

NOORUL ISLAM CENTRE FOR HIGHER EDUCATION

NOORUL ISLAM UNIVERSITY, KUMARACOIL

M.Sc. SOFTWARE ENGINEERING (5 Years)

CURRICULUM & SYLLABUS

SEMESTER – I

Sl. No	Course Code	Course Title	L	T	P	C
THEORY						
1	EG801	Communicative English – I	4	0	0	4
2	MA801	Mathematical Techniques	3	1	0	4
3	SE801	Digital Principles	3	1	0	4
4	SE802	Problem Solving & Programming	4	0	0	4
5	SE803	Computers and PC Troubleshooting	4	0	0	4
PRACTICAL						
5	SE871	Digital Lab	0	1	2	2
6	SE872	C Programming Lab	0	1	2	2
7	SE873	Office Automation Lab	0	1	2	2
TOTAL			18	5	6	26

EG801

COMMUNICATIVE ENGLISH - I

L	T	P	C
4	0	0	4

OBJECTIVES:

- To help students develop various skills required for academic and professional purpose.
- To help students improve their active and passive vocabulary.
- To help students acquire the ability to speak effectively in English in real-life situations.
- To inculcate reading habit and to develop effective reading skills.
- To familiarize students with different rhetorical functions of scientific English
- To enable students write letters and reports effectively in formal and business situations.

UNIT I – BASIC GRAMMAR AND LISTENING:

12

Verb – Tenses – 12 Tenses – 8 Passive forms – Word formation with prefixes and suffixes – Adjectives – Activities on Listening Skills – I.

UNIT II – SPEAKING

12

Expansion of Compound Nouns – Imperatives and Instructions – Conditional Clauses – Gerunds – Activities on Speaking Skills – I.

UNIT III – READING

12

Interrogatives and Question Tags – Asking Questions – Discourse Markers – Activities on Reading Skills – I.

UNIT IV – WRITING

12

Concord – Identifying Common Errors – Cause and Effect Expressions – Paragraph Writing – Writing Instructions – Letter Writing (Formal Letters; Letters of Application, Invitation, Acceptance and Letter declining an Invitation) – Activities on Writing Skills – I.

UNIT V – COMMUNICATIVE ACTIVITIES:

12

Writing and Transcoding – Bar Chart, Flow Chart – Pie Chart – Tree Diagram – Tabular Column – Activities on Communication Skills – I.

TOTAL: 60

TEXT BOOK:

Department of Humanities and Social Sciences, Anna University, Chennai, English for Engineers and Technologies, Combined Edition (Volumes 1 & 2), Chennai. Orient Longman Pvt Ltd., 2006. Themes 1 – 4(Resources, Energy, Computer, Transport).

Suggested Reading:

A.P.J. Abdul Kalam with Arun Tiwari, Wings of Fire: An Autobiography. University Press(India) Pvt Ltd., 1999, 30 th Impression 2007.

Note:

The book given under suggested reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.

MA801	MATHEMATICAL TECHNIQUES	3 1 0 4
UNIT I	MATRICES	9
Rank of a matrix - Consistency of linear system of equations – characteristic equations – Eigen values and Eigen vectors –Cayley Hamilton theorem and its applications		
UNIT II	FUNCTIONS OF SEVERAL VARIABLES	9
Functions of two or more variables-Partial derivatives-Euler’s theorem-Total derivative-Change of variables-Jacobians -Taylor’s theorem		
UNIT III	INTEGRAL CALCULUS	9
Definite integrals- Evaluation of double and triple integrals-Bernoulli’s generalized formula-Area as double integral in Cartesian co-ordinates- Change of order of integration		
UNIT IV	ORDINARY DIFFERENTIAL EQUATIONS	9
Linear differential equations of second order with constant coefficients- Complementary function-Particular integral-Cauchy and Legendre equations of homogeneous type		
UNIT V	FOURIER SERIES	9
Dirichlet’s conditions-General Fourier series-Half range series-Parseval’s identity-Harmonic analysis		
		TUTORIAL: 15
		TOTAL: 60

TEXT BOOK

1. Grewal B.S., “Higher Engineering mathematics”, 40th Edition, Khanna Publishers, New Delhi 2007

REFERENCE BOOKS

1. Veerarajan T, "Engineering Mathematics (for first year)", Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
2. Kandaswamy, K.Thilagavathy, K.Gunavathy, "Engineering Mathematics"

SE801

DIGITAL PRINCIPLES

L	T	P	C
4	0	0	4

UNIT I

Binary Systems : Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic

Boolean Algebra and Logic Gates : Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Digital Logic Gates. **12**

UNIT II

Minimization : Map Method, Four Variable, Five Variable MAP, Product of Sum Minimization, Don't Care Conditions, NAND, NOR Implementation, Introduction to HDL.

Combinational Logic : Combinational Circuits, Analysis and Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexes, HDL for combinational Circuits. **12**

UNIT III

Synchronous Sequential Logic : Sequential Circuits - Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, HDL for Sequential Circuits, State Reduction and Assignment Design Procedure. **12**

UNIT IV

Registers and Counters : Registers, Shift Registers, Ripple Counters, Synchronous Counters, Other Counters, HDL for Registers and Counter. **12**

UNIT V

Asynchronous Sequential Circuit : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and Flow Tables, Race – Free State Assignment Hazards, Design Example. **12**

Total L : 60

TEXT BOOK

1. M.Morrismano, "Digital Design", 3rd edition, Pearson Education, Delhi, 2002.

REFERENCES

1. M.Morris Mano, "Digital Logic and Computer Design", PHI, New Delhi 2002.
2. M.Morri Mano, "Logic and Computer Design Fundamentals", Pearson Education Delhi, 2002.

SE802

PROBLEM SOLVING & PROGRAMMING

L T P C
3 1 0 4

OBJECTIVE

To enable students to

- Acquire knowledge in the fundamental techniques of problem solving.
- Analyze the program and follow the programming style.
- Develop efficient programs in C.

UNIT I:

9

Introduction: Algorithms – Flowcharts – C Data Types – Variables and Arrays – Operators and Expressions – Data Input and Output – Control Statement.

Functions: Definition – Accessing a Function – Function Prototypes – Passing Arguments to a function – Recursion.

UNIT II:

9

Program Structure: Storage Classes – Automatic Variables – External Variables – Static Variables.

Arrays: Definition – Processing Array – Passing Arrays to Function – Multidimensional Arrays – Arrays and Strings.

UNIT III

9

Pointers: Fundamentals – Pointer Declarations – Passing pointers to a Function – Pointers and One Dimensional Arrays – Dynamic Memory Allocation – Pointers and Multidimensional arrays – Arrays of Pointers – Passing Functions to other functions.

UNIT IV:

9

Structures and Unions: Definition – Processing a Structure – Structures and Pointers – Passing Structures to Functions – Unions.

UNIT V:

9

Data Files: Opening and Closing a Data File – Reading and Writing a Data File – Processing a Data File – Binary Files – Unformatted Data Files. Preprocessor directives – Bit Manipulation.

TUTORIAL: 15

TOTAL: 60

TEXT BOOK:

1. Gottfried.B, "Programming with C", Mc-Graw Hill, 2005.
2. Brian W. Kernighan, Dennis M.Ritchie "The C Programming language", Prentice Hall of India, New Delhi, 2004.
3. Deital & Deital, "C How to Program", Pearson Education, 2001.

UNIT 1:

Introduction to today's Desktop & monitors – The preservice checkout – the universal troubleshooting process, spare parts dilemma, benchmarking the PC, Viruses and computer service, Quick-start Bench testing. BIOS – BIOS shortcomings and compatibility issues, Troubleshooting BIOS error messages. **12**

UNIT II:

CDROM and CD-R drives – CD-ROM/CD-R standards and characteristics, Troubleshooting CD-ROM drives, Troubleshooting CD-R drives. Chipsets. CMOS - configuring the CMOS setup. CMOS maintenance and troubleshooting. **12**

UNIT III:

Conflict troubleshooting – Understanding system resources – Recognizing and dealing with conflicts. CPU identification and troubleshooting – Modem CPU concepts, The Intel CPUs, AMD CPUs, Cyrix CPUs, CPU overclocking. Troubleshooting CPU problems. **12**

UNIT IV:

Disk Compression Troubleshooting – Concepts of Compression, before and after compression – Troubleshooting Compressed Drivers. Troubleshooting floppy disk drives. Harddrives – Introduction – drive testing and troubleshooting – Error Codes. **12**

UNIT V:

Keyboard – Keyboard cleaning and maintenance – Keyboard troubleshooting. Memory troubleshooting – Introduction – memory troubleshooting. Modern troubleshooting – Monitor Troubleshooting – Motherboard Troubleshooting. **12**

TOTAL: 60**TEXT BOOK:**

1. Stephen. J. Bigelow – Troubleshooting and Repairing PC's, Tata McGraw Hill Publishing Company Ltd, 2000.
2. Scott Mueller – Upgrading and repairing PC's, Prentice Hall of India, 2000.

SE871

DIGITAL LAB

L	T	P	C
0	1	2	2

1. Binary and BCD counter using 7493
2. Verification of NAND, NOR, XOR, AND, OR Gate Logic
3. Parity Generator
4. Encoder / Decoder
5. Multiplexes / Demultiplexes
6. Adder / Subtractor
7. Code Converters
8. Comparators
9. Up / Down 4 bit Binary Counter
10. Up / Down 4 bit Decimal Counter
11. Shift Register
12. Ring Counter

TOTAL: 45

SE872

C PROGRAMMING LAB

L	T	P	C
0	1	2	2

Implementation of

1. Input / output function
2. Control Functions
3. Functions
4. Arrays
5. Pointers
6. Structures and Unions
7. Files

Using case studies on : Roots of a quadratic equation, Measures of location – Matrix Operations – Evaluation of trigonometric functions – Pay roll problems. String operations like substring, concatenation, finding a string from a given paragraph, finding the number of words in a paragraph.

TOTAL: 45

SE873

OFFICE AUTOMATION LAB

L	T	P	C
0	1	2	2

1. FUNDAMENTALS OF COMPUTERS AND OPERATING SYSTEMS.

Evolution of computers – Organization of Modern Digital Computers – Single user Operating System – Multitasking OS – GUI.

2. OFFICE AUTOMATION

- a. Word Processing
- b. Data Base Management System
- c. Spread Sheet Package
- d. Presentation Software.

TOTAL: 45

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M.Sc. SOFTWARE ENGINEERING (5 Years)

CURRICULUM & SYLLABUS

SEMESTER – II

Sl. No	Course Code	Course Title	L	T	P	C
THEORY						
1	EG802	Communicative English – II	4	0	0	4
2	MA802	Numerical Techniques	3	1	0	4
3	SE804	Software Engineering	4	0	0	4
4	SE805	Computer Architecture	4	0	0	4
5	SE806	Object Oriented Programming and C++	3	1	0	4
6	SE807	Data Structures	3	1	0	4
PRACTICAL						
7	SE874	C++ Lab	0	1	2	2
8	SE875	Data Structures Lab	0	1	2	2
TOTAL			21	5	4	28

EG802

COMMUNICATIVE ENGLISH II

L	T	P	C
4	0	0	4

OBJECTIVES:

- To help students develop various skills required for academic and professional purpose.
- To help students improve their active and passive vocabulary.
- To help students acquire the ability to speak effectively in English in real-life situations.
- To inculcate reading habit and to develop effective reading skills.
- To familiarize students with different rhetorical functions of scientific English
- To enable students write letters and reports effectively in formal and business situations.

UNIT I – BASIC GRAMMAR AND LISTENING: 12

Technical Vocabulary – Active and Passive Vocabulary – Articles – Activities on Listening II.

UNIT II – SPEAKING 12

Prepositions – Non – Verbal Communication - Activities on Speaking Skills – II.

UNIT III – READING 12

Reading Comprehension – Predicting the Content – Critical Reading - Activities on Reading Skills – II – Newspaper Reading.

- 1) Front Page
- 2) Regional news
- 3) Letters to the Editor.
- 4) Sports News.
- 5) World news.

UNIT IV – WRITING 12

Writing Recommendations – Essay Writing – Checklists – Business Letters – calling for Quotation, Placing Orders, Letter of Complaint and Seeking Clarification – Activities on Writing Skills – II.

UNIT V – COMMUNICATIVE SKILLS: 12

Numerical Adjectives – CV / Resume Writing – Communication through Computers – e-mails etc.

TOTAL: 60

UNIT-V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS

9

Taylor's Series Method – Euler's method – Modified Euler's method – Runge-Kutta method of second and fourth order – Solution of boundary value problems using finite difference methods.

TUTORIAL: 15

TOTAL: 60

TEXT BOOK

Jain M.K., Iyengar. S.R.K and Jain. R.K, "Numerical methods for Scientific and Engineering Computations", New Age International(P) Ltd., Publishers, 5th Edition.

REFERENCES

1. Kandasamy, P. Thilagavathy, K. and Gunavathy, K., Numerical Methods, (Revised Edition), S. Chand and Company, New Delhi, 2003.
2. Balagurusamy, E., Numerical Methods, Tata McGraw Hill Pub. Co., New Delhi, 1999.

SE804

SOFTWARE ENGINEERING

L	T	P	C
4	0	0	4

UNIT I

Introduction – The Software problem – Software Engineering Problem – Software Engineering Approach – Summary – Software Process – Characteristics of a Software Process – Software Development Process – Project Management Process – Software Configuration Management Process – Process Management Process – Summary. **12**

UNIT II

Software Requirements Analysis and Specification – Software Requirements – Problem Analysis – Requirements Specification – Validation – Metrics – Summary. **12**

UNIT III

Planning a Software Project – Cost Estimation – Project Scheduling – Staffing and Personnel Planning – Software configuration Management Plans – Quality Assurance Plans – Project Monitoring Plans – Risk Management – Summary. **12**

UNIT IV

Function-oriented Design – Design Principles – Module-Level Concepts – Design Notation and Specification – Structured Design – Methodology – Verification – Metrics – Summary. Detailed Design – Module specifications – Detailed Design – Verification – Metrics – Summary. **12**

UNIT V

Coding – Programming Practice – Top-down and Bottom-up - structured programming – Information Hiding – Programming style – Internal Documentation Verification – Code Reading – Static Analysis – Symbolic Execution – Code Inspection or Reviews – Unit Testing – Metrics – Summary Testing – Fundamentals – Functional Testing versus structural Testing – Metrics – Reliability Estimation – Basic concepts and Definitions – Summary. **12**

TOTAL: 60

TEXT BOOK

1. Pankaj Jalote, “An Integrated Approach to Software Engineering”, Narosa Publishing House, Delhi, 2000.

REFERENCES

1. Pressman R.S., “Software Engineering”, Tata McGraw Hill Pub. Co., Delhi, 2000.
2. Sommerville, “Software Engineering”, Pearson Education, Delhi, 2000.

SE805

COMPUTER ARCHITECTURE

L	T	P	C
4	0	0	4

UNIT I

Basic Structure of computers – Functional Units – Bus Structures – Performance – Evolution - Machine Instructions and programs – Memory operations – Instruction and instruction sequencing – addressing modes – Basic I/O operations – stacks and queues – subroutines – Encoding of Machine instructions. **12**

UNIT II

Arithmetic – Design of fast adders – Binary Multiplication – Division – Floating point numbers and operations. **12**

UNIT III

Processing unit – Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control - Microprogrammed control – pipelining – Basic concepts – Hazards – Inference on instruction sets. Data path and control considerations – Performance issues. **12**

UNIT IV

Memory System – RAM and ROM – Cache memories – Performance considerations – Virtual memories - secondary storage devices – Associative memories. **12**

UNIT V

Input / Output organization – Accessing I/O devices – Interrupts – DMA – Buses – Interface circuits – standard I/O Interfaces. **12**
Case study of one RISC and one CISC Processor.

TOTAL: 60

TEXT BOOK

1. Carl Hamacher, Zvonko Uranesic, Safvat Zaby, “Computer Organisation”, 5th edition, McGraw Hill, 2002.

REFERENCES

1. John P Hayes, “Computer Architecture and Organisation”, 3rd edition, McGraw Hill, 1998.
2. David A Patterson and John L. Hennessy, “ Computer Organisation and Design The Hardware / Software Interface”, 2nd edition, Harcourt Asia, Morgan Kaufmann, 2000.

SE807

DATA STRUCTURES

L T P C
3 1 0 4

UNIT I

Introduction – Structure and Problem Solving – Storage of Information – Linear Data Structures and their sequential storage representation – concepts and Terminology – Storage structure for arrays – Structures and Arrays of Structures – Stacks – Application of Stacks. **9**

UNIT II

Queues – Simulation – Priority Queues Linear Data Structures and their linked storage representation – Pointers and Linked Allocation – Linked Linear Lists – Applications of Linked Linear Lists – Polynomial Manipulation. **9**

UNIT III

Nonlinear Data Structures – Trees – Definition Operations on Binary Trees – Linked Storage representation for Binary Trees – Applications of Trees – Manipulation of Arithmetic Expressions – Symbol Talk construction. **9**

UNIT IV

Graphs and their representation – Matrix representation – List structures – Breadth First Search – Depth First Search spanning Trees – Application of Graphs – PERT and Related Techniques. **9**

UNIT V

Dynamic storage Management – Fixed Block Storage Allocation – First –fit Storage Allocation – Buddy System – File Structures – External Storage Devices – Sequential Files – Structure – Processing Indexed Sequential Files – Structure – Processing Direct Files – Structure Processing. **9**

L : 45, T : 15 , Total 60

TEXT BOOK

1. Tremblay, J.P., and Sorenson, P.G., “An Introduction to Data Structures with Applications”, II edition, Tata McGraw Hill Publication Company Ltd., New Delhi, 2002.
2. E. Balagurusamy, “C and Data Structures”, Tata McGraw Hill Pub. Co., New Delhi, 2002.

REFERENCES

1. A.V. Aho, J.E. Hopcroft and J.D. Ullman “Data Structures and Algorithms” Pearson Education Delhi, 2002
2. Nicklaus Wirth, “Algorithms and Data Structures – Programmes” Prentice Hall of India Pvt. Ltd., New Delhi, 2002
3. Y.Langesam, M.J. Augenstein and A.M. Tenenbaum “Data Structures using C and C++” II edition, Prentice Hall of India, New Delhi, 2002

SE806	OBJECT ORIENTED PROGRAMMING	L	T	P	C
	AND C++	3	1	0	4

UNIT I

Principles of Object Oriented Programming, Simple C++ Program, Tokens, Expressions, Control Structures. **9**

UNIT II

Functions in C++, Classes and Objects. **9**

UNIT III

Constructors and Destructors, Operators Overloading and Type Conversion. **9**

UNIT IV

Inheritance, Extending Classes, Pointers, Virtual Functions and Polymorphism. **9**

UNIT V

Managing Console Input / Output Operations, Working with Files. **9**

L : 45, T : 15 , Total 60

TEXT BOOK

1. E. Balagusamy, “Object Oriented Programming with C++”, 2nd edition, Tata McGraw Hill Pub. Co., New Delhi, 2001.

REFERENCES

1. Kamthane, “Object Oriented Programming with ANSI and Turbo C++”, Pearson Education, Delhi, 2003.
2. Bjerne Stroustrup, “The C++ Programming Language”, Pearson Education, Delhi, 1999.
3. S.B.Lippmann, “The C++ Primer”, Pearson Education, Delhi, 1999.
4. Rober Lafore, “Object Oriented Programming in Microsoft C++”, Galgotia Publications 1999.

SE874

C++ LAB

L	T	P	C
0	1	2	2

1. Simple Programs in C++
2. Create a Complex Number Class with all possible Operators
3. Create a Vector Class
4. Create a String Class
5. Create a Time Class
6. Create a Date Class
7. Create a Matrix Class
8. Create an Employee Class with Derived Classes
9. Create Lists
10. File Handling
11. Operator Overloading

TOTAL: 45

SE875

DATA STRUCTURES LAB

L	T	P	C
0	1	2	2

Arrays and Structures in C, Infix, Postfix, Prefix expressions using stack, Recursion, Linked list, Circular linked list, Queues as circular list, Operation on binary trees – Insert, Quicksort, Heapsort, Shell sort, Sequential search and binary search.

TOTAL: 45

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M.Sc. SOFTWARE ENGINEERING (5 Years)

CURRICULUM & SYLLABUS

SEMESTER – III

Sl. No	Course Code	Course Title	L	T	P	C
THEORY						
1	MA803	Mathematical Techniques - II	3	1	0	4
2	SE808	Database management Systems	4	0	0	4
3	SE809	Software Architecture	4	0	0	4
4	SE810	Advanced Microprocessors	3	1	0	4
5	SE811	Operating System and System Software	4	0	0	4
PRACTICAL						
6	SE876	RDBMS Lab	0	1	2	2
7	SE877	Assembly Language Programming Lab	0	1	2	2
8	SE878	Operating System and System Software Lab	0	1	2	2
TOTAL			18	5	6	26

MA803	MATHEMATICAL TECHNIQUES - II	L	T	P	C
		3	1	0	4

Unit I Partial Differential Equations **12**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of Clairuts equations – Lagrange’s linear equation – Homogeneous linear partial differential equations of second and higher order with constant coefficients.

Unit II Analytic Functions **12**

Functions of a complex variable-Analytic functions- C-R equations in Cartesian coordinates(without proof)-Properties-Construction of analytic functions-Milne Thomson method-Harmonic functions

Unit III Complex Integration **12**

Cauchy’s integral theorem(statement only)-Cauchy’s integral formula(statement only)-Taylor’s and Laurent’s series(statement only)-Singularities-Cauchy’s residue theorem

Unit IV Fourier Transform **12**

Fourier integral theorem(statement only)-Fourier transform-Fourier sine and cosine transform-Properties-Transform of simple functions-Parseval’s theorem- discrete convolution-Periodic sequence and circular convolution- Discrete and Fast Fourier transforms – Definition and simple examples.

Unit V Z-transform **12**

Z-transform - Standard Z-transforms-Properties-Initial and final value theorem - Inverse Z-transform- partial fraction method and residue method – Convolution theorem (excluding proof)

TUTORIAL: 15

TOTAL: 60

Text Book

Grewal B.S., “Higher Engineering mathematics”, 40th Edition, Khanna Publishers, New Delhi 2007

Reference Books

1. Veerarajan T., “Engineering Mathematics(for Semester III), Tata McGraw – Hill Publishing Company Limited, New Delhi .
2. Veerarajan T., “Engineering Mathematics(for Semester III), Second Edition, Tata McGraw – Hill Publishing Company Limited, New Delhi
3. Kandasamy P, Thilagavathy K, and Gunavathy K., “Engineering Mathematics Volume III”, S.Chand & Company Ltd., New Delhi,

SE808	DATABASE MANAGEMENT SYSTEMS	L	T	P	C
		4	0	0	4

UNIT I

INTRODUCTION

File systems versus Database systems – DBMS Architecture – Data Independence – Database Languages-Data Models - Types - ER Model.

10

UNIT II

STORAGE STRUCTURES

Secondary storage Devices – RAID Technology – File organization – Techniques – Indexing – primary indexing-secondary indexing –tree based indexing

10

UNIT III

RELATIONAL ALGEBRA

Relational Algebra – SQL – Relational Calculus – Tuple Relational Calculus – Domain Relational Calculus – Functional Dependencies – Normal Forms – 1NF – 2NF-3NF-BCNF – 4NF-5NF .

15

UNIT IV

QUERY AND TRANSACTION PROCESSING

Algorithms for Executing Query Operations – using Hermistics in Query operations – Cost Estimation – Semantic Query Optimization – Transaction Processing – Properties of Transactions - Serializability – Transaction support in SQL.

15

UNIT V

CONCURRENCY, RECOVERY AND SECURITY

Locking Techniques – Time Stamp ordering – Validation Techniques – Recovery concepts – Types of Database recovery-Recovery Shadow paging – Log Based Recovery – Database Security Issues – Access control – Statistical Database Security.

10

TOTAL: 60

TEXT BOOK

1. S.K.Singh, "Database Systems Concepts, Design and Applications", Pearson Education Pte Ltd., 2006

REFERENCES

1. Abraham Silberschatz, Henry F.Korth and S.Sundarshan "Database System Concepts", Fourth Edition, McGraw Hill, 2002.
2. Ramez Elamassri and Shankant B-Navathe, "Fundamentals of Database Systems", Third Edition, Pearson Education Delhi, 2002.

SE809	SOFTWARE ARCHITECTURE	L	T	P	C
		4	0	0	4

UNIT I

Introduction to software Architecture: Evolution of software development – Fundamentals of software Engineering – Elements of software Architecture – The software product life cycle: Management view – Software Engineering View – Engineering Design View – Architectural View – Synthesizing the Views – The architecture Design Process: Understanding the Problem – Identifying Design Elements and their Relationships – Evaluating the Architecture – Transforming the Architecture.

12

UNIT II

Complexity and modularity: Complexity – Modularity – Modularity Operators - Models and Knowledge Representation: Models – Uses of Models – Role of Models – Modeling the Problem and Solution Domains.

12

UNIT III

Architecture Representation: Goals of Architecture Representation – Foundation of Software Architecture Representation – Architecture Description Languages - Quality Models and Quality Attributes: Process and Product Quality - Specifying Quality Requirements – Understanding Quality Models – Architecting with Quality Attributes – Architecting and Quality Models.

12

UNIT IV

Architectural Design Principles: Architectural level of design – Architecting with Design Operators - Functional Design Strategies - Applying Architectural Styles and Patterns: Defining Architectural Patterns and Style – Common Architectural Styles – Example of Applying Architectural Styles.

12

UNIT V

Creating Architectural Descriptions: Standardizing Architectural Descriptions – Creating an Architectural Description – Applying the architectural Description – Using Architecture frame Works: Software Architecture Frame Works – The 4+1 View Model of Architecture – Reference Model for Open Distributed Processing – Software Architecture Quality : Importance of Assessing Software Architecture – Quality Improvement.

12

TOTAL: 60

TEXT BOOK:

1. Stephen T. Albin , ”The art of software Architecture” , Wiley Dreamtech India pvt. Ltd., NewDelhi , 2003.

REFERENCES:

1. Len Bass, Paul Clements, Rick Kaxman, “Software Architecture in practice “ second edition , Pearson Education, Pvt. Ltd., Indian Branch, Delhi, 2003.
2. Vasudeva Varma , “Software Architecture A case based Approach”, Dorling Kindersley (India) Pvt. Ltd. , 2009

UNIT I

Introduction – Evolution of Microprocessors – Microprocessor family – Classification of computers – Intel 8086 microprocessor: architecture – Internal architecture – External system bus architecture – Memory segmentation – Flag register – Pin description of 8086 microprocessor. **9**

UNIT II

Addressing modes of 8086 – Instruction set – Assembly language programming – 8086 interrupts and interrupt response – Interrupt types. **9**

UNIT III

Programmable interface design – Data transfer scheme – Interfacing devices and I/O devices – 8255A Programmable Peripheral Interface - Intel 8279 programmable keyboard/ display interface – 8237A DMA controller. **9**

UNIT IV

The 80186 Microprocessor – Architecture – Interrupts – Registers – Instruction set- Pin description - The 80286 Microprocessor – Architecture – Pin description – Operating modes - The 80386 Microprocessor – The ‘Flat’ model – Interrupts and Exception – Multitasking – Difference between 80286 and 80386 – Difference from 8086. **9**

UNIT V

Microcontroller 8051 – Introduction – Microprocessors and Microcontrollers – 8051 Microcontroller architecture – Addressing modes – Instruction set – Assembly language programming. **9**

Tutorial: 15, Total: 60

TEXT BOOKS

1. Kaler R S , “A Text book of Microprocessors and Microcontrollers”, I.K. International Publishing House Pvt Ltd, 2011.

REFERENCES

1. Mohammed Rafiquzzaman, “Microprocessors and Microcomputer based system design” , Universal Book Stall,New Delhi,2008.
2. Douglas V Hall, “Microprocessors and Interfacing – Programming and Hardware”, McGraw Hill, 1986.

SE811

**OPERATING SYSTEM AND SYSTEM
SOFTWARE**

**L T P C
4 0 0 4**

UNIT I

Introduction – System Software and machine architecture – Assemblers – Basic assembler functions – Machine dependent features – program relocation – Machine independent features – literals – symbol defining statements –expressions –program blocks-control sections and program linking – Assembler design options-one pass assemblers-multi pass assemblers.

Loader and Linkers: Basic Loader Functions – Machine dependent loader features – relocation – program – linking – Machine independent loader features – Automatic Library search v Loader options – Loader design options – linkage editor – dynamic linking – Bootstrap loader. **12**

UNIT II

Introduction – Main frame systems – Desktop Systems – Multiprocessor – Distributed – Clustered – Real - Time-Hand held – Feature Migration – Computing Environments. Processes Concepts – Scheduling – Operations – Cooperating Processes - Interprocess Communication. **12**

UNIT III

Threads – Overview – Multithreading Models – Issues CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling algorithms – Multiprocessor Scheduling – Real -Time Scheduling Process synchronization Background – The critical section Problem – Synchronization Hardware – Semaphores – Classical Problems of Synchronization – Critical Regions – Monitors. **12**

UNIT IV

Deadlocks – System Model – Characterization – Methods for handling deadlocks – Deadlock Prevention – Avoidance – Detection – Recovery from deadlocks – Memory Management – Background – Swapping – Contiguous Memory allocation – Paging – Segmentation. **12**

UNIT V

Virtual Memory – Background – Demand Paging – Page replacement – Allocation of frames – Thrashing – File System Interface – Concept – Access Methods – Directory Structure **12**

TOTAL: 60

TEXT BOOKS

1. Abraham Silberschatz, Peter BaerGalvin and Greg Gagne, Operating System Concepts, Sixth Edition, John Wiley and Sons and Inc., 2002.
2. Leland –L-Beck, “System Software-An Introduction to Systems Programming”, Pearson Education Publishers, Third Edition-2003.

REFERENCES

1. H.M. Deitel, “Operating Systems” Second Edition, Pearson Education Delhi, 2002.

2. A.S. Tanenbaum and A.S. Woodhull “Operating Systems, Design and Implementation”, Second Edition Pearson Education Delhi, 2002.
3. John J. Donovan, “Systems Programming” Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002.

SE876	RDBMS LAB	L	T	P	C
		0	1	2	2

1. Data Definition, Manipulation of base Tables and views.
2. High level programming language extensions.
3. Front and tools.
4. Forms – Triggers – Menu Design.
5. Reports.
6. Database Design and implementation.

TOTAL: 45

SE877	ASSEMBLY LANGUAGE PROGRAMMING LAB	L	T	P	C
		0	1	2	2

1. Study of Assembler (Turbo) and Assembles directives.
2. Study of INT 21H Functions for input and output.
3. Multiplication, Addition and Subtraction.
4. Packing and unpacking of BCD digits.
5. Conversion from BCD to ASCII and vice versa.
6. Delay loop implementation.
7. Arranging numbers in ascending / descending order.
8. MACROS – Examples.
9. Implementation of string Functions.
10. Displaying the contents of the memory locations.

TOTAL: 45

SE878	OPERATING SYSTEM AND SYSTEM SOFTWARE LAB	L	T	P	C
		0	1	2	2

A. Operating System

1. Writing device drivers in DOS and UNIX environments
2. Performance measures of various processor scheduling methods
3. Process creation, Process synchronization & Interprocess communication using semaphores.
4. Pipes and message in UNIX environment

B. System Software

1. Creation of symbol table.
2. Searching the table of Symbols.
3. Implementation of an assembler.
4. Linking assembly language with C.
5. Developing a simple text editor.
6. Developing a simple graphical editor.
7. Package development.

TOTAL: 45

NOORUL ISLAM CENTRE FOR HIGHER EDUCATION

NOORUL ISLAM UNIVERSITY, KUMARACOIL

M.Sc. SOFTWARE ENGINEERING (5 Years)

CURRICULUM & SYLLABUS

SEMESTER – IV

Sl. No	Course Code	Course Title	L	T	P	C
THEORY						
1	MA804	Discrete Mathematics	3	1	0	4
2	SE812	Software Design Principles	4	0	0	4
3	SE813	Object Oriented Analysis and Design	4	0	0	4
4	SE814	Design and Analysis of Algorithms	3	1	0	4
5	SE815	Computer Networks	3	1	0	4
6	SE816	Computer Graphics	4	0	0	4
PRACTICAL						
7	SE879	Algorithms Lab	0	1	2	2
8	SE880	Case Tools and UML Lab	0	1	2	2
TOTAL			21	4	4	27

MA804

DISCRETE MATHEMATICS

L T P C

3 1 0 4

Unit I Propositional Calculus

9

Propositions-Logical connectives-Truth tables-Conditional and biconditional propositions-Tautologies and Contradictions-Logical equivalences and Implications-Normal forms-Principal conjunctive and disjunctive normal forms-rules of Inference-Arguments-Validity of arguments

Unit II Predicate Calculus

9

Predicates-statement function-Variables-Free and bound variables-Quantifiers-Universe of discourse- Logical equivalences and Implications for quantified statements-Theory of inference-Rules of universal specifications and generalization-Validity of arguments.

Unit III Combinatorics

9

Permutation and Combination-Pigeon hole principle-Principle of Inclusion and exclusion- Recurrence relation - Generating function - Mathematical induction

Unit IV Set theory and Relations

9

Basic concepts-notations-Subset-Algebra of sets- Power set-Cartesian product-Relational Matrix and the graph of relation-Partitions-equivalence relations-Partial ordering-Poset-Hasse diagram

Unit V Graph Theory

9

Definitions and examples –Sub graphs – Operations on Graphs- Graph Isomorphism – Connectivity- Eulerian and Hamiltonian graphs - Shortest path problem

TUTORIAL: 15

TOTAL: 60

Text Book

J.P.Trembley and R.Manohar, “Discrete Mathematical Structure with Applications to computer science”, TMH

References:

1. Kenneth H. Rosen, “Discrete Mathematics and its Applications” Fifth Edition, TMH, 2003.
2. M.K. Venkataraman, N. Sridharan and N.Chandarasekaran,” Discrete Mathematics” The National publishing company,2003
3. Ralph Grimaldi, R.P. Discrete and Combinatorial Mathematics, Fourth Edition, Pearson Education, New Delhi, 2002.
4. Narsingh Deo,“Graph Theory with applications to Engineering and Computer Science” , Prentice Hall of India – New Delhi 2000

SE812

SOFTWARE DESIGN PRINCIPLES

L T P C
4 0 0 4

UNIT I

THE ROLE OF SOFTWARE DESIGN

The nature of the design process-The software design process-Design in the software development process-Design qualities . **12**

UNIT II

TRANSFERRING DESIGN KNOWLEDGE

Describing a design solution –Transferring Design Knowledge-Some Design Representations-TheRationale for method. **12**

UNIT III

DESIGN STRATEGIES

Basic rules of software design-The role of strategy in methods,Design by top-down decomposition-Design patterns. **12**

UNIT IV

DESIGN PRACTICES

Stepwise Refinement-Incremental Design-Structured System Analysis and Structured Design-Jackson System Development-Jackson structured Programming. **12**

UNIT V

OBJECT ORIENTED DESIGN

Designing with objects-The Object Concepts,Design Practices for the Object Oriented Paradigm,Object Oriented Frame works,Object Based Design-Component-Based Design. **12**

TOTAL: 60

TEXT BOOKS

- 1.David Budgen,"Software Design",Second Edition,Published by Pearson Education,2004.
- 2.Software Design Methodology,Published by Elsevier,2005

REFERENCE BOOKS

- 1.Steve McConnell,"Code Complete",MicrosoftPress,1996.

SE813	OBJECT ORIENTED ANALYSIS AND DESIGN	L	T	P	C
		4	0	0	4

UNIT I: OBJECT BASIS

Object Oriented Philosophy - The concept of Object - Object fundamentals – Object state, behavior and method - Encapsulation and information hiding – Class relationships – Polymorphism - Aggregation - Object containment - Meta class. **12**

UNIT II: OBJECT ORIENTED METHODOLOGIES

Jim Rumbaugh’s Object Model – Grady Booch methodology – Ivar Jacobson methodology - Patterns - Frame works - Unified approach – Basics of UML. **12**

UNIT III: OBJECT ORIENTED ANALYSIS

Object oriented analysis the use case driven approach – Use case model – Approaches for Object oriented analysis – CRC cards – Noun phrase approach – Common class pattern approach - Identifying object relationships and methods – CASE Study. **12**

UNIT IV: OBJECT ORIENTED DESIGN

Object oriented design process – Design axioms – Design patterns – Class design - CASE study. **12**

UNIT V: MODELLING WITH UML

Unified modeling language and UA - Diagrams in UML – Use Case diagram – Activity diagram – Statechart diagram – Object diagram - Class diagram – Behaviour diagram- Component diagram – Deployment diagram - CASE study in the scenario Automating a Vending Machine. **12**

TOTAL: 60

TEXT BOOK

1. Ali Bahrami - “Object Oriented Systems Development”, Irwin-McGraw Hill, New Delhi, International editions.

REFERENCES

1. Grady Booch - “Object Oriented Analysis and Design with applications”, II edition, Addison Wesley.
2. Martin Fowler, Kendall Scott - “UML Distilled-Applying the standard Object Modeling Language”, Addison Wesley.

SE814	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P	C
		3	1	0	4

Unit I

Introduction – Algorithm – Specification – Performance Analysis **9**

Unit II

Divide and conquer – General method – Binary search – Finding the maximum and minimum – Merge sort – Quick sort **9**

Unit III

The Greedy method – General method – Knapsack problem – Job sequencing with deadlines.

Dynamic Programming – General method – Multistage graphs – All pairs shortest paths – Single source shortest paths. **9**

Unit IV

Dynamic programming – The Travelling salesman problem – Flow shop scheduling.

Basic traversal and search techniques – Binary trees – Graphs – Connected components and spanning trees – Biconnected components. **9**

Unit V

Backtracking – General method – The 8 – queens problem – Branch and bound – The method – 0/1 Knapsack problem. **9**

TUTORIAL: 15, TOTAL: 60

TEXT BOOK

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, “Computer Algorithms/C++”, Second Edition, Universities Press 2008.

REFERENCES

1. Sara Baase and Allen Van Gelde “Computer Algorithms, Introduction to design and analysis”, III Edition, Pearson Education, New Delhi, 2002.
2. Aho, Hoproft and Ullman “Data Structures and algorithms” Pearson Edition, New Delhi, 2001.

SE815

COMPUTER NETWORKS

L T P C
4 0 0 4

UNIT I:

Uses of Computer Networks - LAN'S - MAN'S and WAN'S and their characteristics - Protocol hierarchies - Connection oriented and connection services - Overview of OSI Reference Model - TCP/ IP Reference model and its comparisons with OSI Model .

12

UNIT II:

Guided Transmission Media – Magnetic media-Twisted Pair - Coaxial Cable and Optic Fibre - Wireless Transmission - Communication Satellites. Ideas of Multiplexing-frequency division-time division - SONET/SDH.

12

UNIT III:

Data Link Layer design Issues - Framing Error Control and Flow Control - Error Detection and Correction - Data Link Protocols – Stop and wait Protocol - HDLC - PPP - Carrier sense multiple Access Protocols.

12

UNIT IV:

Network design Issues - Routing Algorithms - Flooding - Flow based Routing - Distance Vector Routing - Multicast routine - Congestion Control Algorithms General Principles of Congestion Control - Congestion Control for multicasting.

12

UNIT V:

Transport service primitives - Elements of transport protocols - TCP Service model - Issues in application layer - Network Security - Authentication Protocols - Digital Signatures - DNS Signature - Simple Network Management Protocols

12

TOTAL: 60

TEXT BOOK:

1. Andrew.S.Tanenbaum,” Computer Networks”, 4th Edition,2009,Pearson Education.

REFERENCE BOOK

1. William Stallings,”Computer Networking with Internet Protocols and Technology”, 4th Edition,2009, Pearson Education.
2. Douglas.E.Comer,”Computer Networks and Internets”, 2nd Edition, 2002, Pearson Education.

Unit I

A survey of Computer Graphics – Overview of graphics systems – Video display devices – Raster-Scan Systems – Random-Scan Systems – Input Devices – Hard-Copy Devices. **12**

Unit II

Points and Lines – Line-Drawing Algorithms – Circle-Generating Algorithms – Filled-Area Primitives – Attributes of Output Primitives – Line Attributes – Curve Attributes. **12**

Unit III

Two Dimensional Geometric Transformations – Basic Transformations – Matrix Representations – Composite transformations – Other transformations – Two-dimensional Viewing – Line Clipping – Cohen Sutherland Line Clipping – Polygon Clipping – Sutherland-Hodgeman Polygon Clipping – Curve Clipping – Text Clipping. **12**

Unit IV

Three Dimensional Geometric Modeling transformations – Translation – Rotation – Scaling – Other Transformations – Three Dimensional Viewing – Projections – Clipping. **12**

Unit V

Visible Surface Detection methods – Classification Algorithms – Back-Face Detection – Depth-Buffer Method – A-Buffer Method – Scan-Line method – Depth-Sorting method – BSP-Tree method – Area-Subdivision Method – Octree methods – Ray-Casting method – Computer Animations. **12**

TOTAL: 60**TEXT BOOK**

1. Donald Hearn, M. Pauline Baker, “Computer Graphics C Version”, Second Edition, Pearson Education, 2009.

REFERENCES

1. Apurva A. Desai, “Computer Graphics”, Prentice Hall of India, 2008.
2. Amarendra N.Sinha, Arun D Udai, “Computer Graphics”, TataMcGraw Hill Publications, 2008.

SE879

ALGORITHMS LAB

L	T	P	C
0	1	2	2

Implementation of following problems using C

1. Binary Search Algorithm
2. Finding Maximum and Minimum of a given list
3. Mergesort
4. Quicksort using divide-and-conquer algorithm
5. Shortest path algorithms (any 2 algorithms)
6. Traversals and Searching in Graphs
7. Minimal Spanning Tree Algorithm
8. Knapsack problem

TOTAL: 45

SE880

CASE TOOLS AND UML LAB

L	T	P	C
0	1	2	2

1. Familiarization of features of any one of the standard UML case tool.
2. Capturing key functional requirements as Use cases and class diagram for online ticket / hotel reservation systems, student information system, sales and marketing system, banking system and inventory tracking system.
3. Interacting diagrams, state chart diagrams etc for systems in 2.
4. Implementation using any one of object oriented languages like Java, C++ for systems in 2.
5. Component diagrams, deployment diagrams for system in 2.
6. Unit test case, integration test case for systems in 2.

TOTAL: 45

NOORUL ISLAM CENTRE FOR HIGHER EDUCATION

NOORUL ISLAM UNIVERSITY, KUMARACOIL

M.Sc. SOFTWARE ENGINEERING (5 Years)

CURRICULUM & SYLLABUS

SEMESTER – V

Sl. No	Course Code	Course Title	L	T	P	C
THEORY						
1	MA805	Optimization Techniques	3	1	0	4
2	SE817	E – Commerce	4	0	0	4
3	SE818	Software Development using .NET	3	1	0	4
4	SE819	Web Design	3	1	0	4
5	SE820	Theory of Computation	3	1	0	4
6	SE821	Multimedia Systems	4	0	0	4
PRACTICAL						
7	SE881	VB .NET Programming Lab	0	1	2	2
8	SE882	Web design and Accounting Lab	0	1	2	2
TOTAL			20	6	4	28

UNIT I LINEAR PROGRAMMING**9**

Mathematical formulation - Graphical Solution of Linear Programming Models – Simplex Method – Artificial variable - Two Phase Method - Construction of Dual Problem.

UNIT II TRANSPORTATION AND ASSIGNMENT PROBLEMS**9**

Transportation Problems – Initial Basic feasible solutions by North West Corner Rule, Least Cost method, Vogel’s approximation methods – Optimal solution by MODI method – Degeneracy, Unbalanced – Maximization Problems - Assignment problem- Hungarian method- Unbalanced – Maximization Problem

UNIT III PROJECT MANAGEMENT**9**

Network- Construction – Critical Path Method – Project Evaluation and Review Technique.

UNIT IV INVENTORY MODELS**9**

Deterministic Inventory Models – EOQ model with and without shortages – Price Breaks models - Inventory models with Probabilistic demand - continuous review model.

UNIT V QUEUEING THEORY**9**

Introduction – characteristics- queue discipline -Kendall notation – single server, multiple server with finite and infinite capacity – Applications

L: 45 + T: 15 = 60 PERIODS**REFERENCES:**

1. Taha H.A., “Operations Research -An Introduction”, Prentice–Hall of India, 2002.
2. J.K. Sharma, “Operations Research – Theory and Application”, Macmillan, 2003.
3. Gupta P.K., Man Mohan, “Problem in Operations Research” (Methods and Solutions), Sultan Chand and Sons, Ninth Edition, 2003.

SE817**E - COMMERCE**

L	T	P	C
4	0	0	4

UNIT - I

Definitions and concepts, Electronic commerce Framework, Electronic commerce and business plans, cases and Models, Benefits and limitations of E-commerce.

12**UNIT - II**

E-Market places, Types of E-Markets, The Role and values of intermediaries, Electronic catalogs and other market mechanisms, Auctions as EC market mechanisms, Bartering and negotiating online, E-Commerce in the wireless environments, issues in E-Markets.

12

UNIT – III

Internet marketing and Electronic detailing, E-tailoring business models, web advertising, advertising methods, advertising strategies and promotions, economics of advertising.

12

UNIT – IV

E-Supply chains, supply chain problems and solutions, collaborative commerce, corporate portals, E-Government overview, Implementing E-Government online publishing, E-books and blogging, E-Learning.

12

UNIT – V

Electronic payments, Electronic cards and smart cards, E-cash and Innovative payment methods E-Checking, B2B Electronic payments, E-Billing, Launching a successful online business.

12

TOTAL: 60 PERIODS

TEXT BOOK

1. Effrain Turban, David king, Jae Lee, Dennis vichland, “Electronic Commerce 2004: A managerial Perspective “, Pearson Education.

REFERENCES

1. Kamalesh K. Bajaj, “E-Commerce : The cutting Edge Business”, Tata Mc-Graw Hill 2003.
2. Kalakota and Whinston, “Frontiers of Electronic Commerce”, Pearson Education 2002.
3. Brenda Kennan, ”Managing your E-Commerce Business”, Prentice hall India, 2001.
4. Bharat Bhaskar, “Electronic commerce- Framework Technology and Applications”, Tata Mc-Graw Hill 2003.

SE818	SOFTWARE DEVELOPMENT USING .NET	L	T	P	C
		3	1	0	4

UNIT I

Introducing .NET – The .NET Framework – The Common Language Runtime – Building Managed Code – Compiling Managed Code – Organizing Managed Code – Executing Managed Code – Loading Assemblies – Compiling MSIL – Creating a Native Image – Securing Assemblies – Garbage Collection – Application Domains. **9**

UNIT II

The VB.NET Crash Course – What is VB.NET? – Hello World – Variables Constants and Operators – Modularizing your Code –Functions and Subroutines – Using Functions – Using Subroutines – Controlling Program Flow – Handling Errors and Exceptions – Unstructured Error Handling – Structured Exception Handling. **9**

UNIT III

The VB.NET and Object Oriented programming – Class basics – Class Properties – Constructors and Destructors – Inheritance – Overridden Functions – Overloading –

Polymorphism – Interfaces – Implementing Polymorphism – Multithreaded Programming – Threads Synchronization – Events and Thread Synchronization. **9**

UNIT IV

Working with ASP.NET – Features – Anatomy of ASP.NET Pages – Introducing Web Forms – Using HTML Controls – Using Web Controls – Web Control Properties – Web Controls for Displaying and Formatting Data – Creating Buttons – Inputting Text – Selecting Choices – Creating Lists – Miscellaneous Basic Controls. **9**

UNIT V

Creating a Simple ASP.NET Application – ASP.NET Page Directives – ASP.NET Rich Controls – Calendar Control – AdRotator Control – Validation Controls – Data List Controls – Repeater Control – Data Grid Control – User Controls – Authoring a User Control – ASP.NET Intrinsic Objects. **9**

L: 45 + T: 15 = 60 PERIODS

TEXT BOOK:

1. David Chappell, “Understanding .NET”, Second Edition, Pearson Education, 2007.
2. Matt J.Crouch, “ASP.NET and VB.NET Web Programming”, Pearson Education, 2008.

REFERENCES

1. Peter Vogel, “Practical Code Generation in .NET”, Pearson Education, 2012.
2. Andy Wigley, Stephen Wheelwright, “.NET Compact Framework”, TataMcGrawHill Publishing Ltd, 2003.

SE819

WEB DESIGN

L	T	P	C
3	1	0	4

UNIT I

Fundamentals – Introduction to the Internet – WWW – Web Browsers – Web Server – URL – Multipurpose Internet Mail Extensions – HTTP Protocol – Security – The Web Programmer’s ToolBox – Introduction to XHTML – Origins and Evolution – Syntax – Document Structure – Text Markup - Images – HyperText Links – Lists – Tables – Forms – Frames – Differences between HTML and XHTML. **9**

UNIT II

Cascading Style Sheets – Introduction – Levels – Formats – Selector Forms – Property Value Forms – Font Properties – List Properties – Color – Alignment of Text – Box Model – Background Images – The and <div> Tags – Conflict Resolution – Basics of JavaScript – Overview – Object Orientation and JavaScript – Characteristics – Primitives, Operations, and Expressions – Screen Output and Keyboard Input – Control Statements – Object Creation and Modification – Arrays – Functions – Example – Constructors – Pattern Matching Using Regular Expressions – Errors in Scripts. **9**

UNIT III

Introduction to XML – Syntax – Document Structure – Document Type Definitions – Namespaces – Schemas – Displaying Raw XML Documents – Displaying XML Documents with CSS – XSLT Style Sheets – XML Processes – Web Services – The Basics of Perl – Origins and Uses of Perl – Scalars and their Operations – Assignment Statements and Simple I/O – Control Statements – Using Perl for CGI Programming – CGI Linkage – Query String Format – Cookies. **9**

UNIT IV

Servlets and Java Server Pages – Overview – Servlet Details – Storing Information on Clients – Java Server Pages – Introduction to PHP – Origin and Uses of PHP – Overview - Characteristics – Primitives, Operations, and Expressions – Output – Control Statements – Arrays – Functions – Pattern Matching – Form Handling – Files – Session Tracking – Database Access Through the Web – Relational Databases – SQL – Architectures for Database Access – MySQL Database System. **9**

UNIT V

Introduction to Ruby – Origin and Uses of Ruby – Scalar Types and their Operations – Simple I/O – Control Statements – Fundamentals of Arrays – Introduction to Rails – Overview – Document Request – Processing Forms – Rails Applications with Databases – Layouts – Introduction to Ajax – Overview – Basics – Rails with Ajax. **9**

L: 45 + T: 15 = 60 PERIODS

TEXT BOOK:

1. Robert W. Sebesta, “Programming the World Wide Web”, Fourth Edition, Pearson Education, 2012.

REFERENCES

1. Achyut S.Godbole, Atul Kahate, “Web Technologies”, Second Edition, TataMcGrawHill Publications, 2011.
2. D.P.Nagpal, “Web Design Technology”, S.Chand & Company Ltd, 2009.

SE820	THEORY OF COMPUTATION	L	T	P	C
		3	1	0	4

UNIT I LANGUAGE AND FINITE AUTOMATA

Alphabets and Languages – Finite representation of Languages – Deterministic and Nondeterministic finite automata – NFA with -Transitions- Equivalence of DFA and NDFA- Finite automata and regular expressions – Languages that are and are not regular. **10**

UNIT II CONTEXT – FREE LANGUAGES

Context free grammars – Derivation - Derivation trees – Ambiguity – Simplification of Context free grammars – Normal forms - Pushdown automata – Pushdown automata and context free grammars – Languages that are and are not context – free. **10**

UNIT III TURING MACHINES

The definition of a Turing Machine – Design of Turing machine- Computable languages and functions - Two way infinite tape- Power of Turing Machine – Random access Turing machines – Universal Turing Machines. **10**

UNIT IV UNDECIDABILITY

Concept of undecidability – Recursive and Recursively Enumerable languages - Undecidability of Universal Languages – The halting Problem – Post’s Correspondence problem – Unsolvable problems about grammars. **8**

UNIT V COMPLEXITY AND NP-COMPLETENESS

The Class P- The class NP – Properties of NP-complete and NP-hard problems – Vertex cover problem - Hamiltonian path problem – Travelling sales man problem – Partition problem. **7**

L: 45 + T: 15 = 60 PERIODS

TEXT BOOK

1. Lewis, H.R. and Papadimitriou, C.H, “Elements of the Theory of Computation”, Prentice Hall, Second Edition, 2005.

REFERENCES

1. Martin. J, “Introduction to Languages and Theory of Computation”, McGraw Hill Company, 3rd International Edition, 2003.
2. Hopcraft, J.E. Motrani, R and Ullman, J.D, “Introduction to Automata Theory Languages and Computation”, second edition, Pearson education, Delhi,2002.
3. Mishra, K.L.P and Chandrasekaran, “Theory of Computer Science”, 3rd Edition, Printice Hall of India, New Delhi, 2003.

SE821

MULTIMEDIA SYSTEMS

L	T	P	C
4	0	0	4

UNIT I

Introduction to Multimedia: media and Data Streams: Medium Main Properties of Multimedia System-Multimedia-Traditional data streams Characteristics-Data streams Characteristics for continuous Media – Information Units-Sound/Audio: Basic Concepts-music-Computer Image Processing. **12**

UNIT II

Video and Animation: Basic Concepts -Computer based Animation-Data Compression: Storage Space-Coding Requirements-Source, Entropy and Hybrid coding-some Basic Compression Techniques-JPEGH.261-MPEG_DVI. **12**

UNIT III

Optical storage media: Basic Technology-Video Disks and other WORMs Compact Disk Read Only Memory-CD-ROM Extended Architecture-Further CD-ROM Technologies-Computer Technology: Communication Architecture-Multimedia Workstation. **12**

UNIT IV

Multimedia Communication Systems: Application Subsystem – Transport Subsystem-Quality subsystem Quality of service and Resource Management. **12**

UNIT V

Documents and hypertext-Documents-Hypertext and hypermedia-Multimedia applications-media preparation- media composition- media integration – media communication- media entertainment. **12**

TOTAL: 60 PERIODS**TEXT BOOK:**

1. Ralf Steinmetz and Klara Nahrstedt, Multimedia: Computing, Communications and Applications, pearson Education Asia, 2006.

REFERENCE BOOKS:

1. Fred Halsall, Multimedia communications, Pearson education, Edition 2007.
2. K.R. Rao, Zoron . S. Bojkovic, Dragorad, A. Milovanovic, Multimedia Communications systems, Prentice hall of India Pvt Ltd., New Delhi, 2002.

SE881**VB .NET Programming Lab**

L	T	P	C
0	1	2	2

1. Introduction to .NET frame work
2. Design a form to study VB.NET Basic Concept
3. Design a form using different controls their properties and events
4. Design a form using different control structures in VB.NET
5. Design a form to demonstrate an array concepts in VB.NET
6. Design a form using Menus and Dialog boxes
7. Study of Data ADO.NET
8. Study of Data Access in VB.NET
9. Study of Web Capabilities of .NET
10. Deployment of project.

TOTAL: 45 PERIODS

SE882

MULTIMEDIA AND WEB DESIGN LAB

L	T	P	C
0	1	2	2

1. Colors and shading
2. Special Effects
3. Morphing, Warping, Splash, Blur
4. Image processing & enhancement
5. Image scanner principles
6. 2D – Animation
7. Use of Authoring Tools
8. Basic HTML programming.
9. Web page design.

TOTAL: 45 PERIODS

NOORUL ISLAM CENTRE FOR HIGHER EDUCATION

NOORUL ISLAM UNIVERSITY, KUMARACOIL

M.Sc. SOFTWARE ENGINEERING (5 Years)

CURRICULUM & SYLLABUS

SEMESTER – VI

Sl. No	Course Code	Course Title	L	T	P	C
THEORY						
1	SE822	Software Quality Assurance	4	0	0	4
2	SE823	Principles of Management	4	0	0	4
3	SE824	Programming with JAVA	3	1	0	4
4	SE825	Compiler Design	4	0	0	4
5	Xx8x1	Elective I	3	0	0	3
6	Xx8x2	Elective II	3	0	0	3
PRACTICAL						
7	SE8P1	Mini Project based on Software Development	0	0	12	6
TOTAL			21	1	12	28

SE822	SOFTWARE QUALITY ASSURANCE	L	T	P	C
		4	0	0	4

UNIT I: SOFTWARE QUALITY

Basics of software quality – Software quality program – Software modeling – Quality goals – Purpose of quality – SQA planning – Software productivity and documentation.

12

UNIT II: QUALITY ASSURANCE

Software quality assurance plan – Purpose and Scope - Software quality assurance management – Quality tasks – Responsibilities – Documentation.

12

UNIT III: QUALITY ASSURANCE ACTIVITIES

Standards – Practices - Conventions and Metrics - Reviews and Audits – Management and Technical review – Software inspection process – Walk through process – Audit process – Test processes – ISO - CMM compatibility – Problem reporting and corrective action.

12

UNIT IV: METHODOLOGIES

Tools, Techniques and methodologies - Code control - Media control - Supplier control - Records collection - Maintenance and retention - Training and risk management.

12

UNIT V: STANDARDS AND MODELS

ISO 9000 model - CMM model - Comparisons, ISO 9000 weaknesses, CMM weaknesses, SPICE – Software process improvement and capability determination.

12

TOTAL: 60 PERIODS

TEXT BOOK

1. Mordechai Ben Menachem and Garry S. Marliss, “Software Quality – Producing Practical, Consistent Software”, International Thompson Computer Press, 1997.

REFERENCES

1. Watt. S. Humphrey, “Managing Software Process”, Addison – Wesley, 1998. Philip B. Crosby, “Quality is Free: The Art of making quality certain”, Mass Market, 1992.

SE823	PRINCIPLES OF MANAGEMENT	L	T	P	C
		4	0	0	4

UNIT I : NATURE OF MANAGEMENT

Definition of Management-Objectives of Management-Levels of Management-Characteristics of Management-Functions of Management-Importance of Management-Functions of a Manager-Role of Manager-Various approaches of Management.

12

UNIT II: PLANNING

Meaning of planning-Nature of planning-Structure of planning-Steps in planning-Types of plan-Forecasting-Advantages of forecasting,Limitations of forecasting-Management by objectives(MBO),Benefits of MBO. **12**

UNIT III: ORGANISING

Definition-Functions of organisation-Importance of organisation-Formal and Informal organisation-Types of Organisation-line,functional,line and staff- Departmentation,need for departmentation-Types of departmentation. **12**

UNIT IV: DIRECTING

Definition-General aspects of directing-Supervision-roles of a supervisor-Motivation-Motivational theories-Leadership-An overview of leadership styles- Communication-formal and informal communication.. **12**

UNIT V: CONTROLLING

Definition-principles of controlling-Importanceof controlling-Relationship between planning and controlling-Steps in control process-Techniques of control-Budgetary and Non Budgetary control-Types of budgets-Management by exception. **12**

TOTAL: 60 PERIODS

TEXT BOOKS

1. Koontz Harold and Weihrich Heinz,Essentials of Management-McGraw Hill,Fifth Edition,1990.
2. S.Chand&Company Ltd,Ram Nagar,New Delhi,Principles of Management.

REFERENCES

1. T.Ramasamy,Principles of Management,Himalaya Publishing House Pvt-Ltd.
2. Dr.H.R.Mukhi,Principles of Management,Tech India Publications,New Delhi.

SE824

PROGRAMMING WITH JAVA

L	T	P	C
3	1	0	4

UNIT I

Introduction : Java Features – Comparison of Java with C and C++ - Java and Internet – Java Environment – Java program structure – Java tokens – Implementing a Java program – Java virtual machine – Constants – variables – Data types – Scope of variables – Type casting – Operators and expressions – Decision making, Branching and Looping.

9

UNIT II

Classes and arrays: Defining a class – Constructors – Methods – Overloading – static members – Nesting of methods Overriding methods – Final classes – Abstract class – Visibility control – arrays – Creating an array – two dimensional arrays – Strings – String arrays – String methods – String buffer class – Vectors – Wrapper class. **9**

UNIT III

Inheritance, Interfaces and Packages: Defining a subclass – Subclass Constructor – Multi level inheritance – Hierarchical Inheritance – Defining interfaces – Extending interfaces – Implementing interfaces – Java API packages – Creating a package – Accessing and using a package – Adding a class to a package – hiding classes. **9**

UNIT IV

Multithreading Exception handling and files creating threads :Extending the tread class – Thread life cycle – Thread exception – Thread priority – Synchronization – Runnable interface – Exceptions – Throwing own exceptions – Concepts of streams – stream classes – Byte stream classes – character stream classes – Using streams – Using file class – Other stream classes. **9**

UNIT V

Applet programming: Difference between application and applets – Applet life cycle – Creating and executable applet – Designing a web page – Adding applet to HTML File – Passing parameters to Applets. **9**

L: 45 + T: 15 = 60 PERIODS

TEXT BOOK

1. E. Balagurusamy, “Programming with Java “- A primer Third edition, Tata Mcgraw Hill publishing Company Delhi, 2009;

REFERENCE

1. Herbert Schildt, “The Complete Reference Java 2” Fifth edition Tata Mcgraw Hill publishing company, Delhi 2002.

SE825

COMPILER DESIGN

L	T	P	C
4	0	0	4

UNIT I

Introduction to Compiling – Compilers – Analysis of the Source Program – The Phases of a Compiler – Cousins of a Compiler – The grouping of Phases – Compiler Construction Tools – Lexical Analysis – Role – Input Buffering – Specification of Tokens – Recognition – Finite Automata – Regular expression to an NFA. **12**

UNIT II

Syntax Analysis – Role – Context – Free Grammars – Parse Tree and Derivation - Writing a Grammar – Top down parsing – Bottom –up parsing – Shift Reduce Parsing - Operator precedence parsing. **12**

UNIT III

Run-Time environments – Source language issues – Storage organization – Storage – Allocation Strategies – Stack and Heap Allocation - Access to non local names – Parameter passing – Symbol Tables – Hash Tables. 12

UNIT IV

Intermediate Code Generation – Intermediate Languages – Declaration – Assignment Statements – Type Conversions – Boolean Expression – Case Statements – Back Patching - Procedure Calls. 12

UNIT V

Code Generation – Issues – Run-Time Storage Management – Basic blocks and flow graphs - Next – use information - A simple code generator – Register allocation and assignment. Code optimization – Introduction – The Principal Sources of Optimization – Optimization of basic blocks – Loops in Flow Graphs. 12

TOTAL: 60 PERIODS

TEXT BOOK

1. A.V.Aho, R.Sethi, J.D.Ullman, “Compilers – Principles, Techniques and Tools” Pearson Education Delhi, 2008.

REFERENCES

1. Allen Holub.I, “Compiler Design in C” Prentice Hall of India, Delhi, 2002.
2. D.M.Dhamdhere, “Systems Programming and Operating Systems”, Tata McGraw Hill Company, Delhi, 2002.

SE8P1

**Mini Project based on Software
Development**

L	T	P	C
0	0	12	6

The Mini Project is not only a part of the coursework, but also a mechanism to demonstrate the abilities and specialization. It gives more knowledge about the database, programming languages, Scripting languages and web page design. It provides the opportunity for the student to demonstrate originality, teamwork, inspiration, planning and organization in a software project, and to put into practice some of the techniques that have been taught throughout the previous courses. The Mini Project is important for a number of reasons. It provides students with:

- Opportunity to specialize in specific areas of computer science and softwares;
- Future employers will most likely ask about the project at interview;
- Opportunity to demonstrate a wide range of skills and knowledge learned, and
- Encourages integration of knowledge gained in the previous course units.

Mini Project work shall be carried out by a student under the guidance of a faculty. It is mandatory that a Student should submit the document of the completed work in the mid-semester and presentation before the project course committee during the semester in which the mini project work is undertaken. The student should demonstrate that he/she has acquired both analytical and practical skills in the field specialization. The student should submit the mini project report at the end of the semester.

The project report should be documented with an engineering approach to the solution of the problem. The project report should be prepared in order to solve the problem in a methodical and professional manner, making due references to appropriate techniques, technologies and professional standards.

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DEPARTMENT OF SOFTWARE ENGINEERING

M.Sc. SOFTWARE ENGINEERING

CURRICULAM & SYLLABUS

SEMESTER VII

SI NO	Course Code	Course Title	L	T	P	C
THEORY						
1	SE826	Cryptography	4	0	0	4
2	SE827	Advanced JAVA Programming	3	1	0	4
3	SE828	Modeling and Simulation	4	0	0	4
4	SE829	Software Metrics	4	0	0	4
5	Xx8xx3	Elective III	3	0	0	3
6	Xx8xx4	Elective IV	3	0	0	3
PRACTICAL						
7	SE883	Software Engineering Lab I	0	1	2	2
8	SE884	Java Programming Lab	0	1	2	2
TOTAL			21	3	4	26

SE826

CRYPTOGRAPHY

L T P C
4 0 0 4

UNIT I –INTRODUCTION

Security goals- Cryptographic attacks-Services and Mechanisms-Techniques-Mathematics of Cryptography-Integer Arithmetic-Modular Arithmetic-Matrices-Linear Congruence. **12**

UNIT II- SYMMETRIC KEY ENCIPHERMENT

Traditional Symmetric key ciphers-Substitution cipher-Transposition cipher-Stream and block ciphers-Mathematics of Symmetric key cryptography-Algebraic key structures-GF(2n) Fields-Modern symmetric ciphers-Modern block ciphers-Modern stream ciphers. **12**

UNIT III- SYMMETRIC KEY ENCIPHERMENT

Data Encryption Standard-Introduction-DES structure-DES Analysis-Security of DES-Multiple DES-Advanced Encryption Standard-Introduction-Transformations-Key Expansions-AES Ciphers-Examples-Use of modern block ciphers-Use of Stream ciphers. **12**

UNIT IV-ASYMMETRIC KEY ENCIPHERMENT

Mathematics of Asymmetric key cryptography-Primes-Primality testing-Factorization-Chinese Remainder theorem-Quadratic Congruence-Exponentiation and Logarithm. Asymmetric key cryptography-RSA Cryptosystem-Rabin Cryptosystem-El Gamel Cryptosystem-Elliptic Curve Cryptosystem. **12**

UNIT V-INTEGRITY, AUTHENTICATION AND KEY MANAGEMENT

Message Integrity-Random Oracle model-Message authentication-Digital signature-comparison-process-services-attacks-digital signature schemes-Entity authentication-passwords-challenge response-zero knowledge-Bio Metrics. Key management-Symmetric key distribution-Kerberos-Key agreement-Public key distribution-Hijacking. **12**

TOTAL: 60 PERIODS

TEXT BOOK

1. Behrouz.A.Forozoun,DebdeepMukhopadhaya,"Cryptography and Network Security", 2010,Mc-Graw Hill.
2. William Stallings,"Cryptography and Network Security-Principles and practice",2011,Pearson Education.

REFERENCES

1. C.K.Shyamala,N.Harini,Dr.T.R.Padmanabhan,"Cryptograph and Network Security",2011,Wiley India.
2. AbhijitDas,C.E.VeniMadhavan,"Public key cryptography-Theory and practice",2009,Pearson Education.

UNIT-I

The Applet Class – Elements of Graphical User Interfaces-Introduction-Features and Terminology of a GUI-Java Foundation Classes-Event Model- Layout Managers-Events-Painting-Components and facilities for Rich Graphical User Interfaces. Java Beans-Introduction-Component Model-Makes a class a Bean- Bean development Environment-Sun Bean Box-Java Bean Class-Java Bean Properties-Java Bean Class with Events-Bean Info Classes. **9**

UNIT-II

JDBC: JDBC Architecture - Installing the ODBC Driver - Connecting to a Database - Structured Query language. JDBC programming concept: Database URL - Executing the action commands - Query with JDBC - Populating a Database - Executing Queries - Metadata - Scrollable and Updatable Result Sets. **9**

UNIT-III

Network Programming-Introduction-Working with URLs-Working with Sockets-Remote Method Invocation-Remote class of Objects-RMI Server Class-RMI Client Class-JNDI-CORBA, RMI-IIOP and IDL.Security- Introduction- Cryptography-Secure Socket Layer-Security Policy Definition and Enforcement- Java Authentication and Authorization service. **9**

UNIT-IV

Building Web Applications-Introduction-Web Technology of the Web-J2EE Web Application Packaging-Servlets-The Life Cycle of a Servlet-Simple Servlet-Servlet API-Building a Web App With Continuity-Java Server Pages-JSP Tags an API-Java Coding in JSPs-Building Robust Web APPs. **9**

UNIT-V

Enterprise JavaBeans-Introduction-Enterprise Java Beans-Session EJBs-EJB Clients-Entity EJBs-EJB to Database Schema Mapping-Container Managed Persistence-Container Managed Relationships-EJB Query Language-Bean Managed Persistence-Message_Driven Beans-EJB Transactional Characteristics-EJB Security. **9**

T: 15 + L: 45 = TOTAL: 60 PERIODS

TEXT BOOKS

1. Y.Daniel Liang, “Introduction to Java Programming Comprehensive Version”, Prentice Hall Inc., 10th Edition, 2013.
2. Andrew Lee Rubinger and Bill Burke,- “Enterprise Java Beans 3.1” O’REILLY Publishing, Sixth Edition, 2010.
3. Joe Wiggles Worth and Paula McMillan-“JavaTM Programming Advanced Topics”- Thomson Learning Inc. Third Edition,2007

REFERENCES

1. Kogent Learning Solutions Inc.(Author) ,”Java 7 Programming” Dreamtech Press, 2013.
2. Herbert Schildt – “The Complete Reference Java” - Tata McGraw Hill Publishing Company Limited, 7th Edition 2007.
3. DeitelPaul ,Deitel Harvey, “Java How to Program”, Prentice Hall, 9th Edition, 2012.

UNIT I INTRODUCTION

Advantages and Disadvantages, Systems - Components of a system - Types of System - Model of a System – Steps in Simulation Study - Simulation examples(Single server model, Able – Baker problem, News paper seller problem). **12**

UNIT II MODELS IN SIMULATION

Statistical Models – Discrete Distributions – Continuous Distributions – Empirical Distributions, Poisson Process, Queuing models – characteristics, Queuing notations, Simulation Techniques, Monte – Carlo Simulation. **12**

UNIT III RANDOM NUMBERS

Properties of Random numbers, generation of random numbers, Techniques for generating random numbers, tests for random numbers, ψ^2 test, Runs test, Poker test, KolmogrovSimrnov test, Random Variate generation. **12**

UNIT IV SIMULATION LANGUAGES

Introduction to Network Simulator2 NS2 – Basic Architecture – Installation – Directories – Running NS2 Simulator – A Simulation Example. MATLAB: Basic Features – The MATLAB Workspace – Variables – Comments – Complex Numbers – Floating Point Arithmetic – Mathematical Functions – The MATLAB Desktop. Simulation using C++/GPSS/Arena. **12**

UNIT V ANALYSIS OF SIMULATION DATA

Input Modeling – Data Collection, identifying distribution with data, parameter estimation, Goodness-Fit test, selecting input models without data, Multivariate and Time series input models. Verification and Validation of Input Models – Model Building Verification and Validation. **12**

TOTAL: 60 PERIODS**TEXT BOOK**

1. Jerry Banks, John S. Carson, Barry L. Nelson, David M.Nicol, Discrete – Event System Simulation Prentice Hall of India, Delhi, 2008.
2. Duane Hanselman, Bruce Littlefield, “Mastering MATLAB”, Pearson Education, 2011.
3. TeerawatIssariyakul, EkramHossain, “Introduction to Network Simulator NS2”, Springer, 2008.

REFERENCES

1. Geoffrey Gordon, System Simulation, Prentice Hall of India, Delhi, 2005
2. J. Sehriber, Simulation using GPSS-Thomas John Wiley, Singapore, 2001.

UNIT I

Fundamentals of measurement – Measurements in Software Engineering – Scope of Software metrics – Measurement theory – Direct and In-Direct measurement – Scales – Goal question metric – Measuring productivity - Goal based framework – Software measurement validation – Software maturity. **12**

UNIT II

Empirical investigation – Planning experiments – Software metrics data collection - Software measurement data – Analysis techniques – Advanced methods - Planning case studies - Anomalies in data collection – Analysis methods – Statistical methods – Multi attribute utility theory. **12**

UNIT III

Measurement of internal product attributes – Functionality and complexity – Control flow structure - Size and structure – External product attributes – Modularity – Object oriented metrics – General complexity measures - Modeling software quality – Aspects of quality - Measurement of quality. **12**

UNIT IV

Software quality metrics – Product quality – Customer based metrics – Defect density metrics - Process quality – Machine testing – Defect removal - Metrics for software maintenance – Case studies of Metrics Program – Motorola – HP and IBM. **12**

UNIT V

Quality management models – Rayleigh Model – Reliability and predictive validation - Reliability models - Problem Tracking report (PTR) model – Model evaluation – In process metrics – Orthogonal defect classification - Reliability growth model – Model evaluation – Orthogonal defect classification. **12**

TOTAL: 60 PERIODS**TEXT BOOK**

1. Normal. E – Fentor Shari Lawrence Pfllegar, “Software Metrics”, International Thomson Computer Press, 2010.
2. Fenter Norman, E., “Software Metrics ; A Rigorous approach”, Chapmen & Hall, London, 2011.

REFERENCES

1. Stephen H.Kin, “Metric and Models in Software Quality Engineering”, Addison Wesley1995.
2. William. A. Florac and Aretitor D Carletow, “ Measuring Software Process”, Addison –Wesley, 1995.

SE883	SOFTWARE ENGINEERING LAB I	L	T	P	C
		0	1	2	2

1. Preparation of Project Management Plan.
2. Using any of the CASE tools, Practice requirement analysis and specification for different firms.
3. Case study of cost estimation models.
4. Practice object oriented design principles for implementation.
5. Practice function oriented design.
6. Practice creating software documentation for all the phases of software development life cycle with respect to any real time application.
7. Simulate a tool for path testing principles.
8. Simulate a tool for testing based on control structures.
9. Simulate a tools that reflects black box testing concepts

TOTAL: 45 PERIODS

SE884	JAVA PROGRAMMING LAB	L	T	P	C
		0	1	2	2

1. Multithreading Using Priorities
2. File & String Manipulations
3. Write an Applet Program to use various Controls and perform Font Animation.
4. Create a menu with submenu, popup menu, short cut keys, check box items and separator.
5. Implement calculator using Java AWT controls.
6. Create a Student mark statement using JDBC control and display the information using Table.
7. Program to implement Client/Server technology.
8. Write a Java program to create an Employee pay bill calculation using various swing controls.

TOTAL: 45 PERIODS

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SEMESTER VIII

SI NO	Course Code	Course Title	L	T	P	C
THEORY						
1	SE830	Software Testing	4	0	0	4
2	SE831	Web Technology and Web Services	3	1	0	4
3	SE832	Information Security	4	0	0	4
4	SE833	Management Information System	4	0	0	4
5	Xx8xx5	Elective V	3	0	0	3
6	Xx8xx6	Elective VI	3	0	0	3
PRACTICAL						
7	SE885	Web Technology Lab	0	1	2	2
8	SE886	Software Engineering Lab II	0	1	2	2
TOTAL			21	3	4	26

SE830

SOFTWARE TESTING

L T P C
4 0 0 4

UNIT I

Assessing Testing Capabilities and Competencies – Assessing Capabilities, Staff Competency, and User Satisfaction. Building a Software Testing Environment – Creating an Environment Supportive of Software Testing – Minimizing Risks – Policy for Software Testing – Economics of Testing – Testing an Organizational Issue – Management Support for Software Testing – Structured Approach to Software Testing – Developing a Test Strategy

12

UNIT II

Building the Software Testing Process – Software Testing Guidelines – Workbench Concept – Customizing Software Testing Process – Process Preparation Checklist. Selecting and Installing Software Testing Tools – Integrating Tools – Available Tools – Selecting and Using Tools – Training Testers – Appointing Tool Managers.

12

UNIT III

The Seven Step Testing Process - Overview of the Software Testing Process – Advantages – Cost – Seven Step Process – Workbench Skills – Organizing for Testing – Objective – Workbench – Input – Do Procedures – Check Procedures – Output. Developing the Test Plan – Overview – Objective – Concerns – Workbench –Input – Do Procedures – Check Procedures – Output.

12

UNIT IV

Verification Testing - Overview – Objective – Concerns – Workbench –Input – Do Procedures – Test during Requirements Phase – Test During Design Phase – Test During Programming Phase - Check Procedures – Output. Validation Testing - Overview – Objective – Concerns – Workbench –Input – Do Procedures – Build Test Data – Execute Tests – Record Test Results - Check Procedures – Output.

12

UNIT V

Analyzing and Reporting Test Results - Overview – Objective – Concerns – Workbench – Input – Do Procedures – Check Procedures – Output. Acceptance Testing - Overview – Objective – Concerns – Workbench –Input – Do Procedures – Check Procedures – Output. Post Implementation Analysis - Overview – Objective – Concerns – Workbench –Input – Do Procedures – Check Procedures – Output.

12

TOTAL: 60 PERIODS

TEST BOOK

1. William E.Perry, “Effective Methods for Software Testing”, Third Edition, Wiley-India Edition., 2012.

REFERENCE

1. Gopalswamy Ramesh, SrinivasanDesikan, “Software Testing Principles and Practices”,pearson Pub, 2012.
2. Boris Beizer, “Software Testing Techniques”, Second Edition, dreamTech Press, 2011.

SE831	WEB TECHNOLOGY AND WEB SERVICES	L	T	P	C
		3	1	0	4

UNIT I

Internet networking concepts – Devices – Repeaters – Bridges – Routers – Gateways – Topology Architecture of an ISP – IP Address – Transaction Control Protocol – Features of TECP – UDP – DNS – Email – FTP – HTTP – TELNET. **9**

UNIT II

E commerce and Web technology – Aspects and Types – E-procurement models – Supply chain management – Customer Relationship Management – Enabling e-commerce – Web page – Tier architecture – Concepts of Tier – Static Web pages – Dynamic Web pages – DHTML – CGI – Basics of ASP technology – Active Web pages. **9**

UNIT III

Security issues in Transaction Management – Sessions and session Management – Maintaining state information – TP monitors – ORB – Component transaction – monitor – E J B – cryptography – Digital signature and certificates – Secure Socket Layer (SSL) – Credit card Processing Models – Secure Electronic Transaction – 3D Secure Protocol – Electronic money. **9**

UNIT IV

Electronic Data Interchange - XML and WAP – Overview of EDI – Data Exchange Standards – EDI Architecture – EDI and the Internet – Basics of XML – XML Parsers – Need for a standard – Limitations of Mobile Devices – WAP Architecture – WAP stack. **9**

UNIT V

Online Applications - Online Shopping – Online databases – Emerging technologies - Monitoring user events – Need for .NET - Overview of .NET - .NET Framework – Web services. **9**

L: 45 + T: 15 = TOTAL: 60

TEXT BOOK

1. Achyut.S.Godbole and AtulKahate, “Web Technologies”, Tata McGraw Hill, Delhi, 2003.

REFERENCES

1. Ellote Rusty Harold, “Java Network Programming”, O’Reilly Publications, 1997.
2. Jason Hunter, William Crawford, “Java Servlet Programming”, O’Reilly Publications, 1998.

SE832	INFORMATION SECURITY	L	T	P	C
		4	0	0	4

UNIT - 1: INTRODUCTION

History, What is Information Security?, Key Information Security Concepts, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC **12**

UNIT - 2: SECURITY INVESTIGATION

Need for Security, Business Needs, Threats, Attacks, Secure Software Development, Legal, Ethical and Professional Issues, Ethics and Information Security, Codes of Ethics and Professional Organizations. **12**

UNIT - 3: SECURITY ANALYSIS

Risk Management: Overview, Risk Identification, Assessing Risk, Assessing and Controlling Risk, Selecting Risk Control Strategies, Selecting a Risk control Strategy, Risk Management Discussion Points. **12**

UNIT - 4: LOGICAL DESIGN

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity **12**

UNIT - 5: PHYSICAL DESIGN

Security Technology, IDS, Honey pots, Honey nets and Padded Cell Systems, Scanning and Analysis Tools, Biometric Access Control, Cryptography, Access Control Devices, Physical Security, Security and Personnel **12**

TOTAL 60: PERIODS**TEXT BOOKS**

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

REFERENCES

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.

SE833**MANAGEMENT INFORMATION
SYSTEMS****L T P C
4 0 0 4****UNIT I INTRODUCTION**

Overview – Structure of MIS – Survey of Information System Technology – Hardware, Software and Communication or Information – Storage and Retrieval of Data – Transactions Processing, Office Automation and Information Processing Control Function. **12**

UNIT II CONCEPTIONAL FOUNDATIONS

Design making Process – Concept of Information – Human as Information Processors – System Concepts – Concepts of Planning and Control – Organizational Structure and Management Concepts. **12**

UNIT III INFORMATION BASED SUPPORT SYSTEMS

Support System for Planning, Control and Decision making – Support System for Management for Knowledge work – Decision Support Systems. **12**

UNIT IV INFORMATION SYSTEM REQUIREMENTS

Developing a long range Information System – Plan Strategies for the determination of Information requirement – Database requirement – User interface requirements. **12**

UNIT V DEVELOPMENT, IMPLEMENTATION AND MANAGEMENT OF INFORMATION SYSTEM RESOURCES

Developing and Implementing Application Systems – Quality Assurance and Evaluation of Information Systems – Organization and Management of the Information Resources – Further Development and their Organizational and Social Implications **12**

TOTAL: 60 PERIODS

TEXT BOOK

1. Gordan B Davis and Megrette H Olson, "Management Information Systems", McGraw Hill,2007

REFERENCES:

1. Murdick and Ross, "Information System for Modern Management", Prentice Hall of India,1997.
2. David Kroenke, "Management Information Systems", McGraw Hill International Editions,

SE885

WEB TECHNOLOGY LAB

L	T	P	C
0	1	2	2

Creating applications using web development tools

1. HTML & VB Script
2. XML - DTD
3. XML - XSL
4. XML - CSS
5. Translating EDifact document to XML
6. Active Server Pages
7. Java Server Pages
8. Java Servlets
9. .NET Platform
10. C# in .NET Platform

SE886

SOFTWARE ENGINEERING LAB II

L	T	P	C
0	1	2	2

1. Simulate a process maturity model for a function ie., test the function at various loads.
2. Implement some of the software quality assurance factors.
3. Practice software configuration management principles.
4. Implement a tool for data gathering.
5. Develop a tool for process analysis and modelling.
6. Simulate a model that takes care of personnel training in software industry.
7. Implement a capability maturity model for any of the software firm.
8. Simulate the defect prevent model.
9. Case Study – Software standards for different phases of software development life cycle.

TOTAL: 45 PERIODS

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DEPARTMENT OF SOFTWARE ENGINEERING

M.Sc. SOFTWARE ENGINEERING

CURRICULAM & SYLLABUS

SEMESTER IX

SI NO	Course Code	Course Title	L	T	P	C
THEORY						
1	SE834	Software Project Management	4	0	0	4
2	SE835	Software Communication and Documentation	4	0	0	4
3	Xx8xx7	Elective VII	3	0	0	3
4	Xx8xx8	Elective VIII	3	0	0	3
5	Xx8xx9	Elective IX	3	0	0	3
6	Xx8xx10	Elective X	3	0	0	3
PRACTICAL						
7	SE887	Software Engineering Lab III	0	1	2	2
TOTAL			20	1	2	22

UNIT: I**12**

Conventional Software Management: The Waterfall Model, Conventional Software Management Performance. Evolution of Software Economics: Software Economics, Pragmatic Software Cost Estimation. Improving Software Economics: Reducing Software Product Size, Improving Software Processes, Improving Team Effectiveness, Improving Automation through Software Environments, Achieving Required Quality, Peer Inspections- A Pragmatic View. The Old Way and the New: The Principles of Conventional Software Engineering, The Principles of Modern Software Management, and Transitioning to an Iterative Process. Life-Cycle Phases: Engineering and Production Stages, Inception Phase, Elaboration Phase, Construction Phase, Transition Phase (Chapters 1 to 5)

UNIT: II**12**

Artifacts of the Process: The Artifact Sets, Management Artifacts, Engineering Artifacts, Pragmatic Artifacts. Model-Based Software Architectures: A Management Perspective, A Technical Perspective. Workflows of the Process: Software Process Workflows, Iteration Workflows. Checkpoints of the Process: Major Milestones, Minor Milestones, Periodic Status Assessments. Iterative Process Planning: Work Breakdown Structures, Planning Guidelines, The Cost and Schedule Estimating Process, The Iteration Planning Process, Pragmatic Planning. Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, Evolution of Organizations. (Chapters 6 to 11).

UNIT: III**12**

Process Automation: Tools- Automation Building Blocks, The Project Environment. Project Control and Process Instrumentation: The Seven Core Metrics, Management Indicators, Quality Indicators, Life-Cycle Expectations, Pragmatic Software Metrics, Metrics Automation. Tailoring the Process: Process Discriminants, Example- Small-Scale Project versus Large-Scale Project. Modern Project Profiles: Continuous Integration, Early Risk Resolution, Evolutionary Requirements, Teamwork among Stakeholders, Top 10 Software Management Best Practices. Next-Generation Software Economics: Next-Generation Cost Models, Modern Software Economics. Modern Process Transitions: Culture Shifts, Denouement. (Chapters 12 to 17).

UNIT: IV**12**

The State of the Practice in Software Management, The COCOMO Cost Estimation Model: COCOMO, Ada COCOMO, COCOMO II. Change Metrics: Metrics Deviation, Pragmatic Change Metrics. Process Improvement and Mapping to the CMM: CMM Overview, Pragmatic Process Improvement, Maturity Questionnaire, Questions Not Asked by the Maturity Questionnaire, Overall Process Assessment. (Appendices A, B, C, E).

UNIT: V**12**

CCPDS-R Case Study: Context for the Case Study, Common Subsystem Overview, Project Organization, Common Subsystem, Product Overview, Process Overview, Demonstration-Based Assessment, Core Metrics, Other Metrics, People Factors, Conclusions. (Appendix D).

TOTAL 60: PERIODS

TEXT BOOK

1. S.A. Kelkar, "Software Project Management – A Concise Study", III Edition, PHI Learning PV Ltd. 2013.
2. Walker Royce, Software Project Management – A unified Framework, Addison-Wesley, 1998

REFERENCE BOOKS

1. Mike Cotterell, Bob Hughes, 'Software Project Management'. Inclination, Thomas Computer Press, 1995.
2. Darrel Ince, H. Sharp and M. Woodman, 'Introduction to Software Project Management and Quality Assurance', Tata MacGraw Hill 1995.

SE835	SOFTWARE COMMUNICATION AND DOCUMENTATION	L	T	P	C
		4	0	0	4

UNIT I

12

Importance of communication and documentation; Different types of communications; Spoken communication; written communication; Different types of documentation.

UNIT II

12

Elements of good individual communication – getting over nervousness – organizing one self – characteristics of effective communication – augmenting spoken words by actions and other means – other aspects of spoken communication like speeches; presentation; use of visual aids.

UNIT III

12

Meeting – Effective participation – effective management of meetings – preparing minutes – "Virtual" meetings – audio conference – video conference – use of collaboration tools.

UNIT IV

12

Principles of effective written communication – differences between written communication and spoken communication – resume writing – email; effective email techniques – proposals – contracts – user guides – external and internal technical documentation for software – users guides – letters and different types of letters – legal issue.

UNIT V

12

Use of various tools and technologies – need for standardization – role of processes and standards in documentation – on-line help – Impact of internet on documentation – common challenges in the harnessing of technology ; course summary.

TOTAL: 60 PERIODS

TEXT BOOK

1. Thomas T. Barker, "Writing Software Documentation – A Task Oriented Approach", II Edition, Pearson, 2008.

2. Huckin, et al, Technical Writing and Professional Communication, McGraw Hill, 1991.
3. Ron Ludlow and Fergus Panton, The Essence of Effective Communication, PHI (P) Ltd.,New Delhi, 1995.

REFERENCES

1. W.R. Gordin and Edward W. Mammen : The Art of Speaking Made Simple, Rupa&Co.,1982.
2. SushilBahl : Business Communication Today, Response Books, New Delhi, 1996.
3. Eyre, Effective Communication Made Simple, W.H. Allen, London, 1979.
4. Gloria Wilson and Garry Bitter, Learning Media Design (Text and CD Rom), PHI (P) Ltd., New Delhi, 1998.
5. Simmon Collin – Multimedia Made Simple Asian Books (P) New Delhi, 1996.
6. Bennet – Illustrated World of DTP Dreamland Publications, New Delhi, 1998.

SE887	SOFTWARE ENGINEERING LAB III	L	T	P	C
		0	1	2	2
<ol style="list-style-type: none"> 1. Implement all the phases of software developments life cycle using any of the commercially. 2. Implement reusability features. 3. Design and develop application object oriented models. 4. Practice component object model. 5. Implement a tool for knowledge based software engineering. 6. Practice the concepts and principles of data engineering. 7. Develop a tool that implements reverse engineering. 8. Practice the reengineering concepts and principles. 					

TOTAL: 45 PERIODS

NOORUL ISLAM CENTRE FOR HIGHER EDUCATION

NOORUL ISLAM UNIVERSITY, KUMARACOIL

DEPARTMENT OF SOFTWARE ENGINEERING

M.Sc. SOFTWARE ENGINEERING

CURRICULAM & SYLLABUS

SEMESTER X

SI NO	Course Code	Course Title	L	T	P	C
PRACTICAL						
1	SE8P5	Project Work	0	0	32	16
TOTAL			0	0	32	16

**NOORUL ISLAM CENTRE FOR HIGHER EDUCATION
NOORUL ISLAM UNIVERSITY, KUMARACOIL
M.Sc. SOFTWARE ENGINEERING (5 Years)**

LIST OF ELECTIVES

SL. No.	Course Code	Course Title	L	T	P	C
1.	SE8A1	Software Reuse	3	0	0	3
2.	SE8A2	Wireless Technology	3	0	0	3
3.	SE8A3	Virtualization And Cloud Computing	3	0	0	3
4.	SE8A4	Client Server Computing	3	0	0	3
5.	SE8A5	Mobile Computing	3	0	0	3
6.	SE8A6	Extreme Programming	3	0	0	3
7.	SE8A7	Image Processing	3	0	0	3
8.	SE8A8	Design Patterns	3	0	0	3
9.	SE8A9	Decision Support System	3	0	0	3
10.	SE8B1	Distributed Operating System	3	0	0	3
11.	SE8B2	Mobile Application Development	3	0	0	3
12.	SE8B3	Software Agents	3	0	0	3
13.	SE8B4	Network Protocols	3	0	0	3
14.	SE8B5	Advanced Database Management Systems	3	0	0	3
15.	SE8B6	Data Mining and Data Warehousing	3	0	0	3
16.	SE8B7	Soft Computing	3	0	0	3
17.	SE8B8	Software Reliability	3	0	0	3
18.	SE8B9	Personal Software Process and Team Software Process	3	0	0	3
19.	SE8C1	Enterprise Resource Planning	3	0	0	3
20.	SE8C2	Open Source Systems	3	0	0	3

SE8A1

SOFTWARE REUSE

L T P C
3 0 0 3

UNIT I: INTRODUCTION

Introduction – Motivation for Reuse – Reuse driven organizations – Managing a reuse project – the characteristics of reuse of projects – Roles in reuse projects – Adopting a project to reuse – Reuse tools. **9**

UNIT II: REUSE METRICS

Managing a repository – The REBOOT component model – Classification – Configuration management of the repository– Computer supported cooperative working – Process metrics for reuse – Product metrics – Cost estimation – Forming a reuse strategy – Assessing reuse maturity. **9**

UNIT III: REUSABLE COMPONENTS

Practicing reuse – Generic reuse development process– Develop with reuse – Testing reusable components– Technique and life cycles – Object oriented development for reuse – Architectural and Detailed design for reuse – Implementation – Verification testing and validation. **9**

UNIT IV: REUSE PHASES

Development with reuse – specific activities – Common reuse processes – Phases of development with reuse – Impact of reuse on development cycle. **9**

UNIT V: CLEAN ROOM SOFTWARE ENGINEERING

Re-engineering for reuse – Methodology – Retrieving objects in non-object oriented code – Measurements – Tools support for reengineering - Over view of clean room software engineering – Phases in clean room method – Box structures algorithms – Adapting the box structures. **9**

TOTAL: 45 PERIODS

TEXT BOOKS

1. Even-Andre'Karisson, "Software Reuse – A Holistic Approach, John Wiley and Sons, 1996.
2. Karma McClure, "Software Reuse Techniques – Additional reuse to the systems development", Prentice Hall, 1997.

REFERENCES

1. Ivar Jacobson, Martin Griss and Patrick Johnson, "Software Reuse ; Architecture, Process and Organization for business success", ACM press / Addison Wesley, New York, 1997.

SE8A2 WIRELESS TECHNOLOGY

L T P C
3 0 0 3

UNIT I

Characteristics of Wireless Medium - Introduction – Comparison of Wired and Wireless Medium – Radio Propagation Mechanisms – Path Loss Modeling and Signal Coverage – Channel Measurement and Modeling Techniques – What is dB?. **9**

UNIT II

Physical Layer Alternatives for Wireless Networks - Short Distance Baseband Transmission – Traditional Digital Cellular Transmission – Spread Spectrum Transmissions. **9**

UNIT III

Fixed Assignment Access for Voice Oriented Networks – Random Access for Data Oriented Networks – Network Planning – Introduction – Wireless Network Topologies – Cellular Topology. **9**

UNIT IV

GSM and TDMA Technology – What is GSM? – Services – Reference Architecture – CDMA Technology, IS95, IMT2000 – Introduction – Reference Architecture – IS634 Standard – IS41 Standard – IMT2000. **9**

UNIT V

IEEE 802.11 WLANs – Introduction – The PHY Layer – MAC Sublayer – Adhoc Networking – HomeRF – Bluetooth – Wireless Geo Location Systems – System Architecture – Technologies for Wireless Geo Location. **9**

TOTAL: 45 PERIODS

TEXT BOOK

1. Kaveh Pahlavan, Prashanth Kirishnamurthy, “Principles of Wireless Networks – A Unified Approach”, PHI Learning Private Limited, 2009.

REFERENCES

2. Gary S. Rogers, John Edwards, “ An Introduction to Wireless Technology”, Pearson Education, 2009.
3. Lars Ahlin, Jens Zander, Ben Slimance, “Principles of Wireless Communications”, OverSeas Press, 2008.

SE8A3

**VIRTUALIZATION AND CLOUD
COMPUTING**

**L T P C
3 0 0 3**

UNIT I CLOUD COMPUTING

Understanding the Cloud Computing – Cloud Architecture – Cloud Storage – Advantages, Disadvantages of Cloud Computing – Companies in the Cloud Today – Developing Cloud Services – Web:Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On:Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds **9**

UNIT II CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules, To:Do Lists, Contact Lists and Group Projects and Events – Cloud Computing for the Community and Corporation, Using Cloud Services: Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications, Online Planning and Task Management – Collaborating on Event Management, Contact Management, Project Management, Word Processing and Databases – Storing and Sharing Files **9**

UNIT III VIRTUALIZATION & CLOUD COMPUTING

Virtualization & Cloud Computing Overview – Case Study: Enterprise Virtualization & Cloud Computing – Definitions – Hypervisor / Virtual Machine Monitor Architecture – CPU Virtualization Extensions – Network and Storage Virtualization Architecture **9**

UNIT IV VIRTUALIZED ENTERPRISE

Smashing the Virtualized Stack – Case Study: Owning the Virtualized Enterprise – CPU & Chipsets – VMM/Hypervisor/Host – VMs/Guest – Control & Management planes & APIs. **9**

UNIT V CLOUD SECURITY AND PRIVACY

Infrastructure security – Data Security and Storage – Identity and access management – Security management in the cloud – privacy – Security as a cloud service. **9**

TOTAL: 45 PERIODS

TEXT BOOK

1. Michael Miller, Cloud Computing: Web:Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

REFERENCES

1. Christofer Hoff, Rich Mogull, Craig Balding, Hacking Exposed: Virtualization & Cloud Computing: Secrets & Solutions [Paperback], McGraw:Hill Osborne .
2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On:demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.
3. Tim Mather, Subra Kumaraswamy, Shahed Latif, Cloud Security and Privacy – An Enterprise Perspective on Risks and Compliance, By O'Reilly Media, 2009

UNIT I

Basic concepts of Client / Server – Upsizing Down sizing – Right sizing – Characteristics – File servers – Database servers – Transactions servers – Groupware servers – Object Client/Servers – Web Servers – Middleware.

Client / Server building blocks – Operating System services – Base services – External services – server scalability – Remote procedure calls – Multiservers. **9**

UNIT II

SQL Database servers – server architecture – Multithread architecture – Hybrid architecture – stored Procedures – Triggers – Rules – Client / Server Transaction Processing – Transaction models – Chained and nested transactions – Transaction processing monitors – Transaction Management Standards. **9**

UNIT III

Database Connectivity solutions : ODBC – The need for Database connectivity – Design overview of ODBC – Architecture – components – Applications – Driver Managers – Drivers – Data sources – ODBC 2.5 and ODBC 3.0. **9**

UNIT IV

Visual C++: The Windows Programming Model – GDI – resource based programming – DLL and OLE Applications – Visual C++ components – frame work / MFC class Library – basic event handling – SDI – Appwizard – ClassWizard – Model and Models dialogues – other controls – Examples. **9**

UNIT V

Multiple Document Interface – Data Management with Microsoft ODBC – OLE client – OLE server – Client / Server Data Exchange format – Dynamic Data Exchange. **9**

TOTAL: 45 PERIODS**TEXT BOOKS**

1. Robert Orfali, Dan Harkey and Jerri Edwards, Essential Client / Server Survival Guide, John Wiley and sons Inc. 2007.
2. Client/Server computing by Dewire, Tata MC Graw – Hill Education 2003.
3. David J. Kruglinski, Inside Visual C++, Microsoft Press 1992.

REFERENCES

1. Boar, B.H., Implementing Client / Server Computing ; A Strategic Perspectre, McGraw Hill, 1993.
2. Bouce Elbert, Client / Server Computing, Artech. Press, 1994.
3. Alex Berson, Client / Server Architecture, McGraw Hill, 1996.

SE8A5

MOBILE COMPUTING

L T P C
3 0 0 3

UNIT I INTRODUCTION

Mobile and Wireless Devices – Simplified Reference Model – Need for Mobile Computing – Wireless Transmissions – Multiplexing – Spread Spectrum and Cellular Systems – Medium Access Control – Comparisons. **9**

UNIT II TELECOMMUNICATION SYSTEMS

Telecommunication Systems – GSM – Architecture – Sessions – Protocols – Hand Over - Security – DECT - TETRA – Satellite Systems – GEO – LEO - MEO. **9**

UNIT III WIRELESS LAN

IEEE 802.11 – System Architecture – Protocol Architecture – Medium Access Control Layer – MAC Management - Hiper LAN – Hiper LAN1 - WATM – BRAN - Bluetooth – Architecture - Radio layer – Baseband layer - Security - Link Manager Protocol. **9**

UNIT IV MOBILE NETWORK LAYER

Mobile IP - Goals – Packet Delivery – Agent Discovery – Registration – Tunneling - Reverse Tunneling – DHCP - Mobile Adhoc Networks – Routing – Destination sequence distance vector – Dynamic source routing **9**

UNIT V WIRELESS APPLICATION PROTOCOL

WWW – HTTP – HTML - WAP Architecture – Wireless Datagram Protocol – Wireless Transport Layer Security - Wireless Transaction Protocol - Wireless Application Environment - Wireless Session Protocol – Wireless Markup Language - WML Script – Wireless Telephony Applications. **9**

TOTAL: 45 PERIODS

TEXT BOOK

1. Jochen Schiller, “Mobile Communications”, Pearson Education, Delhi, 2000.

REFERENCE

1. Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Danil Mouney, Jari Alvinen, David Bevis, Jim Chan and Stetan Hild, “ The Wireless Application Protocol : Writing Applications for the Mobile Internet”, Pearson Education Delhi, 2001.

SE8A6 EXTREME PROGRAMMING

L T P C
3 0 0 3

UNIT I

Introducing C# - Understanding .Net: The C# environment – Overview of C# - Literals, variables and Data Types – Operators and Expressions. **9**

UNIT II

Decision Making, Branching and Looping – if, if...else, switch, ...? : operators, while, do, for, foreach and jump in loops, Methods in C# - declaring methods, the main method, invoking methods, nesting methods, method parameters, pass by value and pass by reference, output parameters, Variable argument lists – Overloading methods. **9**

UNIT III

Arrays – Creating an array, Variable size arrays, Array list class – Manipulating Strings – Structures, Nested Structures – Enumerations, Initialization, base types and type conversion. **9**

UNIT IV

Classes and Objects – Definition, Creating objects, Constructors and destructors, Nesting, Overloaded constructors, Inheritance and Polymorphism – classical, multilevel, hierarchical inheritances, Subclass, Subclass constructors, Overriding methods, Abstract Classes and Methods, Interfaces, Interfaces and Inheritance – Operator Overloading. **9**

UNIT V

Delegates – Declaration Methods, Initialization and Invocation, Multicast delegates, I/O operations – Console Input/Output, Formatting, Errors and Exceptions, Type of Errors – Exceptions – Exception for debugging. **9**

TOTAL: 45 PERIODS

TEXT BOOK

1. E. Balagurusamy, Programming in C#, Tata Mc-Graw Hill Publishing Company, New Delhi, 2002.

REFERENCES

1. Selvi, T. A Text book on C# : A Systematic approach to object oriented programming, Pearson Education, Delhi, 2003.
2. Lippman, C# Primer, 3rd Edition, Pearson Education, Delhi, 2002.
3. Liberty, J. Programming C#, Second Edition, O'Reilly & Associates Inc., California, 2002.
4. Albahari, B. Prayton, P. and Marill, B. C# Essentials, O'Reilly & Associates Inc., California, 2002.

SE8A7	IMAGE PROCESSING	L	T	P	C
		3	0	0	3

UNIT I

Introduction – Digital Image Processing – Origin – Examples of Fields – Fundamental Steps – Components - Digital Image Fundamentals – Elements of Visual Perception – Light and Electromagnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization. **9**

UNIT II

Spatial Filtering – Histogram Processing – Smoothing Spatial Filters – Sharpening Spatial Filters – Filtering in Frequency Domain – Preliminary Concepts – Smoothing Using Frequency Domain Filters – Sharpening using Frequency Domain Filters. **9**

UNIT III

Image Restoration and Reconstruction – Noise Models – Restoration by Spatial Filtering – Periodic Noise Reduction by Frequency Domain Filtering – Color Image Processing – Color Models – Color Transformations – Smoothing and Sharpening – Image Segmentation based on Color. **9**

UNIT IV

Wavelets and Multiresolution Processing – Background – Multiresolution Expansions – Image Compression – Fundamentals – Basic Compression Methods – Huffman Coding – Arithmetic Coding – LZW Coding – Run-Length Coding – Morphological Image Processing –Erosion and Dilation – Basic Morphological Algorithms. **9**

UNIT V

Image Segmentation – Point, Line and Edge Detection – Detection of Isolated Points – Line Detection – Edge Detection – Thresholding – Global Thresholding – Multiple Thresholds – Variable Thresholding – Region-based Segmentation – Watershed Segmentation Algorithm – Representation and Description – Boundary Descriptors – Regional Descriptors – Object Recognition – Structural Methods. **9**

TOTAL: 45 PERIODS

TEXT BOOK:

1. Rafael C.Gonzalez, Richard E.Woods, “Digital Image Processing”, Third Edition, Pearson Education, 2011.

REFERENCES

1. S.Jayaraman, S.Esakkirajan, T.Veerakumar, “Digital Image Processing”, TataMcGrawHill Education Private Ltd,2011.
2. Anil K.Jain, “Fundamentals of Digital Image Processing”, PHI Learning Private Ltd, 2010.

UNIT –I

Introduction: What Is a Design Pattern? - Design Patterns in Smalltalk MVC - Describing Design Patterns - The Catalog of Design Patterns - Organizing the Catalog - How Design Patterns Solve Design Problems - How to Select a Design Pattern - How to Use a Design Pattern? **9**

UNIT-II

A Case Study: Designing a Document Editor- Design Problems - Document Structure – Formatting - writing patterns - Embellishing the User Interface - Supporting Multiple Look-and-Feel Standards - Supporting Multiple Window Systems - User Operations Spelling Checking and Hyphenation - Summary. **9**

UNIT-III

Creational Patterns: Abstract Factory – Builder - Factory Method – Prototype – Singleton - Discussion of Creational Patterns. Structural Pattern Part-I : Adapter – Bridge - Composite. Structural Pattern Part-II : Decorator – façade – Flyweight - Proxy. **9**

UNIT-IV.

Behavioral Patterns Part-I : Chain of Responsibility – Command – Interpreter - Iterator. Behavioral Patterns Part-II : Mediator – Memento – Observer – State – Strategy - Template Method – Visitor - Discussion of Behavioral Patterns. **9**

UNIT-V

Algorithms and frameworks for patterns - Anti-patterns – Case studies in UML and CORBA - What to Expect from Design Patterns - A Brief History - The Pattern Community An Invitation - A Parting Thought. **9**

TOTAL: 45 PERIODS

TEXT BOOKS

1. Eric Gamma, Richard Helm, Ralph Johnson, John Vlissides, Grady Booch, Design Patterns, Addison Wesley, 1995.
2. Craig Larman, Applying UML and Patterns Prentice Hall, 1998.

REFERENCES

1. Thomas Mowbray and Raphael Malveaux, CORBA and Design Patterns, John Wiley, 1997.
2. William J Brown et al, Anti-Patterns: Refactoring Software, Architectures and Projects in Crisis, John Wiley, 1998.

SE8A9

DECISION SUPPORT SYSTEM

L T P C
3 0 0 3

UNIT I

Concepts in general management: Introduction-planning-organizing-directing-controlling-Information systems : Human information processing models-Types of information system-Decision support systems: Introduction-subsystems in DSS-Computer hardware for DSS – Group decision support system. **9**

UNIT II

Database Management systems: Introduction-Information Characteristics-Pre database system –Various faces of database-Data base models-CODD’s Rule for Relational Data base-Architectural of a DBMS-Data Base Languages- Model Base Management Systems: Introduction-Representation of models-Management science models-Computer Software for DSS Model **9**

UNIT III

Dialogue management subsystem: Introduction-Classification of users-Interface styles-Horizontal pop ups-icon based systems – hardware and software technologies of DSS: Introduction-storage technologies-Applications of distributed computer system-client server technology-object oriented system-ATM technology –New directions in computing-Holographic storage **9**

UNIT IV

Artificial intelligence expert systems applied to DSS: Introduction-Artificial intelligence-Knowledge Representation-application Areas-Expert systems-Knowledge Engineering-Limitations of Expert systems – Internet :Introduction-TCP/IP-Internet Browsers-Web Authoring Tools-Fire walls-EXTRANETS. **9**

UNIT V

Electronic Data Interchange: Components of EDI-EDI standards-EDI Software-Security in EDI-Computer networks: Classification of Computer Networks-Network Topologies-IEEE standards for LAN- Error detection and correction method in Networks using Hamming Code – Example of a DSS software – Interactive Financial Planning System (IFPS). **9**

TOTAL: 45 PERIODS

TEXT BOOK

1. Janakiraman V.S. and Sarukesi, Decision Support System, Prentice Hall of India, New Delhi, 1999.
2. Decision Support Systems and intelligent systems. Efrain Turban, Jay E. Aronson, 7th Edition, Pearson/Prentice Hall 2005

REFERENCES

1. Decision support system in the 21st century, George M. Marakas, Prentice Hall 2003.

2. Decision Support Systems: Concepts and Resources for managers, Daniel J. Power, Greenwood Publishing group,2002

SE8B1	DISTRIBUTED OPERATING SYSTEMS	L	T	P	C
		3	0	0	3

UNIT I

Fundamentals – evolution – System Models – Distributed operating System – Issues – Distributed Computing environment Message passing – Introduction – Features – Issues – Synchronization – Buffering – Message – Encoding – Decoding – Process addressing – Failure Handling. **9**

UNIT II

Remote Procedure calls – Introduction – Model – Transparency – Implementation – Stub Generation – Messages – Marshaling Arguments and results –server Management – Parameter passing Semantics - Call Semantics – Communication Protocols – Complicated RPC's – Client – Server Binding – Exception handling – Security Distributed shared Memory – Introduction – Architecture – Issues – Granularity Structure – Consistency Models – Replacement Strategy – Thrashing. **9**

UNIT III

Synchronization – Introduction – Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock – Handling Deadlocks in Distributed System - Election Algorithms- A Ring Algorithm. **9**

UNIT IV

Resource Management – Introduction – Features – Task Assignment approach – Load-Balancing Approach - Load -Sharing Approach Process Management – Introduction – Process Migration – Threads. **9**

UNIT V

Distributed File Systems – Introduction – Features – File Models – Accessing Models – Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles Naming – Introduction – Features – Terminologies – Concepts. **9**

TOTAL: 45 PERIODS

TEXT BOOK

1. Pradeep K. Sinha, “Distributed Operating Systems, Concepts and Design” Prentice Hall of India, New Delhi, 2001.

REFERENCES

1. Andrew S. Tanenbaum “Distributed Operating Systems”, Pearson Education, Delhi, 2002.
2. Mukesh Singhal and Nirajan G.Shivaratri “Advanced Concepts in Operating Systems”, Tata McGraw Hill Publishing Company, New Delhi, 2001.

SE8B2	MOBILE APPLICATION DEVELOPMENT	L	T	P	C
		3	0	0	3

UNIT I: MOBILE COMPUTING FUNDAMENTALS **9**
 Mobile Computing-Introduction, Architecture for Mobile Computing, Three-Tier Architecture, Design Considerations for Mobile Computing, Mobile Computing through Internet, Mobile Computing through Telephony.

UNIT II: GETTING STARTED WITH MOBILITY **9**
 Mobility landscape, Mobile platforms, Mobile appsdevelopment, Overview of Android platform, setting up the mobile app development environment along with an emulator, a case study on Mobile app development.

UNIT III: BUILDING BLOCKS OF MOBILE APPS **9**
 App user interface designing – mobile UI resources (Layout,UElements,Draw-able, Menu), Activity- states and life cycle, interaction amongst activities.App functionality beyond user interface –Threads,Asynctask,Services – states and lifecycle, Notifications, Broadcastreceivers,Telephony and SMS APIs. Native data handling – on-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet)

UNIT IV: SPRUCING UP MOBILE APPS **9**
 Graphics and animation – custom views, canvas, animation APIs, multimedia – audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope).

UNIT V: TESTING MOBILE APPS AND TAKING APPS TO MARKET **9**
 Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, Junit for Android, Robotium, MonkeyTalk, Versioning, signing and packaging mobile apps, distributing apps on mobile market place.

TOTAL 45: PERIODS

TEXT BOOK

1. AnubhavPradhan, Anil V Deshpande“ Mobile Apps Development” SAMS, Edition: I, 2013.

REFERENCE BOOK

1. Barry Burd, “Android Application Development All in one for Dummies”, SAMS, Edition: I
2. Anil V Deshpande “Teach Yourself Android Application Development In 24 Hours” SAMS, Edition: I

SE8B3	SOFTWARE AGENTS	L	T	P	C
		3	0	0	3

UNIT I AGENTS – OVERVIEW
 Agent Definition – Agent programming Paradigms – Agents Vs Objects – Aglet – Mobile Agents – Agent Frameworks – Agent Reasoning. **9**

UNIT II JAVA AGENTS

Processes – threads – daemons – Components – Java Beans – ActiveX – Sockets, RPCs – Distributed Computing – Aglets Programming – Jini Architecture – Actors and Agents – Typed and proactive messages. 9

UNIT III MULTIAGENT SYSTEMS

Interaction between agents – Reactive Agents – Cognitive Agents – Interaction protocols – Agent coordination – Agent negotiation – Agent Cooperation – Agent Organization – Selfinterested agents in electronic commerce applications. 9

UNIT IV INTELLIGENT SOFTWARE AGENTS

Interface Agents – Agent Communication Languages – Agent Knowledge representation – Agent adaptability – Belief Desire Intension – Mobile Agent Applications. 9

UNIT V AGENTS AND SECURITY

Agent Security Issues – Mobile Agents Security – Protecting Agents against Malicious Hosts – Untrusted Agents – Black Box Security – Authentication for agents – Security issues for aglets. 9

TOTAL : 45 PERIODS

TEXT BOOKS

1. Bradshaw, Software Agents, MIT Press, 2010.
2. Richard Murch, Tony Johnson, Intelligent Software Agents, Prentice Hall, 2000.

REFERENCES

1. Bigus&Bigus, Constructing Intelligent agents with Java, Wiley, 1997.
2. Russel&Norvig, Artificial Intelligence: a modern approach, Prentice Hall, 199

SE8B4

NETWORK PROTOCOLS

L T P C
3 0 0 3

UNIT I

9

Internet Protocol : Routing IP Datagrams – Error and Control Messages (ICMP), Reliable Stream Transport Service (TCP) : TCP State Machine, Response to congestion – congestion, Tail Drop and TCP – Random Early Discard, Routing : Exterior Gateway Protocols and Autonomous Systems (BGP).

UNIT II

9

Internet Multicasting: Hardware Broadcast- Hardware Organ of Multicast – Ethernet multicast - IP multicast - The conceptual Process - IP Multicast Address - Multicast Address semantics – Mapping IP Multicast – HOSt Multicast Delivery Multicast Scope - IGMP-IGMP Implementation- MSg Format - Multicast Slow and Routing inf - Basic Multicast Routing Paradigms –TRPF – Multicast Tree –Essence of Multicast Routing - Reverse Path Multicast- DVMRP- Mrouled Program –CBT-DIM.

Mobile IP :- Mobility - Routing- Addressing - Mobile IP Character – Operation –Addressing Details - agent Respiration – Reg MSG Format – communicate with Foreign Agent -

Datagram transmission – Reception – 2 crossy Problem – Communication with Computer an HM networks.

Bootstrap And Auto configuration (BOOTP, DHCP): Need for Alternative to RARP Using IP to determine IP Address - BOOTP Retransmission Policy- BOOTP Msg Format - 2 step BOOTP Procedure – Vendor Specific Field – Need for dynamic Configure - Dynamic Host Configuration - Dynamic IP Address Assignment - Obtaining Multiple Address - Address Acquisition States - Early Lowest Termination - Lease Renewal State, DHCP Msg Format - DHCP Options and Msg Type- Option Overload- DCHP & DOMAIN Names.

UNIT III

9

The Domain Name System (DNS): Name for Machine-flat name space - Hierarchical Name - Delegation of authority Subset Authority - Internet Domain names - Official and Unofficial Domain Names - Name Item and Syntax of Name - Mapping domain – name to address - domain name resolution - Efficient translation - domain server msg for compressed name format - Abbreviation of domain names - inverse mapping pointer queries.

Applications: Remote Login (TELNET, Rlogin) – Remote interactive computing, TELNET Protocols TELNET Options - TELNET Negotiation Rlogin.

Transfer and Access (FTP, TFTP, NFS):- file access and Transfer –online shared Access-sharing by file transfer FTP- user view of FTP –Anonymous FTP Services TFTP-NFS –NFS Implementation –RPC.

UNIT IV

9

Applications: Electronic Mail (SMTP, POP, IMAP, MIME) – Email – Mailbox – Relationship of internetworking and mail - TCP/IP Standard for E-Mail Service. E-Mail Address - Retrieval Mailbox Protocol MIME Extension - MIME Multipart MSg World Wide Web (HTTP) – Importance of WEB – Architecture - Components URL –Hyper TEST Transfer Protocol - GET Request- Error MSG - Persistent Connection & Length – Data Length & PRM Output - Length Encoding And Header - Condition Requests.

Video over IP (RTP):Audio Clip and Encoding Standards – Audio and Video transmission and Reproduction - Jitter and Playback Delay – RTP – RTP Encapsulation – RTCP - RTCP Operation - IP Telephony and signaling – RSVP – COPS.

UNIT V

9

Applications: Internet Management (SNMP) – Level of management Protocol - Architectural Model - Protocol – The structure of Management information - Motherboard object Names – SNMP - Msg Format - Encode SNMP Msg - New Features SNMPV3 Internet Security and Firewall Design (IP sec) – The Future of TCP / IP (IPV6).

TOTAL: 45 PERIODS

TEXT BOOK

1. Douglas E.Comer, “Internetworking with TCP / IP – Principles, Protocols andArchitectures, Fourth Edition, Prentice – Hall of India, Delhi, 2002.

REFERENCES

1. Uyless Black, ‘Computer Networks – Protocols, Standards and Interfaces’, SecondEdition, Prentice – Hall of India, Delhi, 2002.
2. Udupa, “Network Management System essentials”, McGraw Hill, 1999.

UNIT II**9**

Association Rules: Introduction-What is association rule- Methods to discover associations rule- A priori algorithm – Partition algorithm- Dynamic item set counting algorithm-FP – tree growth algorithm- Eclat and dEclat – Rapid association rule mining – Association rule with item constraints.

UNIT III**9**

Clustering Techniques: Introduction- clustering paradigms- Classical partitioning methods: k-means and k-Medoids. - Hierarchical method: BIRTH-Density Based method: DBSCAN-Outliers.

Decision Tree: what is decision tree- Tree construction principle- Best Split- Splitting Indices- Splitting Criteria- Decision tree construction algorithm- ID3.

UNIT IV**9**

Other techniques :Web mining- Text mining- Spatial mining – Spatial clustering- Neural network- Learning in neural network- Unsupervised learning- Genetic algorithm.

UNIT V**9**

Data warehousing: Introduction- Definition- Multidimensional data model- OLAP operations- Warehouse Schema- Data warehousing Architecture- Warehouse server- Meta data- Data Mart - Data Warehouse Back ended process.

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. Arun K Pujari, “Data Mining Techniques” , University press, Edition 2001.
2. Jiawei Han, MichelineKamber, “Data Mining : Concept and Techniques” , Morgan Kaufmann Publishers, second Edition.

REFERENCE BOOKS:

1. Pang- Ning Tan, Micheal Steinbach, Vipin Kumar, “Introduction to Data Mining”, 2007.
2. David Hand, HeikkiMannila, Padhraic Smyth, “Principles of Data Mining” The MIT Press, Cambridge.
3. Mark Humphries ,Micheal W Hawkins & Michelle C dy, “Data warehousing architecture and implementation” prentice hall of India, 1999.

SE8B7**SOFT COMPUTING**

L	T	P	C
3	0	0	3

UNIT I INTRODUCTION**9**

Soft computing paradigms – Neural network – Fuzzy type – Derivation free optimization methods of genetics algorithms – Soft computing characteristics.

UNIT II FUZZY LOGIC**9**

Sets – Properties – Arithmetics - Members function – Fuzzy relations – Relation equations – Fuzzy measures – Types of uncertainty – Members of uncertainties – Measures of fuzziness – Probabilities Possibility – Measures of fuzzy events.

UNIT III NEURAL COMPUTING**9**

Introduction – Basic Neuron - Neuron modeling – Modeling the single Neuron - Learning in Simple Neuron – Perception earning curve – A Vectorial perspective – The Perception Learning Rule - Proof – Limitations of perception.

UNIT IV NEURAL NETWORKS**9**

Multi-level perception – Algorithms – Visualizing network behaviour – B:PN – Self organizing network – Kohonen algorithms – Hopfield network – Adaptive resonance theory – Pattern classification.

UNIT V GENTIC ALGORITHMS**9**

Introduction – Biological terminology – Search space and fitness landscapes – Elements of genetic algorithms – A Simple Genetic Algorithms – Some Application of Genetic Algorithms - Genetic algorithms in problem solving: Evolving Computer Programming – Data Analysis and Prediction. Genetic Algorithms in scientific Models – Modeling IntractionBetween Learning and Evolution.

TOTAL: 45 PERIODS**TEXT BOOKS**

1. Devendra K. Chaturvedi, “Soft Computing”, Springer, 2008.
2. Kauffmann. A., “Theory of Fuzzy Subsets”, Academic Press, 1989.
3. R.BealeC.T.Jacson, “Neural Computing- An introduction”, Adam Hilger, 1990.
4. Melanie Mitchell, “An Introduction to Genetic Algorithms”, Prentice Hall of India, 1996.

REFERENCES

1. J.S.Jang, C.T.Sun, E. Mizutani, “Neuro – Fuzzy and Soft Computing”, MatlabCurriculum Series, Prentice International, 1997.
2. Simon Havkin, “Neural Networks – A Comprehensive Foundation”, Prentice Hall of Inda, 1994.
3. David E. Gold Berg “Genetic Algorithms in Search, Optimization and Machine Language” Prentice Hall of India, 2006.

SE8B8**SOFTWARE RELIABILITY**

L	T	P	C
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UNIT I INTRODUCTION TO SOFTWARE RELIABILITY**9**

Software Reliability Definitions - software disasters - Errors - faults - failures - different views of software reliability – software requirements specification - Causes of unreliability in software - Dependable systems: reliable, safe, secure, maintainable, and available – Software maintenance.

UNIT II SOFTWARE RELIABILITY IMPROVEMENT**9**

The phases of a Software Project - Monitoring the development process – The software life cycle models - software engineering - Structured Analysis and structured Design – Fault tolerance - Inspection - Software cost and schedule.

UNIT III SOFTWARE QUALITY MANAGEMENT 9

Software quality modeling - Diverse approaches and sources of information - Fault avoidance, removal and tolerance - Process maturity levels (CMM) - Software quality assurance (SQA) - Monitoring the quality of software - Total quality management (TQA) - Measuring Software Reliability - The statistical approach - Software reliability metrics.

UNIT IV SOFTWARE RELIABILITY TECHNIQUES AND TOOLS 9

Data Trends - Complete prediction Systems - overview of some software reliability models - The recalibration of the models - Analysis of model accuracy - Reliability growth models and trend analysis - Software Costs Models - Super models.

UNIT V SOFTWARE RELIABILITY ENGINEERING PRACTICE 9

Testing and maintaining more reliable software –logical testing – functional testing – algorithm testing – regression testing - fault tree analysis – failure mode effects and critical analysis – reusability - case studies.

TOTAL: 45 PERIODS

TEXT BOOKS

1. J.D. Musa, A. Iannino and K.Okumoto, Software Reliability, Measurement, Prediction, Application, McGraw Hill, 2010.
2. J.D. Musa, Software Reliability Engineering, McGraw Hill, 1998.

REFERENCES

1. Michael R. Lyer, Handbook of Software Reliability Engineering, McGraw Hill, 1995.
2. Xie, M., Software Reliability Modelling, World Scientific, London, 1991.

SE8B9	PERSONAL SOFTWARE PROCESS AND TEAMS SOFTWARE PROCESS	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9

Software Engineering – Time management – Tracking Time – Period and Product Planning – Product Planning – Product size – Managing you time Setting Ground Rules – Managing Commitments – Managing schedules.

UNIT II PLANNING 9

The Project Plan – The software development process – Defects – Recording logs - Finding defects – The code review checklist – Design defects – Product quality – Estimate the ultimate yield - Process quality - Calculating the cost of quality.

UNIT III TSP STRATEGY 9

Team software process overview – Structure and Flow - The logic of the team software process – Building effective teams – Launching a team project – Goals - The development strategy – Reuse strategy – The development plan – Defining the requirements.

UNIT IV PRODUCT IMPLEMENTATION**9**

Designing with teams – Designing for Reuse – Design Reviews and Inspections – Product Implementation – The Implementation Strategy – Integration and system testing – System Test Strategy – Documentation - The postmortem.

UNIT V TEAM MANAGEMENT**9**

The team leader role – The team leader principal activities - Development manager role – Development manager principal - The planning manager role – The planning manager principal activities – The quality – Process manager role – The support manager role.

TOTAL: 45 PERIODS**TEXT BOOKS**

1. Watt S Humphrey, “Introduction of Personal Software Process”, Addison Wesley, 2000.
2. Watt S Humphrey, “Introduction to team software process”, Addison Wesley, 2000.

SE8C1**ENTERPRISE RESOURCE PLANNING**

L	T	P	C
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UNIT – I**9**

Enterprise – An overview ERP Introduction-Basic concepts- Risks of ERP-Benefits -ERP and related technologies- Business Process Reengineering - Conceptual Model of ERP, The Evolution of ERP, The Structure of ERP.

UNIT – II**9**

Data ware Housing - Data Mining - Online Analytical Processing(OLAP) - Product Life Cycle Management(PLM) –OLAP- Supply chain Management-Customer relationship management-Advanced Technology and ERP security.

UNIT – III**9**

ERP Implementation strategies- ERP Implementation Life Cycle methodologies - vendors and Consultants-contracts with Vendors, consultants and Employees – Project management and monitoring.

UNIT – IV**9**

Business modules of ERP package – Finance – Manufacturing – Human Resources – Plant maintenance – Materials management – Quality management – Marketing – Sales Distribution and service.

UNIT – V**9**

ERP Marketplace and Marketplace Dynamics – SAP – ORACLE corporation – Turbo charge the ERP system – Enterprise Application Integration – ERP and E-Business – ERP, internet and WWW – Total Quality management – Future Direction and trends in ERP.

TOTAL 45: PERIODS**TEXT BOOK**

1. Alexis Leon, “ERP Demystified”, second edition, Tata McGraw Hill publishing company Ltd., 2008.

2. Rahul V. Altekar “Enterprise Resource Planning”, Tata McGraw Hill, 2004

REFERENCE BOOKS

1. Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI 2002.
2. Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, Thompson Course Technology.
3. Mary Summer, “Enterprise Resource Planning”- Pearson Education.

SE8C2

OPEN SOURCE SYSTEMS

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UNIT I

9

Overview of Free/Open Source Software-- Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage, trends and potential—global and Indian.GNU/Linux OS installation-- detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files & log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

UNIT II

9

Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process; Performing everyday tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities -- configure X windows, detect display devices ; Installing software -- from source code as well as using binary packages. Setting up email servers-- using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) ; Setting up web servers -- using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services -- using squid (http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database).

UNIT III

9

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection – GNU compiler tools; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools -- using CVS to manage source code revisions, patch & diff.

UNIT IV**9**

Understanding the GNU Libc libraries and linker -- linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed&awk scripting. Basics of the X Windows server architecture.

UNIT V**9**

Basics of the X Windows server architecture ; Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localization support.

TOTAL: 45 PERIODS**REFERENCES:**

- 1 N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.
- 2 Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002.
- 3 Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, 2004 On-line material
- 4 Open Sources: Voices from the Open Source Revolution, First Edition, January 1999, ISBN: 1-56592-582-3. URL: <http://www.oreilly.com/catalog/opensources/book/toc.html>
- 5 The Linux Cookbook: Tips and Techniques for Everyday Use, First Edition, Michael Stutz, 2001. URL: http://dsl.org/cookbook/cookbook_toc.html
- 6 The Linux System Administrators' Guide, Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003. URL: <http://www.tldp.org/guides.html>
- 7 Using GCC, Richard Stallman et al. URL: <http://www.gnu.org/doc/using.html>
- 8 An Introduction to GCC, Brian Gough. URL: <http://www.networktheory.co.uk/docs/gccintro/>
- 9 GNU Autoconf, Automake and Libtool, Gary V. Vaughan, Ben Elliston, Tom Tromeu and Ian Lance Taylor. URL: <http://sources.redhat.com/autobook/>
- 10 Open Source Development with CVS, Third Edition, Karl Fogel and Moshe Bar. URL: <http://cvsbook.red-bean.com/>
- 11 Advanced Bash Scripting Guide, Mendel Cooper, June 2005. URL: <http://www.tldp.org/guides.html>
- 12 GTK+/GNOME Application Development, Havoc Pennington. URL: <http://developer.gnome.org/doc/GGAD>
- 13 Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL: