								
1	20MC4L1	Project Work	EEC	24	0	0	24	12
		TOTAL		**24**	**0**	**0**	**24**	**12**

TOTAL NO. OF CREDITS: 89

PROFESSIONAL ELECTIVES (PE)

SEMESTER II

PROFESSIONAL ELECTIVE – I

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20MC2E1	Web Programming Essentials	PE	3	3	0	0	3
2.	20MC2E2	Professional Ethics	PE	3	3	0	0	3
3.	20MC2E3	Security in Computing	PE	3	3	0	0	3
4.	20MC2E4	Accounting and Financial Management	PE	3	3	0	0	3

SEMESTER II

PROFESSIONAL ELECTIVE – II

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20MC2E5	Human Resource Management	PE	3	3	0	0	3
2.	20MC2E6	Resource Management Techniques	PE	3	3	0	0	3
3.	20MC2E7	Artificial Intelligence	PE	3	3	0	0	3
4.	20MC2E8	Cryptography and Network Security	PE	3	3	0	0	3

SEMESTER III

PROFESSIONAL ELECTIVE – III

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20MC3E1	Software Testing and QualityAssurance	PE	3	3	0	0	3
2.	20MC3E2	Data Mining and Data Science	PE	3	3	0	0	3
3.	20MC3E3	Machine Learning	PE	3	3	0	0	3
4.	20MC3E4	Advanced Databases	PE	3	3	0	0	3

SEMESTER III

PROFESSIONAL ELECTIVE – IV

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20MC3E5	Service Oriented Architecture	PE	3	3	0	0	3
2.	20MC3E6	Internet of Things	PE	3	3	0	0	3
3.	20MC3E7	Object Oriented Analysis and Design	PE	3	3	0	0	3
4.	20MC3E8	XML and Web Services	PE	3	3	0	0	3

AUDIT COURSES (AC)

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20AC101	English for Research Paper Writing	AC	2	2	0	0	0
2.	20AC102	Disaster Management	AC	2	2	0	0	0
3.	20AC103	Sanskrit for Technical Knowledge	AC	2	2	0	0	0
4.	20AC104	Value Education	AC	2	2	0	0	0
5.	20AC105	Constitution of India	AC	2	2	0	0	0
6.	20AC106	Pedagogy Studies	AC	2	2	0	0	0
7.	20AC107	Stress Management by Yoga	AC	2	2	0	0	0
8.	20AC108	Personality Development Through Life Enlightenment Skills	AC	2	2	0	0	0

FOUNDATION COURSES (FC)

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20MC101	Mathematical Foundations for Computer Applications	FC	4	3	1	0	4

PROFESSIONAL CORE (PC)

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20MC102	Database Management Systems	PC	3	3	0	0	3
2.	20MC103	Computer Organization	PC	3	3	0	0	3
3.	20MC104	Operating Systems	PC	3	3	0	0	3
4.	20MC105	Programming in Java	PC	4	3	1	0	4
5.	20RM101	Research Methodology and IPR	PC	2	2	0	0	2
6.	20MC1L1	Java Laboratory	PC	4	0	0	4	2
7.	20MC1L2	DBMS Laboratory	PC	4	0	0	4	2
8.	20MC201	Computer Networks	PC	3	3	0	0	3
9.	20MC202	Software Engineering	PC	3	3	0	0	3
10.	20MC203	Python Programming	PC	4	3	1	0	4
11.	20MC204	Data Structures and Algorithms	PC	4	3	1	0	4
12.	20MC2L1	Data Structures and Algorithms Laboratory	PC	4	0	0	4	2
13.	20MC2L2	Python Programming Laboratory	PC	4	0	0	4	2
14.	20MC2L3	Web Programming Laboratory	PC	4	0	0	4	2
15.	20MC301	Web Application Development	PC	4	3	1	0	4
16.	20MC302	Mobile Computing	PC	3	3	0	0	3
17.	20MC303	Cloud and Big Data Analytics	PC	4	3	1	0	4
18.	20MC304	Software Project Management	PC	3	3	0	0	3
19.	20MC3L1	Application Development Laboratory	PC	4	0	0	4	2
20.	20MC3L2	Cloud and Big Data Laboratory	PC	4	0	0	4	2

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20MC1L3	Communication Skills Laboratory	EEC	3	1	0	2	2
2.	20MC2L4	Mini Project	EEC	4	0	0	4	2
3.	20MC4L1	Project Work	EEC	24	0	0	24	12

SUMMARY

S.No	Category	Credits as per Semester				Total Credits
		I	II	III	IV	
1	FC	4	-	-	-	4
2	PC	19	20	18	-	57
3	PE	-	6	6	-	12
4	EEC	2	2	-	12	16
5	AC	0	0	-	-	0
	TOTAL	25	28	24	12	89

20MC101	MATHEMATICAL FOUNDATIONS FOR	L	T	P	C
	COMPUTER APPLICATIONS	3	1	0	4

OBJECTIVES:
- The primary objective of this course is to provide mathematical background and sufficient experienceon various topics of discrete mathematics like matrix algebra, logic and proofs, formal languages and finite state automata.
- This course will extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

PRE-REQUISITE:NIL

UNIT-I   MATRIX ALGEBRA   12
Matrices, Rank of Matrix, Solving System of Equations-Eigen values and Eigenvectors-Inverse of aMatrix - Cayley Hamilton Theorem

UNIT-II   BASIC SET THEORY   12
Basic Definitions - Venn Diagrams and set operations - Laws of set theory - Principle of inclusion and exclusion- Relations- Properties of relations - Matrices of relations - Functions - injective, surjectiveand bijective functions.

UNIT - III   MATHEMATICAL LOGIC   12
Propositions and logical operators - Truth table - Propositions generated by a set - Equivalence andimplication - Basic laws - Some more connectives - Functionally complete set of connectives – Normalforms - Proofs in propositional calculus - Predicate calculus

UNIT - IV   FORMAL LANGUAGES   12
Languages and Grammars-Phrase Structure Grammar-Classification of Grammars-Pumping Lemma ForRegular Languages-Context Free Languages.

UNIT - V   FINITE STATE AUTOMATA   12
Finite State Automata-Deterministic Finite State Automata(DFA), Non Deterministic Finite State Automata (NFA)-Equivalence of DFA and NFA- Equivalence of NFA and Regular Languages

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Understand the basic knowledge of matrix, Rank of a matrix
- Apply the set theory, function and relations concept needed for designing and solving problems
- Formulate truth table for logical operations needed for computer skills
- Predict PCNF & PDNF and its conversion. Apply predict calculus
- Analyze the acquired knowledge of formal languages to the engineering areas like compiler design
- Apply finite automata theory and construct NFA, DFA and its conversion

REFERENCES:
1. Trembley, J.P. and Manohar, R, "Discrete Mathematical Structures with Applications to ComputerScience", Tata McGraw Hill, New Delhi, 2007.

2. Kenneth H.Rosen, " Discrete Mathematics and Its Applications", Tata McGraw Hill, Fourth Edition,2002

3. A.Tamilarasi & A.M.Natarajan, "Discrete Mathematics and its Application", Khanna Publishers, 2 ndEdition 2005.

4. M.K.Venkataraman "Discrete Mathematics", National Publishing Company, 2nd Edition, 2001.

5. Hopcroft and Ullman, "Introduction to Automata Theory, Languages and Computation", Narosa Publishing House, Delhi, 2002.

20MC102   DATABASE MANAGEMENT SYSTEMS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the fundamentals of data models and conceptualize and depict a database systemusing ER diagram
- To know about relational data model and SQL queries
- To understand the transaction management and recovery concepts
- To study about file management and indexing structures
- To understand other special purpose databases

PRE-REQUISITE:NIL

UNIT-I   INTRODUCTION   9

File Systems versus Database Systems – Data Models – DBMS Architecture – Entity RelationshipModel – Enhanced ER Modeling Concepts

UNIT-II   RELATIONAL MODEL   9

Relational Model Concepts – Relational Algebra – Structured Query Language – Queries – RelationalCalculus – Functional Dependencies – 1NF – 2NF – 3NF – 4NF – 5NF

UNIT - III   TRANSACTION PROCESSING   9

Transaction Processing – Properties of Transaction – Serializability – Transaction support in SQL –Locking Techniques – Time Stamp Ordering – Validation Techniques – Granularity of data items –Recovery Concepts – Shadow Paging – Log Based Recovery

UNIT - IV   FILES AND INDEXING   9

File Operations – Hashing Techniques – Indexing – Single Level and Multi Level Indexes – B+ Tree –B Tree – Static Hashing – Indexes on Multiple Keys

UNIT - V   SPECIAL PURPOSE DATABASES   9

OODBMS- - Object-Based Databases - OO Data Model - OO Languages – Persistence – ObjectRelational Databases - XML – Structure of XML –Database Tuning -Case Study for Design and Manage the Database for any Project.

TOTAL:45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Compare different data models and explain how data is represented in each model
- Build database using ER diagram and map ER diagram into relation
- Construct database applications using normalization
- Analyze the requirements of transaction processing and implement concurrency control among transactions
- Construct indexing structure for the given data
- Illustrate various special purpose databases

TEXT BOOKS:

Abraham Silberschatz, Henry F.Korth and S.Sundarshan "Database System Concepts", Sixth Edition,McGraw Hill, 2010.

REFERENCES:

1. C.J. Date, "An Introduction to Database Systems", Eight Edition, Pearson Education Delhi, 2003.
2. Ramez Elamassri and Shankant B-Navathe, "Fundamentals of Database Systems", Sixth Edition,Pearson Education Delhi, 2010.
3. Raghu Ramakrishnan, ―Database Management Systems‖, Fourth Edition, McGraw-Hill CollegePublications, 2015.
4. Peter Rob, Carlos Coronel, "Database System Concepts", Cengage Learning, 2008.

20MC103	COMPUTER ORGANIZATION	L	T	P	C
		3	0	0	3

OBJECTIVES:
- To understand the various number systems
- To become familiar with Boolean algebra
- To study the different types of combinational and sequential circuits
- To comprehend the basis operations that happen in a CPU
- To learn the data path and control path implementation
- To become familiar with the memory hierarchy design and I/O design

PRE-REQUISITE:NIL

UNIT-I   DIGITAL FUNDAMENTALS   8

Number Systems and Conversions – SOP, POS- Boolean Algebra an Simplifications - Minimization of Boolean Functions – Karnaugh Map, QuineMcClusky Method. Logic Gates – NAND NOR implementation

UNIT-II   COMBINATIONAL AND SEQUENTIAL CIRCUITS   10

Design of Circuits –Adder / Subtracter – Encoder – Decoder – MUX /DEMUX – Comparators, Flip flops – Triggering – Master – Slave Flip Flop – State Diagram and Minimization – Registers

UNIT - III   BASIC STRUCTURE OF COMPUTER   9

Functional Units - Basic Operational Concepts – Bus structures – Performance and Metrics – instruction and instruction sequencing – Hardware Software Interface – Addressing modes – InstructionSets – RISC and CISC – ALU Design – Fixed point and Floating point operations

UNIT - IV   PROCESSOR DESIGN   9

Processor basics –CPU Organization – Data Path Design – Control Design – Basic concepts – Hardwired control – Micro Programmed control – Pipe control – Hazards super scale operations

UNIT - V   MEMORY AND I/O SYSTEMS   9

Types of Memory- Primary, Secondary- Virtual Memory – Caches – Associative memories – Input /output system – Programmed I/O – DMA and interrupts – I/O devices

TOTAL:45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:
- Solve Karnaugh map using rules of Boolean algebra
- Construct various combinational and sequential circuits
- Illustrate the various addressing modes
- Identify the flow of principles and their Hazards
- Determine various types of memory
- Analyze various types of I/O systems

REFERENCES:

1. Carl Hamacher, ZvonkoVranesic, Safwat Zaky and Naraig Manjikian, "Computer Organization andEmbedded Systems", Sixth Edition, Tata McGraw Hill, 2012.
2. Carl Hamacher, ZvonkoVranesic and Safwat Zaky, fifth edition, "Computer Organisation" Tata McGraw Hill, 2002.
3. David A. Patterson and John L. Hennessy, "Computer Organization and Design, Fourth EditionMorgan Kaufmann Publishers, 2011.
4. William Stallings, "Computer Organization & Architecture, Tenth Edition, Pearson Education, 2015.
5. M.Morris Mano & Michael B. Cilepti, "Digital Design", Fourth Edition, Pearson Education, 2011.
6. M.Morris Mano, "Computer System Architecture", Second Edition, Prentice Hall of India, 2008.

20MC104	OPERATING SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To provide basic knowledge about operating systems, their services, process concept and processsynchronization
- To explore CPU scheduling concepts and Deadlocks
- To know about Memory Management concepts
- To know about disk structure and disk scheduling algorithms
- To provide knowledge about files and directories

PRE-REQUISITE:NIL

UNIT-I   INTRODUCTION   9

Introduction – Computer systems structures: computer system operation – I/O structure – storage structure – storage hierarchy – Hardware protection – operating system structures: system components – operating system services – system calls – Processes: process concept – process scheduling – operations on processes – cooperating processes – Inter process communication –

process synchronization: The critical-Section problem – Synchronization hardware – Semaphores – classic problems of synchronization

UNIT-II   CPU SCHEDULING AND DEADLOCK   9

CPU Scheduling: Basic concepts – scheduling criteria – scheduling algorithms –

Deadlocks: system model – Deadlock characterization – methods for handling deadlocks – deadlock prevention-deadlock avoidance – deadlock detection – Recovery from deadlock

UNIT - III   MEMORY MANAGEMENT   9

Memory management: Swapping – contiguous memory allocation – Paging –

Segmentation – Segmentation with paging – Virtual memory: Demand paging – Process creation – Page replacement– Allocation of frames – thrashing

UNIT - IV   MASS STORAGE STRUCTURE   9

Mass storage structure – Disk structure – Disk scheduling – Disk management – Swap spacemanagement – RAID structure

UNIT - V   FILE SYSTEM   9

File system interface: File concept – Access methods – Directory structure- File system mounting –file systems in Linux and windows – Mobile operating system

TOTAL:45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:
- Explain the concepts of OS services, process concepts and process synchronization
- Demonstrate the classical problems of synchronization
- Apply CPU Scheduling algorithms with deadlock concepts
- Apply memory management concepts and techniques
- Analyze disk structure and their disk scheduling algorithms
- Apply the concepts of files and directories for the relevant OS

TEXT BOOKS:

1. Abraham silberschatz Peter B.Galvin, G.Gagne, "OPERATING SYSTEM CONCEPTS", WilleyIndia Edition, Eighth Edition, 2010
2. Andrew S.Tanenbaum, "Modern operating systems", Third Edition, PHI Learning Pvt.Ltd.,2008

REFERENCES:

1. William Stallings, "OPEARTING SYSTEM", 7th EDITION , Pearson Education, 2010
2. H M Deital, P J Deital and D R Choffnes, "Operating Systems", 3rdedition,Pearson Education,2011

20MC105	PROGRAMMING IN JAVA	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To understand the Object oriented concepts and its implementation in Java programming.
- To provide skills on implementation of Data Structures
- To understand and apply the fundamentals core java, packages, database connectivity forcomputing
- To enhance the knowledge in the Window Based Application Development

PRE-REQUISITE:NIL

UNIT-I   OBJECT ORIENTED PROGRAMMING AND JAVA   12

Introduction to Programming Languages-Procedure Oriented Language (POP)-Features of Object Oriented Programming Language (OOPs)-POP vs OOPs-Characteristics of OOP-Classes, Objects, Data Abstraction & Encapsulation-Introduction to Java-Features of Java-Data Types, Expressions,Object Creations in Java- Control Structures – Functions-Arrays, Multi-Dimensional Array- Static Data Types & Functions

UNIT-II   POLYMORPHISM & INHERITANCE   12

Polymorphism-Method   Overloading-Constructors-Constructor   Overloading-Inheritance-Method Overriding-Dynamic Binding-Case Study on Dynamic Binding-Final Modifier, Abstract Method-Abstract Class-Interface-Multiple Inheritance-Packages-Access Specifiers.

UNIT - III   EXCEPTIONS & MULTI-THREADING   12

Introduction to Exceptions-Need for Handling Exceptions-Java Built-in Exceptions & ExceptionClasses-Exception Handling Mechanism-try, catch, finally, throw, throws-Customized Exception-Inner Classes-Types of Inner Classes-Thread-Multiple Threading and Multi-Processing-Thread Priorities-Synchronized Thread

UNIT - IV   STREAMS & COLLECTIONS   12

Streams-IO Streams-Byte Array Streams-Buffered Streams-Character Streams-Creating Files-Random Access Files-Introduction to Utility Packages- Introduction to collection – Hierarchy of Collection framework – Generics, stack, Vector, Array list, Linked List, HashSet, HashMap – Java annotations.

UNIT - V   ADVANCED JAVA PROGRAMMING   12

Applet Fundamentals-UI Components-Layout Managers-Working with Windows, Graphics, Text- Frame Window-Events-Event Handling Mechanisms-Mouse and Window Events-Creating Menu Items-Introduction to JDBC-Connecting Database with JDBC-URL-Java Network Programming-TCP Sockets-UDP Sockets-Servlets - RMI

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Describe Java programs using Object Oriented Programming principles
- Develop simple applications using class hierarchy, interfaces, packages
- Illustrate exception handling mechanism and threat concepts
- Apply I/O Stream, util packages and collection frameworks for computing
- Develop GUI based JAVA Applet programs
- Test for socket programs using TCP /IP and UDP

REFERENCES:
1. Herbert Schildt, The Complete Reference – Java 2, Ninth Edition, Tata McGraw Hill, 2014
2. Joyce Farrell, "Java Programming", Cengage Learning, Seventh Edition, 2014
3. John Dean, Raymond Dean, "Introduction to Programming with JAVA – A Problem SolvingApproach", Tata Mc Graw Hill, 2014.
4. Mahesh P. Matha, "Core Java A Comprehensive Study", Prentice Hall of India, 2011
5. R. Nageswara Rao, "Core Java: An Integrated Approach", Dream Tech Press, 2016

20RM101	RESEARCH METHODOLOGY AND IPR	L	T	P	C
		2	0	0	2

OBJECTIVES:

To give an overview of the research methodology and explain the technique of defining a research problem and to explain the functions of the literature review in research. This course can explain the art of interpretation and the art of writing research reports. Also it explains various forms of the intellectual property, its relevance and business impact in the changing global business environment.

PRE-REQUISITE:NIL

UNIT-I   INTRODUCTION TO RESEARCH METHODOLOGY   6

Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations. Effective literature studies, approaches, analysis, Plagiarism, Research ethics.

UNIT-II   EFFECTIVE TECHNICAL WRITING   6

How to write report, Paper Developing a Research Proposal, Format of research proposal, apresentation and assessment by a review committee

UNIT - III   INTELLECTUAL PROPERTY AND INTERNATIONAL SCENARIO   6

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

UNIT - IV   PATENT RIGHTS   6

Scope of Patent Rights, Licensing and transfer of technology, Patent information and databases,Geographical Indications

UNIT - V   NEW DEVELOPMENTS IN IPR   6

Administration of Patent System, New developments in IPR, IPR of Biological Systems, ComputerSoftware etc. Traditional knowledge Case Studies, IPR and IITs.

TOTAL:30 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:
- Explain the scope and objectives of research problem
- Develop effective technical writing for research proposal
- Classify the Intellectual property in IPR
- Determine the procedure for grant of Patents
- Illustrate patent rights, indications
- Predict the new development in IPR

TEXT BOOKS:

1. Debora J. Halbert, "Resisting Intellectual Property (RIPE Series in Global Political Economy)",Taylor & Francis Ltd., 2006.
2. W.H.Mayall, "Industrial Design for Engineers", London Iliffe Books Ltd. 1967.
3. Benjamin W. Niebel, "Product Design and Process Engineering", McGraw-Hill Inc., US, 1974.
4. Morris Asimow, "An Introduction To Design", Prentice-Hall, Inc. First Edition, 1962.
5. Robert P. Merges, Peter S. Menell and Mark A. Lemley, "Intellectual Property in NewTechnological Age", Aspen Law & Business, 2012.
6. T. Ramappa, "Intellectual Property Rights Under WTO: Tasks Before India", A H WheelerPublishing Co. Ltd., 2002.

REFERENCES:

1. S.Melville and W.Goddard, "Research Methodology: An Introduction for Science and EngineeringStudents", Juta & Co. Ltd., 1996.
2. Ranjit Kumar, "Research Methodology: A Step by Step Guide for Beginners", Third Edition, SAGEPublications Ltd., 2010

	L	T	P	C
20MC1L1 **JAVA PROGRAMMING LABORATORY**	0	0	4	2

OBJECTIVES:

- Try and develop the most important technologies that are being used today by web developers to build a wide variety of web applications.
- To develop java based web programming.
- To understand and apply the fundamentals core java, packages, database connectivity forcomputing.
- To enhance the knowledge to server side programming.
- To provide knowledge on advanced features like Applet, sockets etc.

LIST OF EXPERIMENTS:

1. Develop Java program using class, inheritance, package etc for the following
   - Different type of inheritance study.
   - Use of 'this' keyword.
   - Polymorphism.
   - Creation of user specific packages.
   - User specific exception handling.
   - Creation and usage of jar files.
2. Writing window based GUI applications using frames and applets such as calculator application,Fahrenheit to Centigrade conversion etc.
3. Event Handling.
4. Reading and writing text files.
5. Writing an RMI application to access a remote method.
6. Writing a servlet program with database connectivity for a web based application such as students result status checking, PNR number enquiry etc.
7. Create an application to search phone number using contact number using Hash Map.
8. Implementation of socket program using TCP.
9. Implementation of socket program using UDP.
10. Application of threads example.

TOTAL: 60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Develop JAVA programs using OOPS Concepts
- Apply GUI & Event handling for JAVA program
- Develop JAVA programs to read and write text files
- Apply SERVLET & RMI concepts using JAVA programs
- Apply Socket programming & threat concepts
- Examine mapping functions for any given application in JAVA

		L	T	P	C
20MC1L2	**DBMS LABORATORY**	0	0	4	2

OBJECTIVES:
- To Create Tables and Views
- To Insert and Manipulate Records
- To Perform operations in a procedural manner using PL/SQL
- To Implement Procedures and Functions
- To Apply Triggering operations

LIST OF EXPERIMENTS:
1. Basic SQL Commands
2. Tables and Views – Creation (DDL)
3. Data Manipulation: (DML)
   a. INSERT, DELETE and UPDATE in tables, SELECT, Sub Queries and JOIN.
4. TCL and Data Control Commands.
5. High Level Language extensions – PL/SQL
6. Perform Cursors in PL/SQL
7. Use of Procedures and Functions.
8. Packages in PL/SQL
9. Performance of Oracle Triggers.
10. Connectivity with Front end and Back end

TOTAL : 60 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Build different database objects using SQL queries
- Demonstrate the knowledge of inserting and manipulating the data
- Develop programs in PL/SQL environment
- Illustrate the use of procedures and functions in PL/SQL
- Apply Oracle triggers in PL/SQL programs
- Test for connection between front end and back end

	L	**T**	**P**	**C**

20MC1L3   **COMMUNICATION SKILLS LABORATORY**   **L** 1 **T** 0 **P** 2 **C** 2

OBJECTIVES:

- To provide opportunities to learners to practice their communicative skills to make them become proficient users of English.
- To enable learners to fine-tune their linguistic skills (LSRW) with the help of technology to communicate globally.
- To enhance the performance of learners at placement interviews and group discussions andother recruitment procedures.

LIST OF EXPERIMENTS:

1. PC based session (Weightage 40%)

A. English Language Lab (15)

1. Listening Comprehension: (5) Listening and typing – Listening and sequencing of sentences – Filling in the blanks - Listening and answering questions.

2. Reading Comprehension: (5) Filling in the blanks - Close exercises – Vocabulary building - Reading and answering questions.

3. Speaking: (5) Phonetics: Intonation – Ear training - Correct Pronunciation – Sound recognition exercises – Common Errors in English. Conversations: Face to Face Conversation – Telephone conversation– Role play activities

2. **B. Discussion of audio-visual materials (Samples to learn and practice) (6)**

1. Resume / Report Preparation / Letter Writing (1)

Structuring the resume / report - Letter writing / Email Communication - Samples.

2. Presentation skills: (1)

Elements of effective presentation – Structure of presentation - Presentation tools – Voice Modulation –Audience analysis - Body language – Video samples

3. Soft Skills: (2)

Time management – Articulateness – Assertiveness – Psychometrics – Innovation and Creativity - Stress Management & Poise - Video Samples

4. Group Discussion: (1)

Why is GD part of selection process? - Structure of GD – Moderator – led and other GDs Strategies in GD – Team work - Body Language - Mock GD –Video samples

5. Interview Skills: (1)

Kinds of interviews – Required Key Skills – Corporate culture – Mock interviews- Video samples.

3. II. Practice Session (Weightage – 60%)

Resume / Report Preparation / Letter writing: **(2)**

4.SOFT SKILLS (6)

Hard skills & soft skills – soft skills: self-management skills & people skills - training in soft skills persuasive skills – sociability skills –interpersonal skills – team building skills – leadership skills – problem solving skills – adaptability - stress management – motivation techniques – life skills

5. PRESENTATION SKILLS (6)

Preparing slides with animation related to the topic – organizing the material - Introducing oneself tothe audience – introducing the topic – answering questions – individual presentation practice–– presenting the visuals effectively – 5 minute presentation

6. GROUP DISCUSSION SKILLS (5)

Participating in group discussions – understanding group dynamics - brainstorming the topic -– questioning and clarifying –GD strategies (expressing opinions, accepting or refusing others opinions,

turn taking) – activities to improve GD skills – viewing recorded GD - mock GD.

7. INTERVIEW SKILLS (5)

Interview etiquette – dress code – body language – mock interview -–attending job interviews – answering questions confidently – technical interview – telephone/Skype interview - practice in different types of questions – one to one interview &panel interview – FAQs related to job interview- Emotional and cultural intelligence

TOTAL : 45 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Apply the skills required to face the interview
- Develop the skills required for presentation and Group discussion
- Experiment the reading and writing skills for workplace situations
- Develop ideas and concepts on par with global communication
- Make use of Inter personal communication with flair and error-free verbatim
- Analyze all round competency in delivering opt communication for employability

	L	T	P	C
20MC201 **COMPUTER NETWORKS**	3	0	0	3

OBJECTIVES:
- To understand networking concepts and basic communication model
- To understand network technologies to connect to different hosts
- To analyze the function and design strategy of various layers
- To acquire basic knowledge of various application protocol for internet security issues andservices
- To analyze performance of networking and simulate them using networking tools
- To understand network technologies to connect to different hosts

UNIT - I   NETWORK FUNDAMENTALS   9

Categories of Networks – Communication Model – Protocol architecture- ISO/OSI architecture – functionalities of OSI layers – TCP/IP architecture – Types of Networks (LAN, WAN,MAN, VPN,VLAN) – Transmission Media – LAN Topologies.

UNIT - II   N/W TECHNOLOGIES TO CONNECT HOSTS   9

LAN Technologies (Ethernet, Token ring) – WAN Technologies(Circuit Switching – ISDN, Packet Switching – Frame Relay – IEEE 802.11) – Multiple Access- CSMA/CD – Flow Control Techniques – Error Control Techniques.

UNIT - III   INTERNETWORKING   9

IPV4 – Global addresses – ICMP – Routing – Intra Domain Routing Algorithm (RIP, OSPF) – Subnetting – Classless Addressing – Inter Domain Routing – IPV6 – Multicasting.

UNIT - IV   PROTOCOL STACK   9

End –to End protocols [TCP(Segment format, Connection establishment and Termination, Congestion Control, Flow Control), UDP] –

UNIT - V   APPLICATION AND SECURITY   9

Application layer protocols (DNS, SMTP, WWW, SNMP) – Security- threats and services- Cryptography- Algorithms (RSA, DES).

TOTAL : 45 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Illustrate the functionalities and protocols of various layers of networks using different topologies.
- Build Local Area network with various connecting components using transmission media.
- Apply appropriate technologies to connect the hosts to network.
- Organize suitable internetworking routing algorithms for a given network.
- Apply suitable end-to-end protocols using congestion control mechanism.
- Analyze various application protocols and assess its security issues in network.

3. Larry L.Peterson & Bruce S.Davie, "COMPUTER NETWORKS – A SYSTEMS APPROACH", Fifth Edition, Morgan Kaufmann, 2012.

TEXT BOOKS: 4. Andrew S. Tannenbaum David j.Wetherall, "COMPUTER NETWORKS", Fifth Edition,

1. Behrouz A.forouzan, "DATA COMMUNICATION AND NETWORKING", Tata McGraw Hill, Pearson Education, 2014,

5. James F.Kurose, Keith W. Ross, "COMPUTER NETWORKING: A TOP-DOWN Fifth Edition, 2013,

2. William Stallings, "DATA AND COMPUTER COMMUNICATIONS", Pearson Education Nineth APPROACH", Pearson Education, 2012, Edition, 2013.

	L	**T**	**P**	**C**
20MC202 **SOFTWARE ENGINEERING**	3	0	0	3

OBJECTIVES:
- To provide an insight into software life cycle and various software process models
- To estimate the resources for developing the application and to prepare the schedule
- An ability to function effectively on teams to accomplish a common goal.
- An ability to use current techniques, skills, and tools necessary for computing practice.
- To construct software with high quality and reliability.

UNIT – I   INTRODUCTION   9

Role of Software – Software Characteristics – The Software Process – Overview of CMMI – Prescriptive
Process Models: The Waterfall Model, Incremental Models (Incremental and RAD) - Evolutionary Process Models (Prototyping, Spiral and Concurrent Development) – Agile Process Models.

UNIT – II   REQUIREMENT ENGINEERING AND ANALYSIS MODELING   9

Requirements Engineering Tasks - Initiating the Requirements Engineering Process - Eliciting requirements - Negotiating requirements – Validating requirements – Requirements Analysis – Analysis modeling – Data modeling – Flow oriented modeling. Case Study: Project Planning, SRS

UNIT – III   SOFTWARE DESIGN   9

Designing Concepts - Abstraction – Modularity – Software Architecture – Cohesion – Coupling – Dataflow Oriented Design - Jackson System Development - Real time and Distributed System Design –Designing for Reuse –– Case Study: Design for any Application Oriented Project.

UNIT – IV   SOFTWARE TESTING AND MAINTENANCE   9

Software Testing Fundamentals – Software Testing Strategies – Black Box Testing – White Box Testing– System Testing – Object Orientation Testing – State Based Testing - Testing Tools – Test CaseManagement – Types of Maintenance – Case Study: Testing Techniques

UNIT – V   SCM & WEB ENGINEERING   9

Need for SCM – Version Control – SCM process – Software Configuration Items –Taxonomy – Re Engineering – Reverse Engineering - Web Engineering - CASE Repository – Features.

                                                                           TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Illustrate the various process models
- Develop the requirements engineering and analysis modeling
- Develop various models for SRS .
- Experiment the various Software design aspects
- Predict the system with various testing techniques, strategies
- Classify the SCM process used in software development

REFERENCE:

1. Ali Behforroz, Frederick J.Hudson, "Software Engineering Fundamentals", Oxford Indian Reprint,2012.
2. Jibitesh Mishra, Ashok Mohanty, "Software Engineering", Pearson Education, First Edition, 2011.
3. Kassem A. Saleh, "Software Engineering", First Edition, J.Ross Publishing, 2009.
4. Pankaj Jalote, "An Integrated approach to Software Engineering", Third Edition, NarosaPublications, 2011.
5. Roger S. Pressman, David Lowe, "Web Engineering: A Practitioner"s Approach", Special Indian edition, McGrawHill, 2008.
6. Richard Fairley, "Software Engineering Concepts", Tata McGraw Hill Edition, 2008
7. Roger S. Pressman, "Software Engineering: A Practitioner Approach", Seventh Edition, TataMcGraw – Hill International Edition, 2009.
8. Sommerville, "Software Engineering", Tenth Edition, Pearson, 2015.

	L	T	P	C
20MC203 PYTHON PROGRAMMING	3	1	0	4

OBJECTIVES:

- To understand new Programming features in Python
- To provide skills on implementation of Data Structures in Python
- To enhance knowledge on Object Oriented Techniques in Python
- To improve skills on various Special Functions in Python
- To provide knowledge on Web Page Development

UNIT - I   PYTHON STATEMENTS AND FUNCTIONS   12

Introduction- Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions- Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass-Functions; default, keyword arguments parameters, local and global scope, function composition, recursion, Lambda; Strings:string slices, immutability, string functions and methods, string module

UNIT - II   DATA STRUCTURES IN PYTHON   12

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Sets-Tuples: tuple assignment, tuple as return value-Sets vs Tuples- Dictionaries: operations and methods; advanced list processing - list comprehension-Arrays-Numpy-Creating arrays in Numpy-Matrix-Copying arrays-For loop with List-Filter, Reduce, Map Operations

UNIT - III   INHERITANCE AND SPECIAL FUNCTIONS   12

Introduction to Classes-Object creations in python-Constructors-Dunder Functions-Decorators-Property Decorators-Inner Classes-Operator Overloading-Duck Typing-Inheritance-Multiple Inheritances-Method Overriding-Method Resolving Order (MRO)-Runtime Polymorphism

UNIT - IV   MODULES AND FILE HANDLING   12

Modules-PIP-Importing   Modules-User-Defined   Modules-main()   function-Packages-
                        Generators-Exceptions-try, catch, finally-Raise Exception-Threading-Multiple
Threading-Context Manager-
Files: text & Binary files, reading and writing files, format operator; command line arguments

UNIT - V   DATABASE CONNECTIVITY   12

Database   Connectivity-SQLIte,   MySQL-Execute   Queries-Virtual   Environment-Creating   Virtual
Environment- Tkinter-UI Components-Events-Events Handling Mechanisms.

TOTAL: 60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Explain the fundamentals of Python
- Apply the concept of Data Structures in PYTHON
- Apply OOP techniques in PYTHON
- Demonstrate the use of Modules and File handling in Python Programs
- Develop database connectivity using PYTHON
- Discuss the real time applications solved by PYTHON Programs

REFERENCES:

1. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
2. John V Guttag, "Introduction to Computation and Programming Using Python'', Revised and expanded Edition, MIT Press , 2013
3. Timothy A. Budd, "Exploring Python", Mc-Graw Hill Education (India) Private Ltd., 2015.
4. Paul Gries, Jennifer Campbell and Jason Montojo, "Practical Programming: An Introduction to Computer Science using Python 3", Second edition, Pragmatic Programmers, LLC, 2013.

20MC204	DATA STRUCTURES AND ALGORITHMS	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To learn linear data structures-Stack, Queue and Linked List
- To learn non linear data structures –Tree and Graphs
- To be exposed to sorting ,searching and hashing techniques
- To be familiar with the various algorithm design techniques
- To apply the algorithm design techniques to real world problems and analyze them.

UNIT I   LINEAR DATA STRUCTURES   12

Introduction - Abstract Data Types (ADT) – Stack ADT – Operations on Stack - Applications of stack – Infix to postfix conversion – evaluation of expression - Queue ADT – Operations on Queue - Circular Queue - Applications of Queue. List ADT - Array-based Implementation - Singly Linked Lists – Doubly Linked Lists - Applications of linked list – Polynomial Addition

UNIT II   NON LINEAR DATA STRUCTURES   12

Trees and its representation -Binary Tree – expression trees – Binary tree traversals – applications of trees – Binary search tree - Balanced Trees - AVL Tree – B-Tree - Heap- Heap operations- Graph and its representation - Graph Traversals - Depth-first traversal – breadth-first traversal -

applications of graphs-shortest-path algorithms – minimum spanning tree – Prim's and Kruskal's algorithms

UNIT III   SORTING, SEARCHING AND HASH TECHNIQUES   12

Sorting algorithms: Insertion sort - Bubble sort - Quick sort - Searching: Linear search –Binary Search - Hashing: Hash Functions – Separate Chaining – Open Addressing – Rehashing.

UNIT IV   ALGORITHM DESIGN AND ANALYSIS   12

Algorithm Analysis – Asymptotic Notations - Divide and Conquer – Merge Sort - Greedy Algorithms – Knapsack Problem – Dynamic Programming – Warshall's Algorithm for Finding Transitive Closure.

UNIT V   ADVANCED ALGORITHM DESIGN AND ANALYSIS   12

Backtracking – N-Queen's Problem – Branch and Bound –Assignment Problem - P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems – Travelling salesman problem-Amortized Analysis.

TOTAL :60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Demonstrate the operations of Linear Data Structures
- Demonstrate Non Linear Data Structure
- Determine the various sorting and searching techniques
- Apply different algorithm design strategies
- Calculate the Efficiency of given algorithm.
- Categorize the Algorithm design techniques to real world problems

REFERENCES:
1. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education, 2015
2. E. Horowitz, S.Sahni and Dinesh Mehta, "Fundamentals of Data structures in C++", UniversityPress, 2007
3. E. Horowitz, S. Sahni and S. Rajasekaran, "Computer Algorithms/C++", Second Edition, University Press, 2007

TEXT BOOKS:
1. Gilles Brassard, "Fundamentals of Algorithms", Pearson Education 2015
2. Harsh Bhasin, "Algorithms Design and Analysis", Oxford University Press 2015
3. John R.Hubbard, "Data Structures with Java", Pearson Education, 2015
4. M. A. Weiss, "Data Structures and Algorithm Analysis in Java", Pearson Education Asia, 2013
5. Peter Drake, "Data Structures and Algorithms in Java", Pearson Education 2014
6. T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, "Introduction to algorithms", ThirdEdition, PHI Learning Private Ltd, 2012
7. Tanaenbaum A.S.,Langram Y. Augestein M.J, "Data Structures using C" Pearson Education ,2004.

20MC2L1	**DATA STRUCTURES AND ALGORITHMSLABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**4**	**2**

OBJECTIVES:

- To develop skills in design and implementation of data structures and their applications
- To learn and implement linear, non linear and tree data structures
- To study, implement and analyze the sorting technique.
- To implement some common algorithm design techniques.

LIST OF EXPERIMENTS:

1. Stack ADT implementation – Array implementation
2. Infix to postfix conversion
3. Queue ADT implementation – Linked list implementation
4. Singly Linked List operations
5. Binary Search tree implementation
6. Graph Traversals (Breadth First and Depth First search)
7. Spanning Tree Implementation (Prims/ Kruskals)
8. Merge Sort –Divide and Conquer
9. Find the Shortest Path using Dijkstra's Algorithm – Greedy method
10. Warshall's Algorithm for finding transitive closure using Dynamic programming

TOTAL: 60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Demonstrate the various Linear Data Structures
- Demonstrate Tree Operations
- Demonstrate Graph Operations
- Apply different sorting techniques
- Apply Greedy method to find the shortest path problem
- Discuss dynamic programming to find the transitive closure

		L	T	P	C

20MC2L2   **PYTHON PROGRAMMING LABORATORY**

L	T	P	C
0	0	4	2

OBJECTIVES:

- To understand the basic functionalities techniques in python
- To apply the various function techniques
- To implement the Object-oriented Techniques
- To create simple files and databases
- To create Windows and Events oriented programming concepts

LIST OF EXPERIMENTS:

1. Basic Programs using Python.
2. Implement Linear and Binary Search
3. Implement Selection and Merge Sorts
4. Create Classes and Objects
5. Create Modules and Packages
6. Construct a linked list. Prompt the user for input. Remove any duplicate numbers from thelinked list.
7. Read a file content and copy only the contents at even lines into a new file.
8. Create a table in SQLite / MySQL and apply SQL queries
9. Create GUI components using Tkinter
10. Create Mouse Events using Tkinter

TOTAL: 60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Apply the concept of Basic Programs in python
- Apply Object-Oriented Techniques in PYTHON
- Apply compound data structures using PYTHON
- Build File operations using PYTHON
- Apply database connectivity in PYTHON
- Classify window based applications using Tkinter

		L	**T**	**P**	**C**
20MC2L3	**WEB PROGRAMMING LABORATORY**	**0**	**0**	**4**	**2**

OBJECTIVES:

- Try and develop the most important technologies that are being used today by webdevelopers to build a wide variety of web applications.
- To build web applications using proven developer tools and message formats.
- To understand and practice web development techniques on client-side
- Web applications using technologies such as HTML, CSS, Javascript, AJAX, JQuery andJSON.

LIST OF EXPERIMENTS:

1. Create your own Resume using HTML 5 Tags

2. Debug and validate your HTML document (Resume) using W3C validator and fix the issues.(https://validator.w3.org/#validate_by_upload).

3. Add Styles to your Resume using CSS 3 Properties.
  - ➢ Add External, Internal and Inline CSS styles to know the priority.
  - ➢ Add CSS3 Animation to your profile.

4. (a) Add functionalities that use any 2 of HTML 5 API's.
(b). Create a student Registration form for Job Application and validate the form fields using JavaScript.

5. (a) Create a CGPA Calculator in Web Brower using HTML, CSS and JavaScript. Use functions inJavaScript.
(b) Create a Quiz Program with adaptive questions using JavaScript.

6. Create a Pan Card Validation form using Object Oriented JavaScript, consider the 10thcharacter to be analphabet.
  - ➢ Get the user's First Name, Last Name and other required fields as input
  - ➢ Assume the last digit of the Pan Number to be an alphabet
  - ➢ Validate the PAN Number

7. (a) Create an online Event Registration form and validate using JQuery
(b) Create an online video Player which will allow you to play videos from the system and also create custom playlist using JQuery

8. Construct a JSON Structure for a bookstore and validate it using JSON Validator such ashttp://jsonlint.com/ and parse the Json file to list the books under the category "Fiction". Use Javascript or JQuery for parsing.

9. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

10. Develop a Social Media Web Application using HTML5, CSS3, JQuery, AJAX & PHP.

TOTAL: 60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Develop simple web applications using HTML5 and CSS
- Develop simple web applications using scripting languages.
- Develop server side and client side programming
- Develop web application using various technologies using AJAX, JQUERY and JSON
- Develop an application for social media using HTML5, CSS3, JQUERY, AJAX & PHP
- Illustrate database connectivity in PHP

	L	**T**	**P**	**C**

20MC301   **WEB APPLICATION DEVELOPMENT**   **3**   **1**   **0**   **4**

OBJECTIVES:
1. To understand Enterprise Application Development and J2EE Technologies
2. To understand Spring Framework and develop web applications using it.
3. To get familiar with Struts Framework and develop web applications using it.
4. To understand Hibernate Architecture and its working
5. To be familiar with Django Framework.

UNIT I   **J2EE**   **9+3**

Introduction -Enterprise Architecture Styles -J2EE Architecture - Containers - J2EE Technologies - Developing J2EE Applications - Naming and directory services - Using JNDI - JNDI Service providers - Java and LDAP - LDAP operations - Searching an LDAP server - Storing and retrieving java objects in LDAP - Application Servers - Implementing the J2EE Specifications - J2EE packaging and Deployment - J2EE packaging overview - Configuring J2EE packages.

UNIT II   **SPRING**   **9+3**

Spring Form Handling -Validating Form input- Accessing relational data using JDBC with spring- Uploading Files using spring application- Creation of Batch Service- Using Web Socket to build an interactive web application.

UNIT III   **STRUTS**   **9+3**

Introduction to Struts – MVC framework- Struts Architecture – Business Service – Parameter Passing – Action class & configuration files – Struts.xml Tags – Namespace & Wildcards –Model Driven Action – Value stack & OGNL – Validation – Interceptors - Inbuilt Interceptors – Custom Interceptors .

UNIT IV   **HIBERNATE**   **9+3**

HIBERNATE ORM-Persistence-Relational Database-The object relational impedance mismatch - Using Native Hibernate API‟s and hbm.xml- Using the java persistence API‟s -Hibernate Validator – HIBERNATE OGM – HIBERNATE SEARCH - Enabling full text search capabilities in entities - Indexing-Searching -Introduction to Full text search.

UNIT V   **DJANGO**   **9+3**

Introduction to Django - Django model layer – View layer – Template Layer – Forms – Automated admin interface – Django Security – Internationalization and localization – Django Web application tools – Geographic Framework.

                             TOTAL: **60**   **PERIODS**

OUTCOMES:

Upon Completion of the Course, the Students will be able to:
1. Demonstrate J2EE Architecture and its related technologies
2. Discover the features of SPRING framework to develop various JAVA applications
3. Illustrate the process of MVC framework with the help of STRUTS
4. Discuss about hibernate framework to simplify the development process of JAVA applications Unit
5. Construct the web applications with the advancements of DJANGO framework
6. Analyze the various framework to develop the JAVA based applications

REFERENCES:

1. Ayman Hourieh, "Learning Website Development with Django", Packt Publishing, 2008.
2. Craig Walls, "Spring in Action, 4th Edition Kindle Edition, Manning Publication, 2015.
3. James Holmes "Struts: The Complete Reference, " 2nd Edition, McGraw Hill, 2007.
4. Jeff Forcier, Paul Bissex, Wesley J Chun, "Python Web Development with Django (Developer'sLibrary)", Pearson Education, 2009
5. Mark Summerfield, "Programming in Python 3: A Complete Introduction to the Python Language", second edition, Pearson Education, 2010.
6. Patrick Peak and Nick Heudecker, "Hibernate Quickly", Manning Publication, 2007
7. Subrahmanyam, Allamaraju and Cedric Buest , "Professional Java Server Programming (J2EE 1.3Edition), ", Shroff Publishers & Distributors Pvt Ltd
8. Julie Meloni ,"HTML, CSS and JavaScript All in One, Sams Teach Yourself", Secondedition,2014,Pearson
9. Luke Welling and Laura Thomson," PHP and MySQL Web Development", 5th Edition,2016, Addison Wesley.

	L	**T**	**P**	**C**
20MC302 **MOBILE COMPUTING**	**3**	**0**	**0**	**3**

OBJECTIVES:
1. To learn the basic concepts, aware of the GSM, GPRS Architecture.
2. To have an exposure about wireless protocols -WLAN, Bluetooth, WAP.
3. To Know the Mobile IP Network Layer of Mobile communication
4. To understand the concepts of Mobile Transport Layer
5. To impart knowledge about Mobile Application Development

UNIT I   WIRELESS COMMUNICATION FUNDAMENTALS, ARCHITECTURE   9

Frequency Spectrum- Multiplexing- Spread spectrum-GSM vs CDMA - -Comparison of 2G 3 G, 4G - GSM Architecture-Entities-Call Routing- Address and identifiers- GSM Protocol architecture-Mobility Management-Frequency Allocation- Security –GPRS Architecture (entity and Protocol).

UNIT II   MOBILE WIRELESS SHORT RANGE NETWORKS   9

Introduction-WLAN Equipment-WLAN Topologies-WLAN Technologies-IEEE 802.11 Architecture WLAN MAC-Security of WLAN Power Management-Standards- WAP Architecture- Bluetooth Architecture Bluetooth enabled Devices Network-Layers in Bluetooth Protocol-Security in Bluetooth-IrDA- ZigBee

UNIT III   MOBILE IP NETWORK LAYER, TRANSPORT LAYER   9

IP and Mobile IP Network Layer- Packet delivery and Handover Management-Location Management- Registration- Tunneling and Encapsulation-Route Optimization- Mobile Transport Layer-Conventional TCP/IP Transport Layer Protocol-Indirect, Snooping, Mobile TCP.

UNIT IV   MOBILE APPLICATION DEVELOPMENT USING ANDROID   9

Mobile Applications Development - Understanding the Android Software Stack – Android Application Architecture –The Android Application Life Cycle – The Activity Life Cycle- Creating Android Activity Views- Layout -Creating User Interfaces with basic views- linking activities with Intents.

UNIT V   MOBILE APPLICATION DEVELOPMENT USING ANDROID   9

Services-Broadcast Receivers – Adapters – Data Storage, Retrieval and Sharing.-Location basedservices- Development of simple mobile applications

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
1. Illustrate the wireless communication fundamentals and their Architecture
2. Apply the WLAN equipment, topologies and their technologies for short range networks
3. Demonstrate the Bluetooth architecture and their protocols
4. Use the concept of packet delivery & handover management in IP network layer
5. Analyze and compare the application and activity life cycles
6. Apply mobile application development using Android

REFERENCES

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3. Raj Kamal "Mobile Computing" Oxford Higher Education, Second Edition, 2012
4. Pei Zheng, Larry L. Peterson, Bruce S. Davie, Adrian Farrell "Wireless Networking Complete"Morgan Kaufmann Series in Networking , 2009(introduction, WLAN MAC)
5. Vijay K Garg "Wireless Communications & Networking" Morgan Kaufmann Series, 2010
6. Jochen Schillar "Mobile Communications" Pearson Education second Edition, 2009
7. William Stallings, "Wireless Communication and Networks", Pearson Education, 2009.
8. C.Siva Ram Murthy and B.S Manoj, "Ad Hoc Wireless Networks", Pearson Education, 2004.
9. Donn Felker ,'Android Application Development For Dummies, Wiley, 2010
10. Reto Meier, Professional Android 2 Application Development, Wrox's Programmer toProgrammer series
11. Ed Burnette, 'Hello, Android: Introducing Google's Mobile Development Platform' third edition' Pragmatic Programmers,2012
12. Jerome(J.F) Di Marzio "Android A programmer's Guide" Tata McGraw-Hill 2010 Edition

	L	**T**	**P**	**C**
20MC303 **CLOUD AND BIG DATA ANALYTICS**	3	1	0	4

OBJECTIVES:

- To understand evolution of cloud computing, apply the concept of virtualization and its Security.
- To explore the fundamental concepts of big data and analytics
- To apply various techniques for mining data stream.
- To understand the applications using Map Reduce Concepts
- To understand the various search methods and visualization techniques

UNIT - I   CLOUD ARCHITECTURE AND VIRTUALIZATION   **9+3**

Cloud Computing Overview: Characteristics – challenges, benefits, limitations, Evolution of Cloud Computing, Cloud computing architecture, Cloud Reference Model (NIST Architecture) - Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public Vs Private Cloud – Cloud ecosystem – Service management – Computing on demand – Virtualization- Cloud Security. **Case Study: AWS, Google App Engine, Sales force.**

UNIT - II   INTRODUCTION TO BIG DATA   **9+3**

Introduction to Big Data Platform – Characteristics of Big data – Challenges of Big Data Analytics - Need of big data frameworks- Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling -
Statistical Inference - Prediction Error.

UNIT - III   MINING DATA STREAMS   **9+3**

Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP)Applications –- Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT - IV   FRAMEWORKS AND APPLICATIONS   **9+3**

Framework – Hadoop- Setting up a Hadoop Cluster- Security in Hadoop- HDFS- Map Reduce -Hive – Sharding – NoSQL Databases –MongoDB– Analyzing big data with twitter – Big data for Ecommerce – Big data to improve medical innovation.

UNIT - V   DATA ANALYSIS SYTEMS AND VISUALIZATION   **9+3**

Link Analysis – Page Rank - Efficient Computation of Page Rank- Topic-Sensitive Page Rank – Link Spam- Recommendation Systems- A Model for Recommendation Systems- Content Based Recommendations - Collaborative Filtering- Dimensionality Reduction- Visualizations - Visual data analysis techniques-interaction techniques- Systems and applications

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:

1. Summarize cloud computing architecture and virtualization concepts
2. Summarize Big Data Concepts
3. Apply the Big Data Analytic techniques for mining data streams
4. Apply various framework concepts in real time applications
5. Analyze the concepts of data analysis systems
6. Analyze virtualization analysis techniques

REFERENCES:
1. Grewal B.S, "Numerical methods in Engineering and Science", Khanna Publishers, 2013.
2. John. E. Freund, Irwin Miller, Marylees Miller, "Mathematical Statistics with Applications", Seventh Edition, Prentice Hall of India, 2004.
3. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud"O'Reilly.
4. Gautam Shroff, Enterprise Cloud Computing, Cambridge University Press, 2011.
5. James E. Smith, Ravi Nair, "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.
6. John W. Ritting house and James F. Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
7. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
8. Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.
9. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
10. Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, Mastering Cloud Computing", TMGH,2013.
11. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2014
12. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing,2012
13. Da Ruan, Guoquing Chen, Etienne E.Kerre, Geert Wets, Intelligent Data Mining, Springer,2007
14. Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons,2012
15. Pete Warden, "Big Data Glossary", O"Reilly,2011
16. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer,2007

20MC304	SOFTWARE PROJECT MANAGEMENT	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To know of how to do project planning for the software process.
- To learn the cost estimation techniques during the analysis of the project.
- To understand the quality concepts for ensuring the functionality of the software
- To Analyze Risk Identification and Resource Allocation
- To Identify Globalization issues in project management

UNIT - I   OVERVIEW OF SOFTWARE PROJECT MANAGEMENT   9

Introduction to Software Project Management: An Overview of Project Planning: Select Project, Identifying Project scope and objectives, infrastructure, project products and Characteristics. Estimateefforts, Identify activity risks, and allocate resources, TQM, Six Sigma

UNIT - II   EVALUATION AND COSTING OF SOFTWARE   9

Project Evaluation: Strategic Assessment, Technical Assessment, cost-benefit analysis, Cash flow forecasting, cost-benefit evaluation techniques, Risk Evaluation. Selection of Appropriate Project approach: Choosing technologies, choice of process models, structured methods.

UNIT - III   SOFTWARE ESTIMATION TECHNIQUES AND ACTIVITY PLAN   9

Software Effort Estimation: Problems with over and under estimations, Basis of software Estimation, Software estimation techniques, expert Judgment, Estimating by analogy. Activity Planning: Project schedules, projects and activities, sequencing and scheduling Activities, networks planning models,formulating a network model.

UNIT - IV   RISK MANAGEMENT AND RESOURCE ALLOCATION   9

Risk Management: Nature of Risk, Managing Risk, Risk Identification and Analysis, Reducing the Risk. Resource Allocation: Scheduling resources, Critical Paths, Cost scheduling, Monitoring and Control: Creating Framework, cost monitoring, prioritizing monitoring.

UNIT - V   CHALLENGES IN PROJECT MANAGEMENT   9

Globalization issues in project management: Evolution of globalization- challenges in building global teams-models for the execution of some effective management techniques for managing global teams. Impact of the internet on project management: Introduction – the effect of internet on project management – managing projects for the internet – effect on project management activities.

TOTAL : 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

1. Demonstrate the software project planning in Detail
2. Estimate the six sigma techniques in detail
3. Determine the cost benefit evaluation techniques
4. Compare the software estimation techniques available in SPM
5. Examine the risk identification and analysis
6. Discuss the globalization challenges in project management

TEXT BOOKS:

1.   Bob Hughes & Mike Cotterell, "Software Project Management", Tata McGraw- Hill Publications, Fifth Edition 2012
2.   2. Futrell , "Quality Software Project Management", Pearson Education India, 2008

REFERENCES:

1.   Gobalswamy Ramesh, "Managing Global Software Projects", Tata McGraw Hill Publishing Company, 2003
2. Richard H.Thayer "Software Engineering Project Management", IEEE Computer Society
3. S. A. Kelkar," Software Project Management" PHI, New Delhi, Third Edition ,2013
4. http://en.wikipedia.org/wiki/Comparison_of_project_management_software
5. http://www.ogc.gov.uk/methods_prince_2.asp

20MC3L1	**APPLICATION DEVELOPMENT LABORATORY**	L	T	P	C
		0	0	4	2

OBJECTIVES:

- To design applications using J2EE
- To work with LDAP
- To develop a simple application using Spring and Struts Framework

LIST OF EXPERIMENTS:

1. Develop a car showroom inventory web application with 2-tier architecture. Use JSP andJDBC.
2. Develop a real estate web application with n-tier architecture. Use JSP, Servlets and JDBC.
3. Develop web application which stores and authenticates user data using LDAP
4. Create an simple online bookstore using Spring MVC ,JDBC with CURD functionality
5. Design a student management web application using struts MVC, JDBC with CURD functionality.
6. Develop an application that uses GUI components, Font and Colors.
7. Write an application that draws basic graphical primitive on the screen.
8. Implement an application that implements Multi-threading
9. Develop a native calculator
10. Develop an application that uses GPS location information

TOTAL: 60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Implement web applications using JSP, Servlet and JDBC
- Practice web application development using Spring and Struts Framework
- Demonstrate the use of LDAP

20MC3L2	**CLOUD AND BIG DATA LABORATORY**	L	T	P	C
		0	0	4	2

OBJECTIVES:

- Be exposed to tool kits for cloud and Hadoop environment.
- Be familiar with migration of Virtual Machines from one node to another
- Learn to run virtual machines of different configuration.
- Learn to use Hadoop Distributed File System (HDFS) to set up single and multi-node clusters.

LIST OF EXPERIMENTS:

Use Eucalyptus or Open Nebula or Open Stack or equivalent to set up the cloud and demonstrate

1. Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time
2. Find procedure to attach virtual block to the virtual machine and check whether it holds the dataeven after the release of the virtual machine
3. Install a C compiler in the virtual machine and execute a sample program.
4. Install Google App engine. Create a hello world app and other web applications using Python/Java.
5. Show the virtual machine migration based on the certain condition from one node to the other
6. Find procedure to install storage controller and interact with it.
7. Find procedure to set up the one node Hadoop cluster.
8. Mount the one node Hadoop cluster using FUSE.
9. Write a word count program to demonstrate the use of Map - Reduce tasks.
10. K-means clustering using map reduce.

TOTAL: 60 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Use various virtualization tools such as Virtual box/VMware workstation.
- Apply C Compiler in Virtual Machine for various C Programs.
- Design and Implement applications on the Cloud environment.
- Set up and perform Hadoop cluster concept.
- Use the map reduce tasks and implement for various applications.
- Work effectively in a team through proper communication based on the given task and Preparetechnical report on the observations of the experiments.

	L	**T**	**P**	**C**

20MC2E1   **WEB PROGRAMMING ESSENTIALS**   L T P C
                                                             3 0 0 3

OBJECTIVES:

- To understand different Internet Technologies
- To practice markup languages
- To learn java specific web services architecture
- To understand and practice web development techniques on client side.

UNIT – I   INTRODUCTION TO WWW   9

Internet Standards – Introduction to WWW – WWW Architecture – SMTP – POP3 –   File Transfer Protocol - Overview of HTTP, HTTP request – response –– Generation of dynamic web pages.

UNIT – II   HTML 5 & CSS3   9

HTML5 – Tables – Lists – Image – HTML5 control elements – Semantic elements – Drag and Drop – Audio – Video controls – CSS3 – Inline, embedded and external style sheets – Rule cascading – Inheritance – Backgrounds – Border Images –Margins & Padding - Colors – Shadows – Text – Transformations- Position using CSS – Transitions – Animations.

UNIT - III   INTRODUCTION TO JAVA SCRIPT   9

Introduction - Core features - Data types and Variables - Operators, Expressions, and Statements -

Functions - Objects - Array, Date and Math related Objects - Document Object Model - Event Handling - Controlling Windows & Frames and Documents - Form handling and validations.

UNIT – IV   ADVANCED JAVA SCRIPT   9

Classes – Constructors – Object-Oriented Techniques in JavaScript – Object constructor and Prototyping - Sub classes and Super classes –JSON - JQuery and AJAX.

UNIT – V   PHP   9

Introduction - Setting up the environment (LAMP server) - Programming basics Print/echo - Variables and constants – Strings and Arrays – Operators, Control structures and looping structures –Functions – Embedding PHP within HTML - Establishing connectivity with MySQL database.

                                                         TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Outline the basic concepts of information and web architecture.
- Illustrate the skills that will enable to design and build web applications.
- Develop website using Html, CSS.
- Analyze the latest programming language for the implementation of object based andprocedure based applications.
- Understand the applicability of Java Script.
- Illustrate PHP language to connect databases.

REFERENCES:

1. David Flanagan, "JavaScript: The Definitive Guide, Sixth Edition", O'Reilly Media, 2011
2. Harvey & Paul Deitel& Associates, Harvey Deitel and Abbey Deitel, "Internet and World Wide Web - How To Program", Fifth Edition, Pearson Education, 2011
3. James Lee, Brent Ware , "Open Source Development with LAMP: Using Linux, Apache, MySQL, Perl, and PHP" Addison Wesley, Pearson 2009
4. Thomas A. Powell, "HTML & CSS: The Complete Reference", Fifth Edition, 2010
5. Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013
6. Thomas A Powell, "Ajax: The Complete Reference", McGraw Hill, 2008

20MC2E2	PROFESSIONAL ETHICS	L	T	P	C
		3	0	0	3

OBJECTIVES:
- To understand the concepts of computer ethics and hacking.
- To understand the rights of Intellectual Property
- To understand the intricacies of accessibility issues
- To ensure safe exits when designing the software projects
- To understand the Social Networking ethical issues

UNIT - I   INTRODUCTION OF COMPUTER ETHICS AND HACKING   9

Introduction – Computer ethics: an overview – Identifying an ethical issue – Ethics and law – Ethical theories - Professional Code of conduct – A framework for ethical decision making - Computer hacking – Introduction – definition of hacking – Destructive programs – hacker ethics - Professional constraints – BCS code of conduct

UNIT - II   INTELLECTUAL PROPERTY RIGHTS   9

Computer crime - Introduction - What is computer crime – computer security measures –
Professional duties and obligations - Intellectual Property Rights – The nature of Intellectual property – Intellectual Property – Patents, Trademarks, Trade Secrets, Software Issues, Copyright - The extentand nature of software piracy – Ethical and professional issues

UNIT - III   TECHNOLOGY AND SAFETY   9

Introduction – In defense of freedom expression – censorship – laws upholding free speech – Free speech and the Internet - Ethical and professional issues - Internet technologies and privacy – Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk.

UNIT - IV   COMPUTER PROFESSIONAL ISSUES   9

Obstacles to access for individuals – professional responsibility - Empowering computers in the workplace – Introduction – computers and employment – computers and the quality of work – computerized monitoring in the work place – telecommuting – social, legal and professional issues - Use of Software, Computers and Internet-based Tools - Liability for Software errors - Documentation Authentication and Control – Software engineering code of ethics and practices, IEEE CS-ACM Joint task force

UNIT - V   SOCIAL NETWORKING ETHICAL ISSUES   9

Strategies for engineering quality standards – Quality management standards – Social Networking – Company owned social network web site – the use of social networks in the hiring process – Social Networking ethical issues – Cyber bullying – cyber stalking – Online virtual world – Crime in virtual world - digital rights management

TOTAL : 45 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Apply ethical principles, values to tackle with various situations
- Analyze the effective usage of Computer as well as the technology
- Compute the impact on the products/ projects they develop in their career
- Prepare the coding ability of ethics and standards of computer professionals
- Assess the Professional responsibility and empowering access to information in the work place
- Rate the Ethical Issues in Social Networking

TEXT BOOKS:
1. Caroline Whitback," Ethics in Engineering Practice and Research ", Cambridge University Press, 2011.
2. George Reynolds, "Ethics in Information Technology", Cengage Learning, 2011.
3. John Weckert and Douglas Adeney, Computer and Information Ethics, Greenwood Press, 1997.
4. Penny Duquenoy, Simon Jones and Barry G Blundell, "Ethical, legal and professional issues in computing", Middlesex University Press, 2008.

REFERENCES:
1. Richard Spinello, "Case Studies in Information and Computer Ethics", Prentice Hall, 1997.
2. Sara Baase, "A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet", 3rd Edition, Prentice Hall, 2008.

20MC2E3	SECURITY IN COMPUTING	L	T	P	C
		3	0	0	3

OBJECTIVES:
- To understand the basics of cryptography
- learn to find the vulnerabilities in programs and to overcome them,
- know the different kinds of security threats in networks and its solution
- know the different kinds of security threats in databases and solutions available
- learn about the models and standards for security.

UNIT I   ELEMENTARY CRYPTOGRAPHY   9

Terminology and Background – Substitution Ciphers – Transpositions – Making Good Encryption Algorithms- Data Encryption Standard- AES Encryption Algorithm – Public Key Encryption – Cryptographic Hash Functions Key Exchange – Digital Signatures

UNIT II   PROGRAM SECURITY   9

Secure programs – Non-malicious Program Errors – Viruses – Targeted Malicious code – Controls Against Program Threat – Control of Access to General Objects – User Authentication – Good Coding Practices - Most Dangerous Software Errors

UNIT III   SECURITY IN NETWORKS   9

Threats in networks – Virtual Private Networks – PKI – SSL – IPSec – Content Integrity – Access Controls – Honeypots – Traffic Flow Security – Firewalls – Intrusion Detection Systems – Secure e-mail.

UNIT IV   SECURITY IN DATABASES   9

Security requirements of database systems – Reliability and Integrity in databases –Redundancy –Recovery – Concurrency/ Consistency – Monitors – Sensitive Data – Types of disclosures – Inference-finding and confirming SQL injection

UNIT V   SECURITY MODELS AND STANDARDS   9

Secure SDLC – Security architecture models – Trusted Computing Base – Bell-La Padula Confidentiality Model – Biba Integrity Model – Graham-Denning Access Control Model – Harrison-Ruzzo-Ulman Model – Secure Frameworks – COSO – CobiT – Compliances – PCI DSS – Security Standards - ISO 27000 family of standards – NIST.

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Apply cryptographic algorithms for encryption and decryption to reach secure data transmission
- Examine the program threats and apply good programming practice
- Analyze the various threats in Networks
- Apply the various Security Requirements of Database systems
- Use data vulnerability and sql injection in Database
- Construct the various security models and standards

REFERENCES:

1. Charles P. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Fourth Edition, Pearson Education, 2007.

2. Michael Whitman, Herbert J. Mattord, "Management of Information Security", Third Edition, Course Technology, 2010.
William Stallings, "Cryptography and Network Security: Principles and Practices", Fifth Edition, Prentice Hall, 2010.

4. Michael Howard, David LeBlanc, John Viega, "24 Deadly Sins of Software Security: Programming Flaws and How to Fix Them", First Edition, Mc GrawHill Osborne Media, 2009.

5. Matt Bishop, "Computer Security: Art and Science", First Edition, Addison- Wesley, 2002.

6. https://www.owasp.org/index.php/Top_10_2010

7. https://www.pcisecuritystandards.org/security_standards/pci_dss.shtml

8. http://cwe.mitre.org/top25/index.html

9. Justin Clarke "SQL injection Attacks and defense" Elsevier ,2012

20MC2E4	ACCOUNTING AND FINANCIAL MANAGEMENT	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the basic principles of Double entry system and preparation of balance sheet.
- To understand the process of estimating the cost of a particular product.
- To Prepare the estimate for various business activities such as purchase, sale, production andcash budgets
- To ensure decision making process of an organization.

UNIT – I   FINANCIAL ACCOUNTING   9

Meaning and Scope of Accounting-Principles-Concepts-Conventions-Accounting Standards-Final Accounts-Trail Balance-Trading Account-Profit and Loss Account-Balance Sheet-Accounting Ratio Analysis-Funds Flow Analysis-Cash Flow Analysis

UNIT – II   COST ACCOUNTING   9

Meaning-Objectives-Elements of Cost-Cost Sheet-Marginal Costing and Cost Volume ProfitAnalysis-Break Even Analysis-Applications-Limitations-Standard Costing and Variance Analysis-Material- Labor-Overhead-Sales-Profit Variances

UNIT – III   BUDGETS AND BUDGETING CONTROL   9

Budgets and Budgetary Control-Meaning-Types-Sales Budget-Production Budget-Cost of Production Budget-Flexible Budgeting-Cash Budget-Master Budget-Zero Base Budgeting-Computerized Accounting

UNIT – IV   INVESTMENT DECISION AND COST OF CAPITAL   9

Objectives and Functions of Financial Management-Risk-Return Relationship-Time Value of Money Concepts-Capital Budgeting-Methods of Appraisal-Cost of Capital Factors Affecting Cost of Capital-Computation for Each Source of Finance and Weighted Average Cost of Capital.

UNIT – V   FINANCING DECISION AND WORKING CAPITAL MANAGEMENT   9

Capital Structure-Factors Affecting Capital Structure-Concepts of Working Capital-Working Capital Policies-Factors affecting Working Capital-Estimation of Working Capital Requirements

TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Able to understand balance sheet preparation and do analysis
- Able to understand budget preparation and control of a company
- Helps to decide about state of affairs of a particular firm or company
- Ensures the preparation of a fiscal policies of an organization
- Ensures the factors to be considered in investment policies

REFERENCES:

1. I.M.Pandey, "Management Accounting" AND "Financial Accounting", Vikas Publishing HousePrivate Limited, 3rd Edition, 2009
2. Aswat Damodharan, "Corporate finance theory and practice", Johnwiley & Sons, 2008
3. Brigham, Ehrhardt, "Financial Management theory and Practice", 11th Edition, Cengage Learning,2008
4. M.Y.Khan, P.K.Jain, "Financial Management, Text, Problems and Cases, Tata McGraw Hill, 5thEdition, 2008.
5. S.N.Maheswari, "Financial Management and Accounting", Sultan Chand & Sons, 5th Edition, 2010.
6. Srivatsava, Mishra, "Financial Management" Oxford University.

20MC2E5	**HUMAN RESOURCE MANAGEMENT**	L	T	P	C
		3	0	0	3

OBJECTIVES:

• To understand the importance of human resources.

• To describe the steps involved in the human resource planning process

• To understand the stages of employee socialization and training needs.

• To know about the purposes of performance management systems and appraisal.

• To know the list of occupational safety and health administration enforcement priorities.

UNIT I   UNDERSTANDING HRM WITH LEGAL AND ETHICAL CONTEXT   9

Introduction- Importance of HRM – functions – Structure of HRM Department-Trends and opportunities – External Influences Affect HRM- HRM in global environment – The Changing World of Technology- HR & Corporate Ethics – Laws Affecting discriminatory practices – Enforcing Equal Opportunity Employment-Discipline & Employee Rights.

UNIT II   STAFFING, RECRUITMENT AND SELECTION   9

Introduction – An Organizational Framework- Job analysis -Methods -Purpose– Recruiting Goals – Recruiting Sources – Recruiting A Global Perspective- Selection Process – Selection from Global Perspective- job offers – Avoiding hiring mistakes - key element for successful predictors.

UNIT III   TRAINING AND DEVELOPMENT   9

 Introduction – Socialization Process-Purpose of New employee orientation, Employee training- Employee Development– Organization development Calm Waters Metaphor – White-Water Rapids Metaphor – Evaluating training and Development Effectiveness- international training and development issues – Career Development -Value for organization and individual – mentoring and coaching – traditional career stages.

UNIT IV   PERFORMANCE EVALUATION, REWARDS AND BENEFITS   9

Appraisal process – methods – factors distort appraisal – team appraisal – international appraisal – -rewards –Theories of motivation - compensation administration – job evaluation and pay structure – special cases of compensation – executive compensation programs – employee benefits VoluntaryBenefits- International Compensation.

UNIT V   SAFE AND HEALTHY WORK ENVIRONMENT   9

Occupational safety and health act -Contemporary Health and Safety Issues –Employee assistance program – International Safety & Health -labor management - employee unions – labor legislation- Unionizing Employees- Collective Bargaining

TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

• Illustrate the primary external influences affecting HRM.

• Use the components and the goals of staffing, training and development.

• Sequence the Recruitment and selection procedure in various organizations.

• Apply Performance Evaluation Methods for Employees in an Organization

• Use the Rewards and Benefits of the Employee in the Organization.

• Examine the Issues involved in Safe and Health Work Environment

REFERENCES:

1. Decenzo and Robbins, Human Resource Management, Wilsey, 10th edition, 2012.
2. Mamoria C.B. and Mamoria. S., Personnel Management, Himalaya Publishing Company, 1997.
3. Mirza S. Saiyadain Human Resource Management , Tata McGraw Hill , 4th edition 2009
4. Eugence Mckenna and Nic Beach Human Resource Management, Pearson Education Limited,2002.
5. Dessler, Human Resource Management, Pearson Education Limited, 2002.
6. Decenzo and Robbins, Human Resource Management, Wilsey, 6th edition, 2001.
7. Wayne Cascio, Managing Human Resource, McGraw Hill, 1998.
8. Ivancevich, Human Resource Management, McGraw Hill 2002.
9. Biswajeet Pattanayak, Human Resource Management, Prentice Hall of India, 3rd edition 2005

20MC2E6	RESOURCE MANAGEMENT TECHNIQUES	L	T	P	C
		3	0	0	3

OBJECTIVES:

• To provide the concept and an understanding of basic concepts in Operations Research Techniquesfor Analysis and Modeling in Computer Applications.

• To understand, develop and solve mathematical model of linear programming problems

• To understand , develop and solve mathematical model of Transport and assignment problems

• To Understand network modeling for planning and scheduling the project activities

UNIT I   LINEAR PROGRAMMING MODELS   9

Mathematical Formulation - Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques.

UNIT II   TRANSPORTATION AND ASSIGNMENT MODELS   9

Mathematical formulation of transportation problem- Methods for finding initial basic feasible solution – optimum solution - degeneracy –Mathematical formulation of assignment models – Hungarian Algorithm.

UNIT III   INTEGER PROGRAMMING MODELS   9

Formulation – Gomory"s IPP method – Gomory"s mixed integer method – Branch and bound technique.

UNIT IV   SCHEDULING BY PERT AND CPM   9

Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling

UNIT V   QUEUEING MODELS   9

Characteristics of Queuing Models – Poisson Queues - (M / M / 1) : (FIFO / ∞ /∞), (M / M / 1) : (FIFO / N / ∞), (M / M / C) : (FIFO / ∞ / ∞), (M / M / C) : (FIFO / N / ∞) models.

TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

• Apply simplex method to solve LPP
• Solve transportation and assignment problem
• Solve pure and mixed IPP
• Determine the critical path of the project network
• Determine the PERT calculations of the project network
• Distinguish various queuing models using single, multiple server, finite and Infinite capacity

REFERENCES& TEXT BOOKS:

1. A.M.Natarajan, P.Balasubramani, A.Tamilarasi, "Operations Research", Pearson Education, Asia, 2005
2. Gross, D. and Harris, C.M., "Fundamentals of Queueing Theory", Wiley Student, 3rd Edition, New Jersy,2004
3. Ibe, O.C. "Fundamentals of Applied Probability and Random Processes", Elsevier, U.P., 1st Indian Reprint,2007
4. John W. Chinneck "Feasibility and Infeasibility in Optimization Algorithms and Computational Methods"Springer, 2008.
5. N. D Vohra, Quantitative Techniques in Management, TataMcGraw Hill, 2010
6. Prem Kumar Gupta, D.S. Hira, "Operations Research", S.Chand & Company Ltd, New Delhi, 3rd Edition ,2008
7. Ravindran, Phillips, Solberg, "Operations Research: Principles And Practice", 2ND ED, John Wiley &Sons,2007
8. Taha H.A., "Operations Research : An Introduction " 8th Edition, Pearson Education, 2008

20MC2E7	ARTIFICIAL INTELLIGENCE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To provide a strong foundation on fundamental concepts in Artificial Intelligence.
- To enable Problem-solving through various searching techniques.
- To apply these techniques in applications which involve perception, reasoning and learning.
- To apply Artificial Intelligence techniques for information retrieval
- To apply Artificial Intelligence techniques primarily for machine learning.

UNIT - I   INTRODUCTION   9

Introduction – Definition - Future of Artificial Intelligence – Characteristics of Intelligent Agents – TypicalIntelligent Agents – Problem Solving Approach to Typical AI Problems.

UNIT - II   PROBLEM SOLVING METHODS   9

Problem solving Methods - Search Strategies- Uninformed - Informed - Heuristics – Local Search Algorithms and Optimization Problems - Searching with Partial Observations -Constraint Satisfaction Problems – Constraint Propagation - Backtracking Search – Game Playing -Optimal Decisions in Games -Alpha--Beta Pruning -Stochastic Games.

UNIT - III   KNOWLEDGE REPRESENTATION   9

First Order Predicate Logic – Prolog Programming - Unification -Forward Chaining –Backward Chaining - Resolution –Knowledge Representation - Ontological Engineering - Categories and Objects –Events - Mental Events and Mental Objects - Reasoning Systems for Categories-Reasoning with Default Information

UNIT - IV   LEARNING   9

Probability basics - Bayes Rule and its Applications - Bayesian Networks – Exact and Approximate Inference in Bayesian Networks - Hidden Markov Models - Forms of Learning -Supervised Learning - Learning Decision Trees - Regression and Classification with Linear Models - Artificial Neural Networks - Nonparametric Models - Support Vector Machines -Statistical Learning - Learning with Complete Data - Learning with Hidden Variables- The EM Algorithm – Reinforcement Learning.

UNIT - V   INTELLIGENCEANDAPPLICATIONS   9

Natural language processing-Morphological Analysis-Syntax analysis-Semantic Analysis-AiI applications – Language Models - Information Retrieval – Information Extraction - Machine Translation – Machine Learning - Symbol-Based – Machine Learning: Connectionist – Machine Learning.

TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Understand the basics and problem solving approach to AI problems.
- Analyze various search strategies for a problem.
- Use different knowledge representation schemes for typical AI problems.
- Design and implement a typical AI problem to be solved Using Machine Learning Techniques.
- Analyze the design of intelligent Artificial techniques.
- Apply the Intelligent techniques for problem solving.

REFERENCES:

1. S.Russelland P.Norvig, "Artificial Intelligence: A Modern Approach, Prentice Hall, Third Edition, 2016.
2. Elaine Rich and Kevin Knight, Artificial Intelligence, Third Edition, Tata McGraw-Hill, 2010.
3. Patrick H. Winston. "Artificial Intelligence", Third edition, Pearson Edition, 2006.
4. DanW.Patterson, Introduction to Artificial Intelligence and Expert Systems, PHI, 2006.
5. Nils J.Nilsson, Artificial Intelligence: A new Synthesis, Harcourt Asia Pvt. Ltd., 2000.
6. I.Bratko, Prolog: Programming for Artificial Intelligence, Fourth edition, Addison-Wesley Educational Publishers Inc., 2011.
4. Gerhard Weiss, Multi Agent Systems, Second Edition, MIT Press, 2013.

	L	**T**	**P**	**C**

20MC2E8   **CRYPTOGRAPHY AND NETWORK SECURITY**   L T P C
                                                                3 0 0 3

OBJECTIVES:

- To become skilled at fundamentals of secret and symmetric key cryptography
- To know and analyze about the public key cryptography system
- To be aware of the importance of information security
- To describe network security threats, network security tools and applications
- To describe system level security threats

UNIT - I   SYMMETRIC KEY CRYPTOGRAPHY   9

OSI security Architecture – Classical Encryption Techniques – Cipher Principles – Data Encrypted Standard – Blockcipher Design Principles and Modes of operation – Evaluation criteria for AES – AES Cipher – Triple DES – Placement of Encryption function – Traffic Confidentiality.

UNIT - II   PUBLIC KEY CRYPTOGRAPHY   9

Introduction to Number Theory – Public Key Cryptography and RSA – Diffie-Hellman Key Exchange – Elliptic Curve Architecture and Cryptography Key management – Confidentiality using Asymmetric Encryption.

UNIT - III   AUTHENTICATION AND HASH FUNCTION   9

Authentication requirements – Authentication Function – Message authentication Codes – Hash functions – Security of Hash function and MACs – MD5 message digest algorithm – Secure hash Algorithm – RIPEMD – HMAC Digital Signature – Authentication Protocols – Digital SignatureStandard.

UNIT - IV   NETWORK SECURITY   9

Authentication Applications: Kerberos – X.509Authentication Service – Electronic Mail Security – PGP – S/MIME- IP Security – Web Security.

UNIT - V   SYSTEM LEVEL SECURITY   9

Intrusion Detection – Password management – Viruses and related threats – Virus counter measures – Firewall Design Principles – Trusted Systems.

TOTAL : 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Apply symmetric and asymmetric ciphers to encrypt data.
- Apply public key cryptography algorithms for encryption.
- Examine digest for the purpose of authentication.
- Apply hash function concepts.
- Analyze the common network vulnerabilities and their defense mechanism.
- Analyze the anti-threat mechanism for security.

TEXT BOOKS:

1. William Stallings, "Cryptography and Network Security – Principle and Practices", 7th Edition, Pearson Education, 2016.
2. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw-Hill, 2007.

REFERENCES:

1. Atul Kahate," Cryptography and Network Security", Tata Mc Graw – Hill, 2003.
2. http://highered.mcgraw-hill.com/sites/0072870222/student_view0/
3. Charles P. P fleeger and Shari Lawrence P fleeger, "Security in computing", 4thEdition, PrenticeHall, 2006.

	L	T	P	C

20MC3E1 **SOFTWARE TESTING AND QUALITY ASSURANCE** 3 0 0 3

OBJECTIVES:

* To know the behavior of the testing techniques and to design test cases to detect the errors in thesoftware
* To be familiar with test management and test automation techniques.
* To be exposed to test metrics and measurements.
* To learn the functionality of automated testing tools to apply in the specialized environment.
* To understand the models and metrics of software quality and reliability.

UNIT – I   INTRODUCTION   9

Testing as an Engineering Activity – Testing as a Process – Testing Maturity Model- Testing axioms – Basic definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository andTest Design –Defect Examples- Developer/Tester Support of Developing a Defect Repository.

UNIT – II   TESTING TECHNIQUES AND TEST CASE DESIGN   9

Using White Box Approach to Test design - Test Adequacy Criteria – Static Testing Vs. Structural Testing – Code Functional Testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White box Based Test Design – Code Complexity Testing – Evaluating Test Adequacy Criteria. Test Case Design Strategies – Using Black Box Approach to Test Case Design – Random Testing – Requirements based testing – Boundary Value Analysis –Decision tables – Equivalence Class Partitioning – State based testing – Cause-effect graphing – Error guessing –Compatibility testing – User documentation testing – Domain testing – Case study for Control Flow Graph and State based Testing.

UNIT – III   LEVELS OF TESTING   9

The need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing –Compatibility testing – Testing the documentation – Website testing.

UNIT – IV   TEST AUTOMATION   9

Selecting and Installing Software Testing Tools - Software Test Automation – Skills needed for Automation – Scope of Automation – Design and Architecture for Automation – Requirements for a Test Tool – Challenges in Automation – Tracking the Bug – Debugging – Case study using Bug Tracking Tool.

UNIT – V   QUALITY METRICS   9

Six-Sigma – TQM - Complexity Metrics and Models – Quality Management Metrics - Availability Metrics - Defect Removal Effectiveness - FMEA - Quality Function Deployment – Taguchi Quality Loss Function – Cost of Quality. Case Study for Complexity and Object Oriented Metrics.

TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Design test cases suitable for a software development for different domains.
- Analyze the suitable test cases to be carried out.
- Prepare test planning based on document.
- Evaluate the web applications using bug tracking tools.
- Create test strategies and plans, design test cases, prioritize and execute them.
- Apply quality and reliability metrics to ensure the performance of the software and Able to develop and validate a test plan.

REFERENCES:

1. Adithya P. Mathur, " Foundations of Software Testing – Fundamentals algorithms andtechniques", Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008
2. Boris Beizer, " Software Testing Techniques" , Dream Tech Press, 2009
3. Dale H. Besterfiled, "Total Quality Management", Pearson Education Asia, Third Edition, Indian Reprint (2011).
4. Edward Kit, " Software Testing in the Real World – Improving the Process", PearsonEducation, 1995
5. Glenford J. Myers, Tom Badgett, Corey Sandler, "The Art of Software Testing", 3rd Edition, John Wiley & Sons Publication, 2012
6. Illene Burnstein, "Practical Software Testing", Springer International Edition, Chennai, 2003.
7. Naresh Chauhan , "Software Testing Principles and Practices " Oxford University Press , NewDelhi ,2010
8. Ron Patton, "Software Testing", Second Edition, Pearson Education, 2009
9. Renu Rajani, Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques",Tata McGraw Hill,2004
10. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing – Principles and Practices",Pearson Education, 2009
11. Stephan Kan, "Metrics and Models in Software Quality", Addison – Wesley, Second Edition, 2004,William Perry, "Effective Methods of Software Testing", Third Edition, Wiley Publishing.

20MC3E2	DATA MINING AND DATA SCIENCE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To Understand Data mining principles and techniques and Introduce DM as a cutting edgebusiness intelligence
- To learn to use association rule mining for handling large data
- To understand the concept of classification for the retrieval purposes
- To understand the concepts of machine learning
- To learn various applications of Data Science

UNIT - I   DATA MINING & DATA PREPROCESSING   9

Introduction to KDD process – Knowledge Discovery from Databases - Need for Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation

UNIT - II   ASSOCIATION RULE MINING   9

Introduction - Data Mining Functionalities - Association Rule Mining - Mining Frequent Item sets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint- Based Association Mining

UNIT - III   CLASSIFICATION & PREDICTION   9

Classification vs. Prediction – Data preparation for Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back Propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures

UNIT - IV   FUNDAMENTALS OF DATA SCIENCE   9

Introduction to Data Science - Overview of the Data Science process -Introduction to Data science technologies -Introduction to Machine Learning – Regressions –Classification-Clustering

UNIT - V   APPLICATIONS OF DATA SCIENCE   9

Applications of Data Science, Recent trends in various data collection and analysis techniques, various visualization techniques, application development methods used in data science.

TOTAL : 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

1. Demonstrate the Data Mining techniques for data preprocessing
2. Describe data mining algorithms for association rule mining
3. Demonstrate various classification algorithms
4. Apply Data science in techniques such as classification, clustering etc
5. Compare the recent trends in various data collection and analysis techniques
6. Analyze the applications of Data Science

TEXT BOOKS:

1. Jiawei Han, Micheline Kamper, Data Mining: Concepts and Techniques Morgan Kaufman, 2007, ISBN: 1-55860-489-8. Chap1-3, 5-10.

2.G. K. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006

3. Christopher Bishop, "Pattern Recognition and Machine Learning" Springer, 2006

REFERENCES:

1. Berson, Alex & Smith, Stephen J, Data Warehousing, Data Mining, and OLAP, TMH Pub. Co. Ltd, New Delhi, 2012

2. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012

		L	T	P	C
20MC3E3	MACHINE LEARNING	3	1	0	4

OBJECTIVES:
- To understand the concepts of Machine Learning.
- To appreciate supervised learning and their applications.
- To appreciate the concepts and algorithms of unsupervised learning.
- To understand the theoretical and practical aspects of Probabilistic Graphical Models.
- To study applications of machine learning in real world domains

UNIT – I   INTRODUCTION   12

Machine Learning–Types of Machine Learning –Machine Learning process- preliminaries, testing Machine Learning algorithms, turning data into Probabilities, and Statistics for Machine Learning Probability theory – Probability Distributions – Decision Theory - The Bias-Variance Tradeoff.

UNIT – II   SUPERVISED LEARNING   12

Linear Models for Regression – Linear Models for Classification- Discriminant Functions, Probabilistic Generative Models, Probabilistic Discriminative Models – Decision Tree Learning – Bayesian Learning, Naïve Bayes – Ensemble Methods, Bagging, Boosting, Neural Networks, Multi-layer Perceptron, Feed- forward Network, Error Back propagation - Support Vector Machines.

UNIT - III   UNSUPERVISED LEARNING   12

Clustering- K-means – EM Algorithm- clustering around medoids - clustering using kernels - silhouettes - hierarchical clustering - Document clustering - Mixtures of Gaussians –Dimensionality Reduction, Linear Discriminant Analysis, Factor Analysis, Principal Components Analysis, Independent Components Analysis.

UNIT - IV   PROBABILISTIC GRAPHICAL MODELS   12

Graphical Models – Undirected Graphical Models – Markov Random Fields – Directed Graphical Models –Bayesian Networks – Conditional Independence properties – Markov Random Fields Hidden Markov Models – Conditional Random Fields(CRFs).

UNIT - V   APPLICATIONS   12

Object Recognition-Customer Segmentation- Credit Card Fraud Detection- Sentiment Analysis-Diabetes Diagnosis System.

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Apply the Supervised learning methods to solve a problem and identify the accuracy value.
- Implement a Neural Network for an application and analyze the results.
- Use Clustering algorithms for different types of applications.
- Examine the appropriate graph models of machine learning.
- Select a suitable machine learning algorithms for solving real world problems.
- Apply the knowledge of machine learning to explore new applications.

REFERENCES:

1. P. Flach, "Machine Learning: The art and science of algorithms that make sense of data",Cambridge University Press, 2012.
2. Christopher Bishop, "Pattern Recognition and Machine Learning" Springer, 2007.
3. Stephen Marsland, "Machine Learning – An Algorithmic Perspective", Chapman and Hall, CRC Press, Second Edition, 2014.
4. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012.
5. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, Third Edition, 2014.
6. Tom Mitchell, "Machine Learning", McGraw-Hill, 1997.
7. Hastie, Tibshirani, Friedman, "The Elements of Statistical Learning" (2nd edition)., Springer, 2008.
8. M. Mohri, A. Rostamizadeh, and A. Talwalkar, "Foundations of Machine Learning", MIT Press,2012
9. Y. S. Abu-Mostafa, M. Magdon-Ismail, and H.T. Lin, "Learning from Data", AML Book Publishers, 2012.
8. D. Barber, "Bayesian Reasoning and Machine Learning", Cambridge University Press, 2012

20MC3E4	ADVANCED DATABASES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explore the features of Parallel and Distributed databases
- To learn the concepts of Object Oriented Databases
- To provide knowledge about XML Databases
- To know about Temporal and Spatial Databases
- To explore different multimedia data structures and multimedia databases like image, text,audio and video

UNIT - I   PARALLEL AND DISTRIBUTED DATABASES   9

Database System Architectures: Centralized and Client-Server Architectures– Server System Architectures –Parallel Databases: I/O Parallelism – Interquery Parallelism –Intraquery Parallelism – Distributed Databases: - Homogeneous and Heterogeneous Databases - Distributed Data Storage – Distributed Transactions – Concurrency Control in Distributed Databases – Distributed Query Processing.

UNIT - II   OBJECT AND OBJECT RELATIONAL DATABASES   9

Object-Based Databases: Complex Data Types– Structured Types and Inheritance in SQL – TableInheritance – Array and Multiset Types in SQL – Object Identity and Reference Types in SQL – Implementing O-R Features – Persistent Programming Languages – Object-Oriented versus Object –Relational.

UNIT - III   XML DATABASES   9

XML: Motivation – Structure of XML Data – XML Document Schema – Querying and Transformation – Application Program Interfaces to XML –Storage of XML Data – XML Applications.

UNIT - IV   SPATIAL AND TEMPORAL DATABASES   9

Spatial and Temporal Data and Mobility: Time in Databases – Spatial and Geographic Data Mobility and Personal Databases.

UNIT – V   MULTIMEDIA DATABASES   9

Multidimensional Data Structures: k-d Trees – Point Quadtrees – MXQuadtree – R-Tree - Image Databases: Representing Image DBs with Relations – Representing Image DBs with R-Trees – Text/Document Databases: TV Trees - Video Databases – Audio Databases.

TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Understand Parallel Databases and Distributed Databases
- Understand Object Oriented Databases
- Explore XML Databases
- Understand Temporal and Spatial Databases
- Analyze multimedia data structures and multimedia databases

TEXT BOOK:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGraw-HillInternational Edition, Sixth Edition, 2011.
2. V. S. Subramanian, "Principles of Multimedia Database Systems", Elsevier Publishers, 2001.

REFERENCE :

1. R. Elmasri, S. B. Navathe, "Fundamentals of Database Systems", Pearson Education, Seventh Edition,

20MC3E5	SERVICE ORIENTED ARCHITECTURE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To provide fundamental concepts of xml and web services
- To understand Service Oriented Architecture and its principles.
- To gain knowledge about WS standards
- To be familiar with building application based on SOA
- To learn SOA support in .NET and J2EE

UNIT I   XML AND WEBSERVICES   9

Introduction- XML document structure – Well formed and valid documents – Namespaces – DTD –XML Schema – Parsing XML – using DOM, SAX – XML Transformation and XSL – XSL Formatting – Web service architecture – Overview

UNIT II   SOA BASICS   9

Characteristics of SOA, Comparing SOA with Client-Server and Distributed architectures – Benefitsof SOA — Principles of Service orientation – Service layers.

UNIT III   WEB SERVICE STANDARDS   9

Descriptions – WSDL – Messaging with SOAP – Service discovery – UDDI – Service-Level Interaction Patterns – Orchestration and Choreography

UNIT IV   BUILDING SOA-BASED APPLICATIONS   9

Service Oriented Analysis and Design – Service Modeling – Design standards and guidelines —Composition – WS-BPEL – WS-Coordination – WS-Policy – WS-Security

UNIT V   SOA SUPPORT IN .NET AND J2EE   9

SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC)- Web Services Interoperability Technologies (WSIT) – SOA support in .NET – Common Language Runtime - ASP.NET web services-Web Service Enhancement(WSE)-Create web service in .NET

TOTAL:45 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Demonstrate the various XML technologies in web service
- Apply service oriented architecture in web service
- Build web service standards in SOA
- Illustrate SOA based applications
- Construct SOA platform in .NET
- Analyze SOA support in J2EE

REFERENCES:

1. Thomas Erl, "Service-Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2006.

2. Heather Williamson, "XML, The Complete Reference", McGraw Hill Education, 2012.

3. Frank. P. Coyle, "XML, Web Services And The Data Revolution", Pearson Education, 2002.

4. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services. An Architect'sGuide", Pearson Education, 2005

5. Newcomer, Lomow, "Understanding SOA with Web Services", Pearson Education, 2005

6. Dan woods and Thomas Mattern, "Enterprise SOA designing IT for Business Innovation", O'REILLY, First Edition, 2006.

7. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, "Mastering Cloud Computing", McGraw Hill Education, 2013.

20MC3E6	INTERNET OF THINGS	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To understand the fundamentals of Internet of Things.
- To get an exposure on architecture of IoT.
- To learn about the basics of IOT protocols and its security.
- To build a small low cost embedded system using Raspberry Pi.
- To apply the concept of Internet of Things in the real world scenario.

UNIT – I   INTRODUCTION TO IoT   12

Overview and Introduction, Internet of Things (IoT), Web of Things (WoT), Cloud of Things, Need for IoT on Cloud, Services in the Cloud for the Internet of Things, Applications of IoT- Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates - Domain SpecificIoTs-IoTandM2M-IoTSystemManagementwithNETCONF-YANG-IoTPlatformsDesign Methodology.

UNIT - II   IoT ARCHITECTURE   12

M2M high-level ETSI architecture - IETF architecture for IoT - OGC architecture - IoT reference model
- Domain model - information model - functional model - communication model - IoT reference architecture.

UNIT - III   IoT PROTOCOLS   12

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus– Zigbee Architecture – Network layer – 6LowPAN –CoAP – Security.

UNIT - IV   BUILDING IoT WITH RASPBERRY PI & ARDUINO   12

Building IOT with RASPERRY PI- IoT Systems - Logical Design using Python – IoT Physical Devices
& Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi - RaspberryPi Interfaces -Programming Raspberry Pi with Python - Other IoT Platforms - Arduino.

UNIT - V   CASE STUDIES AND REAL-WORLD APPLICATIONS   12

Real world design constraints - Applications - Asset management, Industrial automation, smart grid, Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT – Software & Management Tools for IoT Cloud Storage Models & Communication APIs - Cloud for IoT -Amazon Web Services for IoT.

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Understand the architectures, models and various protocols for IoT.
- Apply Arduino / Raspberry Pi to develop simple applications.
- Examine web services to access/control IoT devices.
- Analyze data analytics techniques to IoT for real time applications.
- Deploy an IoT application and use cloud offerings related to IoT.
- Create appropriate solutions for industrial applications.

REFERENCES:
1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things", Cisco Press,2017.
2. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015
3. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), "Architecting the Internet of Things",Springer, 2011.
4. Jan Ho¨ ller, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Aves and. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.
5. Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
6. Olivier Hersent, David Boswarthick, Omar Elloumi,"The Internet of Things – Key applicationsand Protocols", Wiley,2012.
7. Uckelmann, Dieter, Mark Harrison, and Florian Michahelles, Architecting the Internet of Things. Springer Science & Business Media, 2011.
8. Jean-Philippe Vasseur, Adam Dunkels, Interconnecting Smart Objects with IP: The NextInternet, Morgan Kuffmann, 2010.
9. Doukas, Charalampos, Building internet of things with the Arduino, Create Space IndependentPublishing Platform, 2012.
10. Lu, Yan, Yan Zhang, Laurence T. Yang, Huansheng Ning. The Internet of Things: From RFIDto the Next-Generation Pervasive Networked Systems, CRC Press.
11. Massimo Banzi, Getting Started with Arduino (Make: Projects). O'Reilly Media.2008.
12. Practical Internet of Things Security (Kindle Edition) by Brian Russell, Drew Van Duren.
13. Securing the Internet of Things Elsevier.
14. Security and Privacy in Internet of Things (IoTs): Models, Algorithms, and Implementations

	L	**T**	**P**	**C**
20MC3E7 **OBJECT ORIENTED ANALYSIS AND DESIGN**	**3**	**1**	**0**	**4**

OBJECTIVES:

- To understand the basics of object modeling techniques
- To design with static and Dynamic UML diagrams.
- To enhance knowledge on Axioms and Corollaries
- To implement the software design with design patterns.
- To gain knowledge about open source tools for Computer Aided Software Engineering

UNIT - I   INTRODUCTION   12

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding – Class hierarchy – Relationships –Associations –Attributes—Aggregations and Compositions-Generalizations and Specializations – Dynamic binding – Persistence – Meta classes – Object oriented system development lifecycle.

UNIT - II   MODELS AND UML DIAGRAMS   12

Introduction – Survey – Rumbugh, Booch, Jacobson methods –– Unified approach – Unified modeling language – Static and Dynamic models – UML diagrams – Class diagram-Finding conceptual classes and description classes – Use case diagrams – Use case Modeling – Relating Use cases – include, extend and generalization

UNIT - III   DYNAMIC AND IMPLEMENTATION UML DIAGRAMS   12

UML interaction diagrams - System sequence diagram – Collaboration diagram –State machine diagram and Modeling – Activity diagram – Implementation Diagrams- UML package diagram –– Component and Deployment Diagrams – Design of online railway reservation system using UML diagrams - Dynamic Modeling – Model organization

UNIT - IV   DESIGN PATTERNS   12

Design process and benchmarking – Axioms – Corollaries – Patterns – Frameworks-Designing classes – Class visibility – Refining attributes – Methods and protocols –-Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes-The purpose of a view layer interface-OOUI - MVC Architectural Pattern and Design - Designing the system.

UNIT - V   CASE TOOLS   12

Railway domain: Platform assignment system for the trains in a railway station - Academic domain : Student Marks Analyzing System - ATM system - Stock maintenance - Quiz System - Health Care Systems. Use Open source CASE Tools: Star UML/ UML Graph for the above case studies.

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the Course, the Students will be able to:
- Understand the object oriented concepts and to apply object oriented life cycle model for a project.
- Identify and refine the attributes and methods to develop the object oriented system for the given problem.
- Examine the static models and apply UML diagram for real time domain.
- Analyze dynamic models for a given scenario and draw the model using UML diagrams.
- Use design pattern techniques to design a model for the given system.
- Design a UML diagram for the given scenario using open source CASE tools.

REFERENCES:
1. Ali Bahrami, "Object Oriented System Development", McGraw Hill International Edition, 2008
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Addison Wesley Long man,1999
3. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education,2005.
   Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley,1995
4. Martin Fowler, "UML Distilled A Brief Guide to Standard Object Modeling Language", 3rd Edition, Addison Wesley,2003
5. Brahma Dathan, Sarnath Ramnath, "Object-Oriented Analysis, Design and implementation", Universities Press,2010

20MC3E8	XML AND WEB SERVICES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the advantages of using XML technology family
- To analyze the problems associated with tightly coupled distributed software architecture
- To learn the Web services building block
- To implement e-business solutions using XML based web services

UNIT I   XML TECHNOLOGY FAMILY   9

Introduction - XML – benefits – Advantages of XML over HTML, EDI, Databases – XML based standards – Structuring with schemas - DTD – XML Schemas – XML processing – DOM –SAX – presentation Technologies – XSL – XFORMS – XHTML – Transformation – XSLT – XLINK – XPATH – XQuery

UNIT II   ARCHITECTING WEB SERVICES   9

Business motivations for web services – B2B – B2C – Technical motivations – limitations of CORBA and DCOM – Service-oriented Architecture (SOA) – Architecting web services – Implementation view – web services technology stack – logical view – composition of web services – deployment view – from application server to peer to peer – process view – life in the runtime

UNIT III   WEB SERVICES BUILDING BLOCKS   9

Transport protocols for web services – messaging with web services - protocols - SOAP - describing web services – WSDL – Anatomy of WSDL – manipulating WSDL – web service policy – Discovering web services – UDDI – Anatomy of UDDI – Web service inspection – Ad-HocDiscovery - Securing web services

UNIT IV   IMPLEMENTING XML IN E-BUSINESS   9

B2B – B2C Applications – Different types of B2B interaction – Components of e-business XML systems – eb XML – Rosetta Net - Applied XML in vertical industry – web services for mobile devices

UNIT V   XML CONTENT MANAGEMENT AND SECURITY   9

Semantic Web – Role of Meta data in web content - Resource Description Framework – RDF schema – Architecture of semantic web – content management workflow – XLANG – WSFL – Securing web services

TOTAL :45 PERIODS

OUTCOMES:

Upon Completion of the Course, the Students will be able to:

- Interpret the role of various XML technologies in web applications
- Analyze the problems associated with tightly coupled distributed software architecture
- Illustrate how web service architecture and how the various Web Service Standards arerelated to each other
- Implement e-business solutions using XML based web services
- Illustrate Semantic Web architecture ,content management and security

REFERENCES:

1. Ron Schmelzer et al, "XML and Web Services Unleashed", Pearson Education, 2014.
2. Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2010.
3. Keith Ballinger, ". NET Web Services Architecture and Implementation", Pearson Education,2003.
4. David Chappell, "Understanding .NET A Tutorial and Analysis", Addison Wesley, 2002.
5. Kennard Scibner and Mark C.Stiver, "Understanding SOAP", SAMS publishing, 2000.
6. Nakhimovsky and Tom Myers, "XML Programming: Web Applications and Web Services withJSP and ASP", Apress, 2002.

		L	T	P	C
20AC101	**ENGLISH FOR RESEARCH PAPER WRITING**	**2**	**0**	**0**	**0**

OBJECTIVES:

This course is intended to provide an integrated framework for the students can able to:
- Understand that how to improve your writing skills and level of readability
- Learn about what to write in each section
- Understand the skills needed when writing a Title
- Ensure the good quality of paper at very first-time submission

UNIT I   **4**

Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness.

UNIT II   **4**

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts and Introduction.

UNIT III   **4**

Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check.

UNIT IV   **4**

Key skills are needed when writing a Title, Key skills are needed when writing an Abstract, Key skills are needed when writing an Introduction, Skills needed when writing a Review of the Literature.

UNIT V   **4**

Skills are needed when writing the Methods, Skills needed when writing the Results, Skills are needed when writing the Discussion, Skills are needed when writing the Conclusions.

UNIT VI   **4**

Useful phrases, How to ensure paper is as good as it could possibly be the first-time submission.

TOTAL: 24 PERIODS

REFERENCES:

1. Robert Goldbort, "Writing for Science", Yale University Press, 2006.
2. Robert A Day and Barbara Gastel, "How to Write and Publish a Scientific Paper", Seventh Edition, Greenwood Press, 2011.
3. Nicholas J Higham, "Handbook of Writing for the Mathematical Sciences", Society for Industrial and Applied Mathematics, 1998.
4. Adrian Wallwork, "English for Writing Research Papers", Springer, 2011.

		L	T	P	C
20AC102	**DISASTER MANAGEMENT**	2	0	0	0

OBJECTIVES:

This course is intended to provide an integrated framework for the students can able to:

- Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
- Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
- Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
- Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in.

UNIT I   **4**

Disaster: Definition, Factors and Significance, Difference between Hazard and Disaster.
Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

UNIT II   **4**

Repercussions of Disasters and Hazards: Economic Damage, Loss of Human and Animal Life, Destruction Of Ecosystem.
Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches.
Man-made Disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks and Spills, Outbreaks of Disease and Epidemics, War and Conflicts.

UNIT III   **4**

Disaster Prone areas in India: Study of Seismic Zones, Areas Prone to Floods and Droughts,
Landslides and Avalanches; Areas Prone to Cyclonic and Coastal Hazards with Special Referenceto Tsunami; Post-Disaster Diseases and Epidemics.

UNIT IV   **4**

Disaster Preparedness and Management Preparedness: Monitoring of Phenomena Triggeringa Disaster or Hazard.
Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and other Agencies.
Media Reports: Governmental and Community Preparedness.

UNIT V   **4**

Risk Assessment Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation In Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival.

UNIT VI   **4**

Disaster Mitigation Meaning, Concept and Strategies of Disaster Mitigation, Emerging Trends in Mitigation. Structural Mitigation and Non-Structural Mitigation, Programs of Disaster Mitigation in India

TOTAL: 24 PERIODS

REFERENCES:

1. Nishith Rai and A.K.Singh, "Disaster Management in India: Perspectives, Issues andStrategies", New Royal Book Company, 2007.
2. Pardeep Sahni, Alka Dhameja and Uma Medury, "Disaster Mitigation: Experiences and Reflections", Prentice Hall India Learning Private Limited, 2001.
3. S.L.Goel, "Disaster Administration and Management: Text and Case Studies", Deep & Deep Publication Pvt. Ltd., 2007

20AC103	**SANSKRIT FOR TECHNICAL KNOWLEDGE**	**L**	**T**	**P**	**C**
		2	**0**	**0**	**0**

OBJECTIVES:

- This course is intended to provide an integrated framework for the students can able to:
- Get a working knowledge in illustrious Sanskrit, the scientific language in the world.
- Learning of Sanskrit to improve brain functioning.
- Learning of Sanskrit to develop the logic in mathematics, science and other subjectsenhancing the memory power.
- The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature.

UNIT I   **8**

Alphabets in Sanskrit, Past/Present/Future Tense, Simple Sentences

UNIT II   **8**

Order, Introduction of roots, Technical information about Sanskrit Literature

UNIT III   **8**

Technical concepts of Engineering-Electrical, Mechanical, Architecture, Mathematics

TOTAL: 24 PERIODS

REFERENCES:
1. H.R.Vishwas and Samskrita Bharati, "Abhyậsapustakam", Samskrita-Bharti Publication, New Delhi.
2. Vempati Kutumba Shastri, "Teach Yourself Sanskrit: Prathama Diksha (Sanskrit)", Rashtriya Sanskrit Samsthana, Delhi, 2012.
3. Suresh Soni, "Indias Glorious Scientific Tradition", Prabhat Prakashan, 2006.

		L	T	P	C
20AC104	**VALUE EDUCATION**	**2**	**0**	**0**	**0**

OBJECTIVES:

This course is intended to provide an integrated framework for the students can able to:
- Understand the value of education and self-development.
- Imbibe good values in students and Know about the importance of character.

- Learn the importance of Human values and developing the overall personality.

UNIT I 6

Values and self-development – Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non-moral Valuation, Standards and Principles, Value judgments.

UNIT II 6

Importance of cultivation of values. Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National Unity. Patriotism, Love for nature, Discipline.

UNIT III 6

Personality and Behaviour Development - Soul and Scientific attitude ,Positive Thinking, Integrity and Discipline, Punctuality, Love and Kindness ,Avoid fault Thinking, Free from anger, Dignity of Labour, Universal brotherhood and religious tolerance, True Friendship, Happiness vs. Suffering, Love for Truth, Aware of Self-Destructive habits, Association and Cooperation, Doing best for saving nature.

UNIT IV 6

 Character and Competence – Holy books vs. Blind faith, Self-Management and Good health,
Science of reincarnation, Equality, Non-violence, Humility, Role of Women, All religions andsame message, Mind your Mind, Self-control, Honesty, Studying effectively.

TOTAL: 24 PERIODS

REFERENCES:

1. S.K.Chakraborty, "Values of Ethics for Organization: Theory and Practice", OxfordUniversity Press, 1999.

20AC105	CONSTITUTION OF INDIA	L	T	P	C
		2	0	0	0

OBJECTIVES:

This course is intended to provide an integrated framework for the students can able to:

- Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- Address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood inthe early years of Indian nationalism.
- Address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

UNIT I   HISTORY OF MAKING OF THE INDIAN CONSTITUTION   4

History, Drafting Committee (Composition and Working)

UNIT II   PHILOSOPHY OF THE INDIAN CONSTITUTION   4

Preamble, Salient Features

UNIT III   CONTOURS OF CONSTITUTIONAL RIGHTS AND DUTIES   4

- ➢ Fundamental Rights
- ➢ Right to Equality
- ➢ Right to Freedom
- ➢ Right against Exploitation
- ➢ Right to Freedom of Religion
- ➢ Cultural and Educational Rights
- ➢ Right to Constitutional Remedies
- ➢ Directive Principles of State Policy
- ➢ Fundamental Duties

UNIT IV   4

Organs of Governance:

- ➢ Parliament
- ➢ Composition
- ➢ Qualifications and Disqualifications
- ➢ Powers and Functions
- ➢ Executive
- ➢ President
- ➢ Governor
- ➢ Council of Ministers
- ➢ Judiciary, Appointment and Transfer of Judges, Qualifications Powers and Functions

UNIT V 4

Local Administration:
  ➢ District's Administration head: Role and Importance
  ➢ Municipalities: Introduction, Mayor and role of Elected Representative,
     CEO of Municipal Corporation
  ➢ Pachayati raj: Introduction
  ➢ PRI: Zila Pachayat
  ➢ Elected officials and their roles
  ➢ CEO Zila Pachayat: Position and role
  ➢ Block level: Organizational Hierarchy (Different departments)
  ➢ Village level: Role of Elected and Appointed officials
  ➢ Importance of grass root democracy

UNIT VI 4

Election Commission:
  ➢ Election Commission: Role and Functioning
  ➢ Chief Election Commissioner and Election Commissioners
  ➢ State Election Commission: Role and Functioning
  ➢ Institute and Bodies for the welfare of SC/ST/OBC and women

TOTAL: 24 PERIODS

REFERENCES:
  1. The Constitution of India, January 1950 (Bare Act), Gazette of **India**.
  2. S.N.Busi, "Dr. B.R. Ambedkar Framing of Indian Constitution", Vol. 1 to 6, First Edition, 2016.
  3. M.P.Jain, Justice Jasti Chelameswar and Justice Dama Seshadri Naidu, "IndianConstitution Law", Lexis Nexis, 2018.
  4. D.D.Basu, "Introduction to the Constitution of India", Lexis Nexis, 2011.

		L	T	P	C
20AC106	**PEDAGOGY STUDIES**	**2**	**0**	**0**	**0**

OBJECTIVES:

This course is intended to provide an integrated framework for the students can able to:

- Review existing evidence on the review topic to inform programme design and policy making undertaken by the Department for International Development (DFID), other agencies and researchers.
- Identify critical evidence gaps to guide the development.
- What pedagogical practices are being used by teachers in formal and informalclassrooms in developing countries?
- What is the evidence on the effectiveness of these pedagogical practices, in whatconditions, and with what population of learners?
- How can teacher education (curriculum and practicum) and the school curriculum andguidance materials best support effective pedagogy?
-

UNIT I   INTRODUCTION AND METHODOLOGY   5

- ➢ Aims and rationale, Policy background, Conceptual framework and terminology.
- ➢ Theories of learning, Curriculum, Teacher education.
- ➢ Conceptual framework, Research questions.
- ➢ Overview of methodology and Searching.

UNIT II   THEMATIC OVERVIEW   4

- ➢ Pedagogical practices are being used by teachers in formal and informal Class roomsin developing countries.
- ➢ Curriculum, Teacher education.
- ➢

UNIT III   EVIDENCE ON THE EFFECTIVENESS OF PEDAGOGICAL PRACTICES   5

- ➢ Methodology for the in depth stage: Quality assessment of included studies.
- ➢ How can teacher education (Curriculum and Practicum) and the school curriculum and guidance materials best support effective pedagogy?
- ➢ Theory of change.
- ➢ Strength and nature of the body of evidence for effective pedagogical practices.
- ➢ Pedagogic theory and pedagogical approaches.
- ➢ Teachers' attitudes and beliefs and Pedagogic strategies.

UNIT IV   PROFESSIONAL DEVELOPMENT   5

- ➢ Alignment with classroom practices and follow-up support.
- ➢ Peer support.
- ➢ Support from the head teacher and the community.
- ➢ Curriculum and Assessment.
- ➢ Barriers to learning: Limited resources and large class sizes.

UNIT V   RESEARCH GAPS AND FUTURE DIRECTIONS   5

- ➢ Research design
- ➢ Contexts
- ➢ Pedagogy
- ➢ Teacher education
- ➢ Curriculum and assessment
- ➢ Dissemination and research impact

TOTAL: 24 PERIODS

REFERENCES:
1. Jim Ackers and Frank Hardman, "Classroom Interaction in Kenyan Primary Schools", Compare, Vol. 31, No. 2, 2001. pp. 245-261.
2. Mamta Agrawal, "Curricular reform in schools: The importance of evaluation", Journal of Curriculum Studies, Vol. 36, No. 3, 2004. pp. 361-379.
3. Kwame Akyeampong, "Teacher training in Ghana - does it count? Multi-site teacher education research project (MUSTER), Country Report One, London, DFID, March 2003.
4. Kwame Akyeampong, Kattie Lussier, John Pryor and Jo Westbrook, "Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count?", International Journal of Educational Development, Vol. 33, No. 3, 2013. pp. 272–282.
5. Robin J Alexander, "Culture and Pedagogy: International Comparisons in Primary Education", Wiley- Blackwell, 2001.
6. www.pratham.org/images/resource%20working%20paper%202.pdf.

		L	**T**	**P**	**C**
20AC107	**STRESS MANAGEMENT BY YOGA**	**2**	**0**	**0**	**0**

OBJECTIVES:

This course is intended to provide an integrated framework for the students can able to:
- ➢ Achieve overall health of body and mind
- ➢ Overcome stress
- ➢ Develop healthy mind in a healthy body thus improving social health also
- ➢ Improve efficiency

UNIT I   ASHTANGA   8

Definitions of Eight parts of yoga.

UNIT II   YAM AND NIYAM   **8**

 Do and Not Do in life
  ➤ Ahinsa, Satya, Astheya, Bramhacharya and Aparigraha
  ➤ Shaucha, Santosh, Tapa, Swadhyay, Ishwarpranidhan

UNIT III   ASAN AND PRANAYAM   **8**
  ➤ Various yoga poses and their benefits for mind and body
  ➤ Regularization of breathing techniques and its effects - Types of Pranayam

<div align="right">

TOTAL: 24 PERIODS

</div>

REFERENCES:
1. "Yogic Asanas for Group Training - Part-I", Janardan Swami Yogabhyasi Mandal, Nagpur.
2. Swami Vivekananda, "Raja-Yoga or Conquering the Internal Nature", Vedanta Press,1998.

20AC108	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS	L	T	P	C
		2	0	0	0

OBJECTIVES:
This course is intended to provide an integrated framework for the students can able to:
  ➤ Learn to achieve the highest goal happily
  ➤ Become a person with stable mind, pleasing personality and determination
  ➤ Awaken wisdom in students
  ➤ Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
  ➤ The person who has studied Geeta will lead the nation and mankind to peace andprosperity
  ➤ Study of Neetishatakam will help in developing versatile personality of students.

UNIT I   NEETISATAKAM - HOLISTIC DEVELOPMENT OF PERSONALITY   **8**

- ➢ Verses - 19, 20, 21, 22 (Wisdom)
- ➢ Verses - 29, 31, 32 (Pride and Heroism)
- ➢ Verses - 26, 28, 63, 65 (Virtue)
- ➢ Verses - 52, 53, 59 (Dont's)
- ➢ Verses - 71, 73, 75, 78 (Do's)

**UNIT II   APPROACH   TO   DAY-TO-DAY   WORK   AND   DUTIES: SHRIMAD   8
BHAGWAD GEETA**

- ➢ Chapter 2 - Verses - 41, 47, 48
- ➢ Chapter 3 - Verses - 13, 21, 27, 35
- ➢ Chapter 6 - Verses - 5, 13, 17, 23, 35
- ➢ Chapter 18 – Verses - 45, 46, 48

**UNIT III   STATEMENTS   OF   BASIC   KNOWLEDGE: SHRIMAD   BHAGWAD   8
GEETA**

- ➢ Chapter 2 - Verses - 56, 62, 68
- ➢ Chapter 12 - Verses - 13, 14, 15, 16, 17, 18

   Personality of role model: Shrimad Bhagwad Geeta

- ➢ Chapter 2 - Verses – 17
- ➢ Chapter 3 - Verses - 36, 37, 42
- ➢ Chapter 4 - Verses - 18, 38, 39
- ➢ Chapter 18 - Verses - 37, 38, 63

TOTAL: 24 PERIODS

REFERENCES:
1. Swami Swarupananda, "Srimad Bhagavad Gita", by Advaita Ashram, Kolkata.
2. Pt. Gopinath, "Three Satakam of Bharatrhari (Niti, Srngara, Vairagya)", Rashtriya Sanskrit Sansthan, 2010.

		L	T	P	C
20MCBC1	**FUNDAMENTALS OF COMPUTERS**	**2**	**0**	**0**	**0**

UNIT I   INTRODUCTION   5

Introduction to Computers: History of development of Computers - Computer system concepts – Characteristics - Capabilities and limitations - Generations of Computers - Classification of Computers

UNIT II   BASIC STRUCTURE OF COMPUTER   5

Basic Components of a computer system – Control Unit, ALU, I/ O Devices, Memory – RAM, ROM,EPROM, PROM, Flash Memory and other types of memory

UNIT III   TYPES OF SOFTWARE AND OPERATING SYSTEMS   5

Types of Software – System software, Application software, Utility Software, Shareware, Freeware,Firmware, Free Software. Operating Systems – Functions, Types – Batch Processing, Single User, Multi User, Multiprogramming, Multi-Tasking. Programming languages – Machine,

Assembly, High Level, 4 GL.

UNIT IV   APPLICATIONS OF COMPUTERS   5

Business, Banking, Insurance, Education, Marketing, Health Care, Engineering Design, Military, Communication, and Government

UNIT V   DATA AND INFORMATION   5

Data, Information, Difference between data and information, Introduction to data Processing, fields,Records and Files. Types of files: Master files and Transaction file. Introduction to ERP, SCM.

TOTAL: 25 PERIODS

REFERENCES:

1. Fundamentals of Computers, by Rajaraman V, Adabala N – 17 December 2014
2. Computer Fundamentals: Architecture and Organization by B Ram – 01.08.2018
3. Operating Systems by William Stallings, Pearson Education, 9th edition, 2018
4. Computer Fundamentals: Concepts, Systems, and Applications by Pradeep K Sinha and PritiSinha, 30.11.2004
5. Computer Fundamentals, AnithaGoel, Pearson India, ISBN: 9788131770948, April 2010

	L	**T**	**P**	**C**
20MCBC2 **PROGRAMMING IN C**	**2**	**0**	**0**	**0**

UNIT I   INTRODUCTION   5
History of C, Character set, constants, variables, data types, declaration of variables, assigning values to variables, operators, input-output library functions, basic structure of C program, programming examples

UNIT II   CONTROL STATEMENTS AND LOOPING STATEMENTS   6
Conditional Control Statements, if, if-else, nested if-else, switch-case, Loop Control Statements, while, do-while, for, Nested Loops, programming examples

UNIT III   ARRAYS, STRUCTURES AND UNIONS   8
Arrays - Types of arrays - Initialization - Accessing - examples- Structures: Declaration of Structure Variables, Initialization of Structure Variables, Accessing Structure Members, Reading and Displaying Structure Variables, Pointers to structures, Array of structures, Arrays within structures, Nested structures, Programming Examples, Union: What are unions?, Declaration, Structures versus unions, working with unions, Initializing unions, Advantages of unions, Programming examples

UNIT IV   FUNCTIONS   6
Functions: Parameter Passing Techniques, call by value, call by address, Using Pointers as Arguments, Function Returning value, Functions Returning Address, Function Returning Pointers, Programming examples

UNIT V   POINTERS   5

Declaration of Pointer Variables, Assigning Address to Pointer Variables, Pointer to Pointer, Pointer Arithmetic. Programming examples

Total   30

REFERENCES

1. Byron S Gottfried, ―Programming with C‖, Schaums Outlines, Second Edition, Tata McGraw-Hill, 2006.

2. BrianW. Kernighan and Dennis M. Ritchie, "The C programming Language",2006, Prentice-Hall.

3. Cormen, Leiserson, Rivest, Stein, " Introduction to Algorithms", McGraw Hill, Publishers, 2002.

4. Deitel and Deitel, "C How to Program", Pearson Education. 2013,7th Edition.

5. How to Solve it by Computer, R.G.Dromey, Pearson education , Fifth Edition, 2007.

6. Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.

7.Mastering C- by K R Venugopal , Sudeep R Prasad McGraw Hill Education (India) Private Limited; Second edition 2015.

8. PradipDey, Manas Ghosh, ―Computer Fundamentals and Programming in C, Second Edition, Oxford University Press, 2013.

9. Peter Norton, "Introduction to Computers", Sixth Edition, Tata McGraw Hill Publications, 2007.

10. ReemaThareja, "Programming in C", Oxford University Press, 2011.

11. YashavantKanetkar, "Understanding Pointers In C", 4th Revised & Updated Edition, 2011, BPB Publications.

	L	T	P	C
20MCBC3 **INTRODUCTION TO INTERNET**	2	0	0	0

UNIT I   INTRODUCTION TO INTERNET   5

Internet application Introduction, Internet evolution, Working of Internet, Use of Internet, Overview of World Wide Web (Web Server and Client)

Introduction to Search engine and searching the Web, Downloading files, Introduction to Web Browsers, Working with E-mail(creation and use of the same)

UNIT II   EDI and EPS   6

Electronic Data Interchange: Introduction to EDI, EDI Architecture, Financial EDI, Overview of the technology involved in EDI. Introduction to Electronic Payment System: Introduction to EFT (Electronic Fund Transfer), Introduction to SET (Secure Electronic Transaction) Business requirement addressed by SET, Introduction to Digital Signature and Digital Certificates, Stages of SET, Types of Payment System: Digital Cash, Electronic Cheque, Smart Card, Credit / Debit Card

UNIT III   INTRODUCTION TO HTML   6

Working of HTML, Creating and loading HTML page, Tags, structure of HTML, Document, Standalone Tags, Formatting Text, Adding Images, Creating hyper Links, Tables, Sending E-mail through Web Page, Sample web pages

UNIT IV   INTRODUCTION TO WEB DESIGN   8

Introduction to Web Design, Types of Web Pages, Web Design Pyramid, Building Websites. Web development process model, Designing the Web Pages, Page size, Page type, Page margin, Entrance page, Exit page, Graphics in Webpage Design, Animation Effect, Sound Effect, Color Effect, Uploading the Website (Web space, Domain Name, Hosting the Website)

UNIT V   INTERNET SECURITY   **3**
Security, Privacy, Ethical Issues & Cyber law
Total   **28**
REFERENCES

1. New Perspectives on the Internet: Comprehensive, Ralph Hooper, Jessica Evans, Loose-leafVersion 10th Edition, 2007,ISBN-13:978-1337283908, ISBN-10: 1337283908
2. New Perspectives on the Internet, Comprehensive, Sixth Edition, Schneider and Evans, 2007,ISBN:1-4188-6071-9. Access to a Computer and the Internet
3. Harvey & Paul Deitel& Associates, Harvey Deitel and Abbey Deitel, "Internet and World Wide Web - How To Program", Fifth Edition, Pearson Education, 2011
4. Thomas A. Powell, "HTML & CSS: The Complete Reference", Fifth Edition, 2010

	L	T	P	C

20MCBC4   **OBJECT ORIENTED PROGRAMMING IN C++**   **2 0 0 0**

UNIT I   INTRODUCTION   6
What is object oriented programming? Why do we need object oriented. Programming characteristics of object-oriented languages. Compare C and C++. C++ input and output statements - The setw manipulator.

UNIT II   CLASS AND OBJECTS   6
Introduction to OOPs Concepts.Class and Objects creation in C++ structure of C++ - Constructors - types –destructors – member function - friend function – inline Function.

UNIT III   POLYMORPHISM   6
Function overloading - Operator Overloading in C++, Overloading Unary Operators, Overloading binary operator – this and super keyword

UNIT IV   TEMPLATES AND FILE HANDLING   6
Template – class template – function template – file handling – types of file – random access file.
                                                                Total 24

TEXT BOOK
   Object Oriented Programming in C++ - E.Balagurusamy, 7th Edition Paperback – 2017

REFERENCES
   1. Bhushan Trivedi, "Programming with ANSI C++", Oxford Press, Second Edition, 2012
   2. Ray Lischner, "Exploring C++ : The programmer"s introduction to C++" , apress, 2010
   3. S.B Lippman, Josee, JoseeLajoie, Barbara, " C++ Premier" 4 Edition, Pearson , 2012

	L	T	P	C

20MCBC5   **SYSTEM ANALYSIS AND DESIGN**   **2 0 0 0**

UNIT I   BASIC CONCEPT OF INFORMATION SYSTEMS   5

The System: Definition and Concepts - Elements of a System: Characteristics of a System - Need of Information system - Types of Information : Operational, Tactical, Strategic - Information systems : MIS, DSS

UNIT II   SYSTEM DEVELOPMENT LIFE CYCLE   5

Introduction to SDLC, Various phases: study, analysis, design, development, testing, implementation, System documentation: Types of documentation and their importance – System Maintenance

UNIT III   REQUIREMENTS GATHERING   5

Need of Requirements Gathering, Determination of requirements, Information gathering tools: interviews, group communication, questionnaires, Importance of feasibility study, Types of feasibility study

UNIT IV   SYSTEM ANALYSIS AND DESIGN   5

System Analysis - Concepts - Tools for System Analysis Data Flow Diagram (DFD), Logical and Physical DFDs, System Design – Objectives of design - Top-down and bottom-up design

UNIT V   SYSTEM IMPLEMENTATION AND MAINTENANCE   5

Input design: Input data, Output design; Form Design: Testing – Unit Testing , Integration Testing , Documentation – System evaluation and performance, -Maintenance activities and issues.

Total   25

TEXT BOOK

1. Elias M. Awad : System Analysis and design; Galgotia Publisher, ISBN: 9788175156180, 9788175156180, 01.01.2010
2. James A. Sen : Analysis of Design of Information System TMH, 2012
3. Roger S. Pressman : Software Engineering : A Practitioners Approach,MCH, Eighth Edition, 2015
4. Pankaj Jalote : An Integrated Approach to Software Engineering; Springer,2005

REFERENCES

1. J. L. Whitten & L. D. Bentley : System Analysis and Design Method; TMH, 2007
2. J. B. Dixit &Rajkumar : Structured system Analysis and Design; University Science Press, 2007

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20MCBC6	**COMPUTER GRAPHICS AND MULTIMEDIASYSTEMS**	**2 0 0 0**

UNIT I   INTRODUCTION   5

Overview of Graphics System - Line Drawing and Circle Drawing Algorithms - DDA - Line Clipping - Text Clipping.

UNIT II   2D TRANSFORMATIONS   5

Two dimensional transformations – Scaling and Rotations - Interactive Input methods - Window view port mapping transformation.

UNIT III   3D TRANSFORMATIONS   5

3D Concepts - Projections – Parallel Projection - Perspective Projection – Visible Surface Detection Methods

UNIT IV   OVERVIEW OF MULTIMEDIA   5

Multimedia hardware & software - Components of multimedia – Text, Image –Graphics – Audio – Video – Animation – Authoring.

UNIT V   MULTIMEDIA SYSTEMS AND APPLICATIONS   5

Multimedia communication systems – Data base systems – Presentation requirements –Video conferencing – Virtual reality – Interactive video.

Total   25

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1. Hearn D and Baker M.P, "Computer graphics – C Version", 2nd Edition, Pearson Education, 2004(unit 1, 2 &3).
2. Ralf Steinmetz, Klarasteinmetz, "Multimedia Computing, Communications andApplications", Pearson education, 2004
3. Donald Hearn and M. Pauline Baker, "Computer Graphics C Version", Second Edition, PearsonEducation,2002
4. Mohammad Dastbaz, Designing Interactive Multimedia Systems, McGraw-Hill Publishers, 2002
5. Ze-Nian Li, Mark S Drew and Jiangchuan Liu, "Fundamentals of Multimedia", Second Edition,Springer, 2014