Dr.M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Decl. U/S 3 of the UGC Act 1956)
DEPARTMENT OF INFORMATION TECHNOLOGY

B.Tech – Information Technology (Full Time)
Curriculum and Syllabus
2013 Regulation

III SEMESTER						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BMA13007	Discrete Mathematics	3	1	0	4
2	BEC13012	Communication Systems	3	0	0	3
3	BCS13001	Data Structures & Algorithms	3	0	0	3
4	BEC13033	Digital Electronics and Microprocessor	3	0	0	3
5	BIT13001	Object Oriented Programming	3	1	0	4
6	BIT13002	Information Theory and Coding	3	0	0	3
7	BCS13L02	Data Structures using C++ Lab	0	0	3	1
8	BEC13L23	Digital Electronics an d Microprocessor Lab	0	0	3	1
9	BIT13L01	Object oriented Programming Lab	0	0	3	1
		Total	**18**	**2**	**9**	**23**

IV SEMESTER						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BMA13012	Probability and Linear Programming	3	1	0	4
2	BCS13005	Database Management Systems	3	0	0	3
3	BCS13006	Software Engineering	3	1	0	4
4	BCS13009	Computer Architecture	3	0	0	3
5	BCS13012	Computer Networks	3	0	0	3
6	BIT13003	System Software and Operating System	3	1	0	4
7	BIT13L02	System Software and Operating System Lab	0	0	3	1
8	BIT13L03	RDBMS Lab	0	0	3	1
9	BCS13L08	Network Programming Lab	0	0	3	1
		Total	**18**	**3**	**9**	**24**

V SEMESTER						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BMA13018	Numerical Methods and Optimization Techniques	3	1	0	4
2	BCS13010	Object Oriented Systems Analysis and Design	3	0	0	3
3	BMG13003	Principle of Management	3	1	0	4
4	BCS13004	Computer Graphics and Multimedia	3	1	0	4
5	BIT13004	Visual Programming	3	0	0	3
6	BIT13005	Software Project Management	3	0	0	3
7	BIT13L04	Visual Programming Lab	0	0	3	1
8	BIT13L05	Computer Graphics and Multimedia Lab	0	0	3	1
9	BCS13L07	Software System Development Lab	0	0	3	1
10	BEN13L01	Career and Confidence Building (Soft Skills-I)	0	2	0	2
		Total	**18**	**5**	**9**	**26**

VI SEMESTER						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BIT13006	Mobile Technology	3	1	0	4
2	BIT13007	Internet Programming	3	0	0	3
3	BCS13018	Data Warehousing and Data Mining	3	1	0	4
4	BCS13017	Dot Net Framework	3	0	0	3
5	BIT13EXX	Elective I	3	0	0	3
6	BIT13EXX	Elective II	3	0	0	3
7	BIT13L06	Internet Programming Lab	0	0	3	1
8	BIT13L07	Data Mining Lab	0	0	3	1
9	BCS13L13	Dot Net Lab	0	0	3	1
10	BEN13L02	Qualitative / Quantitative skills (Soft Skills-II)	2	1	0	2
		Total	**20**	**3**	**9**	**25**

VII SEMESTER						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BIT13008	XML & Web Services	3	0	0	3
2	BIT13009	Component Based Technology	3	1	0	4
3	BIT13010	Enterprise Resource Planning	3	0	0	3
4	BIT13011	Mobile Application Development	3	0	0	3
5	BIT13EXX	Elective III	3	0	0	3
6	BIT13EXX	Elective IV	3	0	0	3
7	BIT13L08	XML and Web Services Lab	0	0	3	1
8	BCS13L14	Comprehension / Foreign Language Certification	0	2	0	2
9	BCS13L16	Free and Open Source Software (FOSS) Lab	0	1	3	1
10	BIT13L09	Project (Phase-I)	0	1	3	2
		Total	**18**	**5**	**9**	**25**

VIII SEMESTER						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BMG13004	Entrepreneurship Development	3	1	0	4
2	BIT13EXX	Elective-V	3	0	0	3
3	BIT13EXX	Elective-VI	3	0	0	3
4	BIT13L10	Project (Phase-II).	0	0	12	6
		Total	**9**	**1**	**12**	**16**

Summary of Credits:

1st Year Credits	**45**
3rd Semester Credits	**23**
4th Semester Credits	**24**
5th Semester Credits	**25**
6th Semester Credits	**26**
7th Semester Credits	**25**
8th Semester Credits	**16**
Total	**184**

IT Elective Stream – Grid and Cloud Computing Specialization						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BIT13E01	Multicore Programming	3	0	0	3
2	BIT13E02	Grid Computing	3	0	0	3
3	BIT13E03	Cloud Computing	3	0	0	3
4	BIT13E04	Cloud Infrastructure and Services	3	0	0	3
5	BIT13E05	Virtualization	3	0	0	3
6	BIT13E06	High Performance Computing – Cloud and Grid	3	0	0	3

IT Elective Stream – Mobile Specialization						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BIT13E07	Mobile Networks	3	0	0	3
2	BIT13E08	Mobile Adhoc Networks	3	0	0	3
3	BIT13E09	Mobile Commerce	3	0	0	3
4	BIT13E10	Windows Phone	3	0	0	3
5	BIT13E11	Android	3	0	0	3
6	BIT13E12	Mobile and Pervasive Computing	3	0	0	3

IT Elective Stream – Business Engineering Specialization						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BIT13E13	Business Information Systems	3	0	0	3
2	BMG13E06	Legal Systems in Business	3	0	0	3
3	BIT13E14	Electronic Customer Relationship Management	3	0	0	3
4	BMG13E07	International Business Strategy	3	0	0	3
5	BIT13E15	E Governance	3	0	0	3
6	BMG13E08	Business Essential	3	0	0	3

IT Elective Stream – MIS & Mainframe Specialization						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BIT13E16	Management Information Systems	3	0	0	3
2	BIT13E17	Decision Support System	3	0	0	3
3	BIT13E18	E-Commerce	3	0	0	3
4	BMG13E09	Total Quality Management	3	0	0	3
5	BIT13E19	Supply Chain Management	3	0	0	3
6	BIT13E20	Mainframe Computing	3	0	0	3

IT Elective Stream – Software Engineering Specialization						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BIT13E21	Software Architecture	3	0	0	3
2	BIT13E22	Software Design	3	0	0	3
3	BIT13E23	Software Metrics	3	0	0	3
4	BIT13E24	Risk Management	3	0	0	3
5	BIT13E25	Software Quality and Testing	3	0	0	3
6	BIT13E26	Software Reliability	3	0	0	3

IT Elective Stream – Java and Web Specialization						
S.No	**Sub.Code**	**Title of Subject**	**L**	**T**	**P**	**C**
1	BCS13016	Advanced Java Programming	3	0	0	3
2	BIT13E27	Java Virtual Machine	3	0	0	3
3	BIT13E28	Network Programming Using Java	3	0	0	3
4	BIT13E29	Web Services	3	0	0	3
5	BIT13E30	Middleware Technology	3	0	0	3
6	BIT13E31	Service Oriented Architecture	3	0	0	3

BMA13007 DISCRETE MATHEMATICS 3 1 0 4

OBJECTIVES:

- Understand the theory and techniques of logic, graphs and trees.
- Apply the knowledge and skills obtained to investigate and solve a variety of discrete mathematical problems
- Communicate mathematical ideas
- Make effective use of appropriate technology.

UNIT I :LOGIC **12 Hrs**

Statements – Truth Table – Connectives – Normal Forms – Predicate Calculus – Inference Theory.

UNIT II :COMBINATORICS **12 Hrs**

Mathematical Induction – Pigeon Hole Principle – Principle of Inclusion and Exclusion – Recurrence Relations – Generating Functions.

UNIT III : GROUPS **12 Hrs**

Basic Concepts – Groups – Subgroups – Homomorphism – Kernel – Cosets – Lagrange's theorem (Simple theorems and problems).

UNIT IV : LATTICES **12 Hrs**

Partial ordering – Posets – Hasse Diagram – Lattices – Properties of lattices – Sub lattices – Special lattices Boolean Algebra (Definition and Simple Problems).

UNIT V : GRAPHS **12 Hrs**

Introduction to Graphs – Terminology – Matrix representation of Graphs: Incidence matrix, Adjacency matrix – Graph Isomorphism – Connectivity – Euler and Hamiltonian Paths (Simple theorems and problems).

Total No. of Hrs: 60

TEXT BOOKS

1. Veerarajan T., 2006)Discrete Mathematics, Tata McGraw Hill Publishing Co.,
2. Tremblay J.P., Manohar R., (2004)Discrete Mathematical structures with applications to Computer science, Tata McGraw Hill Publishing Co.,

REFERENCES

1. Kolman, Busby, Ross, (2008) Discrete Mathematical Structures (6th ed.), Pearson
2. Kenneth Rosen, (2007) Discrete Mathematics and its applications (SIE), Tata McGraw Hill Publishing Co

BEC13012 **COMMUNICATION SYSTEMS** **3 0 0 3**

OBJECTIVES:

- Understand basic components of digital communication systems.
- Design optimum receivers for digital modulation techniques.
- Analyze the error performance of digital modulation techniques.
- Design digital communication systems under given power, spectral and error performanceconstrains.

UNIT I :SIGNALS & NOISE **9 Hrs**

Periodic & Aperiodic Signals – Noise - External Noise – Thermal Agitation – Shot Noise – Noise Figure – Signal to Noise Ratio – Equivalent Noise Resistance

UNIT II :INTRODUCTION TO COMMUNICATION **9 Hrs**

Basic Communication Systems – Need for Modulation in Communication Systems – Amplitude Modulation – Double Side Band Amplitude Modulation – Single Side Band and VSB Modulation – Modulators. Noise in Linear Modulators Noise in Linear Modulation Systems. FM Modulation.

UNIT III : DETECTORS, TRANSMITTER AND RECEIVER **9 Hrs**

AM Demodulators – FM Detectors, AM Transmitter. FM Transmitter – SSB Transmitters, Broadband Transmitter and Receiver AM & FM Receivers, Communication Receivers,Integrated Circuit Based AM & FM Transmitter:& Receiver.

UNIT IV : MODULATION TECHNIQUES AND PULSE MODULATION **9 Hrs**

Phase Modulation – Noise Triangle – Pre-Emphasis and De-Emphasis – Stereophonic FM Multiplex System – Comparison of WideBand and Narrow Band FM – AFC, Introduction – Sampling Theorem –Quantization, Quantization Error, PAM, PTM, PM, PCM – Telegraph..

UNIT V : DIGITAL MODULATION & INFORMATION THEORY **9 Hrs**

Introduction to Digital Modulation System, ASK, FSK, PSK, Transmitter and Receiver,Introduction-Information and Entropy,Source Coding Theory,DataCompaction,,Discrete Memoryless Channel,Mutual Information Channel Capacity,Channel Coding Theory.

Total No. of Hrs: 45

TEXT BOOKS

1. Roy Blake, (2002) *Electronic Communication systems*, (2nd ed.), Thomson Learning
2. WayneTomasi,(2004)*ElectronicCommunicationsSystems:Fundamentalsthroughadvanced*(5thed.),Pearson/ Printice Hall
3. Simon Haykins, (2008) *Principles of Communications*, (3rd ed.), Wiley India Publications

REFERENCES

1. Taub& Schilling (2008) *Principles of Communications*, (3rd ed.), Tata McGraw Hill Publications

BCS13001 **DATA STRUCTURES AND ALGORITHMS** **3 0 0 3**

OBJECTIVES:

- Familiarize with good programming design methods, particularly Top Down design.
- Develop algorithms for manipulating stacks, queues, linked lists, trees, graphs.
- Develop the data structures for implementing the above algorithms.
- Develop recursive algorithms as they apply to trees and graphs.
- Familiarize the student with the issues of Time complexity and examine various algorithms from this perspective

UNIT I :LINEAR DATA STRUCTURES **9 Hrs**

Stacks, - Queues - Implementation and Applications - Singly linked list-Doubly linked Lists-circular linked list-Applications

UNIT II :NON LINEAR DATA STRUCTURES **9 Hrs**

Trees – Binary Trees – Binary Search Tree Implementation – Tree Traversals – AVL Trees

UNIT III : ALGORITHM ANALYSIS **9 Hrs**

Sorting and Searching – Space Complexity - Time Complexity Linear and Binary Searching Analysis - Quick Sort - Heap Sort - Merge Sort - Selection Sort - RADIX Sort - Bubble Sort - Insertion Sort - Shell Sort - Analysis

UNIT IV : GRAPH ALGORITHMS **9 Hrs**

Graph Operations – DFS – BFS - Minimum Cost Spanning Tree - Krushkal's Algorithm - Prim's Algorithm - Applications of Graphs

UNIT V : ALGORITHM DESIGN METHODS **9 Hrs**

Greedy method – Shortest path – Divide and Conquer – Matrix Multiplication - Dynamic Programming - Back Tracking – Branch and Bound - NP Complete Traveling Sales Person Problem - N Queens Problem

Total No. of Hrs: 45

TEXT BOOKS

1. Horowitz, E. Sahani, S. & Mehta.(2007) *Fundamentals of Data Structures in C++*, Galgotia.

REFERENCES

1. Weiss Mark Allen (2007) *Data Structures and Algorithm Analysis in C*, (3rd ed.), Pearson
2. Horowitz, E. Sahni&SanguthevarRajasekaran.(2007) *Fundamentals of Computer Algorithms*, Galgotia Publications
3. Jean-Paul, Tremblay, Paul. G. Sorenson. (2007) *An Introduction to Data Structures with Applications*, (2nd ed.), Tata McGraw Hill Publishing Co
4. Sara, Baase. Allen, Van, Gelder.(2000) *Computer Algorithms*, Galgotia

BEC13033 DIGITAL ELECTRONICS AND MICROPROCESSOR 3 0 0 3

OBJECTIVES:

- Knowthe basic concepts of digital electronics and familiarity with available logic design.
- The students will have the awareness of multiplexers and de-multiplexers etc.
- The students Know the basic concepts of Microprocessor and Microcontroller

UNIT I :COMBINATIONAL LOGIC 9 Hrs

Logic gates – AND, OR, NOT, NOR, NAND and EX-OR – Combinational Logic- Arithmetic Circuits – Half adder – Full adder, Half Subtractor - Decimal Adder – Excess 3 Adder – Code Converters – Multiplexer – Demultiplexer- Encoder – Decoder – Design of General Combinational Logic Circuit- PAL, PLA and FPGA.

UNIT II :SEQUENTIAL LOGIC DESIGN 9 Hrs

Building Blocks Of Sequential Logic-Rs, Jk, Master-Slave, D And T Flip-Flop, Asynchronous And Synchronous Counters - Binary And Bcd Counters - Shift Registers –Basic Models Of Sequential Machines – Concept Of State Diagram - State Table – State Reduction - Design And Implementation Of Synchronous Sequential Circuits

UNIT III : INTEL 16 BIT MICROPROCESSORS 9 Hrs

Register organization of 8086, architecture, Min and Max Mode, AddresingModes,physical memory organization. InstructionSet, I/O addressing Capability, special processor activities, Introduction to stack, stack structure of 8086, Interrupt and Interrupt service routines, Interrupt cycle of 8086, Assembly level Programming

UNIT IV : BASIC PERIPHERALS AND THEIR INTERFACING WITH 8086 9Hrs

Basic peripherals and their interfacing with 8086 : Interfacing I/O ports, programmable Peripheral interface,8255, Modes of operation of 8255, Programmable Interval Timer (8253), Programmable Interrupt controller (8259), 8237 DMA Controller, USART -8251

UNIT V : MICROCONTROLLER 9 Hrs

Microcontroller: 8051 Microcontroller hardware –I/O pins, ports and circuits, External memory –Counters and Timers,Serial Data I/O –interrupts, Applications of microprocessor and microcontroller - Stepper Motor controls – Traffic light controls – waveform generation

Total No. of Hrs: 45

TEXT BOOKS

1. A.P.Godse (2008) *Digital Logic: Application & Design*, (1st ed.) ,Technical Publication
2. A.K.RAY, K.M.BHURCHANDI (2011) *Advanced Microprocessors Peripherals, A architecture, Programmingand Interface*, (11th ed.),Tata McGraw Hill Publications

REFERENCES

1. Charles H. Roth (2010) *Fundamentals of Logic Design*,(6th ed.), Cengage learning
2. Volnei A. Pedroni (2008) *Digital Electronics and Design*, Elsevier Inc.
3. Douglas Hall,S S S P Rao (2012) *Microprocessors and Interfacing*,(3rd ed.), Tata McGraw Hill

BIT13001 **OBJECT ORIENTED PROGRAMMING** **3 1 0 4**

OBJECTIVES:

- Prepare object-oriented design for small/medium scale problems
- Demonstrate the differences between traditional imperative design and object-oriented design
- Explain class structures as fundamental, modular building blocks to understand the role of inheritance, polymorphism, dynamic binding and generic structures in building reusable code
- Write small/medium scale C++ programs with simple graphical user interface
- Use classes written by other programmers when constructing their systems
- Understand and to use fundamental data structures: collections, sets, dictionaries, lists, stacks, queues, trees, graphs.

UNIT I :INTRODUCTION **12 Hrs**

Programming methodologies – Comparison – Object Oriented programming concepts-objects-classes-methods and messages-abstraction and encapsulation-inheritance-polymorphism-dynamic binding-message passing – Basics of C++ environment-tokens-keywords-identifiers and constants-data types-operators

UNIT II :CLASSES **12 Hrs**

Definition – Data members – Function members – Access specifiers – Constructor – Default constructors – Copy constructors – Destructors – Static members – This pointer – Constant members – Free store operators – Control statements

UNIT III : INHERITANCE AND POLYMORPHISM **12Hrs**

Overloading operators – Function overloading – Friend function– Virtual functions – pure virtual function- Abstract classes – Inheritance-single inheritance-multilevel inheritance-multiple inheritance-hierarchical inheritance- hybrid inheritance.

UNIT IV : TEMPLATES **12Hrs**

Class templates – Function templates – Exception handling –try catch throw paradigm- terminate and unexpected functions – uncaught exceptions

UNIT V : STREAMS **12 Hrs**

Streams and formatted I/O- I/O manipulators –file handling- random access – object serialization – namespaces –stdnamespace – ANSI string objects – standard template library

Total No. of Hrs: 60

TEXT BOOKS

1. Balagurusamy.E (2008) *Object Oriented Programming with C++*, (4th ed.),TataMcGraw Hill
2. Gary J. Bronson (2005) *Object Oriented Program development using C++*,Thomson Learning

REFERENCES

1. Deitel and Deitel (2011) *C++ How to Program*, (8th ed.), Prentice Hall
2. K.R.Venugopal, Rajkumar, T.Ravishankar (2010) *Mastering C++*,(36thed.),T ataMcGrawHill,
3. Stanley B.Lippman (2012) *The C++ Primer* ,(5thed.),Addison Wesley

BIT13002 INFORMATION THEORY AND CODING 3 0 0 3

OBJECTIVES:

- Calculate the information content of a random variable from its probability distribution.
- Relate the joint, conditional, and marginal entropies of variables in terms of their coupled probabilities.
- Define channel capacities and properties using Shannon's Theorems.
- Construct efficient codes for data on imperfect communication channels.
- Generalize the discrete concepts to continuous signals on continuous channels.
- Understand encoding and communication schemes in terms of the spectral properties of signals and channels.

UNIT I : 9 Hrs

Source Coding - Introduction to information theory- uncertainty and information -average mutual information and entropy - source coding theorem - Shannon-fano coding - Huffman coding-Arithmetic coding - Lempel-Ziv algorithm - run-length encoding and rate distortion function.

UNIT II : 9 Hrs

Channel capacity and coding - channel models - channel capacity -channel coding – informationcapacity theorem-random selection of codes. Error control coding: linear block codes and theirproperties - decoding of linear block code - perfect codes - hamming codes -optimal linear codesand MDS codes.

UNIT III : 9Hrs

Cyclic codes – polynomials - division algorithm for polynomials - a method for generating cyclicCodes - matrix description of cyclic codes - burst error correction - fire codes - golay codes –CRCcodes - circuit implementation of cyclic codes. BCH codes: minimal polynomials- generatorpolynomial for BCH codes - decoding of BCH codes - Reed-Solomon codes and nested codes.

UNIT IV : 9Hrs

Convolutional codes - tree codes and trellis codes- polynomial description of convolutional Codes - distance notions for convolutional codes -generation function - matrix description of convolutional codes - viterbi decoding of convolutional codes -distance bounds for convolutional codes - turbo codes and turbo decoding.

UNIT V : 9Hrs

Trellis Coded Modulation - concept of coded modulation - mapping by set partitioning ungerboeck's TCM design rules - TCM decoder - Performance evaluation for Additive White Gaussian Noise (AWGN) channel - TCM for fading channels.

Total No. of Hrs: 45

TEXT BOOKS

1. J.S.Chitode (2009) *Information Coding Techniques* ,Technical publications
2. Avudaiammal (2010) *Information Coding Techniques*, Tata McGraw Hill

REFERENCES

1. Gareth Aneurin Jones, J. Mary Jones (2000) *Information and Coding Theory* ,Springer
2. Viterbi (2002) *Information theory and coding*, McGraw Hill
3. John G. Proakis (1989) *Digital Communications*, (2nd ed.), McGraw Hill, 1989.
4. Ranjan Bose (2002) *Information theory, coding and cryptography*, Tata McGraw Hill

BCS13L02 **DATA STRUCTURES USING C++ LAB** **0 0 3 1**

OBJECTIVES:

- Extend programming ability using an object oriented language.
- Analyze algorithms to determine time and space complexity.
- Build and manipulate linear and non-linear data structures, including stacks, queues, linked lists, trees, and graphs.
- Sort, search, and merge data.
- Choose the appropriate data structure to use in solving typical computer science problems.

1. Implementation of Stack using arrays and pointers
2. Implementation of Queue using arrays and pointers
3. Implementation of Circular Queue (Using Arrays)
4. Single Linked List
5. Circular Linked List
6. Doubly Linked List
7. Evaluation of Expressions (Infix to postfix conversion & Evaluation of postfix expression)
8. Binary Tree Implementations And Traversals
9. Binary Search Trees
10. Quick Sort , Heap Sort and Merge sort
11. Bubble Sort & Radix Sort.
12. Merge & Selection Sort
13. Linear and Binary Search
14. Implementation of Breadth First Search and Depth First Search
15. Implementation of Graph traversals (BFS and DFS)

BEC13L23 DIGITAL ELECTRONICS AND MICROPROCESSOR LAB 0 0 3 1

OBJECTIVES:

- To make students familiar with different types of designs as sequential logic circuits, combinational logic circuits
- Knowledge of basic electronics & digital techniques
- To provide a platform for the students to do multidisciplinary projects

DIGITAL ELECTRONICS

1. Verification of Truth tables of Logic Gates
2. Characteristics of digital Logic families
3. Implementation of Boolean function
4. Adders / Subtractors
5. Multiplexers / Demultiplexers
6. Encoder / Decoders
7. Implementation of any general combinational logic circuit
8. Study of Flip – Flops
9. Study of Registers
10. Study of Counters
11. Implementation of any general sequential logic circuits
12. A to D Converters

MICROPROCESSOR

Experiments Based on ALP

1. Programs on data Transfer Instructions
2. Programs on Arithmetic and Logical Instructions
3. Programs on Branch Instructions
4. Programs on Subroutines

Experiments based on Interfacing & Microcontroller

1. DAC Interface-waveform generations
2. Stepper Motor Control
3. Keyboard Interface /LCD Interface
4. Data Transfer between two PCs using RS 232 C Serial Port

BIT13L01 OBJECT ORIENTED PROGRAMMING LAB 0 0 3 1

OBJECTIVES:

- Able to write, compile and debug programs in C++ language.
- Able to use different data types in a computer program.
- Able to design programs involving decision structures, loops and functions.
- Able to understand the dynamics of memory by the use of pointers.

1. Design C++ classes with static members, methods with default arguments,
2. Develop friend function to do matrix-vector multiplication
3. Implement complex number class with required operator overloading and type conversion.
4. Implement matrix class with dynamic memory allocation and required methods.
5. Overload the new and delete operators to provide custom dynamic allocation of memory.
6. Implement Matrix class with dynamic memory allocation and necessary methods.
7. Write a C++ program that randomly generates complex numbers
8. Develop a program that implements inheritance
9. Implement string as new data types
10. Stack with Virtual function

BMA13012 PROBABILITY & LINEAR PROGRAMMING 3 1 0 4

OBJECTIVES:

- Use decision modeling using probability
- Plot relations using a Cartesian coordinate system
- Apply linear functions to basic business problems
- Do systems modeling with linear programming

UNIT I : PROBABILITY AND RANDOM VARIABLE 12Hrs

Axioms of Probability – Conditional probability – Total probability – Baye's Theorem – Random variable – Probability mass function – Probability density function – Properties – Moments (Definition and simple problems).

UNIT II : STANDARD DISTRIBUTIONS 12 Hrs

Binomial – Poisson – Geometric –Uniform – Exponential –Normal distributions.

UNIT III : TESTING OF HYPOTHESIS 12Hrs

Tests of Significance – Large Sample Tests – Mean – Proportions – Small Sample Tests – t, F, Chi-square Tests: Independence of Attributes, Goodness of Fit.

UNIT IV : LINEAR PROGRAMMING 12Hrs

Formulation of Linear Programming Problem – Standard form of LPP- Graphical Method -Simplex Method – Big M Method – Two Phase method.

UNIT V : TRANSPORTATION AND ASSIGNMENT 12Hrs

Formulation of Transportation Problem – North West Corner Method – Least Cost Method – Vogel's approximation method – Optimality test – MODI Method – Degeneracy – Assignment problem – Hungarian Method – Travelling Salesman Problem .

Total No. of Hrs: 60

TEXT BOOKS

1. Veerarajan T.(2008) *Probability, Statistics and, Random Processes*, Tata McGraw Hill Publishing Co.
2. Gupta S.C., Kapoor V.K. (2003) *Fundamentals of Mathematical Statistics*, S.Chand& Co

REFERENCES

1. Singaravelu (2008) *Probability and Random Processes*, Meenakshi Agency
2. Hamdy A. Taha, (2010) *Operations Research: An Introduction* (9th ed.), Pearson
3. Panneerselvam R (2011) *Operations Research* , (2nd ed.), PHI

BCS13005 DATABASE MANAGEMENT SYSTEMS 3 0 0 3

OBJECTIVES:

- To understand the different issues involved in the design and implementation of a database system.
- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
- To understand and use data manipulation language to query, update, and manage a database
- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

UNIT I :FUNDAMENTALS OF DATABASE 9Hrs

Introduction: Purpose of database systems – Data Abstraction -data models – Instances and schemas – Data Independence – DDL – DML – Database user – ER model – Entity sets- keys – ER diagram – relational model – structure – relational algebra- relational calculus- views.

UNIT II : SQL 9 Hrs

SQL - QBE - level – Basic Structure – various operations – relational database design – problems in the relational data base design – normalization – normalization using functional – Multivalued join dependence

UNIT III : FILE STRUCTURE, INDEXING & HASHING 9Hrs

File and system structure – overall system structure – file transaction – data dictionary – indexing and hashing basic concepts and B+ tree Indices - static and dynamic hash functions

UNIT IV : SYSTEM IMPLEMENTATION TECHNIQUES 9Hrs

Recovery and atomicity-Failures Classification and types – Transaction model and Log based recovery. Schedules-Serial and Non Serial types-Serialization of schedules and views-locks based protocols –time based protocols, Validation techniques.

UNIT V : DISTRIBUTED DATABASES 9Hrs

Distributed databases-Structures of distributed data bases –Tradeoffs in distributed the database –design of distributed the database –design of distributed database-Transparency and autonomy- distributed query proceeding-Recovery in distributed system –commit protocols – security and integrity violations –authorization and views security specifications –Encryption- Statistical databases. .

Total No. of Hrs: 45

TEXT BOOKS

1. Abraham Silberschatz, Henry F.Korth, S.Sudharshan (2010) *Database System Concepts* (6th ed.),Tata McGraw Hill,New Delhi

REFERENCES

1. RamezElmasri, ShamkantB.Navathe (2008) *Fundamentals of database systems* (5th ed.), Pearson Education
2. C.J.Dat (2012) *An Introduction to Database Systems* (8th ed.),AU, Pearson Education

BCS13006 **SOFTWARE ENGINEERING** **3 1 0 4**

OBJECTIVES:

- An ability to identify, formulate, and solve engineering problems.
- An ability to communicate effectively.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- The ability to analyze, design, verify, validate, implement, apply, and maintain software systems.
- The ability to work in one or more significant application domains.

UNIT I :IMPORTANCE OF SOFTWARE ENGINEERING **12Hrs**

Introduction - Computer Based System Engineering – Emergent System Properties – Systems and their environment – System modeling – The system engineering process – System procurement -Software Process – Software Process Models – Process iteration – Software specification – Software design and implementation – Software validation – Software evolution – Automated process support –Project Management – Management activities - Project planning – Project scheduling – Risk Management.

UNIT II : SOFTWARE REQUIREMENTS **12 Hrs**

Functional and non-functional requirements – User requirements – System requirements – The software requirements document – Requirements engineering Processes –Feasibility studies – Requirements elicitation and analysis – Requirements validation – Requirements management – System Models – Context models – Behavioral models – Data models – Object Models – CASE Workbenches – Software Prototyping Prototyping in the software process – Rapid prototyping technique – User Interface Prototyping

UNIT III : SOFTWARE DESIGN **12Hrs**

Architectural Design – System structuring – Control models – Modular decomposition – domain Specific architectures – Distributed systems architectures – Multiprocessor architectures – Client-Server Architectures – Distributed object architectures – CORBA Object-Oriented Design – Objects and object classes – Design Evolution – Real-time Software design – System design, Real-time executives –Monitoring and control systems – Data acquisition systems – Design with reuse – Component-based development – Application families – Design patterns – User Interface Design – Principles – User Interaction – Information Presentation – User Support – Interface Evaluation

UNIT IV : SOFTWARE QUALITY **12Hrs**

Quality management - Quality assurance and standards- Quality planning-Quality control-Software measurement and metrics- Process measurement-The SEI Process Capability Maturity Model-Process classification.Dependability – Critical systems – Availability and Reliability – Safety – Security.

UNIT V : SOFTWARE DEVELOPMENT AND TESTING **12Hrs**

Verification and Validation– Planning – Software inspections – Automated static analysis – Clean room Software Development – Software Testing – Defect Testing – Integration Testing – Object Oriented Testing – Testing Work benches .

Total No. of Hrs: 60

TEXT BOOKS

1. Ian Sommerville (2008) *Software Engineering*, (8th ed.), Pearson Education Asia

REFERENCES

1. Roger S. Pressman(2011) *Software Engineering: A Practitioner Approach*, (7th ed.), McGraw hill Publications
2. Fairley (2001) *Software Engineering Concepts*, McGraw-Hill

BCS13009 **COMPUTER ARCHITECTURE** **3 0 0 3**

OBJECTIVES:

- Understand the mechanics of how hardware and system software execute the programs.
- Understand software and hardware's contributions to the performance, reliability, and energy efficiency of the programs and systems.

UNIT I :GENERIC CPU FEATURES **9Hrs**

Basic structure of Computer Hardware-Von-Neumann Architecture-Functional units – Bus Structures - Instruction formats and types-Addressing modes. RISC Vs CISC

UNIT II : ARITHMETIC AND LOGIC UNIT **9 Hrs**

Fixed point arithmetic operation-addition, subtraction, multiplication, division Floating point arithmetic operation-Design of ALU.

UNIT III : PROCESSOR UNIT **9Hrs**

Data path implementation-Control unit-hardwired control, micro programmed control, nano programming- Concepts of pipelining- Pipeline hazards

UNIT IV : MEMORY SYSTEM **9Hrs**

Memory hierarchy-Internal organization of RAM, ROM, Interleaved memory-Cache and associative memories-Virtual memory- Memory organization and cache coherence issues.

UNIT V : INPUT/OUTPUT AND PERIPHERALS **9Hrs**

Accessing I/O devices – Programmed Input/Output -Interrupts – Direct Memory Access – IO Processor - Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices. .

Total No. of Hrs: 45

TEXT BOOKS

1. Hayes (2004) ,(2007)digitized *Computer Architecture and Organization*,Tata McGraw Hill

REFERENCES

1. Carl Hamacher V., ZvonkoG.Vranesic, Safwat G. Zaky (2002),digitized(2009)*Computerorganization* Tata McGraw Hill

2. Morris Mano (2007) *Computer System Architecture*,(3rd ed.),Pearson Education

BCS13012 **COMPUTER NETWORKS** **3 0 0 3**

OBJECTIVES:

- To understanding the modern network architectures from a design and performance perspective.
- Thorough knowledge about different layers
- To clarify network terminology

UNIT I :INTRODUCTION **9Hrs**

The uses of computer networks - Network hardware - Network software - Reference model Example of networks- Network standardization. The physical layer: The theoretical basis for data communication - Guided Transmission media - Wireless transmission - Mobile telephone - Communication satellite.

UNIT II : DATA LINK LAYER **9 Hrs**

Data link layer design issues - Error detection and correction - HDLC –Channel access on links – SDMA – TDMA - FDMA – CDMA -Sliding window protocols - ETHERNET - 802.11, 802.16, Bridges and Switches-Bluetooth.

UNIT III : NETWORK LAYER **9Hrs**

Network layer design issues - Circuit switching – Packet switching – Virtual circuit switching-Routing algorithms – Congestion control algorithms - Internetworking- Network layer in Internet -IPV6 .

UNIT IV : TRANSPORT LAYER **9Hrs**

Transport layer design issues - Transport protocols - Simple transport protocol - Internet transport protocols UDP, TCP - Flow Control – Congestion control - Congestion avoidance.

UNIT V : APPLICATION LAYER **9Hrs**

Domain name system - Electronic mail - World Wide Web - HTTP - SNMP – Telnet – FTP-RTP. .

Total No. of Hrs: 45

TEXT BOOKS

1. Andrew S. Tanenbaum (2010) *Computer networks* , (5th ed.),PHI

REFERENCES

1. William Stallings(2007) *Data and computer communications*,(8th ed.), Pearson Education India
2. Douglas E. comer(2006) *Internetworking with TCP/IP*-Volume-I,(5th ed.), PHI
3. Larry L. Peterson, Bruce S. Davie(2011) *Computer Networks: A Systems Approach*,(5th ed.), Morgan Kaufmann Publishers Inc.,
4. Forouzan B. A.(2007) *Data Communications and networking*,(4th ed.), TMH

BIT13003 SYSTEM SOFTWARE AND OPERATING SYSTEM 3 1 0 4

OBJECTIVES:

- To view some of the major tasks of the system software of a computer system, focusing on internal working of the hardware and software interface of a typical system.
- To study and apply concepts relating to operating systems, such as concurrency and control of asynchronous processes, deadlocks, memory management, processor and disk scheduling, storage management

UNIT I :LANGUAGE PROCESSORS 12Hrs

Introduction, Language processing Activities, Fundamentals of language Processing - Data Structures, Search data structures, Allocation data structures, scanning and parsing.

UNIT II : ASSEMBLERS 12Hrs

Elements of assembly language programming, simple assembly scheme, pass structure of Assemblers, Design of two pass Assemblers. Macros and Macro Processor: Macro definition and call, Macro expansion, nested Macro calls, Advanced Macro facilities, Design of a Macro preprocessor

UNIT III : COMPILERS AND INTERPRETERS 12Hrs

Aspects of Compilation, Memory allocation, Compilation of expressions, Compilation of control structures, Code optimization, Interpreters Linkers: Relocation and Linking concept, design of a Linker, Self Relocating Programs

UNIT IV : INTRODUCTION TO OS 12Hrs

Types of OS, I/O Structure, Storage structure, Network structure, System calls. Process Management: Process concept, Multithreading models, CPU Scheduling criteria, algorithms, Multiple processor Scheduling, Real Time Scheduling, Algorithm Evaluation, Deadlock characterization, Prevention, Avoidance, Detection and Recovery.

UNIT V : STORAGE MANAGEMENT 12Hrs

Swapping, Memory Allocation – Contiguous and noncontiguous- Paging, Segmentation, Virtual Memory, demand paging, Page replacement, Allocation of frames, Thrashing, File concept, Access methods, File system structure. I/O Systems- I/O hardware, Disk - Structure, Scheduling, Disk Management and swap space management.

Total No. of Hrs: 60

TEXT BOOKS

1. D.M.Dhamdhere (2009) *Systems Programming and Operating Systems*,(2nd ed.), Tata McGraw-Hill Publishing Company Ltd

REFERENCES

1. Silberschatz, Galvin, Gagne(2003) Operating System Concepts,(6th ed.), John Wiley & Sons (Asia) Pt. Ltd, Singapore,.
2. Andrew S. Tanenbaum, Albert S, WoodHull(2006) *Operating System Design and Implementation*,(3rd ed.), PHI
3. William stallings (2009) *Operating Systems*,(5th ed.),PHI
4. John J Donavan (2009) *System Programming*, Tata McGraw- Hill Publishing Company Ltd

BIT13L02 SYSTEM SOFTWARE AND OPERATING SYSTEM LAB 0 0 3 1

OBJECTIVES:

- Basic LINUXCommands.
- Programs on process creation and synchronization,
- Inter process communication including shared memory, pipes and messages

List of exercises

SYSTEM SOFTWARE

1. File Manipulation
2. Length of Macro
3. Implementation of Macro Processor
4. Implement a Symbol Table with functions to create, insert, modify, search and display.
5. Implementation of Text Editor
6. Implement Pass 1 of Two pass Assembler.
7. Implement pass 2 of Two pass Assembler
8. Implementation of Absolute Loader
9. Implementation of Relocation Loader
10. Implementation of Pass 1 of Direct-Linking Loader.
11. Implementation of Pass 2 of Direct-Linking Loader.

LINUX

1) Solve the following problems with the use of find command:
   a. Change permission of all files and directory
   b. Find all files which contain *
   c. Find all file whose name is not ending with .c
   d. Find either directory starting with d or files starting with f
   e. Find all the hard-links of a file.
   f. Find all files which are modified later than a year
   g. Find all files of the owner user1 in the directory d1
   h. Find all the files having four soft links
i. Find all files modified after f1
   j. Find all files not modified after f1, having owner as root and not ending with .c
2) Solve the following questions using grep filter
   a. What would be the output of grep a b c?
   b. What is the meaning of grep<include> filename?
   c. How would you match a file name starting with two carats?
   d. Count the number of lines having 'printf' in a file and store it in a variable.
   e. How would you list only the soft-links from the ls command?
3) Simulate all Page Replacement Algorithms a) FIFO b) LRU

UNIX

1) Write a program to change current working directory and display the inode details for each file in the new directory.
2) Write a program to implement Parent process – Child process Relationship
3) Write a program to Implement semaphore.
4) Write a program to study Inter Process Communication (IPC) using Pipes.

BIT13L03 **RDBMS LAB** **0 0 3 1**

OBJECTIVES:

- To understand the different issues involved in the design and implementation of a database system.
- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
- To understand and use data manipulation language to query, update, and manage a database

RDBMS

1. Implementation of DDL,DML& DCL Commands
2. Queries in SQL
3. Factorial using function
4. Fibonacci using procedure
5. Checking Amstrong Number
6. Verifying Even or Odd Number
7. Checking Palindrome
8. Create a record with a cursor by updating the table data with new data.
9. Validation of Tables before Insertion and after insertion using Trigger
10. Report generation using Oracle
11. Report generation using VB
12. Database Security

BCS13L08 **NETWORK PROGRAMMING LAB** **0 0 3 1**

OBJECTIVES:

- To impart a solid foundation of the state of the art trends in computer networking and to provide a hands on experience of the same
- The experiments may be taken up with the intention to solidify the foundations of the basic networking course.

1. Socket program for Echo/Ping/Talk commands.
2. Create a Socket (TCP) between two computers and enable file transfer between them.
3. To implement remote command execution (two m/c's can be used).
4. Create a socket (UDP).
5. Port simulating ARP/RARP.
6. Create a socket for HTTP for web page upload and download.
7. File transfer in Client-Server architecture using following methods
   a) Using RS232C
   b) Using TCP/IP
8. To implement RMI (Remote Method Invocation)
9. Perform a case study about different routing algorithms to select the network path with its optimum and economical during data transfer
   a) Shortest path routing
   b) Flooding
   c) Broadcast /Multicast routing
10. Demonstration of Network Simulators.

BMA13018 NUMERICAL METHODS AND OPTIMISATION TECHNIQUES 3 1 0 4

OBJECTIVES:

- Understand the implications of floating point representation in the context of numerical methods.
- Determine which numerical method is appropriate for a particular application, for example, fitting measured data to a curve, solving a system of linear equations, numerically integrating an ODE or optimization
- Construct efficient and modular code for numerical methods and optimization.
- Given a design problem description, extract the objective function with appropriate constraints for optimization.
- Utilize both single and multi-variable optimization techniques in an engineering application.

UNIT I :SOLUTION OF EQUATIONS 12Hrs

Solution of Algebraic and Transcendental equations – Method of false position – Iteration method – Newton-Raphson method – Solution of Linear system of equations – Gauss Elimination method – Gauss-Jordan method – Iterative methods – Gauss-Jacobi method – Gauss-Seidel method – Matrix Inversion by Gauss-Jordan method.

UNIT II : INTERPOLATION 12Hrs

Newton forward and backward differences – Central differences – Stirling's and Bessel's formulae – Interpolation with Newton's divided differences – Lagrange's method.

UNIT III : NUMERICAL DIFFERENTIATION AND INTEGRATION 12Hrs

Numerical differentiation with interpolation polynomials – Numerical integration by Trapezoidal and Simpson's (both 1/3 rd& 3/8 th) rules – Two and three point Gaussian Quadrature formulae – Double integrals using Trapezoidal and Simpson's rules.

UNIT IV : INVENTORY 12Hrs

Elementary concepts – Static EOQ models: Classic EOQ model – EOQ with price breaks – Dynamic EOQ models: No setup model – Setup model.

UNIT V : QUEUING 12Hrs

Elementary concepts – Pure Birth and Death process – Single server Markovian models with infinite and finite capacity – Multi server Markovian models with infinite and finite capacity.

Total No. of Hrs: 60

TEXT BOOKS

1. Veerarajan T. (2005). Numerical Methods, Tata McGraw Hill Publishing Co.,
2. Sastry S.S.,(2003) Introductory Methods of Numerical Analysis, Prentice Hall of India

REFERENCES

1. Hamdy A. Taha, (2010) Operations Research: An Introduction (9th ed.), Pearson
2. Hillier, Lieberman (2005) Introduction to Operations Research (8th ed.) (IAE), Tata McGraw Hill Publishing
3. Panneerselvam R,(2011) Operations Research , (2nd ed.), PHI

BCS13010 OBJECT ORIENTED SYSTEM ANALYSIS AND DESIGN 3 0 0 3

OBJECTIVES:

- Understand Object Oriented concepts, terms and principles
- Develop a project scope, and a project plan with feasibility analysis
- Recognize the importance of good requirement gathering and risk management
- Gain knowledge of object oriented systems analysis and design techniques and models
- Work with and use UML for object oriented modeling

UNIT I :OO CONCEPTS 9Hrs

Object Orientation – System Development – Review of Objects- Inheritance – Object Relationship-Dynamic Binding –OOSD Life Cycle - Process – Analysis – Design –Prototyping – implementation – Testing – Overview of methodologies.

UNIT II : METHODOLOGY AND MODELING 9 Hrs

OMT – Booch Methodology – Jacobson methodology – Patterns – Unified approach -UML –Use case – Class diagrams –Dynamic modeling..

UNIT III : OBJECT ORIENTED ANALYSIS 9Hrs

Use case model – Creation of Classes – Noun Phrase Approach – Responsibilities –Collaborators – Object Relationships – super Sub classes – Aggregation.

UNIT IV : OBJECT ORIENTED DESIGN 9Hrs

OO Design Axioms – Class Visibility – refining Attributes – Methods – Access layer – OODBMS – Table – Class Mapping view layer

UNIT V : TESTING 9Hrs

Quality Assurance testing – inheritance & testing – test plan – usability testing –User satisfaction - testing. .

Total No. of Hrs: 45

TEXT BOOKS

1. Ali Bahrami, (2008) *Object Oriented System Development* ,McGraw Hill International

REFERENCES

1. Craig Larman (2005) *ApplyingUML and Patterns: An Introduction to Object-Oriented Analysis and Design andIterative Development*, (3rd ed.)., Pearson
2. Grady Booch, (2009) *Object oriented Analysis &design*,Pearson Education India
3. Rambaughj ,blaha M premeriani, W., Eddy F and Loresen W.(1997) *Object oriented Modeling &design*,PHI
4. Joey F. George, Dinesh batra Joseph, S.Valacich,JeffreyA.Hoffer(2006) OOSAD ,(2nd ed.)Edition Pearson,2006.

BMG13003 **PRINCIPLES OF MANAGEMENT** **3 1 0 4**

OBJECTIVES:

- Managers manage business organizations in the dynamic global environment
- Organizations develop and maintain competitive advantage
- Business decisions are made using various tools and techniques to remain competitive

UNIT I :FOUNDATIONS OF MANAGEMENT **12Hrs**

Definition-Principles of Management – Nature, Scope, Functions of Management-Management – Science /Art/Profession. Managers Vs Entrepreneurs – Managers Vs Leaders-Types of Business Organization- Guidelines for Managerial Excellence and Success.

UNIT II : PLANNING **12Hrs**

Management Practice –Steps involved in Planning-Planning Premises- Strategy and Tactics – Implementation - Organizing, Co –ordination - Controlling – Management process-Decision-making.

UNIT III : ORGANIZING **12Hrs**

Nature and purpose-Formal and informal organization-Resistance – Standards – Budget – Program – MBO/SWOT – MBE –Organizational Structure and Design – Authority & Responsibility , Relationship – Delegation –Line and Staff authority-Staffing- Selection Process- HRD – Conflicts.

UNIT IV : DIRECTING AND CONTROLLING **12Hrs**

Nature of Evaluation, Designs of problems – Appraising Techniques – Compensation plans – Direction – Leadership-Types of Leadership Motivation-Hierarchy of needs-Co-Ordination – Quantitative and Qualitative measures of Control – Feedback of Management. System and process of Controlling - Requirements for effective control - Control of Overall Performance - Direct and Preventive Control – Reporting.

UNIT V : CONTEMPORARY MANAGEMENT ISSUES **12Hrs**

The Global Environment - Globalization and Liberalization - International Management and Global theory of Management - Enhanced Technology Management – Social Responsibility – Managing Innovation – Stress Management.

Total No. of Hrs: 60

TEXT BOOKS

1. Harold Kooritz& Heinz Weihrich (2006) *Essentials of Management*, Tata McGraw-Hill
2. Tripathy PC And Reddy PN (2008) *Principles of Management*,(4th ed.), Tata McGraw-Hill

REFERENCES

1. Stephen P. Robbins(2012) *Fundamentals of Management : Essential Concepts and Applications*,(8th ed.),Prentice Hall
2. L.M.Prasad (2008) *Principles and Practice of Management*, Sultan Chand & Sons
3. Koontz (2004) *Principles of Management*, McGraw Hill Education

BCS13004 COMPUTER GRAPHICS AND MULTIMEDIA 3 1 0 4

OBJECTIVES:

- To apply the rules and algorithms in generating graphical outputs.
- To develop 3-dimensional objects using suitable transformations.
- To adapt the architecture for design of multimedia system.
- To solve issues related to multimedia file handling.
- To adopt hypermedia standards in developing multimedia applications.

UNIT I :BASICS **12Hrs**

Overview of graphics system-Video display devices-Raster scan system-Random scan system-Graphics monitor and workstation –Input devices-Hard copied devices-Graphic software.

UNIT II : OUTPUT PRIMITIVES **12Hrs**

Output primitives-Line drawing algorithms-Loading the frame buffer-Line function-Circle generation -Ellipse generation curves-Filled area primitives .Attributes of output primitives-Line attributes-Curve attributes-Color and gray scale levels-Area fill attributes-Character attributes-Bundled attributes-Inquiry functions-Antialaising.

UNIT III : TWO DIMENSIONAL TRANSFORMATION & VIEWING **12Hrs**

Two dimensional transformation:-Basic transformation-Matrix representations-Composite transformations-Other transformations-Affine transformation-Raster method for transformation Viewing pipeline-Coordinate reference frame-Window to view port transformation-Two dimensional viewing functions-Clipping operations-Point clipping-Line clipping:Cohen-Sutherland line Clipping, Liang-Barsky line Clipping-Polygon clipping: Sutherland-Hodgeman – Curve Clipping-Text Clipping-Exterior Clipping.

UNIT IV : THREE DIMENSIONAL CONCEPTS AND TRANSFORMATION **12Hrs**

Three dimensional concepts- Three dimensional concepts- Three Dimensional Transformation, Visible Surface Detection Methods:Back Face Detection,Depth Buffer Method,Scan Line Method.

UNIT V : MULTIMEDIA SYSTEM **12Hrs**

Introduction - Multimedia applications-Multimedia system architecture-Objects for multimedia systems-Compression and decompression-Types of compression-Binary image compression schemes - JPEG/MPEG.

Total No. of Hrs: 60

TEXT BOOKS

1. Donald D.Hearn, M.Pauline(2010) *Computer graphics with Open GL*,(4th ed.), Baker and Warren Carithers
2. Koegel Buford JFK (1994),Digitised(2007) *Multimedia Systems*,ACM Press

BIT13004 **VISUAL PROGRAMMING** **3 0 0 3**

OBJECTIVES:

- To introduce the concepts of visual programming.
- To create simple projects using visual basic
- To introduce GUI programming using Microsoft foundation classes.
- To enable the students to develop programs and simple application using Visual C++.

UNIT I :FORMS AND CONTROL **9Hrs**

Customizing a Form-Writing Simple Programs-Toolbox-Creating Controls-Name Property-Command Button-Access Keys-Image Controls-Text Boxes-Labels- Message Boxes-Grid-Editing Tools-Variables-Data Types-String –Numbers.

UNIT II : FUNCTIONS AND EVENTS **9 Hrs**

Displaying Information-Determinate Loops-Indeterminate Loops- Conditionals-Built-In Functions-Functions and Procedures- Lists-Arrays-Sorting and Searching-Records-Control Arrays-Combo Boxes-Grid Control-Projects with Multiple forms- Do Events and Sub Main-Error Trapping.

UNIT III : MENUS AND MOUSE ACTIVITY **9Hrs**

VB Objects-Dialogue Boxes-Common Controls-Menus-MDI Forms-Testing, Debugging and optimization-working with graphics- Monitoring Mouse Activity-File Handling-File System Controls-File System Objects-COM/OLE-Automation- DLL Services-OLE Drag and Drop.

UNIT IV : VISUAL C++ PROGRAMMING **9Hrs**

Visual C++ components – developing simple applications – Microsoft foundation classes – controls – message handling – document view architecture –dialog based applications – mouse and keyboard events – reading and writing documents –SDI and MDI environments – splitter windows and multiple views.

UNIT V : ADVANCED CONCEPTS **9Hrs**

Concepts and tools for Windows application – Procedure oriented Windows applications –Windows Applications using the MFC–Application and class wizards–Getting started with OLE – Getting started with Active X Controls – COM and DHTML

Total No. of Hrs: 45

TEXT BOOKS

1. Gary Cornell(2008)*Visual Basic 6 from the Ground Up*,Tata McGraw Hill, New Delhi
2. David Kruglirski J (2007) *Inside Visual C++*, Microsoft Press
3. Ivor Horton's (2012) *Beginning Visual C++*, Wrox Publication

REFERENCES

1. Deitel&Deitel,T.R.Nieto(2006)*Visual Basic 6, How to program*, Prentice Hall
2. Lars Klander,(2008) *Core visual C++ 6*, Pearson Education Asia
3. Gray J.Bronson (2000) *A first book of Visual C++*, Vikas Publishing House
4. Steven Holzner (2009) *Visual Basic 6, Programming Black Book*, Dream tech Press
5. Noel Jerke (2005) *Visual Basic 6(The Complete Reference)*,Tata McGraw Hill

BIT13005 SOFTWARE PROJECT MANAGEMENT 3 0 0 3

OBJECTIVES:

- To have good knowledge of the issues and challenges faced whiledoing the Software project Management
- To understand why majority of the software projects fails
- How that failure probability can be reduced effectively.
- Will be able to do the Project Scheduling, tracking, Risk analysis, Qualitymanagement and Project Cost estimation using different techniques

UNIT I :INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT 9Hrs

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II : PROJECT EVALUATION AND PROGRAMME MANAGEMENT 9 Hrs

Introduction-Project Portfolio Management– Evaluation of Individual Project-Technical Assessment –Cost Benefit Evaluation Techniques – Risk Evaluation-Programme Management-Allocation of Resource-Strategic Programme Management.

UNIT III : ACTIVITY PLANNING 9Hrs

Objectives – Project Schedule – Sequencing and Scheduling Activities –Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Categories Of Risk –Risk Identification –Planning-Management-PERT Technique-Critical Chain Concepts.

UNIT IV : MONITORING AND CONTROL 9Hrs

Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Priortizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V : MANAGING PEOPLE AND ORGANIZING TEAMS 9Hrs

Introduction – Understanding Behavior – Organizational Behaviour:A Background – Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team –Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

Total No. of Hrs: 45

TEXT BOOKS

1.Bob Hughes, Mike Cotterell,Rajib Mall (2012)*Software Project Management*,(5th ed.),Tata McGraw Hill

REFERENCES

1. Ramesh, Gopalaswamy,(2001)*Managing Global Project*,Tata McGraw Hill
2. Royce(2005)*Software Project Management*,Pearson Education
3. Jalote(2002)*Software Project Manangement in Practice*,Pearson Education

BIT13L04 VISUAL PROGRAMMING LAB 0 0 3 1

OBJECTIVES:

- Introduces the knowledge and techniques to develop a reliable Graphical User Interfaces (GUIs)
- To learn the basic principles of visual C++
- Able to connect Database connection

This course

VISUAL BASIC

1. Adding Menus to Form
2. Creating dialog boxes with Various Options
3. MDI Applications
4. Writing code for Various Keyboard and Mouse Events
5. OLE Container Control
6. Data access through Data control and DAO
7. Active X control
8. Active X Document
9. Active X DLL

VISUAL C++

1. Creating applications with App wizard
2. Working with MFC
3. Exception handling
4. Loading - Editing and - Adding resources - Linking resources to applications
5. Drawing bitmaps
6. Threads
7. OLE
8. Graph Applications

BIT13L05 COMPUTER GRAPHICS AND MULTIMEDIA LAB 0 0 3 1

OBJECTIVES:

- To make students aware of the concepts underlying modern Computer Graphics and Machine Vision
- The student will have the generic skills to design algorithms for digital image synthesis for a broad-based set of computing problems in various domains.
- To support research and education of Computer Science students in the fields of Multimedia Technology such as image editing, photo-retouching, web design, etc.

COMPUTER GRAPHICS:

1. Implementation of DDA Line Drawing Algorithm.
2. Implementation of Bresenhams Line Drawing Algorithm.
3. Implementation of Bresenhams Circle Drawing Algorithm.
4. Two Dimensional transformations - Translation, Rotation, Scaling.
5. Two Dimensional transformations -Reflection, Shear.
6. Implementation of 2D Composite Transformations.
7. Implementation of 2D clipping using Cohen Sutherland Algorithm.
8. Implementation of 2D Windowing.

MULTIMEDIA:

1. Animation using Authoring tools

a. Flash

i. Create Text and shape animation

ii. Develop a presentation for a product using techniques like Guide Layer, masking and onion Skin

b. Photoshop

i. Convert the given old photo into a new photo using a photo editing tool.

ii. Create and demonstrate blending effects for an image

iii. Blending two given images smoothly (morphing)

2. Create a simple animation movie for a theme

a. Rhymes for kids

b. Department facilities

c. A theme from idikasa (Ramayana / Mahabharata)

BCS13L07 SOFTWARE SYSTEM DEVELOPMENT LAB 0 0 3 1

OBJECTIVE: To develop a mini-project following the exercises listed below.

- Develop a problem statement.
- Develop an IEEE standard SRS document.
- Identify Use Cases and develop the Use Case model.
- Identify the business activities and develop an UML Activity diagram.
- Identity the conceptual classes and develop a domain model with UML Class diagram.
- Using the identified scenarios find the interaction between objects and represent
- them using UML Interaction diagrams.
- Identify the User Interface.
- Implement the system

EXERCISES

A. Online Railway reservation system
B. Student Mark Analysis system
C. Payroll processing application
D. Inventory system
E. Quiz system
F. Automating the Banking process
G. Course Registration System
H. Library management system
I. Passport Automation System

SOFTWARE REQUIRED:

Languages: C/C++/JDK 1.3, JSDK, WEB BROWSER & UML

Any Front End Tools (Like VB, VC++, Developer 2000)

Any Back End Tools (Like Oracle, MS-Access, SQL, DB2)

Modelling and Design : Rational Rose

BEN13L01 CAREER AND CONFIDENCE BUILDING 0 2 0 2

OBJECTIVES:

To Improve:

- Behavioural Patterns and Basic Etiquette
- Value System
- Inter Personal Skills
- Behaving in Corporate Culture
- Self Awareness / Confidence
- Managing Self and Personality Styles including Body Language
- International Culture / Cross Cultural Etiquette

UNIT I

Creation of awareness of the top companies / different verticals / courses for improving skill set matrix, Industry expectations to enable them to prepare for their career - Development of positive frame of mind - Avoiding inhibitions - Creation of self awareness - Overcoming of inferiority/ superiority complex.

UNIT II

Selection of appropriate field vis-a-vis personality / interest to create awareness of existing industries, Preparation of Curriculum Vitae - Objectives, profiles vis-a-vis companies.

UNIT III

Group discussions: Do's and Don'ts - handling of Group discussions – What evaluators look for! Interpersonal relationships - with colleagues - clients - understanding one's own behaviour - perception by others, How to work with persons whose background, culture, language / work style different from one's, behaviour pattern in multi-national offices.

UNIT IV

Interview - awareness of facing questions - Do's and Don'ts of personal interview / group interview, Enabling students prepare for different procedures / levels to enter into any company - books / websites to help for further preparation, Technical interview - how to prepare to face it, Undergoing employability skills test.

UNIT V

Entrepreneurship development - preparation for tests prior to the interview - Qualities and pre-requisites for launching a firm.

Total No. of Hrs: 30

BIT13006 **MOBILE TECHNOLOGY** **3 1 0 4**

OBJECTIVES:

- Understand the characteristics and limitations of mobile hardware devices including their user-interface modalities
- The ability to develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts
- An awareness of professional and ethical issues, in particular those relating to security and privacy of user data and user behavior

UNIT I :WIRELESS COMMUNICATION FUNDAMENTALS **12Hrs**

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing– Modulations – Spread Spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks

UNIT II : TELECOMMUNICATION NETWORKS **12Hrs**

Telecommunication systems- GSM – GPRS – DECT –UMTS-IMT-2000 – Satellite Networks- Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB- DVB

UNIT III : WIRELESS LAN **12Hrs**

Wireless LAN – IEEE 802.11 – Architecture – services – MAC – Physical layer – IEEE 802.11a- 802.11b standards – HIPERLAN – Blue Tooth.

UNIT IV : MOBILE NETWORK LAYER **12Hrs**

Mobile IP – Dynamic Host Configuration Protocol – Routing – DSDV – DSR – Alternative Metrics.

UNIT V : TRANSPORT AND APPLICATION LAYERS **12Hrs**

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0

Total No. of Hrs: 60

TEXT BOOKS

1. JochenSchiller(2008)*Mobile Communications*,(2nd ed.),PHI/Pearson Education
2. William Stallings(2005)*Wireless Communications and Networks*,(2nd ed.),PHI/Pearson Education

REFERENCES

1. KavehPahlavan, PrasanthKrishnamoorthy,(2006) *Principles of Wireless Networks*, PHI/Pearson Education
2. Uwe Hansmann, LotharMerk, Martin S.Nicklons and Thomas Stober,(2005*) Principles of Mobile Computing*, Springer, New York
3. HazysztofWesolowshi,(2007) *Mobile Communication Systems*, John Wiley and Sons Ltd,

BIT13007 **INTERNET PROGRAMMING** **3 0 0 3**

OBJECTIVES:

- Recognize the Internet.
- differentiate between Internet Protocols
- understand different formatting tags
- understand tables, layers, frames, forms and CSS

UNIT I :BASIC NETWORK AND WEB CONCEPTS **9Hrs**

Internet standards – TCP and UDP protocols – URLs – MIME- CGI – Introduction to SGML

UNIT II : JAVA PROGRAMMING **9 Hrs**

Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client /server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation.

UNIT III : SCRIPTING LANGUAGES **9Hrs**

HTML – forms – frames – tables – web page design – JavaScript introduction – control structures – functions – arrays – objects – simple web applications

UNIT IV : DYNAMIC HTML **9Hrs**

Dynamic HTML – introduction – cascading style sheets – object model and collections –event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data

UNIT V : SERVER SIDE PROGRAMMING **9Hrs**

Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.

Total No. of Hrs: 45

TEXT BOOKS

1. Deitel, Deitel and Nieto(2004) Internet and World Wide Web – How to program,(4th ed.), Pearson Education Publishers
2. Naughton (1999) The Complete Reference – Java2, (3rd ed.),Tata McGraw-Hill

REFERENCES

1. R. Krishnamoorthy& S. Prabhu (2004) *Internet and Java Programming*, New Age International Publishers
2. Thomno A. Powell (2003) *The Complete Reference HTML and XHTML*,(4th ed.),Tata McGraw Hill
3. Elliotte Rusty Harold (2002) *Java Network Programming*, O'Reilly Publishers

BCS13018 DATA WAREHOUSING AND DATA MINING 3 1 0 4

OBJECTIVES:

- Conceptual, Logical, and Physical design of Data Warehouses OLAP applications and OLAP deployment
- Have a good knowledge of the fundamental concepts that provide the foundation of data mining
- Design a data warehouse or data mart to present information needed by management in a form that is usable for management clients

UNIT I :DATA WAREHOUSING 12Hrs

Introduction to Data Warehousing- Adavntages- What makes Data Warehousing a reality- Data warehousing Components-Building a Data Warehouse-mapping Data Warehouse to a Multiprocessor-Architecture-DBMS Schemas for Design Support.

UNIT II : ETL AND BUSINESS TOOLS 12Hrs

Data Extraction-Cleaning and Transferring tools- Meta data.Reporting and Query tools and Application-OLAP-Patterns and Models- Statistics.

UNIT III : DATA MINING 12Hrs

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing.- Data Cleaning –Missing Values-Noisy Data-Inconsistent Data-Data Integration and Transformation-Data Reduction -Dimensionality Reduction – Evaluation criteria of Various Mining Techniques

UNIT IV : ASSOCIATION RULE MINING AND CLASSIFICATION 12Hrs

Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Constraint Based Association Mining – Classification and Prediction - Decision Tree Induction - Entropy and Classification Algorithms -Bayesian Classification – Rule Based Classification.

UNIT V : CLUSTERING TECHNIQUES 12Hrs

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods - Kmeans – Partitioning Methods – Hierarchical Methods - Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis –Genetic Algorithm For Mining - Data Mining Applications.

Total No. of Hrs: 60

TEXT BOOKS

1. Alex Berson-Stephen. J.Smith,(2006) *Data warehousing-Data Mining and OLAP*,TMH
2. Jiawei Han and MichelineKamber (2011) *Data mining concepts and techniques*,Morgan Kaufmann Publishers

EFERENCES

1. Arun K Pujari (2002) *Data Mining Techniques*,Universities Press (India) Ltd.
2. Sam Anahory, Dennis Murry (2004) *Data Warehousing in the real world*, Pearson Education
3. Margaret H. Dunham (2006) *Data Mining: Introductory and Advanced Topics*, Pearson

BCS13017 **DOT NET FRAMEWORK** **3 0 0 3**

OBJECTIVES:

- Microsoft Framework Architecture
- Development of Console Application
- Building Windows application
- OOP using C#.NET
- Data access mechanisms provided by ADO.NET

UNIT I : DOTNET FRAMEWORK **9Hrs**

DOT NET platform, .NET Frame work, Common Language Runtime, Namespace, assemblies, .NET memory management Introduction to C#.net, Introduction to VB.NET.

UNIT II : C# DOTNET **9 Hrs**

Introduction to c#- Understanding C# in .NET, Overview of c#, literals, Variables, Data Types. Operators-Expressions,-Branching and Looping Operations- Methods, Arrays Strings- Structures and Enumerations – Classes and Objects- inheritance and Polymorphism-Multiple Inheritance-Operator Overloading, Events -Console I/O Operations and Exception.

UNIT III : VB DOTNET **9Hrs**

Introduction- Windows application- Web application- Building Blocks- programming Fundamentals- Creation of Windows Forms-SDI Vs MDI -Crating run time Windows Controls- File handling-Interaction with other Applications- Creating and using reports- Debugging and Packaging.

UNIT IV : ADO DOTNET **9Hrs**

ADO DOTNET, Connected Objects- Disconnected Objects-Data Form Wizard, Data Bound Form- Various Connection Methodologies for Database - Querying database, usage of Data Adapter class.-Working with data off-line-Data view object -strongly typed Dataset Objects - Working with XML data- Building Windows based and web based application-DOTNet data providers

UNIT V : ASP DOTNET AND WEB SERVICES **9Hrs**

Concepts and tools for Windows application – Procedure oriented Windows applications –Windows Applications using the MFC–Application and class wizards–Getting started with OLE – Getting started with Active X Controls – COM and DHTML

Total No. of Hrs: 45

TEXT BOOKS

1. Kogent Solutions Inc (2009) *C# 2008 Programming: Covers DOTNet 3.5 Black Book*, Platinum Ed, Dreamtech Press
2. E. Balagurusamy (2010) *Programming in C#*, (3rd ed.),Tata McGraw-Hill

REFERENCES

1. ThuanL.Thai, Hoang Lam (2003) *DOTNET Framework Essentials*, (3rd ed.),O'reilly Media Inc
2. Kip R Irvine Tony Gaddis (2009) *Starting Out with Visual Basic 2008* , (4th ed.), Addison Wesley publication
3. Evjen, Hanselman, Rader (2005) *Professional ASP DOTNET 2.0* , John Wiley & Sons
4. David Sceppa (2013) *Programming Microsoft ADO DOTNET4*, Amazon.com
5. Web reference *http://msdn.microsoft.com/en-us/vstudio/default.aspx*

BIT13L06 INTERNET PROGRAMMING LAB 0 0 3 1

OBJECTIVES:

- Be able to use such Internet tools as email, ftp, and search engines;
- Be able to create simple web pages using HTML
- Be able to write simple programs using Java Servlets.

LIST OF EXPERIMENTS

1.Create a web page with the following using HTML

i) To embed an image map in a web page

ii)To fix the hot spots

iii)Show all the related information when the hot spots are clicked.

2. Create a web page with all types of Cascading style sheets.

3. Client Side Scripts for Validating Web Form Controls using DHTML

4. Write a program in Java to create applets incorporating the following features:

5. Create a color palette with matrix of buttons Set background and foreground of the control text area by selecting a color from color palette. In order to select Foreground or background use check box control as radio buttons To set background images

6. Write programs in Java using Servlets:

To invoke servlets from HTML forms

To invoke servlets from Applets

7. Write a program in Java to create three-tier applications using JSP and Databases

1. for conducting on-line examination.
2. for displaying student mark list. Assume that student information is available in database which has been stored in a database server.

8. Programs using XML – Schema – XSLT/XSL

9. Programs using AJAX

10.Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base.

BIT13L07 **DATA MINING LAB** **0 0 3 1**

OBJECTIVES:

- Able to write simple programs using Rattle an open source Tool(R)
- Able to write simple programs using Weka machine learning toolkit

1. Introduction to exploratory data analysis using Rattle an open source Tool(R)
2. Introduction to regression using Rattle an open source Tool. (R)
3. Introduction to the Weka machine learning toolkit
4. Classification using the Weka toolkit – Part 1
5. Classification using the Weka toolkit – Part 2
6. Performing data preprocessing for data mining in Weka
7. Performing clustering in Weka
8. Association rule analysis in Weka
9. Data mining case study using the CRISP-DM standard
10. Data mining case study using the CRISP-DM standard

BCS13L13 **DOTNET LAB** **0 0 3 1**

OBJECTIVES:

- Able to write simple programs using C# Dot net
- To write VB.NET Programs
- Get thorough knowledge about ADO.NET
- Make simple applications using ADO and ASP

C# DOTNET

1. Implementation of Operator Overloading

a. Complex Number

b. Matrix

c. Time(+.-)

2. Implementation of Multiple Inheritance

a. Employee

b. Area of an Object

3. Implementing Multithreading

VB DOTNET

4 .Designing a Calculator

5. Implement File Handling(Read,Delete,Modify)

6. Implement Exception Handling

a. Voter problem

b. Student Status

7. Event Handling – Mouse Click,Button click

ASP DOTNET

8. Super Market

9. Hotell Management System

ADO DOTNET

10. Student Attendance Calculation

11. Hospital management System

WEB SERVICE

12. Income tax calculation

Dr.M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Decl. U/S 3 of the UGC Act 1956)
DEPARTMENT OF INFORMATION TECHNOLOGY

BEN13L02 **QUALITATIVE / QUANTITATIVE SKILLS** **2 1 0 2**

OBJECTIVE

The objective of this course is to build confidence and inculcate various Soft skills and to help Students to identify and achieve their personal potential at the end of this training program the participant will be able to, explain the concept of problem solving

- Outline the basic steps in problem solving
- List out the key elements
- Explain the use of tools and techniques in problem solving
- Discuss the personality types and problem solving techniques.
- By adapting different thinking styles in group and lean environment.
- Recognizing and removing barriers to thinking in challenging situations.
- Make better decision through critical thinking and creative problem solving.

METHODOLOGY

The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities
2. Collaborative learning
3. Interactive sessions
4. Ensure Participation
5. Empirical Learning

UNIT – 1

Self Introduction- Narration – Current News Update – Numbers – Height & Distance – Square & Cube Roots.

UNIT – 2

Current Tech Update – Verbal Aptitude Test 1 – GD – 1 Odd man out series – Permutation & Combination – Problems on ages.

UNIT – 3

GD –II – Resume Writing – Mock Interview I / reading comprehension

UNIT – 4

Mock Interview II / reading comprehension – Mock Interview III / reading comprehension – GD – III – Ratio & Proportion – Clocks – H.C.F. &L.C.M

UNIT – 5

GD – IV – Verbal Aptitude Test II – Review – Partnership – Puzzles – Test

Total No of Hrs: 30

REFERENCES:

1. Pushplata and Sanjay Kumar (2007) *Communicate or Collapse: A Handbook of Effective Public Speaking, Group Discussions and Interviews*, Prentice – Hall, Delhi
2. Thorpe, Edgar (2003) *Course in Mental Ability and Quantitative Aptitude*, TMHl,
3. Thorpe, Edgar (2003) *Test of Reasoning* , Tata McGraw-Hill
4. Prasad, H.M (2001) *How to prepare for Group Discussion and Interview*, TMH
5. *Career Press Editors. 101 Great Resumes* (2003) Jaico Publishing House
6. Agarwal, R. S.(2004) *A Modern Approach to Verbal and Non- Verbal Reasoning*, S. Chand & Co.
7. Mishra Sunita and Muralikrishna (2004) *Communication Skills for Engineers*,(1st ed.), Pearson

BIT13008 **XML & WEB SERVICES** **3 0 0 3**

OBJECTIVES:

- understand and write well-formed XML documents
- write the schema for the given XML documents
- DTD and XML Schema languages
- format XML data to the desired format

UNIT I :INTRODUCTION **9Hrs**

Role Of XML - XML and The Web - XML Language Basics - SOAP - Web Services - Revolutions Of XML - Service Oriented Architecture (SOA).

UNIT II : XML TECHNOLOGY **9 Hrs**

XML - Name Spaces - Structuring With Schemas and DTD - Presentation Techniques - Transformation - XML Infrastructure.

UNIT III : SOAP **9Hrs**

Overview Of SOAP - HTTP - XML-RPC - SOAP: Protocol - Message Structure - Intermediaries - Actors - Design Patterns And Faults - SOAP With Attachments.

UNIT IV : WEB SERVICES **9Hrs**

Overview - Architecture - Key Technologies - UDDI - WSDL - ebXML - SOAP And Web Services In E-Com - Overview Of .NET And J2EE.

UNIT V : XML SECURITY **9Hrs**

Security Overview - Canonicalization - XML Security Framework - XML Encryption – XML Digital Signature - XKMS Structure - Guidelines For Signing XML Documents - XML In Practice.

Total No. of Hrs: 45

TEXT BOOKS

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

REFERENCES

1. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh (2004) *Developing Java Web Services*, Wiley Publishing Inc.

2. Sandeep Chatterjee, James Webber (2004) *Developing Enterprise Web Services*, Pearson Education

BIT13009 COMPONENT BASED TECHNOLOGY 3 1 0 4

OBJECTIVES:

- Show clear understanding of theoretical concepts of component based development and be able to apply the appropriate techniques of implementation using EJB 3 technology.
- To show the ability to critically discuss the key concepts in component based development and influence of this topic to modern trends in business computing and software engineering
- Show detailed knowledge of aspects of EJB 3 technology that allow development of applications based on components and service oriented architecture

UNIT I :INTRODUCTION TO COMPONENTS 12Hrs

Software Components – objects –Components and objects- modules –White box versus black box abstraction and reuse- interfaces – explicit context dependencies-component weight-callbacks – directory services – component architecture

UNIT II : JAVA BASED COMPONENT TECHNOLOGIES 12Hrs

Overview and history of Java component technologies-Java, the language– Interface versus classes-Threads and synchronization- Java Beans – Events and connections – properties – introspection – JAR files –Basic Java services-reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP

UNIT III : CORBA COMPONENT TECHNOLOGIES 12Hrs

Java and CORBA – Interface Definition language – Object Request Broker – system object model – Corba services – CORBA component model –portable object adapter-CCM components-CCM Containers– application objects – model driven architecture

UNIT IV : DOTNETBASED COMPONENT TECHNOLOGIES 12Hrs

The first fundamental wiring model -COM – COM object reuse – Interfaces and polymorphism-categories-interfaces and versioning –Other COM services- dispatch interfaces and dual interfaces –outgoing interfaces and connectable objects – Compound documents and OLE- OLE containers and servers – Active X controls – .NET components - assemblies – appdomains – contexts – reflection – remoting

UNIT V : COMPONENT FRAMEWORKS AND DEVELOPMENT 12Hrs

Frameworks for contextual composition –COM+ contexts – EJB containers – CLR contexts and channels – Black Box component framework – directory objects – cross-development environment – component development - component-oriented programming – Tools-Component design and implementation tools – testing tools-assembly-tools.

Total No. of Hrs: 60

TEXT BOOKS

1. Clemens Szyperski (2011) *Component Software: Beyond Object-Oriented Programming*,(2nd ed.),Pearson Education publishers

REFERENCES

1. Ed Roman (2009) *Mastering Enterprise Java Beans*, (3rded.) John Wiley & Sons Inc.,
2. Mowbray (2003) *Inside CORBA*, Pearson Education.
3. Freeze (2001) *Visual Basic Development Guide for COM & COM+*, BPB Publication
4. Hortsamann, Cornel (2002) *CORE JAVA Vol-II* ,Sun Press

BIT13010 ENTERPRISE RESOURCE PLANNING 3 0 0 3

OBJECTIVES:

- Comprehend the technical aspects of ERP systems
- Learn concepts of reengineering and how they relate to ERP system implementations
- Be able to map business processes using process mapping techniques
- Understand the steps and activities in the ERP life cycle
- Be able to identify and describe typical functionality in an ERP system

UNIT I :INTRODUCTION TO ERP **9Hrs**

Evolution of ERP – Advantages of ERP – Business modeling – Business process engineering – Management Information systems – Decision support system – Executive information system – Data Ware housing – Data Mining – Supply Chain management

UNIT II : BUSINESS MODELING FOR ERP **9 Hrs**

Building The Business model - ERP implementation – an Overview – Role of Consultant, Vendors and Users, Customization- Precautions- ERP Post implementation options - ERP Implementation Technology – Guidelines for ERP Implementation.

UNIT III : ERP AND THE COMPETITIVE ADVANTAGE **9Hrs**

ERP domain MPGPRO – IFS/Avalon- Industrial and financial systems- Baan IV SAP – Market Dynamics and dynamic strategy.

UNIT IV : COMMERCIAL ERP PACKAGE **9Hrs**

Description – Multi- client server solution- Open technology User Interface-Application Integration.

UNIT V : ARCHITECTURE **9Hrs**

Basic architectural Concepts- The system control interfaces- Services Presentation interface – Database Interface.

Total No. of Hrs: 45

TEXT BOOKS

1. Vinod Kumar Garg and N.K.Venkita Krishnan (2005) *Enterprise Resource Planning Concepts and Practice*,PHI
2. Alexis Leon (2006) *Enterprise Resource Planning*,Tata McGraw Hill publications

REFERENCES

1. Jose Antonio Fernandz (2004) *The SAP R/3 Handbook*, TMH

BIT13011 MOBILE APPLICATION DEVELOPMENT 3 0 0 3

OBJECTIVES:

- Describe the limitations and challenges of working in a mobile and wireless environment
- Describe and apply the different types of application models/architectures used to develop mobile software applications
- Describe the components and structure of a mobile development frameworks

.

UNIT I :INTRODUCTION **9Hrs**

Introduction to Mac, XCode, Objective C- Mobile Devices Profiles - Mobile Software - Options for development

UNIT II : INTRODUCTION TO SOFTWARE AS A SERVICE **9Hrs**

Service Oriented Computing Examples- Google Maps- Amazon Web Services

UNIT III : USER INTERFACE (UI) DEVELOPMENT FOR MOBILE APPS **9Hrs**

UI elements views-User Interface Frameworks – Gesture based interfaces

UNIT IV : GOOGLE ANDRIOD PLATFORM **9Hrs**

The Eclipse Simulator - Google Application Architecture - Eventbased programming

UNIT V : APPLE IPHONE PLATFORM **9Hrs**

UIKit for Interfaces - Event Handling and Graphics Services - Layer Animation

Total No. of Hrs: 45

TEXT BOOKS

1. Ed Burnette (2009) *Hello, Android: Introducing Google's Mobile Development Platform*,Pragmatic Bookshelf
2. Marko Gargenta (2011) *Learning Android* ,O'Reilly Media

REFERENCES

1. Richard Rodger (2012) *Beginning Mobile application development in the cloud*, Wrox Publication

BIT13L08 **XML AND WEB SERVICES LAB** **0 0 3 1**

OBJECTIVES:

- Able to create web forms
- Able to design web site

1. Table Creating using HTML
2. Developing Style Sheet using HTML
3. Developing Web form using HTML
4. Basic program to create and publish web service
5. Web site Designing
6. Creating Style sheet using XML
7. Creating XML document using DTD
8. Generating XML code in Java
9. Adding Data in XML document through Java
10. Creation of XML DTD in Java
11. Development of a java web service for squaring an integer.
12. Development of a java client application for consuming java web service.

BCS13L14 COMPREHENSION / FOREIGN LANGUAGE CERTIFICATION 0 2 0 2

The objective of comprehension is to provide opportunity for the student to apply the knowledge acquired during the academic program to real – life problems which he/she may have to face in future as an engineer.

Therefore the students are to be guided for objective and Technical interview for prospective placement or higher studies. This may be carried out through practice problems based on various subjects. Weekly 2 hours may be allotted for this purpose.

The end semester examination can be conducted as objective type for 100 marks, inclusive of core subjects and technologies.

Any Foreign Language Certification obtained on languages like French, German, Japanese etc can also be considered for awarding the 2 credits.

BCS13L16 **FREE AND OPEN SOURCE SOFTWARE (FOSS) LAB** **0 1 3 1**

OBJECTIVES:

- Able to know PHP and MySQL
- Write simple program using Python Programming

S.NO	NAME OF THE EXPERIMENT
1.	LINUX INSTALLATION AND BASIC OPERATION
2.	MYSQL INSTALLATION AND BASIC COMMANDS
3.	PHP –DESIGN A WEBPAGE
4.	PHP AND MYSQL CONNECTIVITY
5.	PYTHON PROGRAMMING

1. Getting started with Linux, learn basic Commands and directory structure, execute file and directory operation. (1 session)
2. Learn the basic commands to execute the operation. (2 sessions)
3. MY SQL Installation and basic commands to execute the operation. (2 session)
4. To Create Login Page using PHP for Conference Announced (2 sessions)
5. To create a login form and test the connectivity with MYSQL for a application like registration for a Conference organizer. (3 sessions)
6. Get started with Python, learn the basic types and control flow statements.

Python Programs (4 sessions)

a. String Concatenation in python programming
b. Write a python program to perform function in Lists
c. Write a python program to perform functions in tuples
d. Write a python program to perform functions in Dictionary.
e. Write a python Program to select odd number from the lists
f. Conditional statement in Python
g. For Statement in Python
h. Prime Number using Python.

BIT13L09 **PROJECT - PHASE I** **0 1 3 2**

OBJECTIVES:

- Able to do main projects in their respective domain

B.Tech IT Project carries 8 credits of which, Phase I carries 2 credit. In Phase I, Students are expected to

(i) Identify a Problem.

(ii) Have the feasibility explored.

(iii) Freeze the Requirement specification (both user and system).

(iv) Construct the architectural model (as many as required).

(v) Design the solution.

BMG13004 **ENTREPRENEURSHIP DEVELOPMENT** **3 1 0 4**

OBJECTIVES:

- Understanding of the sources of innovation opportunities and development of the skills to identify and analyze these opportunities for entrepreneurship and innovation.
- Understanding of the industry dynamics of and factors for developing successful innovations and apply this understanding to innovations in sectors including energy, healthcare and technology.
- Development of a personal skill set for creativity, innovation and entrepreneurship and specific concepts and tools for combining and managing creativity and innovation in an organization.

UNIT I :ENTREPRENEUR **12Hrs**

Traits and types, Creating and starting the venture – Sources of new ideas,Methods of generating ideas, Product planning and development process and establishing evaluation criteria.

UNIT II : BUSINESS PLAN **12Hrs**

Marketing plan - Marketing research for the new venture, Marketing mix, steps in preparing marketing plan.Financial plan – Proforma of income statements, Cash flow, Balance sheet, Break even Analysis, Application of funds. Organizational plan-legal forms of Business, Tax attributes, Role of Board of Directors, Advisors, Designing the organization. Risk assessment, Sources of finance-equity, Financial Institutions and Commercial banks.

UNIT III : RECORD KEEPING **12Hrs**

Meaning, Methods, Types, Hiring-concept, Procedure for hiring, Motivation – Entrepreneurial theories of motivation, Leadership - Styles of leadership.

UNIT IV : FINANCIAL CONTROL **12Hrs**

Managing cash flow, managing inventory, fixed assets, Managing cost and profits, Taxes.Entrepreneurial skills – Marketing skills, Strategic planning, Time Management skills, Negotiation skills.

UNIT V : OTHER ROUTES FOR SUCCESS **12Hrs**

Joint venture – Meaning, Types, Advantages Acquisition – Meaning, Importance advantages merger - Advantages, Disadvantages franchising – Advantages of franchising entrepreneur's point of view, Types going public – Raising funds from the market.

Total No. of Hrs: 60

TEXT BOOKS

1. Robert Hisrich, Michael Peters, Dean Shepherd,(2011)*Entrepreneurship*,(6th ed.), Tata McGraw-Hill

REFERENCES

1. Donald F. Kuratko, Richard M. Hodgetts (2008) *Entrepreneurshiptheory, Process and Practice* , (8th ed.), Cengage learning
2. PrasanaChandra(2009) *Projects-planning, analysis, selection, implementation and reviews*,(7th ed.),Tata McGraw-Hill

BIT13L10 **PROJECT - PHASE II** **0 0 12 6**

OBJECTIVES:

- Able to do projects in their respective domains

Students are expected to carry out the rest of the following stages of software development life cycle which they have started during project phase -I :

(i) Implement the Design using suitable technologies.
(ii) Generate the test cases.
(iii) Demonstrate the solution with suitable user interface.
(iv) Prepare a project report consolidating the phase-I and II activities.

BIT13E01 **MULTICORE PROGRAMMING** **3 0 0 3**

OBJECTIVES:

- Understand Multi-core architectures & the fundamental tools
- Explore parallel programming patterns and programming with Windows Threads
- Use Intel Thread Building Blocks to improve application performance with both thread checker and profiler tools

UNIT I :INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES **9Hrs**

Scalable design principles – Principles of processor design – Instruction Level Parallelism, Thread level parallelism. Parallel computer models –- Symmetric and distributed shared memory architectures – Performance Issues – Multi-core Architectures - Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture.

UNIT II : PARALLEL PROGRAMMING **9 Hrs**

Fundamental concepts – Designing for threads – scheduling - Threading and parallel programming constructs – Synchronization – Critical sections – Deadlock.Threading APIs.

UNIT III : OPEN MP PROGRAMMING **9Hrs**

Open MP – Threading a loop – Thread overheads – Performance issues – Library functions. Solutions to parallel programming problems – Data races, deadlocks and livelocks – Non-blocking algorithms – Memory and cache related issues.

UNIT IV : MPI PROGRAMMING **9Hrs**

MPI Model – collective communication – data decomposition – communicators and topologies – point-to-point communication – MPI Library.

UNIT V : MULTITHREADED APPLICATION DEVELOPMENT **9Hrs**

Algorithms, program development and performance tuning.

Total No. of Hrs: 45

TEXT BOOKS

1. Shameem Akhter and Jason Roberts (2006) *Multi-core Programming*, Intel Press
2. Michael J Quinn (2003) *Parallel programming in C with MPI and OpenMP*, Tata Mcgraw Hill,

REFERENCES

1 John L. Hennessey and David A. Patterson (2007) *Computer architecture – A quantitative approach*, (4th ed.),Morgan Kaufmann/Elsevier Publisher

2. David E. Culler, Jaswinder Pal Singh (1999) *Parallel computing architecture : A hardware/ software approach* , Morgan Kaufmann/Elsevier Publishers

BIT13E02 **GRID COMPUTING** **3 0 0 3**

OBJECTIVES:

- Present the principles underlying the function of distributed systems and their extension to grid and cloud computing and virtualization techniques
- Create an awareness of the fundamental technical challenges in advanced distributed systems design and implementation;
- Expose students to current technology used to build architectures to enhance distributed computing infrastructures with various computing principles and paradigms, including grid and cloud computing;

UNIT I :INRODUCTION **9Hrs**

High Performance Computing - Cluster Computing - Meta-computing - Peer-to-Peer Computing - Internet Computing - Grid Computing – Types of grids - The Grid: Past - Present, Future - A New Infrastructure for 21st Century Science - Grid Applications.

UNIT II : GRID COMPUTING TECHNOLOGY **9 Hrs**

The Evolution of the Grid - Desktop Grids - Cluster Grids – HPC Grids – Computational and Data Grids.

UNIT III : THE ANATOMY OF THE GRID **9Hrs**

Virtual organizations, Grid architecture and its Relationship to other distributed technologies – autonomic computing – service on demand – SOA and the Grid – semantic grids - Service virtualization – Infrastructure and applications.

UNIT IV : THE OPEN GRID SERVICES ARCHITECTURE & INFRASTRUCTURE **9Hrs**

Evolution to OGSA, Physiology of the Grid: OGSA Infrastructure - OGSA Basic Services, Creating and Managing Grid Services, Managing Grid Environments - Grid-Enabling software applications, Grid-Enabling network services, Grid Security, Grid Resource Management and Scheduling - High-level Introduction to OGSI, Technical details of OGSI specification.

UNIT V : APPLICATION CASE STUDY **9Hrs**

Globus Toolkit – Architecture, Programming model, Sample Implementation, High Level Services

Total No. of Hrs: 45

TEXT BOOKS

1. Joshy Joseph and Craig Fallenstein(2004)*Grid Computing*, Pearson Education, New Delhi
2. Ahmar Abbas (2008) *Grid Computing Practical Guide to Technology and Applications*, Firewall Media, New Delhi

REFERENCES

1. Ian Foster and Carl Kesselman (2006) *The Grid : Blueprint for a New Computing Infrastructure*, Morgan Kaufman, New Delhi
2. Fran Berman, Geoffrey Fox and Anthony Hey J G (2003) *Grid Computing Making the Global Infrastructure a Reality*, Wiley, USA
3. C S R Prabhu (2008) *Grid and Cluster Computing*, Prentice Hall, New Delhi

BIT13E03 CLOUD COMPUTING 3 0 0 3

OBJECTIVES:

- To provide students with the fundamentals and essentials of Cloud Computing.
- To provide students a sound foundation of the Cloud Computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.
- To enable students exploring some important cloud computing driven commercial systems such asGoogleApps, Microsoft Azure and Amazon Web Services and other businesses cloudapplications.

UNIT I : INTRODUCTION TO CLOUD COMPUTING 9Hrs

Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds,Administering& Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS-Cloud computing platforms: Infrastructure as service: Amazon EC2,Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing

UNIT II : INTRODUCTION TO CLOUD TECHNOLOGIES 9Hrs

Study of Hypervisors Compare SOAP and REST Webservices, AJAX and mashups-Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization Multitenant software: Multi-entity support, Multi-schema approach, Multitenance using cloud data stores, Data access control for enterprise applications,

UNIT III : DATA IN THE CLOUD: RELATIONAL DATABASES, CLOUD FILE SYSTEMS 9Hrs

GFS and HDFS, BigTable, HBase and Dynamo.Map-Reduce and extensions: Parallel computing, The map-Reduce model, Parallel efficiency of Map-Reduce, Relational operations using Map-Reduce, Enterprise batch processing using Map-Reduce, Introduction to cloud development, Example/Application of Mapreduce, Features and comparisons among GFS,HDFS etc, Map-Reduce model

UNIT IV : CLOUD SECURITY FUNDAMENTALS 9Hrs

Vulnerability assessment tool for cloud, Privacy and Security in cloud-Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access controlIdentity management, Access control, Autonomic Security- Cloud computing security challenges: Virtualization security managementvirtual threats, VM Security Recommendations, VM-Specific Security techniques,Secure Execution Environments and Communications in cloud.

UNIT V : ISSUES IN CLOUD COMPUTING 9Hrs

Implementing real time application over cloud platform Issues in Intercloud environments, QOS Issues in Cloud, Dependability, data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud computingenvironment.Cloud Middleware. Mobile Cloud Computing. Inter Cloud issues. A grid of clouds,Sky computing, load balancing, resource optimization, resource dynamic reconfiguration, Monitoring in Cloud.

Total No. of Hrs: 45

TEXT BOOKS

1. Judith Hurwitz, R.Bloor, M.Kanfman, F.Halper (2010) *Cloud Computing for Dummies*,Wiley India Edition
2. Ronald Krutz and Russell Dean Vines (2010) *Cloud Security*, Wiley,India

REFERENCES

1. Scott Granneman,(2008) *Google Apps*, Pearson.
2. Tim Malhar, S.Kumaraswammy, S.Latif ,*Cloud Security & Privacy*, SPD, O'REILLY.
3. Antohy T Velte, et.al (2009) *Cloud Computing : A Practical Approach*,McGraw Hill
4. Barrie Sosinsky (2011) *Cloud Computing Bible*, Wiley, India
5. Gautam Shroff (2010) *Enterprise Cloud Computing* ,Cambridge.

BIT13E04 **CLOUD INFRASTRUCTURE AND SERVICES** **3 0 0 3**

OBJECTIVES:

- cloud deployment and service models, cloud infrastructure, and the key considerations in migrating to cloudcomputing.
- Knowledge about MPI programming

UNIT I :INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES **9Hrs**

Scalable design principles – Principles of processor design – Instruction Level Parallelism, Thread level parallelism. Parallel computer models –- Symmetric and distributed shared memory architectures – Performance Issues – Multi-core Architectures - Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture.

UNIT II : PARALLEL PROGRAMMING **9 Hrs**

Fundamental concepts – Designing for threads – scheduling - Threading and parallel programming constructs – Synchronization – Critical sections – Deadlock.Threading APIs.

UNIT III : OPEN MP PROGRAMMING **9Hrs**

Open MP – Threading a loop – Thread overheads – Performance issues – Library functions. Solutions to parallel programming problems – Data races, deadlocks and livelocks – Non-blocking algorithms – Memory and cache related issues.

UNIT IV : MPI PROGRAMMING **9Hrs**

MPI Model – collective communication – data decomposition – communicators and topologies – point-to-point communication – MPI Library.

UNIT V : MULTITHREADED APPLICATION DEVELOPMENT **9Hrs**

Algorithms, program development and performance tuning.

Total No. of Hrs: 45

TEXT BOOKS

1. Shameem Akhter and Jason Roberts (2006) *Multi-core Programming*, Intel Press
2. Michael J Quinn (2003) *Parallel programming in C with MPI and OpenMP*, Tata Mcgraw Hill,

REFERENCES

1 John L. Hennessey and David A. Patterson (2007) *Computer architecture – A quantitative approach*, (4th ed.),Morgan Kaufmann/Elsevier Publisher

2. David E. Culler, Jaswinder Pal Singh (1999) *Parallel computing architecture : A hardware/ software approach* , Morgan Kaufmann/Elsevier Publishers

BIT13E05 **VIRTUALIZATION** **3 0 0 3**

OBJECTIVES:

- Candidates should know and understand the general concepts, theory and terminology of Virtualization.
- Work in Network virtualization

UNIT I :OVERVIEW OF VIRTUALIZATION **9Hrs**

Basics of Virtualization - Virtualization Types – Desktop Virtualization – Network Virtualization – Server and Machine Virtualization – Storage Virtualization – System-level or Operating Virtualization – Application Virtualization-Virtualization Advantages - Virtual Machine Basics – Taxonomy of Virtual machines - Process Virtual Machines - System Virtual Machines – Hypervisor - Key Concepts

UNIT II : SERVER CONSOLIDATION **9 Hrs**

Hardware Virtualization – Virtual Hardware Overview - Sever Virtualization – Physical and Logical Partitioning - Types of Server Virtualization – Business cases for Sever Virtualization – Uses of Virtual server Consolidation – Planning for Development – Selecting server Virtualization Platform

UNIT III : NETWORK VIRTUALIZATION **9Hrs**

Design of Scalable Enterprise Networks - Virtualizing the Campus WAN Design - WAN Architecture - WAN Virtualization - Virtual Enterprise Transport Virtualization–VLANs and Scalability - Theory Network Device Virtualization Layer 2 - VLANs Layer 3 VRF Instances Layer 2 - VFIs Virtual Firewall Contexts Network Device Virtualization - Data-Path Virtualization Layer 2: 802.1q - Trunking Generic Routing Encapsulation - IPsec L2TPv3 Label Switched Paths - Control-Plane Virtualization–Routing Protocols- VRF - Aware Routing Multi-Topology Routing.

UNIT IV : VIRTUALIZING STORAGE **9Hrs**

SCSI- Speaking SCSI- Using SCSI buses – Fiber Channel – Fiber Channel Cables – Fiber Channel Hardware Devices – iSCSI Architecture – Securing iSCSI – SAN backup and recovery techniques – RAID – SNIA Shared Storage Model – Classical Storage Model – SNIA Shared Storage Model – Host based Architecture – Storage based architecture – Network based Architecture – Fault tolerance to SAN – Performing Backups – Virtual tape libraries.

UNIT V : VIRTUAL MACHINES PRODUCTS **9Hrs**

Xen Virtual machine monitors- Xen API – VMware – VMware products - Vmware Features – Microsoft Virtual Server – Features of Microsoft Virtual Server

Total No. of Hrs: 45

TEXT BOOKS

1. William von Hagen (2008) *Professional Xen Virtualization*, Wrox Publications
2. Chris Wolf , Erick M. Halter (2005) *Virtualization: From the Desktop to the Enterprise*, APress

REFERENCES

1. Reddy, Victor Moreno (2006) *Network virtualization*, Cisco Press
2. James E. Smith, Ravi Nair (2005) *Virtual Machines: Versatile Platforms for Systems and Processes*, Elsevier/Morgan Kaufmann
3. David Marshall, Wade A. Reynolds (2006) *Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center*, Auerbach Publications

BIT13E06 HIGH PERFORMANCE COMPUTING – CLOUD AND GRID 3 0 0 3

OBJECTIVES:

- Present the principles underlying the function of distributed systems and their extension to grid and cloud computing and virtualization techniques
- Get knowledge about grid scheduling, resource management
- To get idea about virtualization.
- Knowledge about cloud storage and security

UNIT I :INTRODUCTION TO GRID ARCHITECTURE 9Hrs

Grid related standard bodies - Grid types-Topologies, Components and Layers- Comparison with other approaches - System Infrastructure - Traditional paradigms for distributed computing - Web Services - Grid standards : OGSA & WSRF - Introduction to Globus Toolkit 3 & GT 4.

UNIT II : SEMANTIC GRID & AUTONOMIC COMPUTING 9 Hrs

Metadata & Ontology in semantic Web Semantic Web Services - Layered Structure of Semantic Grid - Semantic Grid Activities - Autonomic Computing - Basic Services - Grid Security - Grid Monitoring - GMA, Review criteria overview of Grid Monitoring system – Autopilot - Computational grids, Data grids, architecture of Grid systems, Grid security infrastructure.

UNIT III : GRID SCHEDULING & RESOURCE MANAGEMENT 9Hrs

Scheduling Paradigms -How Scheduling Works - Review of Condor - Introduction to Cloud Computing Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS / HAAS and Others, Organizational scenarios of clouds, Administering &Monitoring cloud services, benefits and limitations

UNIT IV : VIRTUALIZATION & CLOUD 9Hrs

Virtualization characteristics, Managing virtualization, Virtualization in cloud,Virtualization desktop and managing desktops in the cloud and security issues – storage Virtualization – Clustering – Network Virtualization.

UNIT V : CLOUD STORAGE AND DATA SECURITY 9Hrs

Storage basics, Storage as a service providers, security, aspects of data security, data security mitigation, provider data and it's security.

Total No. of Hrs: 45

TEXT BOOKS

1. Maozhen Li, Mark Baker (2005) *The Grid Core Technologies* ,John Wiley & Sons
2. Tim Malhar, S.Kumaraswammy, S.Latif, SPD, (2009) *Cloud Security &Privacy*,O'REILLY

REFERENCES

1. Daniel Minoli (2009) *A networking Approach To Grid Computing*,John Wiley & Sons, INC Publications,
2. J.Vette, Toby J. Vette, Robert Elsenpeter (2011) *Cloud Computing: A Practical Approach*, Tata McGraw Hill
3. Judith Hurwitz, R.Bloor, M.Kanfman, F.Halper (2009) *Cloud Computing for Dummies*,Wiley Indian Edition

BIT13E07 **MOBILE NETWORKS** **3 0 0 3**

OBJECTIVES:

- Get the idea about adhoc and sensor networks
- Thorough knowledge about wireless networks technology

UNIT I :AD HOC NETWORKS **9Hrs**

Characteristics and Applications of Ad hoc Networks, Routing - Need for routing and routing classifications, Table Driven Routing Protocols, Source Initiated On-Demand Routing Protocols,, Hybrid Protocols - Zone Routing, Fisheye Routing, LANMAR for MANET with group mobility, Location Added Routing, Distance Routing Effects, Micro discovery and Power Aware Routing..

UNIT II : SENSOR NETWORKS **9 Hrs**

Wireless Sensor Networks, DARPA Efforts, Classification, Fundamentals of MAC, Flat routing - Directed Diffusion, SPIN, COGUR, Hierarchical Routing, Cluster base routing, Scalable Coordination, LEACH, TEEN, APTEEN and Adapting to the dynamic nature of Wireless Sensor Networks.

UNIT III : WIRELESS BROADBAND NETWORKS TECHNOLOGY OVERVIEW PLATFORMS AND STANDARDS **9Hrs**

Wireless broadband fundamentals and Fixed Wireless Broadband Systems, Platforms- Enhanced Copper, Fiber Optic and HFC, 3G Cellular, Satellites, ATM and Relay Technologies, HiperLAN2 Standard, Global 3G CDMA Standard, CDMA Harmonization G3G Proposal for Protocol Layers.

UNIT IV : MANAGING WIRELESS NETWORKS AND TESTING **9Hrs**

Managing Wireless Broadband Operations Management of LMDS Systems and their Application, Principles of operations Management, LMDS Versus Other Access technologies, Applications, Testing Wireless Satellite Networks and Fixed Wireless Broadband Networks.

UNIT V : ADVANCED WIRELESS NETWORKS **9Hrs**

Wireless. Broadband Network Applications: Teleservices Model and Adaptive QoS Parameters, Modeling of Wireless. Broadband Applications, Multicomponent Model, Residential High speed Internet Wireless Broadband Satellite Systems, Next Generation Wireless Broadband Networks - 3G, Harmonized 3G, 3G CDMA, Smart Phones and 3G Evolution.

Total No. of Hrs: 45

TEXT BOOKS

1. Joh R. Vacca (2001) *Wireless Broadband Networks Handbook 3G, LMDS and Wireless Internet*, Tata McGraw-Hill
2. D.P. Agrawal and Qing-An zeng (2006) *Introduction to Wireless and Mobile Systems* ,Thomson

REFERENCES

1. Martyn Mallick (2003) *Mobile and Wireless Design Essentials*, Wiley
2. KaveshPahlavan and Prashant Krishnamurty (2002) *Principles of Wireless Networks A unified Approach*, Pearson Education,

BIT13E08 **MOBILE AD HOC NETWORKS** **3 0 0 3**

OBJECTIVES:

- Knowledge of mobile ad hoc networks, design and implementation issues, and available solutions.
- knowledge of routing mechanisms
- Knowledge of the 802.11 Wireless Lan (WiFi) and Bluetooth standards. Thisincludes their designs, operations, plus approaches to interoperability.

UNIT I :INTRODUCTION **9Hrs**

Introduction to adhoc networks – definition, characteristics features, applications -Characteristics of Wireless channel, Adhoc Mobility Models:- Indoor and outdoor models.

UNIT II : MEDIUM ACCESS PROTOCOLS **9 Hrs**

MAC Protocols: design issues, goals and classification. Contention based protocols- with reservation, scheduling algorithms, protocols using directional antennas. IEEE standards: 802.11a, 802.11b, 802.11g, 802.15. HIPERLAN

.UNIT III : NETWORK PROTOCOLS **9Hrs**

Routing Protocols: Design issues, goals and classification.Proactive Vs reactive routing, Unicast routing algorithms, Multicast routing algorithms, hybrid routing algorithm, Energy aware routing algorithm, Hierarchical Routing, QoS aware routing.

UNIT IV : END-END DELIVERY AND SECURITY **9Hrs**

Transport layer : Issues in desiging- Transport layer classification, adhoc transport protocols. Security issues in adhoc networks: issues and challenges, network security attacks, secure routing protocols.

UNIT V : CROSS LAYER DESIGN AND INTEGRATION OF ADHOC FOR 4G **9Hrs**

Cross layer Design: Need for cross layer design, cross layer optimization, parameter optimization techniques, Cross layer cautionary prespective. Intergration of adhoc with Mobile IP networks.

Total No. of Hrs: 45

TEXT BOOKS

1. C.Siva Ram Murthy and B.S.Manoj (2007) *Ad hoc Wireless Networks Architectures and Protocols*, (2nd ed.), Pearson Education
2. Charles E. Perkins (2000) *Ad hoc Networking* , Addison Wesley

REFERENCES

1. Mohammad Ilyas (2002) *The handbook of adhoc wireless networks,* CRC press,
2. T. Camp, J. Boleng, and V. Davies ,*A Survey of Mobility Models for Ad Hoc Network Research*, WirelessCommun. and Mobile Comp., Special Issue on Mobile
3. V.T.Raisinhani and S.Iyer (2004) *ÉCLAIR; "An Efficient Cross-Layer Architecture for wireless protocol stacks*, World Wireless cong., San francisco,CA,

BIT13E09 **MOBILE COMMERCE** **3 0 0 3**

OBJECTIVES:

- To understand the E – commerce strategies and value chains
- To understand the M-commerce services
- To understand M – commerce infrastructure and applications.
- To know the availability of latest technology and applications of M- commerce in various domains.
- To apply mobile commerce in business-to-business application.

UNIT I :ELECTRONIC COMMERCE **9Hrs**

Traditional commerce and E-commerce – Internet and WWW – Role of WWW – Value Chains – Strategic Business And Industry Value Chains – Role of E-commerce. Packet Switched Networks – TCP/IP Protocol Script – Internet Utility Programmes – SGML, HTML And XML – Web Client And Servers – Web Client/Server Architecture.

UNIT II : MOBILE COMMERCE **9 Hrs**

Introduction – Infrastructure of M–Commerce – Types Of Mobile Commerce Services – Technologies Of Wireless Business – Benefits And Limitations, Support, Mobile Marketing & Advertisement, Non– Internet Applications In M–Commerce – Wireless/Wired Commerce Comparisons.

UNIT III : MOBILE COMMERCE **9Hrs**

Technology : A Framework For The Study Of Mobile Commerce – NTT Docomo's I-Mode – Wireless Devices For Mobile Commerce – Towards A Classification Framework For Mobile Location Based Services – Wireless Personal And Local Area Networks .

UNIT IV : MOBILE COMMERCE **9Hrs**

Theory And Applications : The Ecology Of Mobile Commerce – The Wireless Application Protocol – Mobile Business Services – Mobile Portal – Factors Influencing The Adoption of Mobile Gaming Services – Mobile Data Technologies And Small Business Adoption And Diffusion – E–commerce in The Automotive Industry – Location–Based Services.

UNIT V : BUSINESS– TO– BUSINESS MOBILE E– COMMERCE **9Hrs**

Enterprise Enablement – Email and Messaging – Field Force Automation (Insurance, Real Estate, Maintenance, Healthcare) – Field Sales Support (Content Access, Inventory) – Asset Tracking and Maintenance/Management – Remote IT Support – Customer Retention (B2C Services, Financial, Special Deals) – Warehouse Automation – Security.

Total No. of Hrs: 45

TEXT BOOKS

1. E.BrianMennecke, J.TroyStrader, (2005) *Mobile Commerce: Technology, Theory and Applications*, Idea Group
2. Ravi Kalakota, B.AndrewWhinston,(2007) *Frontiers of Electronic Commerce*, Pearson Education,

REFERENCES

1. P. J. Louis (2009) *M-Commerce Crash Course*, McGraw- Hill Companies
2. Paul May (2006) *Mobile Commerce: Opportunities, Applications, and Technologies Of Wireless Business*,,Cambridge University Press.

BIT13E10 **WINDOWS PHONE** **3 0 0 3**

OBJECTIVES:

- Provides an appropriate entry point to a future career in technology.
- Some hands-on experience or training.

UNIT I : **9Hrs**

The Basics-Introduction-Hello, Windows Phone - Getting Oriented - An Introduction to Touch - Bitmaps, Textures- Sensors and Services - Issues in Application Architecture.

UNIT II : **9 Hrs**

Silver light- XAML Power and Limitations- Elements and Properties- the Intricacies of Layout- the App Bar and Controls.

UNIT III : **9Hrs**

Dependency Properties- Data Bindings - Vector Graphics - Raster Graphics – Animations- The Two Templates - Items Controls-Pivot and Panorama.

UNIT IV : **9Hrs**

XNA- Principles of Movement - Textures and Sprites - Dynamic Textures- From Gestures to Transforms

UNIT V : **9Hrs**

Touch and Play - Tilt and Play

Total No. of Hrs: 45

TEXT BOOKS

1. Charles Petzold, (2007) *Programming Windows Phone 7*, Microsoft Press .

REFERENCES

1. Andy Wigley&Peter ,*Windows Phone 7 Silverlight Development Step by Step*
2. Michael Stroh's (2010) *Windows Phone 7 Plain & Simple*

BIT13E11 **ANDROID** **3 0 0 3**

OBJECTIVES:

- Build own Android apps
- Explain the differences between Android and other mobile development environments
- Understand how Android applications work, their life cycle, manifest, Intents, and using externalresources
- Design and develop useful Android applications with compelling user interfaces .

UNIT I INTRODUCTION & GETTING STARTED 9Hrs

Background-Open platform for Mobile Development - Native Android Application- Android SDK Features – Android Run on – why develop for android? – Development Framework – Developing for Android, Mobile Devices – Examples – Android Development tools.

UNIT II : CREATING APPLICATIONS & USER INTERFACES 9 Hrs

Introduction to Application Manifest - Manifest Editor – Android Application Life Cycle – Understanding Application Priority – Process States – Externalizing Resources – Android Activities – Android UI Design – Introduction to Views , Layouts - Creating Views ,Menus – using Menu.

UNIT III : DATA STORAGE AND RETRIEVAL 9Hrs

Android Techniques for Saving Data –Saving Simple Application Data – Saving & Loading Files – Database in Android –Introduction to Content Providers.

UNIT IV : MAPS , GEOCODING , LOCATION BASED SERVICES & NOTIFICATION 9Hrs

Using Location based Services – Setting up Emulators with Test Providers – Selecting a Location Provider – Finding your Location – Using Proximity Alerts – Using Geocoder – Creating Map based Activites – Mapping examples – Introduction to Notification.

UNIT V : ACCESSING ANDROID HARDWARE 9Hrs

Using Media APIs – Using Camera – Sensor Manager – Accelerometer & Compass - Android Telephony – Using Bluetooth – Managing Network &Wi -Fi Connections – Controlling Device Vibrations.

Total No. of Hrs: 45

TEXT BOOKS

1. Reto Meier (2009) *Professional Android Application Development* ,Wiley Publishing Inc.

REFERENCES

1. Rick Rogers , John Lombardo, *Android Application Development* .
2. Marko Gargenta,(2011) *Learning Android* , O'Reilly Publication

BIT13E12 MOBILE AND PERVASIVE COMPUTING 3 0 0 3

OBJECTIVES:

- To introduce the characteristics, basic concepts and systems issues in mobile and pervasive computing
- To illustrate architecture and protocols in pervasive computing and to identify the trends andlatest development of the technologies in the area
- To give practical experience in the area through the design and execution of a modest research project
- To design successful mobile and pervasive computing applications and services

UNIT I :MOBILE NETWORKS **9Hrs**

Cellular Wireless Networks – GSM – Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security GPRS.

UNIT II : WIRELESS NETWORKS **9 Hrs**

Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services –Network -HiperLAN – Blue Tooth- Wi-Fi – WiMAX

UNIT III : ROUTING **9Hrs**

Mobile IP – DHCP – AdHoc– Proactive and Reactive Routing Protocols – Multicast Routing.

UNIT IV : TRANSPORT AND APPLICATION LAYERS **9Hrs**

Mobile TCP– WAP – Architecture – WWW Programming Model– WDP – WTLS – WTP –WSP – WAE – WTA Architecture – WML – WMLScripts.

UNIT V : PERVASIVE COMPUTING **9Hrs**

Pervasive computing infrastructure-applications- Device Technology – Hardware,Human-machine Interfaces, Biometrics, and Operating systems– Device Connectivity –Protocols, Security, and Device Management- Pervasive Web Application architecture-Access from PCs and PDAs – Access via WAP.

Total No. of Hrs: 45

TEXT BOOKS

1. Jochen Schiller,(2003) Mobile Communications,(2nd ed.), PHI,
2. Jochen Burkhardt, (2007) Pervasive Computing: Technology and Architecture of Mobile Internet Applications, (3rd ed.),Addison-Wesley Professional

REFERENCES

1. Chimay J Anumba, XiangyaWang ,(2010) *Mobile and Pervasive Computing in Construction*,Wiley Publication

BIT13E13 **BUSINESS INFORMATION SYSTEMS** **3 0 0 3**

OBJECTIVES:

- Analyse, model and design core business processes
- Acquire, implement and use enterprise-wide information systems and strategies for governance
- Align information systems with business objectives

UNIT I : **9Hrs**

Introduction – Decisions – Value of Information – The idea of a system – Management Information Sytems – Informal and formal information – The need for a business strategy – Strategic Business Planning – Business Information Systems Strategy – Information systems strategy today – Networks and distributed systems — Distribution of data –Effects of internet on business

UNIT II : **9 Hrs**

Internet and Financial Transactions – ecommerce business models – Business Intelligence from analyzing data and information – File structures –Record structures – Physical and logical views of data – Data storage , and lists – storage –Relational Models – Object Oriented Model

UNIT III : **9Hrs**

The need for systems analysis and design - The need for structured approach to analysis and design – Life cycle of a system – Structured approach and the life cycle – Alternative approaches to information systems development – System analysis – Data flow diagrams – Data Dictionary – Decision tables - logic flowcharts

UNIT IV : **9Hrs**

Top down versus bottom up approaches to data modeling – Entity Relationship Modelling – Data analysis and modeling - Process modeling and data modeling – Tranition from analysis to design – suggests alternative designs – Walkthroughs and formal reviews

UNIT V : **9Hrs**

Detailed Design – Systems specification – Implementation – Systems changeover – Evaluation and maintenance – Emergence of object oriented approaches- Static Modelling –Dynamic Modelling

Total No. of Hrs: 45

TEXT BOOKS

1. Graham Curtis and David Cobham, (2008) Business Information Systems ,Analysis , Design and Practice,(6th ed.),Pearson Education Limited

REFERENCES

1. HD Clifton , DC Ince , AG Sutcliffe (2008) Business Information Systems ,(6th ed.),Pearson Education Limited

BMG13E06 **LEGAL SYSTEMS IN BUSINESS** **3 0 0 3**

OBJECTIVES:

- Students will demonstrate an informed understanding of the law and social responsibility relevant to managing an organization domestically and internationally.
- Students will demonstrate the ability to apply an informed understanding of the law and social responsibility to individual, organizational, and social issues.

UNIT I : **9Hrs**

The Companies Act 1956 : Types of Companies, Procedure for formation, Promoters. Distinction between Company and Partnership, Concept of Corporate veil, Doctrine of Constructive Notice and Indoor Management. Provisions of Company law relating to Managerial Personnel-Remuneration, Appointment & Removal, Powers and Obligations.Oppression and Mismanagement.Winding up of Company.

UNIT II : **9 Hrs**

The Indian Contract Act 1972 : Classification of Contracts, Essentials of a contract-Offer, Acceptance, Consideration, Capacity to contract, Free Consent, Performance, Discharge of Contracts, Remedies for Breach of Contract. Sale of Goods Act 1930: Contract of sale, Difference between Sale and Agreement to sell, Conditions and Warranties. Transfer of Property. Performance of the Contract-Rights of an Unpaid Seller

UNIT III : **9Hrs**

The Negotiable Instruments Act 1881 : Features of Negotiable Instruments, Promissory Note, Bill of Exchange, Cheque, Liabilities of Parties, Holder in Due course - Privileges , Dishonour Procedures, Bankers duties /powers, Discharge of Negotiable instruments, Endorsements.

UNIT IV : **9Hrs**

The Competition Act 2002: Prohibition of Certain Agreements, Abuse of Dominant Position and Regulation of combinations-Competitive Commission of India-Duties/Powers and functions of Commission, Penalties-Finance Accounts and Audit-Miscellaneous Right To Information Act 2005. Intellectual Property Rights.

UNIT V : **9Hrs**

Introduction to VAT: The Information Technology Act 2000; Law relating to Insurance Consumer Protection Act 1986-Formation, Unfair Trade Practices; Law relating to Environment Act 1986.

Total No. of Hrs: 45

TEXT BOOKS

1.Akhileshwar Pathak,(2009) *Legal Aspects of Business*,(4th ed.), Tata Mcgraw Hill,

REFERENCES

1. Kapoor.N.D (2008) *Elements of Mercantile Law*, (29th ed.),Sultan Chand &Co.

2. Kuchal,(2009) Business Law ,(3rd ed.),Vikas Publications

3. Saravanavel.P&Sumathi, (2009) Legal Systems in Business,(9th ed.), Himalaya Publishing House

BIT13E14 ELECTRONIC CUSTOMER RELATIONSHIP MANAGEMENT 3 0 0 3

OBJECTIVES:

- An understanding of the concept of customer relationship management.
- An understanding of the benefits delivered by CRM, the contexts in which it is used, the technologies that are deployed and how it can be implemented.
- An understanding of the requirements of writing and referencing a report for assessment, and presenting key points in a concise way.

UNIT I INTRODUCTION 9Hrs

Definition -CRM as a business strategy -Elements of CRM - CRM Processes and systems- Entrance, applications and success of CRM

UNIT II STRATEGY AND ORGANIZATION OF CRM 9Hrs

Customer-supplier relationships - History - Description of customer-supplier relationships -Dynamic in relationships - Communities -Case study: The relation between a logistics service provider and its new client

UNIT III CRM AS AN INTEGRAL BUSINESS STRATEGY 9Hrs

Nature of the CRM strategy - Context of the CRM strategy - Results of a successful CRM strategy Case study: Orange Line

UNIT IV CRM SYSTEMS AND THEIR IMPLEMENTATION 9Hrs

CRM Systems And Their Implementation: Overview of CRM systems - call centre - Internet and the website - Data warehouse and data mart - Campaign management systems - Content management system - Suppliers of CRM systems Case study: Canada Post delivers on its CRM strategy

UNIT V ECRM 9Hrs

Meaning and definition- features of ECRM- Framework and Architecture- Building ECRMTools to maintain ECRM- Elements, types and process of Data mining- Applications of Data Mining- Advantages of ECRM

Total No. of Hrs: 45

TEXT BOOKS

1. Ed Peelen (2007) *Customer Relationship Management*, Pearson Education
2. Pujawalia Mann,(2005) *E-Commerce*,Niddhi MJP Publishers

REFERENCES

1. Konstantinos Tsiptsis, AntoniosChorianopoulos (2004) Data Mining Techniques in CRM
Wiley InterScience

BMG13E07 **INTERNATIONAL BUSINESS STRATEGY** **3 0 0 3**

OBJECTIVES:

- Understanding of international trade law, the obligations of the parties in an international contract for the sale of goods, and the remedies available in the event of a breach of contract.
- How to readfinancial statements, present to them
- Some knowledge of international business law, provide them with a brief overview of the existing international regulatory bodies in international business and address the main legal issues stemming from the globalization of business.

UNIT I **9Hrs**

Introductions and initial discussion on Globalization- Globalization & Business Today- Ethics in International Business- International Trade Theory- Foreign Direct Investment- National Differences in Political Economy- National Differences in Culture

UNIT II **9Hrs**

The Strategy of International Business- Entering Foreign Markets- Exporting, Importing, & Countertrade - Global Production, Outsourcing, & Logistics- Global Marketing and R &D - Global HR

UNIT III **9Hrs**

E-Commerce in the global Environment, Government's involvement in global B2, B2B business terms and conditions (global business contract model) including issues such as methods of payment, governing laws, specifications, delivery terms, etc

UNIT IV **9Hrs**

Export controls and re-export authorization- Import issues (duties, tariffs, quotas, methodology)- Countertrade and offsets- International transfer pricing (taxes and duties)- Business operating environment (ethics and laws including FCPA)

UNIT V **9Hrs**

Marketing And Business Strategy - World Class Business Environment, CASE STUDIES

Total No. of Hrs: 45

TEXT BOOKS

1. Hill, Charles (2008) *Global Business Today*,(6th ed.), McGraw Hill Irwin
2. Cullen, J.B. (2008) *Multinational Management: A Strategic Approach* , (3rd ed.), Ohio: South-Western

BIT13E15 **E GOVERNANCE** **3 0 0 3**

OBJECTIVES:

- Basic knowledge on the use of e-governance and its importance to society
- The ability and skills necessary for employees to use e-governance in their country, in local vernacular languages where applicable.

UNIT I INTRODUCTION **9Hrs**

E-Governance: Needs of E-Governance-Issues in E-Governance applications and the Digital Divide - Evolution of E-Governance - Its scope and content -Present global trends of growth in E-Governance - Other issues.

UNIT II MODELS OF E GOVERNANCE **9Hrs**

Introduction -Model of Digital Governance - Broadcasting/ Wilder Dissemination Model - Critical Flow Model - Comparative Analysis Model - Mobilization and Lobbying Model -Interactive-service Model/Government-to-Citizen-to-Government Model (G2C2G); Evolution in E-Governance and Maturity Models: Five Maturity Levels - Characteristics of Maturity Levels - Key areas - Towards Good Governance through E-Governance Models.

UNIT III E-GOVERNANCE INFRASTRUCTURE AND STRATEGIES **9Hrs**

E-readiness: Digital System Infrastructure -Legal Infrastructural Preparedness -Institutional Infrastructural Preparedness - Human Infrastructural Preparedness - Technological Infrastructural Preparedness - Evolutionary Stages in E-Governance.

UNIT IV DATA WAREHOUSING AND DATA MINING IN GOVERNMENT **9Hrs**

Introduction -National Data Warehouses: Census Data - Prices of Essential Commodities - Other areas for Data Warehousing and Data Mining: Agriculture - Rural Development – Health – Planning – Education- Commerce and Trade - Other Sectors.

UNIT V CASE STUDIES **9Hrs**

Nepalese Context: Cyber Laws - Implementation in the Land Reform -Human Resource Management Software - India: NICNET – Collectorate - Computer-aided Administration of Registration Department (CARD) - Smart Nagarpalika -National Reservoir Level and Capacity Monitoring System -Computerization in Andra Pradesh - EkalSevaKentra - SachivalayaVahini, Bhoomi- IT in Judiciary -E-Khazana – DGFT - PRAJA -E-Seva - E-Panchyat -General Information Services of National Informatics Centre -E-Governance initiative in USA - E-Governance in China - E-Governance in Brazil and Sri Lanka.

Total No. of Hrs: 45

TEXT BOOKS

1. C.S.R. Prabhu,(2004) *E-Governance: Concepts and Case Studies*,Prentice-Hall of India Private Limited
2. Backus, Michiel,(2001) *E-Governance in Developing Countries, IICD Research Brief, No. 1*

BMG13E08 **BUSINESS ESSENTIAL** **3 0 0 3**

OBJECTIVES:

- The tools to start a business with a well-tested and clear plan in place,
- Ongoing skills development to help companies succeed and grow,
- The ability to stay current in today's changing marketplace, which is essential for small business owners and managers to succeed

UNIT I : MICRO ECONOMICS **9Hrs**

The Basic Economic Problem: Scarcity - Optimal Decision Making: Marginal Analysis - Supply and Demand I: Market Equilibrium - Market Structures - Price Elasticity and Profit Maximization - Labor Markets and Wage Determination - Government Regulation.

UNIT II: BUSINESS LAW **9Hrs**

Foundations and Sources of Law - Traditional and Alternative Dispute Resolution - Tort Law and Criminal Law – Contracts - Sales Law - Business Structure - Property Law - Financial Law.

UNIT III: MARKETING MANAGEMENT **9Hrs**

An Introduction to Marketing - Developing a Marketing Strategy - Understanding the Marketing Environment - Understanding Consumer Behavior - Business Markets - Market Segmentation and Positioning - The Market Research Process, Global Marketing.

HUMAN RESOURCE ADMINISTRATION

Understanding Your Legal Role - Job Analysis and Workforce Planning – Recruiting – Recruiting – Employment - Compensation and Benefits - Employee and Labor Relations - Occupational Safety and Health - Performance Management.

UNIT IV: FINANCIAL ACCOUNTING **9Hrs**

Welcome to the World of Accounting -Accounting Process and Cycle - A Walk Down the Balance Sheet: Cash and Accounts Receivable - A Walk Down the Balance Sheet: Inventory - A Walk Down the Balance Sheet: Long Term Assets - A Walk Down the Balance Sheet: Internal Controls and Liabilitie s - A Walk Down the Balance Sheet: Share Holder Equity.

LEADERSHIP ESSENTIALS

Leadership and Self-Awareness - Building Effective Relationships - Understanding and Managing Conflict - Getting Results Through Others: The Performance Management Process - Getting Results Through Others: Setting Goals and Expectations - Getting Results Through Others: Giving and Receiving Feedback - Performance and Development Planning.

UNIT V :PROJECT MANAGEMENT **9Hrs**

Introduction and Key Definitions - Project Initiation - Project Planning: Overview – SOW – WBS - Project Planning: Estimating and Task Dependencies - Project Planning: Critical Path Analysis and Gantt Charts - Project Planning: Resource Allocation and Risk Planning - Managing Projects - Project Closure.

Total No. of Hrs: 45

TEXT BOOKS

1. Gaylord A. Jentz,(2010) *Business Law Today,TheEssentisls*, (1st ed.),Roger Leroy Miller
2. Ewan Maclntyre (2011) *Essentials of Business Law*, ,(3rd ed.),,Pearson education

BIT13E16 MANAGEMENT INFORMATION SYSTEMS 3 0 0 3

OBJECTIVES:

- why information systems are so important today for business and management;
- Evaluate the role of the major types of information systems in a business environment and their relationship to each other;
- Assess the impact of the Internet and Internet technology on business electronic commerce and electronic business;
- Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges

UNIT I ORGANIZATIONS, MANAGEMENT AND THE NETWORKED ENTERPRISE 9Hrs

Information Systems in Global Business- Global E-Business-Information Systems-Strategy Systems- Ethical and Social issues in Information System - Analyzing Business Resource for an Enterprise System.

UNIT II IT INFRASTRUCTURE 9Hrs

IT infrastructure- Emerging Technology - Business Intelligence: Databases and Information Management – Telecommunication - Internet and Wireless Technology - Information Security Systems

UNIT III KEY SYSTEM APPLICATION FOR THE DIGITAL AGE 9Hrs

Enterprise application- Ecommerce-Digital Markets- Digital Goods- Managing knowledge- Decision Making – Enterprise portal design

UNIT IV BUILDING AND MANAGING SYSTEMS 9Hrs

Building Systems - Project Management- Establishing Business values - Managing Change - Managing Global System - Redesigning Business Processes- Case studies

UNIT V ADVANCED CONCEPTS IN INFORMATION SYSTEM 9Hrs

Enterprise Resource Planning - modules : Human Resources, Finance – Accounting - Production & Logistics - Supply Chain Management – CRM - Procurement - Management System Object Oriented modeling- case studies

Total No. of Hrs: 45

TEXT BOOKS

1. James A, O' Brian,(2007) *Management information systems* ,(7th ed.), TMH Publisher
2. Kenneth C. Laudon, Jane P.(2008) *Management Information Systems: Managing the Digital Firms* Pearson Education, TMH, 2008.

REFERENCES

1. James A. O'Brien, Northern Arizona University,George M. Marakas, University of Kansas, (2007) *Introduction to Information Systems*
2. Ross and Clagget (2004) *Information System for Modern Management*, Prentice-Hall of India Pvt. Ltd.
3. Alexis Leon,(2007) *Enterprise Resource Planning*, TMH

BIT13E17 DECISION SUPPORT SYSTEM 3 0 0 3

OBJECTIVES:

- To review and clarify the fundamental terms, concepts and theories associated with Decision Support Systems, computerized decision aids, expert systems, group support systems and executive information systems.
- To examine examples and case studies documenting computer support for organizational decision making, and various planning, analysis and control tasks.
- To discuss and develop skills in the analysis, design and implementation of computerized Decision Support Systems.
- To examine user interface design issues and evaluate the user interfaces and capabilities of Decision Support Systems.

UNIT I INTRODUCTION 9Hrs

Decision support at roadway package system, Managers and decision making, Managerial decision making and informative

UNIT II DSS 9Hrs

DSS configuration , Characteristics and capabilities of DSS, component of DSS, Data management subsystem ,Model management subsystem, Dialog subsystem , classification of DSS, Distinguishing DSS from MIS and management science, Modelling for MSS , Static and dynamic models, Treating certainity, Uncertainity and risk, Influence diagrams, Optimization via mathematical programming , Heuristic program, Simulation, Multidimensional modeling, Visual spreadsheet, Financial and planning modeling.

UNIT III INTELLIGENT DSS, USER INTERFACE 9Hrs

Knowledge based DSS concepts and definitions, Artificial intelligence versus natural intelligence, Knowledge in AI, Types of knowledge based DSS, Intelligent DSS, User interface, Interface models, Graphics, Multimedia and hypermedia ,GIS, NLP overview, methods ,DSS development strategies, Development process, Team development DSS , DSS development tools.

UNIT IV ENTERPRISE SUPPORT SYSTEM 9Hrs

Networked Decision Support: The internet, Intranet and collaborative technologies, Group decision support system - Decision making in groups , Goal of GDSS , GDSS software, Idea generation, Negotiation support system -EIS concepts and definition , Executive role, Characteristics of EIS, Comparing and integrating EIS and DSS, Enterprise EIS, EIS implementation.

UNIT V EXPERT SYSTEM AND INTELLIGENT SYSTEM 9Hrs

Fundamentals of expert system, Expert system concepts, Structure, Human elements, Working, Benefits, Limitation, Success factors, Types, Knowledge engineering, Scope of knowledge, Difficulties in knowledge acquisition, Methods of knowledge acquisition, Knowledge representation, Inferencing with rules, Frames , Model-based reasoning, Casebased reasoning, Introduction to building expert systems.

Total No. of Hrs: 45

TEXT BOOKS

1. Efraim Turban,,Jaye,Aronson,(2005) *Decision Support Systems and Intelligence Systems*,Prentice hall

REFERENCES

1. Turban E.(1995)Decision Support and Expert Systems, Management Support Systems,(7th ed.), Maxwell Macmillan
2. V.S. Janaki Raman and K. Sarukesi,(2004) *Decision Support Systems*, Prentice Hall of India Pvt. Ltd.
3. Clyde W. Holsapple and Andrew B. Whinston. ,(2000) *Decision Support Systems: A Knowledge-Based Approach*, Thomson Learning Custom
4. Ramesh Sharda, and DursunDelen,(2010) *Decision-Support-Business-Intelligence Systems*, Prentice Hall

BIT13E18 **E – COMMERCE** **3 0 0 3**

OBJECTIVES:

- Understand the nature of e-Commerce;
- Recognize the business impact and potential of e-Commerce;
- Explain the technologies required to make e-Commerce viable;
- Discuss the current drivers and inhibitors facing the business world in adopting and using eCommerce;
- Explain the economic consequences of e-Commerce;
- Discuss the trends in e-Commerce and the use of the Internet**.**

UNIT I INTRODUCTION 9Hrs

Technology Infrastructure- The Internet and the world wide web

UNIT II BUSINESS STRATEGIES FOR E-COMMERCE 9Hrs

Selling on the Web- revenue models and building a web presence, marketing on the web, Business-to-business activities: Improving efficiency and reducing costs, Social networking, Mobile Commerce and online auctions, Environment of E-commerce- Legal, Ethical and Tax issues.

UNIT III INFRASTRUCTURE AND TECHNOLOGY FOR E COMMERCE 9Hrs

Packet Switched Networks-TCP/IP Protocol Scripts-SGML, HTML & XML- Web clients and server Architecture – Intranets and Extranets-Web Server Hardware and Software-Security and Payment.

UNIT IV WEB PAGE HOSTING 9Hrs

Introduction, Web Page Elements, Web page development Life-cycle, Installing web pages on a web server, Legal and ethical issues in web publishing, E-commerce portal design strategy: Delivering value through e-commerce portal, Aligning business value with portal strategy,.

UNIT V CASE STUDIES 9Hrs

Ebay in action, Strategic initiatives by Indian railway, Airtel- Getting, selling channels to work together, Using E-commerce for order fulfilling in supply chain management.

Total No. of Hrs: 45

TEXT BOOKS

1. Gary P. Schneider (2010) *Electronic Commerce Pub*, Cengage Learning
2. Mr. Amir Manzoor(2010) *E-Commerce: An Introduction* Lambert Academic Publishing

REFERENCES

1. Janice ,(2000) *The Complete E-Commerce Book:Design, Build & Maintain a Successful Web-basedBusiness* ice Reynolds
2. Kenneth Laudon and Carol GuercioTraver (2009) *E-Commerce 2010*, Prentice Hall
3. Sanjay Mohapatra (2012) *E-Commerce Strategy: Text and Case* (Springer Texts in Business and Economics)Springer

BMG13E09 **TOTAL QUALITY MANAGEMENT** **3 0 0 3**

OBJECTIVES:

- To know business excellence models and be able assess organization's performance making reference to their criteria
- To know the principles of total quality management and peculiarities of their implementation
- To be able to use quality management methods analyzing and solving problems of organization

UNIT I INTRODUCTION 9Hrs

Introduction - Need for quality - Definition of quality - Dimensions of quality, Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran Crosby – Barriers to TQM. TQM models, Deming Wheel, Deming philosophy.

UNIT II TOTAL QUALITY MANAGEMENT PRINCIPLES 9Hrs

Leadership – Quality Council, Strategic quality planning, Quality statements - Customer focus Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement – PDSA cycle, 5s, Kaizen - Supplier partnership – Supplier selection, Supplier Rating.

UNIT III QUALITY MANAGEMENT TOOLS FOR BUSINESS APPLICATION 9Hrs

Principles and applications of quality functions deployment, failure mode and effect analysis, taguichi techniques,7 old QC tools,7 new management tools, statistical quality control techniques, mistake proofing, bench marking,8D methodologies.

UNIT IV QUALITY IMPERATIVE FOR BUSINESS IMPROVEMENTS 9Hrs

Dimensions of quality, reliability prediction analysis, total productive maintenance, cost of quality, business process re-engineering, process capability analysis, quality assurance and ISO 9000 and QS 9000 certifications-Team Building –Communication and Transactional Analysis.

UNIT V TQM IMPLEMENTATION STRATEGIES 9Hrs

Organizational structures and mind set of individuals, motivational aspects of TQM, change management strategies, training for TQM, TQM roadmap, quality improvement index.

Total No. of Hrs: 45

TEXT BOOKS

1. Dale H.Besterfiled, et al(2006) *Total Quality Management*,(3rd ed.), Pearson Education Asia,Indian
2. Joel E Ross (2005) *TOTAL QUALITY MANAGEMENT*, (3rd ed.),C R C Press LLC

REFERENCES

1. William J.Kolarik,(1999) *Creating Quality*, McGraw Hill Inc, NY
2. Dale H.Besterfield Et Al,(2003) *Total Quality Management* , Prentice Hall,
3. Suganthi,L and Anand Samuel, (2006)*Total Quality Management*, Prentice Hall (India) Pvt. Ltd.
4. Janakiraman,B and Gopal, R.K, (2006) *Total Quality Management – Text and Cases*, Prentice Hall (India) Pvt. Ltd.

BIT13E19 SUPPLY CHAIN MANAGEMENT 3 0 0 3

OBJECTIVES:

- To introduce students to the development of mathematical modeling and solution tools for logistics and supply chain management;
- To teach students to use tools to analyze strategic, tactical, and operational decisions including facility location, vehicle routing, and inventory management; and,
- To engage students in case studies based on real world logistics and supply chain decisions

UNIT I INTRODUCTION 9Hrs

Understanding the Supply Chain-Supply Chain Performance: Achieving Strategic Fit and Scope-Supply Chain Drivers and Metrics.

UNIT II DESIGNING THE SUPPLY CHAIN NETWORK 9Hrs

Designing Distribution Networks and Applications to E-Business- Network design in the supply Chain-Designing global Supply Chain Networks.

UNIT III PLANNING DEMAND AND SUPPLY IN A SUPPLY CHAIN 9Hrs

Demand Forecasting in a supply Chain-Aggregate planning in A supply Chain- Sales and Operations Planning: Planning Supply and Demand in a Supply Chain.

UNIT IV PLANNING AND MANAGING INVENTORIES IN A SUPPLY CHAIN 9Hrs

Managing Economies of scale in a supply chain: Cycle inventory-managing Uncertainity in a supply chain: safety Inventory-determining the optimal Level of Product Availability

UNIT V MANAGING CROSS - FUNCTIONAL DRIVERS IN A SUPPLY CHAIN 9Hrs

Sourcing Decisions in a Supply Chain-Pricing and Revenue Management in a Supply Chain-Information Technology in a Supply chain-Co Ordination in a Supply Chain.

Total No. of Hrs: 45

TEXT BOOKS

1. Sunil Chopra and Peter Meindl,(2007) *Supply Chain Management-Strategy Planning and Operation,* Prentice Hall

REFERENCES

1. R.B. Handfield, E.L. Nochols Jr.,(1999) *Introduction to Supply Chain Management*,,Pearson Education,
2. Jeremy F. Shapiro, (2001) *Modeling the Supply Chain*, Duxbury Thomson Learning,
3. David Simchi Levi, Philip kaminsky, Edith Simchi Levi,(2000) *Designing and Managing theSupply Chain*: *Concepts, Strategies, and Case Studies*, Irwin McGraw Hill,

BIT13E20 MAINFRAME COMPUTING 3 0 0 3

OBJECTIVES:

- Explain the major features and facilities of the mainframe.
- Explain the structure of mainframe applications and databases.
- Apply classroom learning to practical mainframe technology management problems

UNIT I MVS CONCEPTS 9Hrs

MVS overview-system initialization-storage management-job management-managing work-data management-I/O processing-termination and recovery.TSO commands-general syntax of JCL statements

UNIT II JCL AND VSAM 9Hrs

Explanation of job statements-explanation of EXEC statements-explanation of DD statements-additional parameters on JOB,EXEC,DD statements-classification-instream and catalog procedures-utilities-abend codes. VSAM data set organization structure-IDCAMS commands-JCL for VSAM-buffering-alternative index-repro-backup and recovery-export and import.

UNIT III 9Hrs

COBOL/370 - Structured programming constructs-fundamentals of COBOL-data definition-conditional statements-perform statements-compiler option-table definition-COBOL call and parameter passing-file handling.

DB2 - RDBMS concepts-structural query language-normalisation-DB2 architecture-DB2 objects-locks-program preparation-cursors-null indicators-optimization-utilities.

UNIT IV CICS 9Hrs

CICS introduction-terminal control-application housekeeping-EXEC, interface locks-supply transactions – CESM,CESF,CEMT,CEDF-NMDS-BMS-abend codes-file control-program control-TSQ-TDQ-pseudo conversation-recovery and roll back.

UNIT V 9Hrs

Main Frames in Today's Business – Introduction to Z series H/W , Z/OS ., ISPF Editor ISPF Data Utility Functions – Z/OS Production Environment.

Total No. of Hrs: 45

TEXT BOOKS

1. Mike Ebbers, John Kettner,WayneO'Brien,Bill Ogden,(2011) *Introduction to the New Mainframe: z/OSBasics*, IBM Redbooks(SG24-6366-01)

REFERENCES

1. M.K. Roy and D.GoshDastidar ,(2006) *COBOL PROGRAMMING*,John Wiley And Sons
2. Stern & Stern (2007) *STRUCTURED COBOL PROGRAMMING*,(8th ed.),,JOHN Wiley India
3. Grant Allen(2008) *Beginning DB2 : from Novice to Professional* , Apress
4. Mary Lovelace, Jose Dovidauskas, Alvaro Salo, Valerio Sokai, (2012) *VSAM Demystified (SG246105)*IBM Red Books
5. Doug Lowe ,(1994) *MVS JCL*,(2nd ed.),MIKE MURACH ASSOCIATE
6. Saba Zamir, ChandanRanade , (2007) *MVS JCLPrimer*,McGrawhill
7. Murach's*OS/390 and Z/OS JCL* ISBN:1-890774-14-6.

BIT13E21 **SOFTWARE ARCHITECTURE** **3 0 0 3**

OBJECTIVES:

- Ability to understand the Software Architectural perspective and how it differs from lower-level design
- Ability to understand the need for a Software Architecture.
- Ability to understand current era Software Architectures

UNIT I INTRODUCTION **9Hrs**

Introduction - Software Architecture - Definition - Prospects - State of Art - Architectural Styles - Pipes and Filters - Layered Systems - Repositories - Process Control - Other familiar Architecture – Heterogeneous Architectures.

UNIT II SHARED INFORMATION SYSTEMS **9Hrs**

Shared Information Systems : Shared Information Systems - DB Integration - Integration in Software Development Enviroments – Integration and Design of Building - Architecture Structures for Shared Information Systems.

UNIT III ARCHITECTURE DESIGN **9Hrs**

Architectural design and Mapping - Round trip engineering - Architecture design patterns - Object Oriented Organization.

UNIT IV USER INTERFACE ARCHITECTURE **9Hrs**

Architecture design guidance - User Interface Architecture - Quantified design space - Formalizing architectural description language - First class connectors - Adding implicit invocation to traditional programming languages.

UNIT V TOOLS **9Hrs**

Tools for Architectural design - Unicon, A4 - Exploiting style in architectural design – Architectural Interconnection - Case Studies.

Total No. of Hrs: 45

TEXT BOOKS

1. Mary Shaw and David Garlan, (2003) *Software Architecture – Perspectives on an emerging Discipline*, PHI,

REFERENCES

1. Bass, L., Clements P. and Kazman, R., (2003) *Software Architecture in Practice*, Addison Wesley
2. John Robinson, (2004) *Software Design for Engineers and Scientists*, Newnes
3. R. S. Pressman,(2009) *Software Engineering*,(6th ed.), McGraw Hill Inc.,
4. A. G. Suteliffe,(1995) *Human Computer Interface Design*,(2nd ed.), Macmillan
5. Wolfgang pree,(1995) *Design patterns for object Oriented Software Development* , Addison Wesley
6. R.N.Taylor,N.Medvidoic,andE.M.Dashofy, (2009) *Software Architecture :foundation ,theory & practice*
7. DR.helensharp,protessor Yvonne Rogers, (2007) *Interaction Design,beyond human computer interaction*

BIT13E22 SOFTWARE DESIGN 3 0 0 3

OBJECTIVES:

- Develop and debug a complete computer program including both network communication and graphical user interface components.
- Analyze and explain the behavior of computer programs and modify them based on this understanding.
- Be able to communicate this understanding to others.
- Use modern programming tools and environments, including an ability to read API documentation and use new libraries.
- Design a multi-component software application, appropriately taking into account the customer and the user.
- Appropriately document designs and software produced.
- Work cohesively in a team environment.

UNIT I DESIGN FUNDAMENTALS 9Hrs

The nature of Design process, Software design processes-Building Modules-transferring design knowledge-Constraints up on the design process and product-recording design decisions, Design qualities-assessing the design-quality attribute of the design product..

UNIT II DESIGN KNOWLEDGE 9Hrs

Describing a design solution-representing abstract ideas-design viewpoints for software,, transferring design knowledge-the need to share knowledge-architectural concept-design methods-design patterns, Rationale for method-software design method-support provided by design method-problem domains and their influences, design process and design strategies-role of strategy in methods-descibing design process-top-down de-composition-design by composition-organizational influences upon design., design patterns-template-reuse.

UNIT III DESIGN MODELS 9Hrs

Stepwise refinement-architectural consequences-strengths and weakness, Structured system analysis and design method-SSA/SD representation forms-process-role of heuristics, Jackson structured programming-background-representation forms-process-heuristics, Jackson system development-representation forms-process-heuristics, Design with objects-object concept-design practices for object oriented paradigm-object oriented frameworks-OOdesign-object based design. Cohesive Strength and coupling measures-Agile Development.

UNIT IV HCL 9Hrs

Human Computer Interaction – 8 golden rules for interface design – interaction styles-display devices-input and output devices, usability.

UNIT V DESIGN PRACTICES 9Hrs

Component based design-component concept-designing components, A formal approach to design-model based strategies-Property based strategies.

Total No. of Hrs: 45

TEXT BOOKS

1. David Budgen,(2003) *Software Design* , Addison-Wesley

REFERENCES

1. Pressman R.S, (2006) *Software Engineering* ,(4th ed.), McGraw Hill Inc.,
2. Steve McConnell,(2004) *Code Complete*, Microsoft press
3. Ed Downs, Peter Clare, Jan coe,(2004) *Structured System Analysis and Design methods Application and Context*, Prentice Hall
4. A.G. Suteliffe, (2008) *Human Computer Interface Design* ,(2nd ed.), Macmillan

BIT13E23 **SOFTWARE METRICS** **3 0 0 3**

OBJECTIVES:

- Understand the basic metrics and measurement theory and terminology
- Identify internal and external customers who need software metrics information
- Select software metrics based on goals
- Design and tailor the selected metrics to match your information needs

UNIT I MEASUREMENTS THEORY **9Hrs**

Fundamentals Of Measurement - Measurements In Software Engineering - Scope Of Software Metrics - Measurements Theory - Goal Based Framework - Software Measurement Validation.

UNIT II DATA COLLECTION AND ANALYSIS **9Hrs**

Empirical Investigation - Planning Experiments - Software Metrics Data Collection - Analysis Methods – Statistical Methods.

UNIT III PRODUCTS METRICS **9Hrs**

Measurement Of Internet Product Attributes - Size And Structure - External Product Attributes - Measurement Of Quality.

UNIT IV QUALITY METRICS **9Hrs**

Software Quality Metrics - Product Quality - Process Quality - Metrics For Software Maintenance - Case Studies Of Metrics Program - Motorola - Hp And IBM.

UNIT V MANAGEMENT METRICS **9Hrs**

Quality Management Models - Rayleigh Model - Problem Tracking Report (PTR) Model - Reliability Growth Model - Model Evaluation - Orthogonal Classification.

Total No. of Hrs: 45

TEXT BOOKS

1. Norman E, Fentar, Share Lawrence Pflieger, (1998) *Software Metrics*, International Thomson Computer Press
2. Stephen H. Kin, (2002) *Metric and Models in Software Quality Engineering*, Addison Wesley

REFERENCES

1. Christ of ebert and Reiner Dumke ,(2007) *SoftwareMeasurement establish – extract-evaluate-execute*
2. Steave McConnell, (2006) *Software estimation:Demstifying the Black Art(Best Practices(Microsoft)*
3. C.Ravindranathpandian,(2003) *Software metrics: a guide to planning, analysis , and application*

BIT13E24 **RISK MANAGEMENT** **3 0 0 3**

OBJECTIVES:

- Identify and categories the various risks face by an organization;
- Explain the various risk control measures available;
- Design a risk management program for a business organization.
- Suggest ways to finance risk.
- Apply the insurance mechanism in risk management.
- Describe the management of international risk.

UNIT I THE RISK MANAGEMENT PROCESS 9Hrs

Introduction to software risk management, why do we need to manage risk in software development, Use, Objectives, Risk Management Paradigm, Risk management and litigation. Models for Risk Management.

UNIT II DISCOVERING RISK IN SOFTWARE DEVELOPMENT 9Hrs

Risk attributes and Identification, Identifying software risk, Common software project risks, Risk Taxonomy, Risk Mapping, statements, reviews., Risk ownership and stakeholder management.

UNIT III RISK ASSESSMENT 9Hrs

Objectives and goals. Approach to assessment, Risk assessment tools and techniques, presenting the risk findings.

UNIT IV PLANNING RISK MITIGATION STRATEGIES 9Hrs

Risk Planning, Best practices in the risk planning, Risk management tools, Risk mitigation strategies, Formulating and Implementing risk management plans.

UNIT V MONITORING RISK IN SOFTWARE PROJECTS 9Hrs

Developing a process for monitoring risk, formulating a project risk database, Managing and tracking risk, Risk support tools. Software Risk Metrics, organization, estimation, development methodology.

Total No. of Hrs: 45

TEXT BOOKS

1. Yacov Y. Haimes, (2011) *Risk Modeling, Assessment, and Management*, Wiley
2. John Mcmanus,(2004) *Risk Management in software development projects*, Elsevier Butterworth-Heinemann,

REFERENCES

1. Martin Loosemore, John Raftery, (2006) *Risk management in projects*,Taylor& Francis Ltd
2. Ravindranath P. C, (2007) *Applied Software Risk Management*, Auerbach,
3. Dale Walter Karolak,,(1995) *Software engineering risk management*, Wiley-Ieee Computer Society

BIT13E25 SOFTWARE QUALITY AND TESTING 3 0 0 3

OBJECTIVES:

- Have an ability to apply software testing knowledge and engineering methods.
- Have an ability to design and conduct a software test process for a software testing project.
- Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation**.**

UNIT I SOFTWARE QUALITY 9Hrs

Views of quality-hierarchical modeling-Boehm and McCall's models-quality criteria interrelation-measuring quality-quality metrics-overall measure of quality, Developments in measuring quality: Gilb approach-quality profiles-Management of quality tools for quality-quality standards

UNIT II QUALITY MANAGEMENT SYSTEM 9Hrs

Historical perspective -elements of QMS-Human Quality Culture- QMS for software - Quality Assurance- ISO9000-3-ISO9000 series a generic quality management standard Impact of ISO9000 and Tick IT-Models and Standards for Process Improvement: CMM Levels of CMM-Role of CMM-SPICE

UNIT III SOFTWARE TESTING 9Hrs

Role of software testing –Testing Defect- Testing Strategy: SDLC- A structural approach to testing –Test Strategy-Testing methodology: Verification and Validation, Functional and Structural Testing-Developing Testing Methodologies.

UNIT IV SOFTWARE TESTING METHODS AND INSTALLATION 9Hrs

Software Testing Techniques-Selecting and Installing Software Testing Tools– Testing RAD-Testing Security-Creating Test Documentation-Testing System Documentation

UNIT V SOFTWARE TESTING STRATEGIES 9Hrs

Software Testing Process-Overview– Developing Test Plan-Requirement Phase Testing-Design Phase Testing, Program phase Testing-Execute Test and Record Results-Acceptance Test-Report Test results – Testing Software Installation-Testing Software Changes – Test Effectiveness Evaluation – Test Measurement Process – Test Metrics.

Total No. of Hrs: 45

TEXT BOOKS

1. Alan Gillies,(2004) *Software quality: Theory and Management*, International Thompson, Computer press
2. William Perry,(2006) *Effective Methods for Software Testing*, Willam Perry, USA

REFERENCES

1. Ron patton ,(2005) *Software Testing*, Techmedia
2. Stephen H.Khan,,(2002) *Metrics and models in software quality engg*, Addison –Wesley
3. Sue Carroll, TazDaughtrey ,(2007) *Fundamental Concepts for the Software Quality Engineer - Business and Economics*
4. Jeff Tian, (2006) *Software Quality Engineering: Testing, Quality Assurance and Quantifiable*- Computers

BIT13E26 **SOFTWARE RELIABILITY** **3 0 0 3**

OBJECTIVES:

- Ability to define necessary software reliability project goals.
- Ability to develop and deploy operational profiles.
- Ability to implement reliability testing procedures.
- Ability to apply software reliability models.
- Ability to build fault prediction models for large systems.

UNIT I INTRODUCTION **9Hrs**

Approach of Software Reliability Engineering-Problem Process and product-Testing acquired Software - Software Practitioner's biggest problem- Reliability Concepts-Software Reliability and hardware Reliability-Defining the product.

UNIT II IMPLEMENTATION **9Hrs**

Developing operational profiles - creating operational List-obtaining occurrence rates - Determining occurrence probabilities - Graphical representation of the operational profile-Module usage Table-Operations and run concepts

UNIT III ENGINEERING "JUST RIGHT" RELIABILITY **9Hrs**

Defining failure - choosing a common measure –Setting system failure intensity Objectives-user needs for reliability and availability-common failure intensity objective-Engineering software reliability strategies-inherent fault density-fault exposure ratio.

UNIT IV PREPARING FOR TEST **9Hrs**

Planning number of new test cases-allocating new test cases-distributing new test cases - new operations - detailing test cases - Preparing test procedures - graphical representation of the operation profile Execution test: Planning and allocating test time –invoking test-Identifying failures-analyzing test output for deviation.

UNIT V GUIDING TEST **9Hrs**

Tracking reliability growth-estimating failure intensity for evolving programs-Handling unreported failures-Certifying with different risk levels-Discrimination ratios-Operational profile variation.Deploying SRE: Persuading your boss, coworkers and stakeholders – executing the deployment- consultant-consultee's viewpoint.

Total No. of Hrs: 45

TEXT BOOKS

1. John D. Musa,(2008) *Software Reliability Engineering*, (2nd ed.),Tata McGraw Hill

REFERENCES

1. John D. Musa, Anthony Iannino, et al ,(1987) *Software Reliability – Measurement, Prediction, Application, Series in Software Engineering and Technology*, McGraw Hill

2. Norman E . Fenton, Shari Lawrence Pfleeger,(2003) *Software metrics*, (2nd ed.), International Student Edition,

BCS13016 ADVANCED JAVA PROGRAMMING 3 0 0 3

OBJECTIVES:

- Understand some advanced programming concepts
- Define the problem and write large programs
- Write the simplest possible program that solves a given problem while explaining to the reader how it solves that problem

UNIT I JAVA BASICS REVIEW 9Hrs

Java Streaming - Components and Events Handling - Threading Concepts –Byte Code Interpretation - Java Native Interfaces, AWT/Swing Programming

UNIT II ADVANCED NETWORKING AND BEANS 9Hrs

Networking Features - Client-Server computing – Sockets - secure sockets – custom sockets –UDP datagrams – multicast sockets - URL classes – Reading / Writing Data from the server – writing data -Developing Distributed Applications - RMI - Remote Objects – Object Serialization - Bean Concepts - Events in Bean Box - Bean customization and persistence.

UNIT III JAVA DATABASE PROGRAMMING 9Hrs

Connecting to Databases - JDBC principles - Databases access - Database Support in Web applications - Using BLOB and CLOB objects – storing Multimedia data into databases – Multimedia streaming applications – Java Media Framework.

UNIT IV WEB BASED JAVA 9Hrs

Server Side Programming – Servlets – Java Server Pages - Struts – MVC framework, Advanced Java Scripting Techniques

UNIT V ENTERPRISE APPLICATIONS 9Hrs

Server Side Component Architecture – Introduction to J2EE – Session Beans – Entity Beans – Persistent Entity Beans – Transactions- JAR File Format and Creation.

Total No. of Hrs: 45

TEXT BOOKS

1. Herbert Schildt (2011) *JAVA Complete Reference*, (8th ed.),
2. McGovern et al,(2011) *J2EE 1.4 Bible*,Wiley India,
3. Herbert Schildt ,(2007) *J2EE Complete Reference*

REFERENCES

1. Patrick Naughton, “COMPLETE REFERENCE: JAVA2”, Tata McGraw-Hill, 2003.
2. Keogh,(2002) *J2EE The Complete Reference*
3. Web reference*: http://java.sun.com.*

BIT13E27 **JAVA VIRTUAL MACHINE** **3 0 0 3**

OBJECTIVES:

- Be able to write customized class loaders
- Be able to use reference objects for writing code that automatically free objects and cleanup resources,
- Be able to use various reflection classes to handle dynamic object types,
- Understand the Java thread model and various synchronization mechanisms,
- Be able to write effective multi-threaded applications

UNIT I JAVA PROGRAMMING LANGUAGE 9Hrs

Types, value, variables, conversions – Names and packages, classes, fields, method, static initializes, constructors, interfaces, nesting – Arrays – Exception – Execution – Threads.

UNIT II JAVA VIRTUAL MACHINE (JVM) STRUCTURE 9Hrs

Data types – Runtime data base areas and frames – Objects – Floating point arithmetic – Exceptions –Instruction set summary – Class libraries.

UNIT III CLASS FILE FORMAT 9Hrs

Class and interfaces names, descriptors – Constant pool – Fields, methods, attributes – Constraints –Verification..

UNIT IV RUNTIME ISSUES 9Hrs

Runtime constant pool – Virtual machine start up – Creation, loading, linking, initialization – Binding - Instruction set – Threads and locks.

UNIT V COMPILING FOR JVM 9Hrs

Constants, local variables, control constructs – Arithmetic – Runtime constant pool – Arguments, method, class instances – Arrays - Compiling switches – Exceptions – Synchronization.

Total No. of Hrs: 45

TEXT BOOKS

1.TimLindholm, Frank Yellin, GiladBracha, Alex Buckley,(2012) *The Java Virtual Machine Specification*: *Java Se*, (7th ed.),Prentice Hall

REFERENCES

1. Ken Arnold and James Gosling, (2009) *The Java Programming Language*, Pearson Edu, (3rd ed.), Pearson Edu,

2.Joshua Engel,(2006) *Programming for the Java Virtual Machine*, Addison Wesley

BIT13E28 **NETWORK PROGRAMMING USING JAVA** **3 0 0 3**

OBJECTIVES:

- to understand the 3-tier software architecture (presentation/client tier, application tier, data tier).
- to understand the basics of network security and using SSL for secure communication.
- to write network applications using state-of-the-art RPC technologies including: RMI, CORBA, EJB, and Web Services (SOAP and UDDI).
- to understand e-mail programming (JavaMail, SMTP, POP, IMAP).

UNIT I **9Hrs**

Networks-The Layers of a Network –IP- TCP and UDP -The Internet - The Client/Server Model - Internet Standards – URIs – HTML - SGML and XML- HTTP - MIME - Media Types- Server Side Programs - Output Streams - Input Streams - Filter Streams - Readers and Writers - Running Threads - Returning Information from a Thread – Synchronization – Deadlock - Thread Scheduling - Thread Pools.

UNIT II **QUALITY MANAGEMENT SYSTEM** **9Hrs**

The Inet Address Class - Inet4Address and Inet6Address -The Network Interface Class - Some Useful Programs - The URL Class - The URL Encoder and URL Decoder Classes - The URI Class, Proxies - Communicating with Server-Side Programs Through GET - Accessing Password-Protected Sites

UNIT III **SOFTWARE TESTING** **9Hrs**

Socket Basics - Investigating Protocols with Telnet - The Socket Class -Socket Exceptions - Socket Addresses – Examples -The Server Socket Class - Some Useful Servers - Secure Sockets - Secure Communications - Creating Secure Client Sockets -Methods of the SSL Socket Class - Creating Secure Server Sockets -Methods of the SSL Server Socket Class - An Example Client -An Example Server – Buffers – Channels -Readiness Selection

UNIT IV **SOFTWARE TESTING METHODS AND INSTALLATION** **9Hrs**

The UDP Protocol - The Datagram Packet Class - The Datagram Socket Class - Some Useful Applications - Datagram Channel - Working with Multicast Sockets - URL Connections - Opening URL Connections - Reading Data from a Server - Reading the Header - Configuring the Connection - Configuring the Client Request HTTP Header - Writing Data to a Server Content Handlers - The Object Methods - Security Considerations for URL Connections- Guessing MIME Content Types - HTTP URL Connection - Caches - Jar URL Connection

UNIT V **SOFTWARE TESTING STRATEGIES** **9Hrs**

The URL Stream Handler Class- Writing a Protocol Handler - More Protocol Handler Examples and Techniques - The URL Stream Handler Factory Interface The Content Handler Class- The Content Handler Factory Interface - A Content Handler for the FITS Image Format - Remote Method Invocation-Implementation - Loading Classes at Runtime The java.rmi Package- The java. rmi.registry Package - The java. rmi.server Package - Sending Email - Receiving Mail - Password Authentication - Addresses - The URL Name Class - The Message Class - The Part Interface - Multipart Messages and File Attachments -MIME Messages –Folders.

Total No. of Hrs: 45

TEXT BOOKS

1. Elliotte Rusty Harold, (2005) *Java Network Programming*,(3rd ed.), OREILLY Publication.

REFERENCES

1. Merlin and ConardHughes,MichaelShoffnerandMaria Winslow ,*Java Network Programming*,PHI.
2. Prashant Sridharan, "*Advanced Java Networking*" PHI
3. Todd Courtois "*Java Networking and Communications*" PHI
4. NatarajNagartham ,ArvindSrinivasam,Waite group "*Java Networking and AWT API Super Brian Maro Bible*"

BIT13E29 **WEB SERVICES** **3 0 0 3**

OBJECTIVES:

- work in a team and to build a larger service-oriented application based on Web services
- analyze messages exchanged between Web service
- create Web services based on their description
- use Web services according to their description
- compose new Web services from existing Web services

UNIT I INTRODUCTION 9Hrs

An Overview of web services-The Technologies of web Services-The J2EE Web service APIs-JAX-RPC,SAAJ,JAXR,JAXP-XML basics-Anatomy of an XML Document-XML Declaration –Elements-Attributes-Comments-CDATA Section- Processing XML Documents-XML Namespace.

UNIT II XML SCHEMA 9Hrs

Schema Basics-XML Schema Document-Simple Types-Complex Types-sequence of elements –Attributes-Occurrence Constraints – The all Element-Global element- Qualified and Unqualified Elements-Inheritance of Complex Types-Extension-restriction – abstract base Types-Inheritance of Simple Types-List and Union Types-Anonymous Types- Importing and including Schemas.

UNIT III SOAP 9Hrs

Basic Structure of SOAP-SOAP Namespaces-SOAP Headers-SOAP Body-SOAP Messaging Models- SOAP faults-SOAP Faultcode Element-Client Fault-Server fault-MustUnderstand Fault-fault string Elements-Faultactor Element-Detail Element-SOAP over HTTP-SOAP with HTTP POST Messages-HTTP Response Codes.

UNIT IV WSDL 9Hrs

Basic Structure of WSDL-WSDL Declaration-WSDL Abstract Interface: The Message Element-The portType Element Operation Element-Parameter Order-operation Overloading-WSDL Message Exchange Patterns- WSDL Implementation – WS-I Conformance claims.

UNIT V UDDI 9Hrs

UDDI Data Structures- businessEntity Structures-businessService and bindingTemplate structures-tModel Structures-tModel XML Schema-The publisherAssertion Structure-UUID Keys.UDDI Inquiry API- UDDI SOAP Messaging-The inquiry Operations- UDDI Publishing API-Operation Definitions and Payloads-Fault Messages.

Total No. of Hrs: 45

TEXT BOOKS

1. Richard Monson-Haefel-(2009)"J2EE Web Services" Pearson Education
2. F.P.Coyle- (2006) "*XML, Web Services, and the Data Revolution*" Pearson Education

REFERENCES

1. S. Chatterjee, J. Webber, (2008) "*Developing Enterprise Web Services*", Pearson Education
2. R. Nagappan, R. Skoczylas, R.P. Sriganesh (2008) "*Developing Java Web Services*" , Wiley India

.BIT13E30 MIDDLEWARE TECHNOLOGY 3 0 0 3

OBJECTIVES:

- Recognize the difference between HTML, XHTML, MySQL& PHP.
- Understand different Web controls
- Understand connecting Web pages with DB.

UNIT I INTRODUCTION 9Hrs

Emergence of Middleware – Objects, Web Services – Middleware Elements – Vendor Architecture – Interoperability – Middleware in Distributed Applications – Types of Middleware – Transaction-Oriented Middleware – MOM – RPC.

UNIT II OBJECT ORIENTED MIDDLEWARE 9Hrs

OOM – Developing with OOM – Heterogeneity – Dynamic Object Request – Java RMI – COM+.

UNIT III COMPONENT OBJECT RESOURCE BROKER ARCHITECTURE (CORBA) 9Hrs

Naming – Trading – Life Cycle – Persistence – Security – CORBA.

UNIT IV WEB SERVICES 9Hrs

Introduction – XML Web Services standards – Creating Web Services – Extending Web Services – Messaging Protocol – Describing – Discovering – Securing.

UNIT V OTHER TYPES OF MIDDLEWARE 9Hrs

Real-time Middleware – RT CORBA – Multimedia Middleware – Reflective Middleware – Agent-Based Middleware – RFID Middleware.

Total No. of Hrs: 45

TEXT BOOKS

1. Chris Britton and Peter Eye, (2004)"*IT Architecture and Middleware*", (2nd ed.),Pearson Education.
2. Wolfgang Emmerich, (2000) "*Engineering Distributed Objects*", John Wiley
3. Keith Ballinger, (2003) ".*NET Web Services – Architecture and Implementation*", Pearson Education,

REFERENCES

1. Qusay H. Mahmoud, (2004) "Middleware for Communications", John Wiley and Sons,

2. Gerald Brose, Andreas Vogel, Keith Duddy, (2004)"*JavaTM Programming with CORBATM*: *Advanced Techniques for Building Distributed Applications*",(3rd ed.), Wiley

3. Michah Lerner, (2000) "*Middleware Networks: Concept, Design and Deployment of Internet Infrastructure*", Kluwer Academic Publishers

BIT13E31 SERVICE ORIENTED ARCHITECTURE 3 0 0 3

OBJECTIVES:

- Design, develop and test Web services.
- Learn standards related to Web services: Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), and Universal Description, Discovery and Integration (UDDI).
- Learn basic principles of Service-Oriented Architecture and apply these concepts to develop a sample application

UNIT I INTRODUCTION 9Hrs

Open Standards-Structure of SOA Applications- Web & Binary Exchange ServicesBusiness Implications-Presentation Services- SOA Runtime products- Services: Loose coupling-Service Registry-Service level agreements- Message exchange patterns- QOS

UNIT II XML 9Hrs

Intro to XML-XML as used in SOA-Structure of an XML document-Namespaces-XML Schema-Data type reuse-Instance document-Aspects of XPath- SOA standards: WSDL, SOAP, UDDI

UNIT III BPEL 9Hrs

Use of WSDL, BPEL File structure-Scopes-Message Exchanges-Variables and XPath Partner links-Correlation sets – fault handling-compensation and termination handling concurrency

UNIT IV SCA 9Hrs

SCA Domain-Bindings & Enterprise service bus-policies and support for conversations components- composites-higher and lower composites- composite inclusion- constraining type.

UNIT V SDO 9Hrs

Data graph-object definition- SDO annotations-Data Access services- SDO code details.

Total No. of Hrs: 45

TEXT BOOKS

1. Ben Margolis (2006) "*SOA for the Business Developer: Concepts, BPEL, and SCA (Business Developers series*) "

REFERENCES

1. Michael Bell (2005) "*Service Oriented Modelling (SOA) Service Analysis, Design and Architecture*

SOA Principles of Service Design ",ThomasErl

2. "*SOA Design Patterns*" (2004) Thomas Erl Prentice Hall Services.