Semester-I

17CAP101 INFORMATION TECHNOLOGY 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To familiarize the students with PC, MS DOS and MS WINDOWS commands such as file creation, editing and directory creation.
- To learn the usage of MS office: MS WORD, use of database and spread sheet, slide creation with PowerPoint.
- To understand about information integrity and security
- To use of a visual programming language such as Visual Basic for various applications.
- To understand the role of hardware components
- To know about client server technology

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Understand the meaning and basic components of a computer system.
2. Define and distinguish Hardware and Software components of computer system.
3. Identify different computing machines during the evolution of computer system.
4. Gain knowledge about five generations of computer system.
5. Identify and discuss the functional units of a computer system.
6. Gain the knowledge on Network security

UNIT I - INFORMATION CONCEPTS AND PROCESSING

Evolution of information processing, data information language and communication.Elements of a computer processing system: Hardware - CPU, storage devices and media, VDU, input-output devices, data communication equipment Software- system software, application software.

UNIT II - PROGRAMMING LANGUAGES

Classification, machine code, assembly language, higher level languages, fourth generation languages. Operating systems: Concept as resource manager and coordinator of processor, devices and memory. Concept of priorities, protection and parallelism. Command interpreter, Typical commands of DOS/ UNIX/Network, GUI- Windows.

UNIT III - COMPUTERS AND COMMUNICATION

Single user, multi-user, work station, client server systems, Computer networks, network protocols, LAN, WAN, Internet facilities through WWW, Mosaic, Gopher, html, elements of Java.

UNIT IV - SECURITY

Information integrity definition, ensuring integrity, Computer security: Perverse software, concepts and components of security, Preventive measures and treatment.

UNIT V - RANGE OF APPLICATION

Scientific, business, educational, industrial, national level weather forecasting, remote sensing, planning, multilingual applications.

SUGGESTED READINGS

1. Rajaraman V. (1996). Fundamental of Computers, 2nd edition, Prentice Hall of India, New Delhi.
2. Sanders, D.H. (1998) .Computers Today, McGraw Hill. India.
3. Trainer T., et al. (1994).Computers, 4th edition, McGraw Hill.
4. V. Rajaraman, Neeharika Adabala. (2014).Fundamentals of Computers, 6th edition, Prentice Hall of India, New Delhi.

Semester-I

17CAP102 C PROGRAMMING AND DATA STRUCTURES 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3Hours

COURSE OBJECTIVE

Enable the student

- To understand the concept of programming (i.e., computer following a series of instructions)
- To exercise various features of C programs (looping, branching, pointers and structures)
- To write well-structured modular and readable programs with good documentation.
- To understand the concept of a program in a high-level language being translated by a compiler into machine language program and then executed.
- To know about various data structures such as stacks, Queues, linked lists and trees
- To know about pointers and arrays

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Can learn the fundamentals of C programming.
2. Choose the loops and decision making statements to solve the problem.
3. Implement different Operations on arrays.
4. Understand pointers, structures and unions.
5. Implement file Operations in C programming for a given application.
6. Implement the program using pointers and arrays

UNIT I - INTRODUCTION

Introduction to algorithms, Flow charts, Tracing flow charts, Problem solving methods, Need for computer languages, Reading programs written in C language, C character set, Identifiers and keywords, Data types, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, functions, Pre-processor command: # include, define, ifdef. Preparing and running a complete C program.

UNIT II - OPERATORS AND EXPRESSIONS

Arithmetic, unary, logical, bit-wise, assignment and conditional operators, Library functions, Control statements: while, do-while, for statements, nested loops. Ifelse, switch, break, continue and goto statements, comma operator.

UNIT III - FUNCTIONS

Defining and accessing: passing arguments, Function prototypes, Recursion, Use of library functions, Storage classes: automatic, external and static variables, Arrays: Defining and processing, Passing to a function, Multi dimensional arrays. Strings, operations on strings.

UNIT IV - POINTERS

Declarations. Passing to a function. Operations on pointers. Pointers and arrays. Arrays of pointers. Structures: Defining and processing. Passing to a function. Unions. Data files: Open, close, create, process. Unformatted data files.

UNIT V- DATA STRUCTURES

Data Structures: Stacks, queues, lists, trees and their application

SUGGESTED READINGS

1. Hutchison, R. (1990). Programming in C. McGraw Hill, New York.
2. Johnson Baugh. R and Kalin. M (1989). Applications Programming in C, Prentice Hall of India.
3. Rajaraman.V. (1995).Computer Programming in C, Prentice Hall of India, New Delhi.
4. Nanjesh Bennur. (2016). Programming in C and Data Structures , Second edition IPH, India.

SEMESTER-I

17CAP103 COMPUTER ORGANIZATION AND ARCHITECTURE 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To understand the architecture of the basic functional units of the computer such as the input output system, memory systems and secondary storage systems.
- To acquire basic understanding about the hardware and software interaction.
- To acquire knowledge about the Instruction Set used
- To know how the benchmarks that help in evaluating the performance of computer systems.
- To acquire knowledge about the Addressing modes used
- To know about I/O interruption

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Design digital circuits by simplifying the Boolean functions
2. Understand the organization and working principle of computer hardware components
3. Understand mapping between virtual and physical memory
4. Acquire knowledge about multiprocessor organization and parallel processing
5. Trace the execution sequence of an instruction through the processor
6. Understand the data transfer techniques

UNIT I - INTRODUCTION

Principles of Computer design - Software, hardware interaction layers in computer architecture. Central processing unit. Machine language instructions, Addressing modes, instruction types, Instruction set selection, Instruction cycle and execution cycle.

UNIT II - CONTROL UNIT

Control unit, Data path and control path design, Microprogramming Vs hardwired control, RISC Vs CISC, Pipelining in CPU design: Superscalar processors.

UNIT III – MEMORY SYSTEM

Memory system, Storage technologies, Memory array organization, Memory hierarchy, interleaving, cache and virtual memories and architectural aids to implement these.

UNIT IV – I/O DEVICES

Input-output devices and characteristics. Input-output processing, bus interface, data transfer techniques, I/O interrupts, channels.

UNIT V - PERFORMANCE EVALUATION

Performance evaluation - SPEC marks Transaction Processing benchmarks.

SUGGESTED READINGS

1. Mano. M (1994). Computer System and Architecture, 3rd edition, Prentice Hall of India, New Delhi.
2. Pal Chauduri, P. (1994). Computer Organisation and Design, Prentice Hall of India, New Delhi.
3. Rajaraman,V. and Radhakrishnan. T. (1997). Introduction to Digital Computer Design , 4th edition, Prentice Hall of India, New Delhi.
4. Stallings. W. (1999). Computer Organization and Architecture, 2nd edition, Prentice Hall of India, New Delhi.
5. William Stallings.(2016).Computer Organization and Architecture : Designing for Performance, 10th Edition, PEARSON.

SEMESTER-I

17CAP104 MATHEMATICAL FOUNDATIONS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3Hours

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COURSE OBJECTIVES

Enable the student

- To understanding the basics of mathematical logics
- Know about the Predicate and relational calculus
- To enhance the knowledge about the algebraic structures
- To make the fundamental idea of applying Graph theory for data representation on computers
- To apply the acquired knowledge of problem solving in Computers
- To understand the storage representation and manipulation of graphs

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Acquire the basic knowledge of matrix, set theory, functions and relations concepts needed for designing and solving problems
2. Acquire the knowledge of logical operations and predicate calculus needed for computing skill
3. Able to design and solve Boolean functions for defined problems
4. Apply the acquired knowledge of formal languages to the engineering areas like Compiler Design
5. Apply the acquired knowledge of finite automata theory
6. Design discrete problems to solve by computers.

UNIT I - MATHEMATICAL LOGIC

Mathematical logic: Notation, Connectives Normal forms, Theory of inference for statement calculus.

UNIT II - PREDICATE CALCULUS

Predicate calculus, Inference theory of the predicate calculus, Relations and ordering, Functions, Recursion.

UNIT III - ALGEBRAIC STRUCTURES

Algebraic Structures: Groups, Application of residue arithmetic to computers, Group codes.

UNIT IV - GRAPH THEORY

Graph theory: Definition, Paths, reachability, connectedness- Matrix representation of graphs- Trees.

UNIT V - STORAGE REPRESENTATION

Storage representation and manipulation of graphs: Trees- List structures and graphs-Pert and related techniques.

SUGGESTED READINGS

1. Kolman, B., and Busby. R. (1987). Discrete Mathematical Structures for ComJ;luter Science , Prentice Hall.
2. Sahni, S. (1981). Concepts in Discrete Mathematics. Camelot Publisher. U.S.A.
3. Tremblay, J.P., el. al. (1987). Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill.
4. Gerard O'Regan. (2016). Guide to Discrete Mathematics: An Accessible Introduction to the History, Theory, Logic and Applications 1st Edition, Springer.

SEMESTER-I

17CAP105 INTRODUCTION TO MANAGEMENT FUNCTIONS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To know about the Selection training and appraisal of Human Resource.
- To learn about various Marketing strategies.
- To understand financial management and analysis.
- To apply their knowledge in Manufacturing and Strategic management.
- To understand the implementation of business strategy for running the business firms successfully.
- To apply their knowledge in Strategic management.

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Develop a responsible attitude towards the use of computer as well as the technology.
2. Able to envision the societal impact on the products/ projects they develop in their career
3. Understanding the code of ethics and standards of computer professionals.
4. Analyze the professional responsibility and empowering access to information in the work place.
5. Assess the quality of organization
6. Implement marketing plans for running the companies to make profit

UNIT I - HRD

HRD: selection, appraisal, training and information systems.

UNIT II - MARKETING

Understand the concept of marketing mix. These marketing mix elements consist of product policy and design, pricing, choice of marketing intermediaries, methods of physical distribution, use of personal selling, advertising and sales promotion, marketing research, and marketing organization.

UNIT III - FINANCE

Finance function (concept, scope, and its relationship with other functions) : tools of financial analysis (funds and cash flow analysis, ratio, analysis, risk-return trade-of): financial forecasting (profonna income statement and balance sheet, cash flow forecasting under uncertainty, financial planning): estimation and management of working capital (operating cycle concept, inventory, accounts receivables, cash and accounts payables, working capital requirements).

UNIT IV - MANUFACTURING

Operations Planning and Control (aggregate planning, multiple product batch, production cycles, short term scheduling of job shop, setting production rate in continuous production systems, activity scheduling in projects, introduction to project time calculations through PERT/CPM): Management of supply chain, materials management (introduction to materials management, systems and procedures for inventory management planning, and procurement of materials): quality management (quality concept and planning. standardizations, quality circles).

UNIT V - STRATEGY

Firm and its Environment: strategies and resources; industry structure and analysis; evaluation of corporate strategy; strategies for growth and diversification; process of strategic planning.

SUGGESTED READINGS

1. Agarwal, R.D. (1986). Organization and Management, Tata McGraw Hill, New Delhi.
2. Massie. (1996). Essentials of Management. 4th edition, Prentice Hall of India.
3. Stephen P. Robbins. (2016).Organizational Behavior, Sixteenth edition, Pearson Education

Principles of Management

SEMESTER-I

17CAP111 INFORMATION TECHNOLOGY - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To familiarize the students with PC, MS DOS and MS WINDOWS commands such as file creation, editing and directory creation.
- To learn the usage of MS office: MS WORD, use of database and spread sheet, slide creation with PowerPoint.
- To understand about information integrity and security
- To use of a visual programming language such as Visual Basic for various applications.
- To understand the role of hardware components
- To know about client server technology

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Understand the meaning and basic components of a computer system.
2. Define and distinguish Hardware and Software components of computer system.
3. Identify different computing machines during the evolution of computer system.
4. Gain knowledge about five generations of computer system.
5. Identify and discuss the functional units of a computer system.
6. Gain the knowledge on Network security

List of Practicals

1. MS DOS Commands – create file, copy, move, and rename files
2. Design a Word document containing an advertisement/ notification column
3. Create a table in word to show student marks and calculate the total and average using formulas
4. Create a word document to show Mail merge
5. Illustrate the use of Review Tools to track changes made in a document
6. Create an Excel sheet illustrate sorting and filtering of data
7. Create MS-Excel sheets showing conditional formatting
8. Create an Excel applications to demonstrate Chart tools
9. Demonstrate Data validation with an example

10. Create a Power point Presentations for your profile

11. Create a Power point Presentations for an Advertisement with Animations
12. Write a Visual Basic program to perform arithmetic operations
13. Write a Visual Basic program to design and code the user Registration form

SUGGESTED READINGS

1. Rajaraman V. (1996). Fundamental of Computers, 2nd edition, Prentice Hall of India, New Delhi.
2. Sanders, D.H. (1998) .Computers Today, McGraw Hill. India.
3. Trainer T., et al. (1994).Computers, 4th edition, McGraw Hill.
4. V. Rajaraman, Neeharika Adabala. (2014).Fundamentals of Computers, 6th edition, Prentice Hall of India, New Delhi.

SEMESTER-I

17CAP112 PROGRAMMING IN C - PRACTICAL 5H - 2C

Instruction Hours / week: L: 0 T: 0 P: 5 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

COURSE OBJECTIVE

Enable the student

- To understand the concept of programming (i.e., computer following a series of instructions)
- To exercise various features of C programs (looping, branching, pointers and structures)
- To write well-structured modular and readable programs with good documentation.
- To understand the concept of a program in a high-level language being translated by a compiler into machine language program and then executed.
- To know about various data structures such as stacks, Queues, linked lists and trees
- To know about pointers and arrays

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Can learn the fundamentals of C programming.
2. Choose the loops and decision making statements to solve the problem.
3. Implement different Operations on arrays.
4. Understand pointers, structures and unions.
5. Implement file Operations in C programming for a given application.
6. Implement the program using pointers and arrays

List of Practical

1. SIN and COS Series
2. Array Operations (Insert, Delete and Display)
3. Bubble Sorting.
4. Stack
5. Queue.
6. Implement String functions
7. Pointers and Arrays, Pointers and function
8. Recursive function
9. Dynamic Memory Allocation
10. Matrix Operations (Addition, Subtraction and Multiplication)

11. Linked List Operations.
12. Mark sheet preparation using array of structures
13. Electricity Bill Preparation using Files (Use structures)
14. Implement TWO Dos commands using Command line arguments
15. Design an application using VRAM
16. Display a message every 5 minutes using TSR programming

SUGGESTED READINGS

1. Hutchison, R. (1990). Programming in C. McGraw Hill, New York.
2. Johnson Baugh. R and Kalin. M (1989). Applications Programming in C, Prentice Hall of India.
3. Rajaraman.V. (1995).Computer Programming in C, Prentice Hall of India, New Delhi.
4. Nanjesh Bennur. (2016). Programming in C and Data Structures , Second edition IPH, India.

SEMESTER-I

17CAP113 TALLY - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- Designed to impart knowledge regarding concepts of Financial Accounting
- Tally is an accounting package which is used for learning to maintain accounts.
- Useful for students to get placements in different offices as well as companies in Accounts departments.
- To gain the hands-on experience on creating the balance sheets
- To understand the management of accounts in any organization
- To apply their knowledge in Strategic management.

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. To maintain accounts with and without inventory.
2. To help in maintaining accounts in the different languages that are supported by Tally.
3. To understand the Point of Sale and Payroll features of Tally.
4. To implement the account ledgering process of any organization
5. To gain the knowledge of the maintenance of account vouchers in an organization
6. To assess the flow management

List of Practical

1. Create a new company in integrate accounts mode and account with inventory mode
2. Create a primary and sub groups using single or multiple ledger mode
3. Create minimum 10 ledgers using single or multiple ledger, and alter and delete any 2 ledger
4. Create a new company, ledger and record minimum 10 transactions without adjustment
5. Create a new company, ledger and record minimum 10 transactions with any five adjustments and display the relevant results

6. Enter the following voucher
    - Payment vouchers
    - Receipt
    - Purchase
    - Sales
    - Credit note
    - Debit note
    - Journals
    - Memo
    - Optional
7. Prepare trail balance for the company
8. Prepare profit & loss a/c and balance sheet

SUGGESTED READINGS

1. Shraddha Singh,Navneet Mehra. (2014).Tally ERP 9, Latest Revised Edition edition , V&S Publishers

SEMESTER-II

17CAP201 OBJECT-ORIENTED PROGRAMMING WITH C++ 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To understand the Object Oriented Programming concepts and techniques
- To understand the fundamentals of programming in C++
- To understand and utilize the concepts of procedural abstraction, data abstraction and encapsulation, polymorphism and inheritance with respect to C++ programming language
- To apply their programming knowledge for real time software development
- To apply the extensible Class types, User-defined operators and function Overloading in C++
- To know about preprocessor in C++

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Understand and design the solution to a problem using object-oriented programming concepts.
2. Use proper class protection mechanism to provide security.
3. Demonstrate the use of virtual functions to implement polymorphism.
4. Understand and implement the features of C++ including templates, exceptions and file handling
5. Solve complex problems in Object oriented programming
6. Use preprocessor in the object oriented programming

UNIT I - Introduction to Computers and C++ Programming:

Introduction to Computers and C++ Programming: Computer Organization – History of C and C++ - C++ standard Library – Arithmetic- Decision making: Equality and Relational Operators. Control Structures: Pseudocode- if, if/else selection structures – while, for, do while repetition structure- Assignment, Increment, Decrement operators – switch Multiple selection structure – break and continue statements – Logical, Equality, Assignment operators.

Functions: Function Definitions, Prototypes – Storage classes- Recursion- Functions with Empty Parameter Lists – Inline functions- SUGGESTED READINGS and Reference Parameters – Default Arguments – Unary Scope Resolution Operator- Function overloading – Function Templates.

UNIT II – Arrays, Pointers and Strings and Classes and Data Abstraction

Arrays: Declaring Arrays – Passing Arrays to Functions – Sorting Arrays – Linear Search and Binary Search.

Pointers and Strings **:** Pointer variable declaration and initialization- Pointer Operators- Calling functions by reference –Pointer expression and Pointer arithmetic- relationships between Pointer and Arrays – Arrays of Pointers – Function Pointers – Introduction to character and String Processing.

Classes and Data Abstraction : Structure Definitions- Class Scope and Accessing Class Members – Access Functions and Utility Functions- Constructors- Destructors.

UNIT III – Classes & Operator Overloading

Classes **:** Part II : Introduction- friend functions and friend classes- this pointer- new, delete operator- static class members- Data abstraction and Information hiding- Container Classes and Iterators.

Operator Overloading **:** Fundamentals and restriction of operator overloading –Overloading Stream Insertion, Stream Extraction, Unary, Binary, ++ and – operators. Inheritance : Base Classes and derived Classes – Protected Members- casting base class pointers to derived class pointers- Using member Functions- public, protected, private inheritance – Direct Base classes and Indirect Base classes- Using constructors and Destructors in Derived Classes.

UNIT IV - Virtual Functions, Polymorphism and Templates

Virtual Functions and Polymorphism **:** Type Fields and switch statement – virtual functions- abstract base classes and concrete classes- polymorphism- New classes and Dynamic binding – virtual destructors. C++ Stream Input/output : Introduction- Streams- Stream Output- Stream Input- Stream Manipulators- Stream Format states- Stream error states.

Templates **:** Function, Class templates – Overloading template functions- Templates and Inheritance, friends, static members.

UNIT V - Exception Handling, File Processing, The Preprocessor and Standard C++ Language Additions

Exception Handling : Basics of C++ Exception handling: try, throw, and catch – Throwing, catching, and rethrowing an exception, Exception specifications.

File Processing: Data Hierarchy- files and streams- Creating, Reading, Updating sequential Access files and Random Access files.

The Preprocessor **:** #include, # define, #error, # pragma preprocessor directives.

Standard C++ Language Additions : Boolean data type- static_cast, const_cast, reinterpret_cast operator, namespaces.

SUGGESTED READINGS

1. Deitel. H.M & P.J.Deitel. (2006). C++ How to Program, 5th Edition, Pearson Education Asia, New Delhi.
2. Bjarne Stroustroup. (2013). The C++ Programming Language, Thirteenth Impression,Addison Wesley, New Delhi.

3. Herbert Scheildt. (2001). Teach Yourself C++, 3rd Edition, Tata McGraw Hill ,New Delhi.
4. Robert Lafore. (2000). Object-Oriented Programming in Turbo C++, Galgotia Publications, New Delhi.
5. E.Balagurusamy. (2017), object-oriented programming with c++, 7th edition, McGraw Hill Education, New Delhi

WEB SITES

1. http://www.cplusplus.com/doc/tutorial/
2. www.cplusplus.com/
3. www.cppreference.com/

SEMESTER-II

17CAP202 OPERATING SYSTEM 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To provide students with Extensive knowledge of principles and modules of operating systems
- To learn about the fundamental operating system abstractions such as processes, threads, files, Semaphores, IPC abstractions, shared memory regions, etc.
- To understand the principles of concurrency and synchronization, and apply them to write correct Concurrent programs/software.
- To learn the Basic resource management techniques (scheduling or time management, space management) and principles and how they can be implemented.
- To understand the working of MS-Windows, UNIX and LINUX Operating Systems
- To know about distributed file system

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. To understand the operating system components and i ts services
2. To implement the algorithms in process management and solving the issues of IPC
3. To demonstrate the mapping between the physical memory and virtual memory
4. To understand file handling concepts in OS perspective
5. To understand the operating system components and services with the recent OS
6. To understand the concept of paging and segmentation

UNIT I - Introduction

Introduction: Evolution of operating systems. Types of operating systems. Different views of the operating system, operating system concepts and structure.
Processes: The Process concept, systems programmer's view of processes. The operating system services for process management. Scheduling algorithms. Performance evaluation.

UNIT II - Memory Management

Memory Management :Memory management without swapping or paging, swapping, virtual memory, page replacement algorithms, modeling paging algorithms, design issues for paging systems, segmentation.

UNIT III – Inter process Communication and synchronization and File Systems

Interprocess Communication and synchronization: The need for interprocess synchronization, mutual exclusion, semaphores, hardware sport for mutual exclusion. Queuing implementation of semaphores, classical problems in concurrent programming, critical region and conditional critical region, monitors, messages, deadlocks.
File Systems: File systems, directories, file system implementation, security protection mechanisms.

UNIT IV - Input/Output, Disks, Clocks and Distributed File System
Principles of I/O Hardware: I/O devices, device controllers, direct memory access.
Principles of I/O Software: Goals interrupt handlers, device drivers, device independent I/O software. User space I/O software.
Disks: Disk hardware, .scheduling algorithms, Error handling, trac-at-a-time caching, RAM Disks.
Clocks: Clock hardware, memory mapped terminals, I/O software. Terminals: Terminal hardware, memory mapped terminals, I/O software.
Processes and Processors in Distributed Systems: Threads, system models, processor allocation, scheduling.
Distributed File Systems: Design, implementation, trends.

UNIT V – Case Studies
Performance Measurement, monitoring and evaluation
Introduction, important trends affecting performance issues, why performance monitoring and evaluation are needed, performance measures, evaluation techniques, bottlenecks and saturation, feedback loops.
Case Studies: MS.DOS, MS WINDOWS, LINUX (UNIX) operating system.

SUGGESTED READINGS

1. Deitel. H.M. (1984).An Introduction to Operating Systems. Addison Wesley Publishing Company.

2. Milenkovic, M.(1992).Operating Systems• Concepts and Design. McGraw Hill International Edition Computer Science series.

3. Peterson, J.L. Abraham Silberschatz. (1989).Operating System Concepts. Addison Wesley Publishing Company.

4. Tanenbaum. A.S. (1995).Modem Operating Systems, Prentice Hall of India Pvt. Ltd.

5. Tanenbaum. A.S.(2015). Modern Operating Systems. Prentice Hall of India Pvt. Ltd.

SEMESTER-II

17CAP203 INFORMATION SYSTEMS: ANALYSIS, DESIGN AND IMPLEMENTATION 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To understand about complex system development
- To know the importance of classes and objects and their interrelationships
- To analyze and evaluate complex design structures
- To use Unified Modeling Language to construct various UML models
- To implement class diagrams, interaction diagrams, state chart diagrams, activity diagrams for implementing Object oriented Software designs
- To know the basics of software market

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Get an insight into the processes of software development
2. Able to understand the problem domain for developing SRS and various models of software engineering
3. Able to Model software projects into high level design using DFD,UML diagrams
4. Able to Measure the product and process performance using various metrics
5. Able to Evaluate the system with various testing techniques and strategies
6. Know about Object oriented analysis and design through object modeling technique

UNIT I - Overview of Systems Analysis and Design

Overview of Systems Analysis and Design: Systems Development Life Cycle. Concept and Models: requirements determination. Logical design. Physical design, test planning implementation planning and performance evaluation; communication, interviewing, presentation skills; group dynamics; risk and feasibility analysis; group-based approaches. JAD, structures walkthroughs, and design and code reviews; prototyping; database design; software quality metrics; application categories software package evaluation and acquisition.

UNIT II - Information requirement Analysis

Information requirement Analysis: Process modelling with physical and logical data flow diagrams, data modelling with logical entity relationship diagrams; Developing a Proposal: Feasibility study and cost estimation. System Design: Design of input and control, design of

output and control, file design/database design, Process design, user interface design; prototyping; software constructions; documentation.

UNIT III - Application Development Methodologies and CASE tools

Application Development Methodologies and CASE tools: Information engineering, structured systems analysis and design and object oriented methodologies for application development data modeling, process modeling, user interface design and prototyping; use of computer aided Software engineering (CASE) tools in the analysis, design and implementation of information systems.

UNIT IV - Design and Implementation of platforms

Design and Implementation of platforms: Object oriented analysis and design through object modeling technique, object modeling, dynamic modeling and functional modeling, object oriented design and object oriented programming systems for implementation, object oriented data bases.

UNIT V - Managerial Issues in Software Projects

Managerial Issues in Software Projects: Introduction to software markets; planning of software projects, size and cost estimations; project scheduling; measurement of software quality and productivity; ISO and capability maturity models for organizational growth. The course should be based on lectures, case analysis and laboratory work. Cases should be used to illustrate each major topic in the course.

SUGGESTED READINGS

1. Haryszkiewycz, LT. (1989). Introduction of Systems Analysis and Design, Prentice Hall of India.

2. Rajaraman.V. (1991).Analysis and Design of Information Systems, Prentice Hall of India.

3. Senn, LA. (1986).Analysis and Design of Information Systems, Tata McGraw Hill Book Company.

4. Whiten, 1.K., Bentley, L.D., Beslow, V.M. (1994).Systems Analysis and Design Methods, Galgotia Publications Pvt. Ltd.

5. Kenneth E.Kendal and Julie.(2013). System Analysis and Design. 9th edition, Pearson.

SEMESTER-II

17CAP204 ACCOUNTING AND MANAGEMENT CONTROL 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To acquaint students with the accounting concepts, tools and techniques for managerial decision.
- To understand the relation of accounting to economic activity
- To organize information for decision-making and the resource acquisition decision
- To manage the uses of cash and non-cash resources
- To apply a range of models and methods in different contexts
- To analyze an organization's activities.

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. To analyze the reasons and consequences of management accounting and control
2. To understand the relationship between strategy development in management accounting and control
3. To maintain the trial balance and financial statements
4. To obtain knowledge and understanding of models and methods in management accounting and control
5. To identify and analyze problems and solutions in real-life situations
6. To develop budgeting and control for any organization

UNIT I - Introduction

Basic Accounting and conventions underlying preparation of Financial Statements (balance sheet highlighting accounting equation. profit and loss statement; accounting processes; basic accounts, trial balance and financial statements; issues such as provisions for bad debts tax, dividends, losses such as bad debts, missing information, classification effect, cost of assets, rentals, etc);

UNIT II - Income

Income Measurement (revenue; recognition and matching costs and revenues; inventory valuation); Depreciation Accounting; Intangible Assets Accounting; Understanding published annual accounts including funds flow statement.

UNIT III - Cost

Basic Cost Concepts: (introduction; cost classification; allocation, appointment and absorption; cost centers); Cost Analysis for Managerial Decisions (direct costing, break-even analysis; relevant costs; pricing; pricing-joint costs; make or buy; relevant fixed costs and sunk costs) Cost Analysis for Control (standard costing; variances; material, labour, overhead, sales, and profit); Standard Cost Accounting (budgeting and control; elements of budgeting; control of manufacturing and manufacturing expenses; performances appraisal, evaluation of cost control systems).

UNIT IV - Introduction to Management Control Systems

Introduction to Management Control Systems; Goals, Strategies, and Key Variables; Performance Measures; Responsibility Centers and Transfer Price; Investment Centers; Reporting Systems; Management by Objectives;

UNIT V - Budgeting and Control

Budgeting and Control; Organizational Relationships in Control; Control Dynamics; Top Management and Control; Strategic and Long-Range Planning; Control of Service Organizations; Control of Projects; Control of Non-Profit Organizations; Control of Multinational Companies.

SUGGESTED READINGS

1. Bhattacharya, S.K., and Dearden, John.(2009) Accounting for Management, Prentice Hall of India, New Delhi.
2. Chadwick. (1996). The Essence of Financial Accounting, Prentice Hall of India Pvt. Ltd., New Delhi.
3. Homgren, Sundem and Selto. Introduction to Management Accounting,(1993). 9th Edition, Prentice Hall of India Pvt. Ltd.
4. Welch, Hilton and Gordon. Budgeting: Profit Planning and Control,(1998). 5th Edition, Prentice Hall of India Pvt. Ltd., New Delhi.
5. Peter Harish, Profit Planning (2010), 2nd Edition, Butterworth Hannemann publications.

SEMESTER-II

17CAP205 PROBABILITY AND COMBINATIONS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To equip the students with the fundamental principle of counting.
- To find the permutation when the all objects are distinct or non distinct.
- To find the combination of objects.
- To understand Connection between Permutations & Combinations.
- To distinguish between Permutations & Combinations
- To know about Recurrence relations

COURSE OUTCOMES (COs)

Upon successful completion of the course, the student will be able to:

1. Demonstrate knowledge of statistical terms.
2. Analyze the four basic sampling techniques for implementing in Statistics
3. Explain the difference between an observational
4. Explain an experimental study in statistics
5. To modify the statistical data in frequency distributions using histograms
6. To summarize data using the measures of central tendency such as mean, median, mode and midrange

UNIT I - Probability
Probability: Sample space. Events. Axioms. Conditional probability. Bayes rule. Random variables: Discrete and continuous.

UNIT II - Distribution and density functions
Distribution and density functions. Marginal and conditional distributions. Stochastic independence.

UNIT III - Expectation
Expectation: Expectation of a function. Conditional expectation and variance. Moment generating function. Cumulant generating functions. Characteristic functions. Distributions: Discrete and continuous distributions.

UNIT IV - Permutations and combinations
Permutations and combinations. Distinct and non-distinct objects. Generating functions for combinations. Enumerators for permutations. Distribution of distinct objects.

UNIT V - Recurrence relations

Recurrence relations: Linear and with two indices. Principles of inclusion and exclusion. Formula derangement. Restrictions on relative positions.

SUGGESTED READINGS

1. Liu, C.L. (1996). Introduction to Combinatorial Mathematics. McGraw Hill.
2. Ross. S .(1976). A First Course in Probability, Collier Macmillan, New York.
3. Duo code.(2017). Probability: Mastering Permutations And Combinations. CreateSpace Independent Publishing Platform; 2 edition

SEMESTER-II

17CAP211 OBJECT ORIENTED PROGRAMMING WITH C++ - PRACTICAL 5H - 2C

Instruction Hours / week: L: 0 T: 0 P: 5 **Marks: Internal: 40 External: 60 Total: 100**
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To understand the Object Oriented Programming concepts and techniques
- To understand the fundamentals of programming in C++
- To understand and utilize the concepts of procedural abstraction, data abstraction and encapsulation, polymorphism and inheritance with respect to C++ programming language
- To apply their programming knowledge for real time software development
- To apply the extensible Class types, User-defined operators and function Overloading in C++
- To know about preprocessor in C++

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Understand and design the solution to a problem using object-oriented programming concepts.
2. Use proper class protection mechanism to provide security.
3. Demonstrate the use of virtual functions to implement polymorphism.
4. Understand and implement the features of C++ including templates, exceptions and file handling
5. Solve complex problems in Object oriented programming
6. Use preprocessor in the object oriented programming

List of Practical

1. Create a class Date whose data members are Day, month, and Year. Write necessary member functions and perform the following operations using overload operators
   Increment a date by a day
2. Compares two dates
3. Create a class String that has a character array as a data member and perform the following operations using overloaded operators.
   - '+' To add two strings
   - '+=' To concatenate one string with the other
   - '==' To compare two strings

4. Create a class Computer and derive two classes Client and Server from it. Have the data members of the classes as follows.
   In the main () program, get the data about n clients and servers and print it back in a neat format.
5. Create four classes with the relationship and data members as in shown in the diagram.
   In the main () program, have the facility to
   - Store the details of n inpatients and outpatients
   - Display the details in a neat format
6. Create a class staff that contains the name, designation, and years of experience of a staff member of a college. Using containership, create two more classes Teaching Staff and Non-Teaching Staff according to the following specifications. In addition to the properties of the staff class, the Teaching Staff class should contain the highest qualification the staff member possesses and the departments he belongs to. The Staff class needs to contain the properties of Staff only. In the main (), get data about some of the teaching and NonTeachingStaff members of your college and print the details in neat format.
7. Create a class Address as whose data members are Name, Street, City, Pin code and Phone Number of a person. In the main () program, using array of pointers, get addresses of n persons, sort it in alphabetical order of names and display it back in a neat format.
8. Create a class Shape that contains two data members of type double to hold the two dimensions of the shape.
   Derive 3 more classes' circle, rectangle, And Triangle from the class Shape. Using appropriate member functions, get the values, calculate and print the area of different shapes using dynamic binding.
   Hint:- write 2 member functions in all the derived classes: one to set the data and the other to calculate and display the area.
9. Create two classes British and Metric to store the measurements of distance in the British (feet and inches) and Metric (meters and centimeters) systems respectively.
   In the main () program, perform the following:
   - Get two measurements: one in British and the other in Metric
   - Ask the user in which system (British or Metric) (s) he wants the output.
   - Add two input measurements and print the result according to the user's choice.
10. Create a class that copies the content of a text file into another file. Write the program in such a way that the program accepts command line arguments and make the program to execute in a way exactly the copy command in Dos works.
11. Sort an integer and a floating –point array using function template.
12. Create a class template stack that accepts a generic data type as a parameter and performs the basic operations of a stack. Using the above class in the main () program, implement stacks for integer and floating point data types separately and perform the operations on the stack.

SUGGESTED READINGS

1. Deitel. H.M & P.J.Deitel. (2006). C++ How to Program, 5th Edition, Pearson Education Asia, New Delhi.

2. Bjarne Stroustroup. (2013). The C++ Programming Language, Thirteenth Impression,Addison Wesley, New Delhi.
3. Herbert Scheildt. (2001). Teach Yourself C++, 3rd Edition, Tata McGraw Hill ,New Delhi.
4. Robert Lafore. (2000). Object-Oriented Programming in Turbo C++, Galgotia Publications, New Delhi.
5. E.Balagurusamy. (2017), object-oriented programming with c++, 7th edition, McGraw Hill Education, New Delhi

SEMESTER-II

17CAP212 OPERATING SYSTEM - PRACTICAL 4H – 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To provide students with Extensive knowledge of principles and modules of operating systems
- To learn about the fundamental operating system abstractions such as processes, threads, files, Semaphores, IPC abstractions, shared memory regions, etc.
- To understand the principles of concurrency and synchronization, and apply them to write correct Concurrent programs/software
- To learn the Basic resource management techniques (scheduling or time management, space management) and principles and how they can be implemented.
- To understand the working of MS-Windows, UNIX and LINUX Operating Systems
- To know about distributed file system

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. To understand the operating system components and i ts services
2. To implement the algorithms in process management and solving the issues of IPC
3. To demonstrate the mapping between the physical memory and virtual memory
4. To understand file handling concepts in OS perspective
5. To understand the operating system components and services with the recent OS
6. To understand the concept of paging and segmentation

List of Programs:

1. To write a Linux program to display process deadlock state.
2. To write a program to implement signal handling.
3. Write a Shell program to handle student data base with options given below:

   a) Create data base. b) View Data Base. c) Insert a record d) Delete a record.

   e) Modify a record. f) Result of a particular student. g) Exit.
4. To write a simple Linux program using thread.
5. Deadlock avoidance using Banker's Algorithm.
6. To write a program to display the date & time using TCP Sockets.

7. To write a program to display the date & time using UDP Sockets.
8. Simulation of following CPU scheduling algorithms:
   A. FCFS
   B. SJF (preemptive and non-preemptive)
   C. Priority scheduling (preemptive and non-preemptive)
   D. Round Robin Scheduling
9. To write a Linux program to create a lock file.
10. To write a program to display the user information

SUGGESTED READINGS

1. Deitel. H.M. (1984).An Introduction to Operating Systems. Addison Wesley Publishing Company.
2. Milenkovic, M.(1992).Operating Systems• Concepts and Design. McGraw Hill International Edition Computer Science series.
3. Peterson, J.L. Abraham Silberschatz. (1989).Operating System Concepts. Addison Wesley Publishing Company.
4. Tanenbaum. A.S. (1995).Modem Operating Systems, Prentice Hall of India Pvt. Ltd.
5. Tanenbaum. A.S.(2015). Modern Operating Systems. Prentice Hall of India Pvt. Ltd.

SEMESTER-II

17CAP213 CASE TOOLS - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To provide students with Extensive knowledge of case tools
- To learn about the relational database design
- To learn about the fundamental application development tools
- To understand the principles of management tools
- To learn about the selenium tool.
- To know about Revision control system

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Outline the history of CASE tools.
2. Outline the cost of using and building CASE tools.
3. Use at least two CASE tools for each software development phase.
4. Evaluate existing CASE Tools.
5. Compare and contrast the fitness of existing CASE Tools to the needs of specific software development context.
6. Know to manage the process of software development

List of Practical

1. CASE tools
Use of diagramming tools for system analysis, such as Turbo analyst, for preparing Data Flow diagrams and E-R diagrams. Use of tools for relational database design such as relational Designer.

2. Application Development Tools:
Use of toots such as Power Builder, Delphi, Magic etc. in developing application software including interactive data-entry screens, transaction processing, report generations, etc.

3. Management Tools:
Use of tools for managing the process of software development such as Source Code Control System (SCCS), Revision Control System (RCS), Make etc.

4. **Program Using Selenium Tool: [web: http://docs.seleniumhq.org]**
   i. Using seleniumhq tool perform single webpage test case

ii. Using seleniumhq tool perform testing for multiple webpage

SUGGESTED READINGS

1. Alan W. Brown, David J. Carney, Edwin J. Morris, Dennis B. Smith, Paul Zarrella.(1994). Principles of CASE Tool Integration, Oxford University Press
2. Storr, A., Jarvis, D.H. (1996). Software Engineering for Manufacturing Systems Methods and CASE tools. Springer.

SEMESTER-III

17CAP301 DATABASE MANAGEMENT SYSTEMS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To able to understand the role and nature of relational database management systems (RDBMS) in today's IT environment.
- To translate written business requirements into conceptual entity-relationship data models.
- To convert conceptual data models into relational database schemas using the SQL Data Definition Language (DDL).
- To manipulate databases using the SQL Data Manipulation Language (DML).
- Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
- To take backup and perform recovery.

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Define the terminology, features, classifications, and characteristics embodied in database systems.
2. Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms, such as a data dictionary.
3. Demonstrate an understanding of the relational data model.
4. Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
5. Formulate, using relational algebra, solutions to a broad range of query problems.
6. Perform Database backup and recovery from catastrophic failure

UNIT I – DATABASE CONCEPTS

Basic concepts - Database & Database Users - Characteristics of the Database - Database Systems. Concepts & Architecture-Date Models. Schemas & Instances - DBMS Architecture & Data Independence - Data Base languages & Interfaces – Data Modelling using the Entity - Relationship Approach

UNIT II – RELATIONAL MODEL

Relational Model. Languages & Systems - Relational Data Model & Relational Algebra - Relational Model Concepts - Relational Model Constraints-Relational Algebra - SQL - A Relational Database Language - Date Definition in SQL - View & Queries in SQL - Specifying Constraints & Indexes in SQL - Specifying Constraints & Indexes in SQL - a Relational Database Management Systems - ORACLE/INGRES

UNIT III – HIERARCHICAL MODEL

Conventional Data Models & Systems - Network, Data Model & IDMS Systems - Membership types & options in a set - DML for the network model - Navigation within a network database - Hierarchical Data Model & IMS System - Hierarchical Database structure - HSAM, HISAM, HDAM & HIDAM organization - DML for hierarchical model - Overview of IMS

UNIT IV - NORMALIZATION

Relational Data Base Design - Function Dependencies & Normalization for Relational Databases - Functional Dependencies - Normal forms based on primary keys - (INF, 2NF, 3NF & BCNF) - Lossless join & Dependency preserving decomposition

UNIT V – CONCURRENCY CONTROL

Concurrency Control & Recovery Techniques - Concurrency Control Techniques - Locking Techniques - Time stamp ordering - Granularity of Data items - Recovery Techniques -Recovery concepts - Database backup and recovery from catastrophic failures - Concepts of Object oriented data base management systems.

SUGGESTED READINGS

1. Date, C.J., A.Kannan, S.Swamynathan (2012). An Introduction to Database Systems, Pearson education.
2. Desai. B. (2005). An Introduction to Database Concepts, Galgotia Publications. New Delhi.
3. Elmsari and Navathe.(2011). Fundamentals of Database Systems, Addison Wesley, New York.
4. Ullman. J.D. (2008). Principles of Database Systems, Galgotia Publications. New Delhi.
5. Carolyn E. Begg and Thomas M. Connolly (2005). Database Systems: A Practical. Pearson education.

17CAP302 COMPUTER NETWORKS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To become familiar with layered communication architectures (OSI and TCP/IP).
- To understand the client/server model and key application layer protocols.
- To learn sockets programming and how to implement client/server programs.
- To understand the concepts of reliable data transfer and how TCP implements these concepts.
- To learn the principles of routing and the semantics and syntax of IP.
- To learn the various network protocols

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able :

1. To master the terminology and concepts of the OSI reference model and the TCP- IP reference model.
2. To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks,
3. To be familiar with wireless networking concepts,
4. To be familiar with contemporary issues in networking technologies
5. To understand the functionalities needed for data communication into layers
6. To know the various security methodology in network

UNIT I – INTRODUCTION TO COMPUTER NETWORK

Introduction to computer network

Advantages of networks - Structure of the communications network - point-to-point and multidrop circuits - data flow and physical circuits - network topologies - topologies and design goals - Hierarchical topology - horizontal topology (Bus) - star topology - ring topology - mesh topology. The telephone network, switched and non-switched options - fundamentals of communications theory - channel speed and bit rate - voice communications and analog waveforms - bandwidth and the frequency spectrum - connecting the analog and digital worlds - digital worlds - digital signals- the modem, asynchronous and synchronous transmission.

Wide area and local networks, connection oriented and connectionless networks, classification of communications protocols, time division multiple access (TDMA), time division multiplexing (TDM), carrier sense (Collision) systems, token passing, peer-to-peer priority systems; priority slot, carrier sense (collision free) systems, token passing (priority) systems.

UNIT II – LAYERED PROTOCOLS & LAN

Layered Protocols and the OSI model
Goals of Layered Protocols, network design problems" communication between layers, introduction to standard organizations and the OSI model, standards organizations, Layers of OSI, OSI status.

Local Area Networks: Why LANs?, Primary attributes of a LAN, Broadband and baseband and base LANs, IEEE LAN standards, e1ationship of the 802 standards to the ISO/CCITT model., connection options with LANs, LLC and MAC protocol data units, LAN topologies and protocols., token ring (Priority), token bus and IEEE 802.4, metropolitan area networks (MANs), ANSI fiber distributed data interface.

UNIT III – NETWORK PROTOCOLS

Network Protocols: TCP, UDP, IP, ICMP, SNMP, and RMON.**TCP/IP:** TCP/IP and internetworking, example of TCP/IP operations, related protocols ports and sockets. The IP address structure, major features of IP, IP datagram. Major IP services. IP source routing, value of the transport layer, TCP, Major features of TCP, passive and active operation, the transmission control block (TCP), route discovery protocols, examples of route discovery protocols, application layer protocols.

UNIT IV- PROTOCOLS

Polling/Selection Protocols: Character and bit protocols, binary synchronous control (BSC) HDLC; HOLC options, HDLC frame format, code transparency and synchronization, HDLC transmission process, HDLC subsets, SDLC, Protocol conversion.
Switching and Routing in Networks: Message switching, packet switching, when and when not to use packet switching, packet routing, packet switching support to circuit switching networks.
The X.25 Network and Supporting Protocols: Features of X.25, Layers of X.25 and the Physical layer, X.25 and the data link layer. Companion standards to X.25, features of X.25, X.25 channel options, flow control principles, other packet types, X.25 logical channel states, packet formats. Internetworking, connectionless mode networks, the frame relay and X.25 stacks.

UNIT V – NETWORK SECURITY
Network Security: IP Security: Architecture, Authentication header, Encapsulating security payloads, combines security associations, key management. Web Security: Secure socket layer and transport layer security, secure electronic transaction (SET). System Security: Intruders, Viruses and related threads, firewall design principals, trusted systems

SUGGESTED READINGS

1. Black. V (1996). Computer Networks Protocols, Standards and Interfaces, Prentice Hall of India.
2. Stallings. W 2007). Computer Communication Networks, 4th edition, Prentice Hall of India.
3. Tanneabaum. A.S (2003). Computer Networks, 4th edition ,Prentice Hall of India.
4. B. Forouzan, Debdeep Mukhopadhyay (2015). Cryptography and Network Security, TMH

17CAP303 ADVANCED JAVA AND SPRINGS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To develop the code with various Java data types, conditions and loops.
- To implement arrays, functions and string handling techniques.
- To understand object oriented programming through Java using Classes, Objects and various Java concepts like Abstract, Final etc.
- To implement multi-threading and exception handling.
- To write a code in JDBC to communicate with Database.
- To know about files and streams in Java

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Able to implement, compile, test and run Java program,
2. Able to make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API
3. Able to understand the components and patterns that constitute a suitable architecture for a web application using java servlets
4. Able to demonstrate systematic knowledge of backend and front end by developing an appropriate application.
5. Write code with spring framework components.
6. Use collection such as list, set, map in java programming

UNIT I – Exception Handling

Exception Handling, Exception-Handling Fundamentals, Exception Types- checked & unchecked, Uncaught Exceptions, Using try and catch, Multiple catch Clauses, Nested try Statements, throw, throws and finally. Multithreaded Programming: Introduction to Threads, Creating and Running Threads, Volatile Variables, Life Cycle of a Thread, Thread Priorities and Thread Scheduling – Creating and Executing Thread – Thread Synchronization Runnable Interface

UNIT II – Files and Streams

Files and Streams: Advanced Input/output Streams, Readers and Writers, Character and Byte Streams, Print Writer, Reading Text, Scanner Class, Reading and Writing Files, Copying a File, Class File, Creating a Sequential, Access File, Reading Data from a Sequential, Access File,

Random-Access Files, Creating/Writing/Reading Random-Access Files, New I/O APIs for the Java Platform.

UNIT III - Collections

Collections Framework: Overview, Generics Fundamentals, Auto boxing, The Collection Interfaces-List Interface, Set Interface, Sorted Set Interface, Navigable Set Interface, The Collection Classes- Array List, Linked List, Hash Set, Linked Hash Set, Tree Set, Accessing a Collection via an Iterator, Enumeration Interface, Vector, Hash Table, Properties, String Tokenizer and Date Class. Serialization: Serializable, Externalizable.

UNIT IV – Spring Framework

Introducing the Spring Framework, Spring Framework Run Time & architecture, Inversion of Control (IoC), Dependency Injection, Different Forms of Dependency Injection, Dependency Injection variants, DI classes & Parameter in Spring framework, Bean naming, @Auto wired annotation, The Bean Factory, XML Bean Configuration, Managing the Bean Lifecycle, Basics of Aspect-Oriented Programming (AOP), AOP concepts - Join point, Point cut, Advice, Types of advice, @AspectJ support

UNIT V - JDBC

DAO Support and JDBC Framework, Operations with JdbcTemplate, JdbcTemplate Convenience Methods, Basic Queries Using the JdbcTemplate, Batch Updates, Transaction and Resource Management, Global transaction vs. local transaction, Declarative transaction management, XML-based, Annotation-based, Object/Relational Mapping, Basic O/R Mapping, Object Query Languages, Data Access Objects, Setup in a Spring Context, Introduction to Spring MVC, Dispatch Servlet, Context configuration, Identify the design goals and core concepts of Spring MVC, Spring MVC controllers & Views

SUGGESTED READINGS

1. Deitel & Deitel. (2014). Java How to Program, 10th Edition, Pearson Education Asia, New Delhi.
2. Craig Walls. (2014). Spring in Action, 4th Edition
3. Herbert Schildt (2014). Java Complete Reference, 9th edition. Tata McGraw Hill, New Delhi.
4. Balagurusamy.E. (2012). Programming with Java, 3rd edition ,Tata Mc-Graw Hill, New Delhi.
5. ISRD Group. (2012). Introduction to Object Oriented Programming through Java, 1st Edition, Tata Mc- Graw Hill, New Delhi.
6. Aaron walsh, Justin couch & Daniel H.Steinberg. (2000). Java 2 Programming, IDG Books India (P) Ltd., New Delhi.
7. Rod Johnson, Jurgen Holler & Alef Arendsen. (2013) Professional Java Development with the Spring Framework

WEB SITES

1. java.sun.com/docs/books/tutorial/
2. www.java.net/

SEMESTER-III

17CAP304 STATISTICAL COMPUTING 4H -4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To define concepts of statistical measures, relationship between variables,
- To explain the hypothesis of statistical testing, theory of estimation
- To explain Statistical Quality Control methodologies
- To enter and manipulate data within SAS and R
- To perform basic statistical analyses using SAS and R and interpret the output
- To find information on how to perform advanced statistical analyses using SAS and R, and then undertake such analyses.

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

UNIT I – INTRODUCTION TO STATISTICS

Statistical Measures: Introduction to descriptive Statistics-basic definitions, frequency distribution, Measure of Central Tendency: Mean Median and Mode. Measure of Dispersion: Absolute and relative measure of dispersion: Range, Mean deviation, Quartile deviation, Standard deviation and corresponding relative measures.

UNIT II – CORRELATION AND REGRESSION

Correlation and Regression: Types of Correlation – Simple and Multiple, Positive and Negative, Linear and Non-Linear, Partial and Total. Methods of calculating correlation coefficient: Scatter diagram, Karl Pearson and Spearmen (Rank) correlation coefficient, Regression: Types, lines and equations, Linear Regression - least square method of solving regression equations, X on Y and Y on X.

UNIT III - HYPOTHESIS

Testing of Hypothesis: Introduction to Inferential Statistics: Null and alternative hypothesis, Type I and Type II errors, Standard error, level of significance, acceptance and rejection regions and procedure for testing hypothesis. Large sample test - Z test - tests for means, variances and proportions, Small sample tests based on t, F and Chi- square distributions.

UNITIV - ESTIMATIONS

Estimation and Design of Experiment: Point Estimation - characteristics of estimation - interval estimation -interval estimates of mean, standard deviation and\proportion. Design of Experiments: Completely Randomized Design (CRD), Randomized Block Design (RBD) and Latin Square design (LSD) Models

UNIT V - SQC

Statistical Quality Control (SQC): Statistical basis for control charts, control limits. Controlcharts for variables - $\overline{X}$, R charts. Charts for defectives – p and np charts. Chart for defects – C chart. Acceptance Sampling – single and double sampling plans.

SUGGESTED READINGS

1. R.S.N.Pillai, Bagavathy. (2002). Statistics, S. Chand & Company Ltd, New Delhi.
2. T N Srivastava and ShailajaRego., (2012). Statistics for Management, McGraw Hill Education, New Delhi.
3. Steven K Thompson., (2012). Sampling, John wiley and sons inc.
4. Montgomery Douglas C.,(2008). Introduction to Quality Control, Sixth Edition, John Wiley and Sons.
5. T.Veerarajan. (2017). Fundamentals of Mathematical Statistics, Yesdee Publishing Pvt Ltd.

SEMESTER-III

17CAP305 MANAGEMENT SUPPORT SYSTEMS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To build knowledge about decision support system (DSS) which is a computer program application
- To analyze business data and presents it so that they can make business decisions more easily
- To help the students to distinguish it from an "operational application" that collects the data in the course of normal business operation
- To know about expert system in management
- To identify Group Decision in Support Systems (GDSS) and Decision Conferencing.
- To manage the organization in an efficient way

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Discuss today's turbulent business environment and describe how organizations survive and even excel in such an environment.
2. Discuss the need for computerized support of managerial decision making.
3. Describe the conceptual foundation of the decision support system (DSS)
4. Describe the business intelligence (BI) methodology and relate them each other.
5. List the major tools of computerized decision support and major issues in implementing computerized decision support systems.
6. Define the conceptual foundations of decision making.

UNIT I - INTRODUCTION

Introduction to the concept of Decision Support System: Components of DSS: Dialogue Management.

UNIT II – DECISION SUPPORT SYSTEMS

Data Management and Model Management for DSS; Examples of different type of DSS; Systems Analysis and Design for DSS.

UNIT III – MODELS AND ALGORITHMS

Models in the context of DSS; Algorithms and Heuristics; DSS Applications in different functions.

UNIT VI – DESIGN OF INTERFACES

Design of interfaces in DSS; An overview of DSS generators; Group Decision in Support Systems (GDSS) and Decision Conferencing.

UNIT V – EXPERT SYSTEMS

Introduction of Expert Systems. Expert Systems in Management; Case Study on Expert System. Introduction to GlS; MSS based on GIS; Case Studies; Executive Information Systems (EIS).

SUGGESTED READINGS

1. Bhatnagar, S.C. and Ramani K. V.(1992). Computers and Information Management, Prentice Hall of India. New Delhi.
2. David M. Kroenke, Richard Hatch.(1994). Management information systems, 3rd edition, Mitchell McGraw Hill, New York.
3. Lucas, H.C.(1994).Information system concepts for management,5th edition, McGraw Hill.. New York.
4. Maryam Alvi. Group Decision support Systems, Info. Sys. Mgt (ISM)", Vol. 8. No.3 Summer 91 .
5. Sprauge, R.H., and McNurlin, B.C (2004). Information Systems Management in Practice, 6th ed. Prentice Hall international. New Jersey.
6. Sprague. R.H. and Carlson, E.D (1982). Building Effective Decision Support Systems, Prentice Hall. New Jersey.
7. Maeve Cummings, Stephen Haag (2012). Management Information Systems for the Information Age, Barnes & Noble, Edition 9.

SEMESTER-III

17CAP311 DATABASE MANAGEMENT SYSTEMS - PRACTICAL 5H -2C

Instruction Hours / week: L: 0 T: 0 P: 5 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To able to understand the role and nature of relational database management systems (RDBMS) in today's IT environment.
- To translate written business requirements into conceptual entity-relationship data models.
- To convert conceptual data models into relational database schemas using the SQL Data Definition Language (DDL).
- To manipulate databases using the SQL Data Manipulation Language (DML).
- Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
- To take backup and perform recovery.

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Define the terminology, features, classifications, and characteristics embodied in database systems.
2. Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms, such as a data dictionary.
3. Demonstrate an understanding of the relational data model.
4. Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
5. Formulate, using relational algebra, solutions to a broad range of query problems.
6. Perform Database backup and recovery from catastrophic failure

List of Practical

Tool: MySQL

Some sample applications which may be programmed, are given below

I Create following tables with appropriate constraints.

1. Write SQL statement for following queries.
   a. Age of employees.

b. Employees whose take home salary is in the range Rs10,000 and 15,000
c. Employees whose has put 10 years of service.
d. Employees working under the department head RAGURAMAN
e. Senior and youngest employee in each department.
f. Employees who retires after one year.

2. Write cursors
   a. To raise the basic salaries by 25 percent
   b. To retain male employee in the existing employee table and to move female employees to a new table.
3. Create following views
   a. For male employees of age more than 45 years.
   b. For operator with the CHECK OPTION.
   c. For Female employees working under the department head RAJARAMAN.
   d. For male employees with the CHECK OPTION.
4. Create a trigger which fires when one tries
   a. To update records in employee table on Sundays.
   b. To insert records in salary table with basic >30000
5. Generate a pay slip where 40 percent, 20 percent and 15 percent of basic is given as HRA, TA and DA for the employees.
6. Write SQL statement selects all employees and all basic salaries using FULL OUTER JOIN

II Create following tables with appropriate constraints.

1. Take a stock report and list of books in circulation.

2. Write SQL statements for following queries.
   a. Authors of C and C++ books.
   b. List of books issued for UG student
   c. Title of books in computer science department.
   d. Titles of book by the author 'DIETEL'.
   e. Publishers of C and C++ books.
   f. Number of book issued to each student
   g. Publisher details of Commerce Department.

III Write a cursor

a. To move books costing more than Rs.1500 into a separate table, Reference table.
b. To move damaged books into a separate table damaged table.

Some sample PL/SQL Programs

1. Write a recursive program for finding the factorial of a given number.
2. Write a recursive program for finding the first n Fibonacci number.
3. Write a PL/SQL program for multiplication tables 3, 4, 5 and 6.
4. Write a recursive program for finding the reverse of a given number.

5. Write SQL queries to illustrate the string functions mathematical functions.
6. Write a program for finding the reverse of a given string.
7. Write a program using triggers, joins and SQL developer programs

SUGGESTED READINGS

1. Date, C.J., A.Kannan, S.Swamynathan (2012). An Introduction to Database Systems, Pearson education.
2. Desai. B. (2005). An Introduction to Database Concepts, Galgotia Publications. New Delhi.
3. Elmsari and Navathe.(2011). Fundamentals of Database Systems, Addison Wesley, New York.
4. Ullman. J.D. (2008). Principles of Database Systems, Galgotia Publications. New Delhi.
5. Carolyn E. Begg and Thomas M. Connolly (2005). Database Systems: A Practical. Pearson education

SEMESTER-III

17CAP312 COMPUTER NETWORK - PRACTICAL 4H -2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To become familiar with layered communication architectures (OSI and TCP/IP).
- To understand the client/server model and key application layer protocols.
- To learn sockets programming and how to implement client/server programs.
- To understand the concepts of reliable data transfer and how TCP implements these concepts.
- To learn the principles of routing and the semantics and syntax of IP.
- To learn the various network protocols

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able :

1. To master the terminology and concepts of the OSI reference model and the TCP- IP reference model.
2. To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks,
3. To be familiar with wireless networking concepts,
4. To be familiar with contemporary issues in networking technologies
5. To understand the functionalities needed for data communication into layers
6. To know the various security methodology in network

List of Practical

1. Write a networking program in Java to implement a TCP server that provides services for a TCP Client.
2. Write a networking program to implement socket programming using User datagram Protocol in Java.
3. Implement an FTP server using socket programming.
4. Implement a chat server using socket programming.
5. Implement an ECHO server using socket programming.
6. Implement Address Resolution Protocol using socket programming.
7. Implement Ping server and Ping client using socket programming.

8. Using UDP to transfer a text file from one host to another.
9. Implement Remote Command Execution using network programming.
10. Simulate simple Web Browser.
11. Write a Java program to check whether the given DNS is found in the internet or not.
12. Write a network program using HTTP to print the document for the given URL.

SUGGESTED READINGS

1. Black. V (1996). Computer Networks Protocols, Standards and Interfaces, Prentice Hall of India.
2. Stallings. W 2007). Computer Communication Networks, 4th edition, Prentice Hall of India.
3. Tanneabaum. A.S (2003). Computer Networks, 4th edition ,Prentice Hall of India.
4. B. Forouzan, Debdeep Mukhopadhyay (2015). Cryptography and Network Security, TMH

SEMESTER-III

17CAP313 ADVANCED JAVA AND SPRINGS - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To develop the code with various Java data types, conditions and loops.
- To implement arrays, functions and string handling techniques.
- To understand object oriented programming through Java using Classes, Objects and various Java concepts like Abstract, Final etc.
- To implement multi-threading and exception handling.
- To write a code in JDBC to communicate with Database.
- To know about files and streams in Java

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Able to implement, compile, test and run Java program,
2. Able to make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API
3. Able to understand the components and patterns that constitute a suitable architecture for a web application using java servlets
4. Able to demonstrate systematic knowledge of backend and front end by developing an appropriate application.
5. Write code with spring framework components.
6. Use collection such as list, set, map in java programming

List of Practical

1. Write a java Thread java program by Extending thread Class
2. Write a java program to get file list from a folder filtered by Extensions
3. Write a java program to sort Linked List Using Comparator
4. Write a java program to read all elements in Array L[1]ist by using Iterator
5. Write a java program to copy Map content to another Hash Table
6. Write a java program to compare two sets and retain elements which are same on both sides

7. Write a java program to get spring Application Context Object Reference
8. Write a java program to load multiple java based configuration in the spring using IMPORT @ Annotation
9. Write a java spring AOC Advice using PointCuts concept – to check the name match
10. Write a java program to update customer Information Using JDBC Connection
11. Write a java program to Execute select Query Using JDBC Connection
12. Write a java program to get IP Address of a Host in Java

SUGGESTED READINGS

1. Deitel & Deitel. (2014). Java How to Program, 10th Edition, Pearson Education Asia, New Delhi.
2. Craig Walls. (2014). Spring in Action, 4th Edition
3. Herbert Schildt (2014). Java Complete Reference, 9th edition. Tata McGraw Hill, New Delhi.
4. Balagurusamy.E. (2012). Programming with Java, 3rd edition ,Tata Mc-Graw Hill, New Delhi.
5. ISRD Group. (2012). Introduction to Object Oriented Programming through Java, 1st Edition, Tata Mc- Graw Hill, New Delhi.
6. Aaron walsh, Justin couch & Daniel H.Steinberg. (2000). Java 2 Programming, IDG Books India (P) Ltd., New Delhi.
7. Rod Johnson, Jurgen Holler & Alef Arendsen. (2013) Professional Java Development with the Spring Framework

WEB SITES

1. java.sun.com/docs/books/tutorial/
2. www.java.net/

SEMESTER-IV

17CAP401 J2EE 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

Course Objectives

Enable the student

- To understand J2EE as an architecture and platform for building
- To deploy web-based, n-tier, transactional, component-based enterprise applications
- To understand the fundamental concepts of XML and related technologies
- To acquire knowledge on how XML is currently being used in various application areas
- To know how to parse and transform XML documents via tools and through programming APIs
- To understand the EJB architecture and have a good grasp on when to use and how to use various EJB bean types and acquire relevant Java programming experience

Course Outcomes (COs)

Upon completion of this course, Students will be able to :

1. Characterize the concepts J2SE and J2EE
2. Develop Enterprise Applications using Session Bean, Entity Bean and MDB
3. Demonstrate the hierarchy of Java classes to provide software solutions using Java APIs
4. Analyze the components and patterns of Java Servlet architecture for webapplications
5. Apply systematic Java programming knowledge to connect backend and front end
6. Implement the Java Servlet to transfer data

UNIT I – J2EE OVERVIEW

J2EE Overview – Beginning of Java – Java Byte code – Advantages of Java –J2EE and J2SE. J2EE Multi Tier Architecture – Distributive Systems – The Tier – Multi Tier Architecture – Client Tier, Web Tier, Enterprise Java Beans Tier, Enterprise Information Systems Tier Implementation.

UNIT II - J2EE DATABASE CONCEPTS

J2EE Database Concepts:Data – Database – Database Schema. JDBC Objects: Driver Types – Packages – JDBC Process – Database Connection – Statement Objects – Result Set – Meta Data.

UNIT III - JAVA SERVLETS

Java Servlets: Benefits – Anatomy – Reading Data from Client –Reading HTTP Request Headers – Sending Data to client – Working with Cookies.

UNIT IV – ENTERPRISE JAVA BEANS

Enterprise Java Beans – Deployment Descriptors – Session Java Bean –Entity Java Bean – Message Driven Bean.

UNIT V – JAVA SERVER PAGES

Java Server Pages – Java Remote Method Invocation.

SUGGESTED READINGS

1. Joseph J Bambaraetal. (2001). J2EE Unleashed, 1st Edition, Tech Media.
2. Paul J Perrone, Venkata S R R Chaganti, S .R.Venkata Krishna, R Chaganti and Tom Schwenk. (2003). J2EE Developer's Handbook, Sams Publications.
3. Rod Johnson. (2004). J2EE Development without EJB, 1st Edition, Wiley Dream Tech India, New Delhi.
4. Rod Johnson. (2004). Expert One-On-One J2ee Design and Development , John Wiley & Sons, Incorporated.
5. Jim Keogh. (2017). The Complete Reference J2EE, 1st Edition, Tata MGraw Hill Edition, New Delhi .

WEB SITES

1. java.sun.com/javaee/
2. java.sun.com/j2ee/1.4/docs/tutorial/doc/
3. www.j2eebrain.com/
4. http://www.codejava.net/java-se/jdbc/connect-to-oracle-database-via-jdbc
5. http://mrbool.com/how-to-create-rmi-client-and-server-to-invoke-remove-method-of-rmi-server-in-java/28320

SEMESTER-IV

17CAP402 MOBILE COMPUTING 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To introduce an advanced element of learning in the field of wireless communication and the concepts of wireless devices and mobile computing.
- To introduce wireless communication and networking principles, that support connectivity to cellular networks, wireless internet and sensor devices.
- To understand the use of transaction and e-commerce principles over devices to support mobile business concepts
- To learn the basic concepts, aware of the GSM, SMS, GPRS Architecture.
- To understand the mobile operating system development environment such as android.
- To demonstrate the features of Android Mobile Operating System for developing Android Applications

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Gain the knowledge about various types of Wireless Data Networks and Wireless Voice Networks.
2. Analyze the architectures and the challenges of Wireless Networks.
3. Analyze the role of Wireless Protocols in Wireless Networks.
4. Know about different types of Wireless Communication Networks and their functionalities.
5. Develop Mobile Applications Using Android
6. Identify the features involved in Bluetooth technology.

UNIT I - INTRODUCTION

Mobile Computing- Middleware and Gateways-Developing Mobile Computing Applications-Security in Mobile Computing – Architecture of Mobile Computing-Three-Tier Architecture-Design Consideration for Mobile Computing-Mobile Computing through Internet- Mobile Computing through Telephone-Developing an IVR Applications

UNIT II – BLUETOOTH AND GSM

Bluetooth- Features and working of RFID - Wireless Broadband (WiMax)- Mobile IP – IPV6-Java Card –Global System for Mobile Communications – GSM Architecture – Call Routing in GSM – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency Allocation – Authentication and Security- Mobile Computing Over SMS – SMS-Value Added Services through SMS.

UNIT III – GPRS, 3G AND 4G NETWORKS

GPRS and Packet Data Network – GPRS Network Architecture – GPRS Network Operations – Data Services in GPRS- Applications for GPRS – Limitations of GPRS- Spread Spectrum Technology- CDMA Versus GSM – – Features of 3G Networks –Architecture of 3G- Applications of 3G - Features of 4G- Architecture of 4G - Wireless Technologies Used in 4G- Merits and Demerits of 4G

UNIT IV – MOBILE AD-HOC NETWORKS

MOBILE Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc Networks (VANET) – MANET Vs VANET – Security

UNIT V – ANDROID OPERATING SYSTEM

History of Android -Introduction to Android Operating Systems -Android Architecture - Android Virtual Device Manager - Features of Eclipse and Android Studio-Comparison of Kotlin Language to Java- User Interface Architecture of Android: Application context, intents, Activity life cycle, User Interface Design of Android –Features of Android SQLite Database

SUGGESTED READINGS

1. Asoke K. Talukder, Roopa R. (2011). Mobile Computing: technology, applications, and service creation, New Delhi ,Tata McGraw Hill.
2. R.Roger, J Lombarddo, Z Mednieks and B. Meike (2010). Android Applications Development, O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi.
3. JochenSchiller (2000). Mobile Communication, Addison Wesley.
4. Brian Fling (2009). Mobile Design and Deevelopment, O'Reilly Media, Inc
5. William C.Y.Lee (1993). Mobile Communication Design Fundamentals, John Wiley.
6. Ivan Stojmenovic, (2002). Handbook Of wireless Networks And Mobile Computing, A Wiley-Interscience Publication.
7. Charles E.Perkins, (2008).Ad Hoc Networking, Addison-Wesley Publications

WEBSITES:

1. en.wikipedia.org/wiki/Mobile_computing
2. www.cse.iitk.ac.in/users/rkg/Talks/mobile_main.pdf
3. www.tutorialspoint.com/android/
4. pl.cs.jhu.edu/oose/resources/android/Android-Tutorial.pdf

SEMESTER-IV

17CAP403 ORGANIZATIONAL BEHAVIOUR 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks: Internal: 40 External: 60 Total: 100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

1. To make the students familiar with basic concepts of management & human behavior in an Organizational context and application of these concepts to managerial problems.
2. To integrate the relevant knowledge drawn from related disciplines like psychology, sociology and anthropology to make them applicable for studying and analyzing organizational behavior.
3. To gain a solid understanding of human behavior in the workplace from an individual, group, and organizational perspective and frameworks and tools to effectively analyze and approach various organizational situations.
4. To maintain decision making
5. To know about perception
6. To gain knowledge on conflict management

COURSE OUTCOMES (COs)

Upon completion of this course, the student will have reliably demonstrated the ability to:

1. Analyze individual and group behavior, and understand the implications of organizational behavior on the process of management.
2. Identify different motivational theories and evaluate motivational strategies used in a variety of organizational settings.
3. Evaluate the appropriateness of various leadership styles and conflict management strategies used in organizations.
4. Describe and assess the basic design elements of organizational structure
5. Evaluate their impact on employees.
6. Explain how organizational change and culture affect working relationships within organizations.

UNIT I - MANAGEMENT OVERVIEW

Management overview: – evolution of management - functions - characteristics and Importance of management - management vs administration - role of manager - planning: Meaning - steps in planning - objectives - management by objectives.

UNIT II - DECISION MAKING

Decision making: meaning, process. Organization – departmentalization - manpower planning - Process of recruitment and selection, placement and orientation - directing – motivation – Communication. Control – need, process, steps in control.

UNIT III – INTRODUCTION TO ORGANIZATION BEHAVIOR

Organization behavior: meaning and definition - fundamental concepts of ob – contributing Disciplines to the ob field - learning – theories of learning - personality – determinants of Personality - theories of personality - psycho-analytical, social learning, job-fit, and trait Theories.

UNIT IV - PERCEPTION

Perception – factors influencing perception – attribution theory – frequently used shortcuts in Judging others - perceptual process - organization errors of perception - attitudes – types of Attitudes - functions of attitudes. Values – types of values- value across cultures – groups - Stages of group development - group norms - group cohesiveness.

UNIT V – CONFLICT MANAGEMENT

Conflict – meaning – functional vs. Dysfunctional conflict - levels of conflict – conflict Management. Stress – causes of stress – effects of occupational stress - coping strategies for Stress. Organizational change - forces for change - resistance to change- overcoming resistance To change.

SUGGESTED READINGS

1. Koontz and weirich.(2010). Essentials of management, Tata mcgraw hill, New Delhi.
2. Stephen robbins (2012). Organizational behavior, Prentice hall of India.
3. Vsp rao, V.Hari Krishna. (2009). Management: text and cases, excel books, New Delhi.
4. Robbins.S.P.(2006). Fundamentals of management, Pearson publications, New Delhi.
5. Gilbert. (2008). Management today principles and practice, tata mcgraw hill,
6. Fred luthans(1995),"organizational behavior", 7th edition, Tata mcgraw hill, New Delhi.
7. Steven. Lmc shane and mary ann Von glinow. (2001). Organizational behavior, 2nd edition, tata Mcgraw hill.
8. Stephen p robbins and timothy a judge (2007). Organizational behavior, Prentice hall of India.
9. L .m. Prasad(2001).Organizational behaviour, 3rd edition, sultan chand and sons.
10. L.m.prasad. (2013). Principles and practice of management, sultan chand & sons,

SEMESTER-IV

17CAP404D DATABASE ADMINISTRATION 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks: Internal: 40 External: 60 Total: 100**

End Semester Exam: 3 Hours

Course Objective

Enable the student

- To install and configure database
- To create users and assign roles
- To optimize schemas, tables, indexes and views
- To manage database services and clients
- To move the data from one database to another database.
- To take backup and perform recovery.

Course Outcomes(COs)

Upon completion of this course, students will be able to:

1. Design, model and install any database management systems by using Oracle database as sample.
2. Plan, design, construct, control and manage database instances, database network environment, storage structures, user security, database backup and recovery, database maintenance
3. Define and devise transaction management, concurrency control, crash recovery components
4. Examine and perform data base administration roles
5. Examine the database operations by using Oracle database system as a sample.
6. Apply the knowledge of VLDB to control the distributed databases

UNIT I - INTRODUCTION TO ORACLE DBA

Oracle DBA's: The Oracle DBA's Role- Oracle Database 10g Architecture: Oracle Databases and instances- Oracle Logical Storage structures – Oracle Logical Database structures – Oracle Physical Storage structures- Multiplexing Database Files - Oracle Memory Structures-Oracle Backup and Recovery – Security Capabilities – Tablespace Architecture – Oracle Tablespace installation – Traditional Disk Space Storage – Automatic Storage Management

UNIT II – INTRODUCTION TO SPACE MANAGEMENT

Common Space Management Problems – Oracle Segments, Extents and Blocks – Space Management Methodologies – SYSAUX monitoring and usage – Archived Redo Log File Management – Built in Space Management Tools: Segment Advisor – Undo Advisor and the Automatic Workload Repository – Index usage – Space Usage Warning Levels – Reusable space allocation – Managing alert and Trace Files with ADR – Transaction Basics – Undo Basics – Managing Undo Tablespaces – Flashback features

UNIT III – INTRODUCTION TO TUNING APPLICATION

Tuning Application Design – Tuning SQL – Tuning Memory Usage – Tuning Data Access – Tuning Data Manipulation – Tuning Physical Storage – Reducing Network Security – Database Authentication Methods

UNIT IV – AUTHORIZATION METHODS

Database Authorization Methods – Auditing: Auditing Locations – Statement Auditing – Privilege Auditing Schema Object Auditing – Auditing Related Data Dictionary Views – Logical Backups – Physical Backups – Using Data Pump Export and Import – Data Pump Import Options – Integration of Backup Procedures

Overview of Oracle Net – Using the Oracle Net Configuration Assistant – Using the Oracle Net Manager – Starting the Listener Server Process – Controlling the Listener Server Process Using Data links

UNIT-V - CREATING TABLE SPACES IN A VLDB ENVIRONMENT

Creating Table spaces in a VLDB Environment: Big file Table space Basics – Creating and Modifying Big file Tablespace – Big file Tablespace ROWID format – DBMS_ROWID and Big file Tablespaces.- Advanced Oracle Table Types – Using Bitmap Indexes – Oracle Data Pump Remote queries – Remote Data Manipulation: Two Phase Commit – Managing Distributed Data – Managing Distributed Transactions – Monitoring and Tuning Distributed Database

SUGGESTED READINGS

1. Bob Bryla, Kevin Loney. (2008). Oracle Database 11g DBA Handbook, McGraw-Hill Osborne.
2. Saikat Basak .(2010), Oracle DBA Concise Handbook , Ensel Software.
3. Amarnath Reddy. (2018) ,Oracle DBA 11g/12c – Database Administration for junior DBA.

WEB SITES:

1. www.oracle.com/technology/software/products/database/oracle10g/index.html
2. www.oracle-base.com/articles/10g/
3. www.adp-gmbh.ch/ora/misc/10g.html

SEMESTER-IV

17CAP404N CRYPTOGRAPHY AND NETWORK SECURITY 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

Course Objectives

Enable the student

- To teach fundamental aspects of security in a modern networked environment with the focus on system design aspects and cryptography in the specific context of network.
- To build protection mechanisms in order to secure computer networks.
- To write coding to encrypt "Plain Text" into "Cipher Text" and vice versa, using different encryption algorithms.
- To choose a suitable ciphering algorithm according to the required security level.
- To build cryptosystems by applying encryption algorithms,
- To build secure authentication systems by use of message authentication techniques.
- To know about the blockchain technology

Course Outcomes (Cos)

Upon completion of this course, students will be able to:

1. Classify the symmetric encryption techniques
2. Illustrate various Public key cryptographic techniques
3. Evaluate the authentication and hash algorithms.
4. Summarize the intrusion detection and its solutions to overcome the attacks.
5. Demonstrate the basic concepts of system level security
6. Apply the block chain technology for security

UNIT I - INTRODUCTION TO CRYPTOGRAPHY

Introduction to Cryptography – Security Attacks – Security Services – Security Algorithm – Stream cipher and Block cipher – Symmetric and Asymmetric – Key Cryptosystem; Symmetric Key Algorithms: Introduction – DES – Triple DES – AES – IDEA – Blowfish – RC5.

UNIT II - PUBLIC KEY CRYPTOSYSTEM

Public Key Cryptosystem: Introduction to Number Theory – RSA Algorithm – Key Management – Diffie-Hell man key exchange – Introduction to Elliptic Curve Cryptography; Message Authentication and Hash functions – Hash and Mac Algorithm – Digital Signatures and Authentication Protocol.

UNIT III - NETWORK SECURITY PRACTICE

Network Security Practice: Authentication Applications – Kerberos – X.509 Authentication Services and Encryption Techniques:; E-mail security – PGP – s/MIME – IP Security.

UNIT IV - WEB SECURITY

Web Security – Secure Socket Layer – Secure Electronic Transaction; System Security – Intruders and Viruses – Firewalls – Password Security.

UNIT V – CRYPTOGRAPHIC ALGORITHMS, SECURITYAND STEGNOGRAPHY

Case Study: Implementation of Cryptographic Algorithms – RSA – DSA – ECC (C / JAVA Programming). Network Forensic – Security Audit; Other Security Mechanism: Introduction to Stenography – Quantum Cryptography – Water Marking – DNA Cryptography.

SUGGESTED READINGS

1. Bruce Schneir .(2006). Applied Cryptography, 2nd Edition. CRC Press, New Delhi.
2. A.Menezes, P.Van Oorschot and Vanstone. (2010). Hand Book of Applied Cryptography, 2nd Edition. CRC Press, New Delhi.
3. Ankit Fadia. (2010), Network Security, 2nd Edition. McMillan India Ltd, New Delhi.
4. William Stallings. (2013). Cryptography and Network Security, 6th Edition. Pearson Education, New Delhi.

WEB SITES

1. williamstallings.com/Crypto3e.html
2. u.cs.biu.ac.il/~herzbea/book.html
3. www.flipkart.com/search-books/cryptography+and+network+security+William+ stallings+ebook

SEMESTER-IV

17CAP404S SOFTWARE TESTING 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

Course Objectives

Enable the student

- To perform test each time they are run, thereby eliminating human error.
- To test how the software reacts under repeated execution of the same operations.
- To program sophisticated tests which bring out hidden information from the application.
- To reuse tests on different versions of an application, even if the user interfaces changes.
- To know the risks in project management system
- To know about various testing

Course Outcomes (COs)

Upon completion of this course, students will be able to

1. Test the software by applying testing techniques to deliver a product free from bugs
2. Evaluate the web applications using bug tracking tools.
3. Investigate the scenario and the able to select the proper testing technique
4. Explore the test automation concepts and tools
5. Deliver quality product to the clients by way of applying standards such as TQM, Six Sigma
6. Evaluate the estimation of cost, schedule based on standard metrics

UNIT I – INTRODUCTION TO TESTING

Introduction: Purpose of Testing – Dichotomies - Model for Testing – consequences of bugs-Taxonomy for bugs

UNIT II – FLOW GRAPHS AND PATH TESTING

Flow/Graphs and Path Testing: Path testing basics-predicates, path predicates and Achievable paths – Path sensitizing– path instrumentation-implementation and application of path testing

UNIT III - INTRODUCTION TO FLOW TESTING

Transaction flow testing: – Transaction flow - Transaction flow testing techniques – implementation comments – testability tips -Data flow testing basics- Data flow testing strategies.

UNIT IV – DOMAINS AND PATHS

Domains and paths-Nice Domains and Ugly Domains-Domain testing-Domains and interface testing-Domains and testability-Metrics-Linguistic metrics-structural metrics-Hybrid metrics-metrics implementations-Testability tips

UNIT V – RISK ANALYSIS

Risk Analysis: Benefits of Risk analysis – Project Management Strategies and Risk – MITs risk Analysis – MITs Ranking Criteria - Using Risk Ranking in Forensics –Test estimation process-MIT totals worksheet-Sizing worksheet

SUGGESTED READINGS

1. Boris Beizer. (2003). Software Testing Techniques, II Edn., DreamTech India, New Delhi. (UNIT – I, II, III, IV)
2. Marnie L Hutcheson. (2003). Software testing fundamentals, 1st Edison, Wiley, DreamTech India, New Delhi. (UNIT – V)
3. Burnstein. (2003).Practical Software Testing, Springer International Edison.
4. E. Kit. (1995). Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.
5. R.Rajani, and P.P.Oak.(2004). Software Testing, Tata Mcgraw Hill, New Delhi.
6. Dorothy Graham,Rex Black, and et.al(2011). Foundations of Software Testing - ISTQB Certification. 3rd Edition, Cengage Learning

WEB SITES

1. http://my.safaribooksonline.com
2. http://www2.sas.com
3. http://www.softwaretesting fundamentals.com
4. www.cs.cmu.edu
5. www.softwaretesting management.con
6. http://www.java2novice.com/junit-examples/test-list-objects/

SEMESTER-IV

17CAP404W XML 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To be aware of a range of XML tools (Many of them are free).
- To know how to set out an XML document
- To define custom markup language
- To understand the purpose of using DTDs and Schemas to validate XML
- To use XSLT to write a style sheet for XML document to produce multiple output
- To know about DOM

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Learn the basics of creating XML documents, transforming XML documents, and validating XML documents.
2. More specifically, you will learn the basics and history of XML and how to write your own XML documents.
3. Learn how to transform XML documents into documents of other types using XSLT.
4. Learn how to write valid XML documents based on a DTD.
5. Combine XML with existing web technologies.
6. Implement using XML Path language

UNIT I - INTRODUCTION

World Wide Web: Introduction to the Internet and World Wide Web: W3C – History of Internet- World Wide Web- SGML – XML Resources – Internet and World Wide Web resources. Creating Mark up with XML: Introduction – Parsers and well formed XML Documents – Parsing an XML Document - Characters – Mark up – CDATA Sections – XML Namespaces

UNIT II – INTRODUCTION TO DTD

Document Type Definition – Parsers, Well formed and valid XML documents – Element type declarations – Attribute declarations- Attributes Types. Schemas:– Schemas VS DTD's – MSXML Schemas, W3C XML Schema –Declaring Types and Elements –Attribute constraints and Defaults - Simple type - Empty elements -Mixed content elements – Creating Attribute Groups

UNIT III – INTRODUCTION TO DOM

Document Object Model: DOM implementations – DOM with JavaScript – Components- Creating nodes – Traversing the DOM. Simple API for XML: DOM vs SAX – SAX based Parsers.

UNIT IV –XML PATH LANGUAGE

XML Path Language: Nodes – Location Paths; XSLT: Templates - Creating Elements and attributes – Iteration and Sorting – Conditional Processing – Copying Nodes – Combining style sheets – variables. XLink, XPointer, XInclude and XBase.

UNIT V - XML TECHNOLOGIES AND APPLICATIONS

XML Technologies and Applications: XML Query Language – Directory Services Markup Language – Resources Definition Framework – XML topic Maps – Virtual Hyper Glossary – Channel Definition Format – Information and Content Exchange Protocol – Platform for Privacy preferences – XML Metadata Interchange.

SUGGESTED READINGS

1. Ann Novarro, Chuck white, Linda Burman. (2000). Mastering XML, 1st Edition, BPB Publi, New Delhi.
2. Steve Holzner.(2001). Inside XML, 1st Edition, TechMedia, New Delhi.
3. Deitel & Deitel. (2008), XML How to Program . 1st Edition, Pearson Education, New Delhi.

WEB SITES

1. en.wikipedia.org/wiki/XML
2. www.w3.org/XML/
3. www.w3schools.com/xml/default.asp
4. http://www.cs.nmsu.edu/~epontell/courses/XML/material/xmlparsers.html#shapes_SAX

SEMESTER-IV

17CAP404B MANAGERIAL ECONOMICS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To provide students with a basic understanding of the economic theory and analytical tools that can be used in decision making problems.
- To have a good understanding of economic concepts and tools, that have direct managerial applications.
- To sharpen their analytical skills through integrating their knowledge of the economic theory with decision making techniques.
- To provide a basic introduction to econometric analysis and its role in managerial decision making.
- Make optimal business decisions by integrating the concepts of economics, mathematics and statistics.
- To know about demand analysis

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Understand the roles of managers in firms
2. Understand the internal and external decisions to be made by managers
3. Analyze the demand and supply conditions and assess the position of a company
4. Design competition strategies, including costing, pricing, product differentiation, and market environment according to the natures of products and the structures of the markets.
5. Analyze real-world business problems with a systematic theoretical framework.
6. Maintain product and cost analysis

UNIT I - NATURE AND SCOPE OF MANAGERIAL ECONOMICS

Nature and scope of managerial economics. Objectives of the firm. Managerial and behavioral theories of the firm.

UNIT II - DEMAND ANALYSIS

Concepts of opportunity cost, incremental, time perspective. Principles of discounting and equimargins. Demand analysis - purposes and concepts. Elasticity of demand. Methods of demand forecasting.

UNIT III - PRODUCT AND COST ANALYSIS

Product and cost analysis: short run and long run average cost curves. Law of supply. Economies and diseconomies of scale. Law of variable proportions. Production function - single output isoquants.

UNIT IV – CONCEPT OF PRICING

Pricing: Prescriptive approach. Price determination under perfect competition. Monopoly, oligopoly and monopolistic competition. Full cost pricing, product line pricing. Pricing strategies.

UNIT V – INTRODUCTION TO PROFIT

Profits: Nature and. measurement policy. Break-even analysis. Case study.

SUGGESTED READINGS

1. Dean. J. (1982). Management Economics. Prentice Hall of India, New Delhi.
2. Mote. V.L.. et al,(1980). Managerial Economics: Concepts and Cases. Tata McGraw Hill. New Delhi.
3.Dominick Salvatore. (2016). Managerial Economics: Principles and Worldwide Applications, Seventh Edition, Adapted version

WEB SITES

1. http://www.pondiuni.edu.in/sites/default/files/Managerial%20Economics.pdf
2. http://www.comp.nus.edu.sg/~ipng/mecon/sg/01int_sg.pdf
3. http://www.li.suu.edu/library/circulation/Tufte/econ6200dtManagerialEconomicsFa12Ch1.pdf
4. http://www.bput.ac.in/lecture_notes/ME%20Managerial%20Economics.pdf

SEMESTER-IV

17CAP405D DISTRIBUTED DATABASE MANAGEMENT SYSTEM 4H -4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks: Internal: 40 External: 60 Total: 100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To design good performing distributed database schemas.
- To create optimized query execution plan.
- To efficiently distribute and manage the data.
- To manage distributed access control
- To know how to make secure the databases.
- To know how to deployment of DDBE Software

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. The physical structure of the database to handle data
2. Students would be able to implement the logic by using tools like ERD
3. Ability to normalize the database & understand the internal data structure
4. Students would clearly understand the transaction system
5. Extract the data efficiently
6. Detect or Avoid deadlock using the deadlock handling method

UNIT I – INTRODUCTION TO DATABASE CONCEPTS

Database concepts: Data Models- Database Operations- Database Management-DB Clients, Servers, and Environments. DBE Architecture**:** Services- Components and Subsystems- Sites - Expected Services-Expected Subsystems- Typical DBMS Services**–** DBE Taxonomy**:** COS Distribution and Deployment- COS Closeness or Openness-Schema and Data Visibility- Schema and Data Control.

UNIT II – DESIGN ALTERNATIVES AND FRAGMENTATION

Data Distribution Alternatives: Design Alternatives- Localized Data- Distributed Data. Fragmentation: Vertical Fragmentation- Horizontal Fragmentation. Distribution Transparency: Location Transparency-Fragmentation Transparency-Replication Transparency-Location, Fragmentation, and Replication Transparencies.

UNIT III - QUERY OPTIMIZATION

Query Optimization: Sample Database- Query Processing in Centralized Systems: Query Parsing and Translation - Query Optimization- Query Processing in Distributed Systems- Heterogeneous Database Systems - Concurrency Control in Distributed Database Systems.

UNIT IV - DEADLOCK HANDLING

Deadlock Handling: Deadlock Definition- Deadlocks in Centralized Systems- Deadlocks in Distributed Systems- Distributed Deadlock Detection. Replication Control: Replication Control Scenarios. Failure and Commit Protocols: Terminology- Commit Protocols.

UNIT V - DDBE SECURITY

DDBE Security: Cryptography- Securing Data. Traditional DDBE Architectures: Classifying the Traditional DDBMS Architecture- The MDBS Architecture Classifications- Approaches for Developing A DDBE- Deployment of DDBE Software.

SUGGESTED READINGS

1. Ceri.(1985). Distributed Databases Principles and Systems , 1st Edition Mchraw Hill Pub.
2. Tamer Ozus M,Patrick Valduriez,S.Sridhar. (2006). Principle Of Distributed Database Systems, 1st Edition , Pearson Education.
3. William M.NewMan, Robort F.Sproull. (2004). Principles of Interactive Computer Graphics, 1st Edition , Pearson Education.
4. Saeed K. Rahimi And Frank S. Haug.(2010). Distributed Database Management Systems :A Practical Approach, 1st Edition, A John Wiley & Sons, Inc., Publication.

WEB SITES

1. en.wikipedia.org/wiki/Distributed_computing
2. www.webopedia.com/TERM/D/distributed_computing.html
3. www.tech-faq.com/distributed-computing.shtml
4. http://www.inf.unibz.it/dis/teaching/DDB/ln/ddb01.pdf

Semester-IV

17CAP405N	**TCP/IP**	**4H- 4C**

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks: Internal: 40 External: 60 Total: 100**

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To learn about IPv4 forwarding and routing.
- To learn about host name resolution and the Domain Name System (DNS).
- To learn about IPv6 addresses.
- To know the Architectural Overview of the TCP/IP Protocol Suite
- Describe the DHCP discovery process
- To know about UDP operation

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Configure subnets using IP classes B and C
2. Explain TCP/IP protocols, ports, sockets, and data encapsulation
3. Describe the process of packet fragmentation and reassembly
4. Explain the key features and functions of TCP and UDP
5. Use Wireshark to identify ICMP request and reply packets
6. Know the operation of DHCP

UNIT I - INTRODUCTION

Introduction: WAN, WAN technologies - Internetworking concepts - Protocols and Standards - TCP/IP protocol suite - Internetworking Devices – Routing Concept - Classful IP Addressing – Subnetting – Supernetting – Classless Addressing

UNIT II – ARP & RARP

ARP & RARP – Proxy ARP – ARP over ATM – ARP and RARP Protocol Format. IP Datagram – Fragmentation – Options – IP Datagram Format – Routing IP Datagrams – Checksum. ICMP: Types of Messages - Message Format – Error Reporting – Query – Checksum - ICMP Package

UNIT III - ROUTING AND ROUTED PROTOCOLS

Routing and Routed Protocols - Autonomous Systems – Routing Table - Interior Gateway Protocols – Exterior Gateway Protocols – Routing in Internet. Group Management – IGMP Message – IGMP Operation – Process to Process Communication.

UNIT IV - UDP OPERATION

UDP Operation – TCP Services - Flow Control – Multicast Routing – Multicast Routing Protocols. BOOTP - DHCP – Address Discovery and Binding. DNS – Name Space – DNS in Internet – Resolution – Resource Records.

UNIT V – REMOTE LOGIN

Remote Login - FTP – SMTP – SNMP. IP over ATM Wan – Cells – Routing the Cells. Mobile IP: Addressing – Agents – Agent discovery – Registration – Data Transfer – VPN.

SUGGESTED READINGS

1. Douglas E. Comer. (2000). Internetworking With TCP/IP, Vol 1: Principles Protocols and Architecture. 4th Edition. New Delhi: Pearson Education.
2. William Stallings. (1997). Data and Computer Communication, 5th Edition. New Delhi: Prentice Hall of India.
3. Behrouz A. Forouzan. (2010). TCP/IP Protocol Suite, 4th Edition. New Delhi: Tata McGraw Hill Publication.

WEB SITES

1. en.wikipedia.org/wiki/Internet_protocol_suite
2. http://docwiki.cisco.com/wiki/Introduction_to_WAN_Technologies
3. www.yale.edu/pclt/COMM/TCPIP.HTM
4. www.w3schools.com/tcpip/default.asp

SEMESTER-IV

17CAP405S OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

Course Objectives

Enable the student

- To use object-oriented technologies and Unified Modeling Language 2.2
- To perform object-oriented analysis and design
- To explain how the Unified Modeling Language (UML) represents an object-oriented system using a number of modeling views.
- To know about class diagrams
- To design the application using interaction diagram
- To construct various UML models (including use case diagrams, class diagrams, interaction diagrams, state chart diagrams, activity diagrams, and implementation diagrams) using the appropriate notation.

Course Outcomes (Cos)

Upon Completion of this course, student will be able to

1. Understand of programming language concepts;
2. Demonstrate the software engineering principles
3. Apply the principles of software engineering to software design;
4. Apply the knowledge of OOAD to complete large software project
5. Analyze the deployment of UML diagrams for software design
6. Apply the principles of software engineering quality principles for developing quality software

UNIT I - STRUCTURE OF COMPLEX SYSTEMS

Complexity: The structure of complex systems-the inherent complexity of software-The five attributes of a complex system-Organized and Disorganized complexity-Bringing order to Chaos-On Designing complex systems. The Object model: The evolution of the object model-Foundations of the object model-Elements of the object model-Applying the object model.

UNIT II – INTRODUCTION OF CLASSES AND OBJECTS

Classes and Objects: The nature of an object-Relationship among objects-The nature of a class-Relationships among classes-The interplay of classes and objects-On building quality classes and objects.

UNIT III – CLASSIFICATION AND NOTATION

Classification: The importance of proper classification-Identifying classes and objects-Key abstraction and mechanisms. Notation: The unified modeling language-Package diagrams-Component diagrams.

UNIT IV - DEPLOYMENT DIAGRAMS

Deployment diagrams-Use case diagrams-Activity diagrams-Class diagrams-Sequence diagrams-Interaction overview diagrams-Composite structure diagrams -State machine diagrams-Timing diagrams-Object diagrams-communication diagrams.

UNIT V - PROCESS AND PRAGMATICS

Process: First principles-The Macro Process: The software development lifestyle- The Micro Process: The analysis and design process. Pragmatics: Management and planning-Staffing-Release management-Reuse-Quality assurance and metrics-

SUGGESTED READINGS

1. Martin Fowler, Kendall Scott. (2004). UML Distilled, 2nd Edition, Pearson Education, New Delhi. [UNIT 5]
2. James Rumbaugh, Ivar Jcobson and Grady Booch.(2003). The Unified Modeling Language Reference Manual, 1st Edition, Addison Wesley, New Delhi.
3. Boar (2004).Xml Web Services In The Organization, Wppublisher
4. Grady Booch. (2007). Object Oriented Analysis and Design, 3rd Edition, Addison Wesley, New Delhi. [UNIT 1 to 4]

WEB SITES

1. uml-tutorials.trireme.com/
2. http://www.devshed.com/c/a/Practices/Introducing-UMLObjectOriented-Analysis-and-Design/
3. http://community.sparxsystems.com/tutorials/object-oriented-analysis-and-design

SEMESTER-IV

17CAP405W WEB SERVICES 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

Course Objectives

Enable the student

- To be able to describe the interoperable web services architecture, including the roles of SOAP and WSDL.
- To use lower-level SOAP and XML APIs for services and/or clients.
- To build and Host Web Services.
- To apply the web service security
- To know the basic WSDL structure
- To develop the web service application

Course Outcomes (Cos)

Upon completion of the course, students will be able to

1. Understand the use of web services in B2C and B2B applications.
2. Understand the design principles and application of SOAP
3. To know the principles of REST based web services.
4. Design collaborating web services according to a specification.
5. Implement an application that uses multiple web services in a realistic business scenario.
6. Use industry standard open source tools such as Apache Axis2, Tomcat, Derby and Eclipse to build, test, deploy and execute web services and web applications that consume them.

UNIT I – INTRODUCTION TO WEB SERVICES

Introduction: What are Web Services – Importance of web services – Web services and enterprises; XML Fundamentals:: XML Documents - Namespaces – Schema – Processing XML.

UNIT II – SOAP AND WSDL

SOAP: SOAP Model – messages – Encoding – RPC – Alternative SOAP encodings – Document, RPC, Literal, Encoded – SOAP, Web Services and the REST Architecture
WSDL: Structure – Using SOAP and WSDL. UDDI- UDDI Business Registry – Specification – Data Structures – Life cycle Management – Dynamic Access Point Management.

UNIT III – INTRODUCTION TO WEB SERVICES AND WORKFLOW

Advanced Web Services Technologies and Standards: Conversation – Overview – Web Services Conversation Language – WSCL Interface Components- Workflow-Business Process

Management – Workflow and Workflow Management systems – BPEL. Transaction –ACID transaction – Distributed Transaction – OASIS Business Transaction Protocol.

UNIT IV - WEB SERVICE SECURITY

Security – Security Basics – Security Issues – Types of Security Attacks – WS –Security. Mobile and Wireless – Mobile Web Services – Challenges with mobile – Proxy Based Mobile Systems -Direct Mobile Web service access - J2ME Web Services

UNIT V - WEB SERVICE APPLICATIONS

Building Real World Enterprise Web Service and Applications: Real World Web Service Application Development – Development of Web services and Applications onto Tomcat application Server and Axis Soap Server.

SUGGESTED READINGS

1. Martin Kalin. (2013). Java Web Services: Up and Running, 2nd Edition, O'Reilly Media,USA.
2. Vikram Ramchand, Sonal Mukhi. (2008). XML Web Services and SOAP , 1st Edition, BPB Publications, New Delhi.
3. Eric A Marks and Mark J Werrell. (2003). Executive Guide to Web Services, 1st Edition, John Wiley and Sons, New Delhi
4. Sandeep Chatterjee, James Webber. (2009). Developing Enterprise Web Services: An Architect's Guide, 4th Edition, Pearson Education, New Delhi.

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WEB SITES

1. www.w3schools.com/webservices/default.asp
2. en.wikipedia.org/wiki/Web_service
3. www.webservices.org/
4. https://www.cl.cam.ac.uk/~ib249/teaching/Lecture1.handout.pdf
5. http://www.codejava.net/java-ee/web-services/create-client-server-application-for-web-service-in-java

SEMESTER-IV

17CAP405B CORPORATE PLANNING 4H -4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To explain the relationship between planning and organizational performance.
- To define corporate planning.
- To explain why corporate plan do fail and what can be done to ensure its success.
- To explain when should a strategic plan be made?
- To define objectives and why are they considered the foundation of planning
- To describe the organization behaviour

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Understand the strategic decisions that organizations make and have an ability to engage in strategic planning.
2. Explain the basic concepts, principles and practices associated with strategy formulation and implementation.
3. Integrate and apply knowledge gained in basic courses to the formulation and implementation of strategy from holistic and multi-functional perspectives.
4. Analyze and evaluate critically real life company situations
5. Develop creative solutions, using a strategic management perspective.
6. Conduct and present a credible business analysis in a team setting.

UNIT I - SIGNIFICANCE OF PLANNING

Significance of Planning: Types. Needs. Requisites. Corporate planning: system approach. Role of the planner. Corporate planning and budgeting.

UNIT II - SOCIAL RESPONSIBILITIES

Social responsibilities: Scope, contents, cooperation and society, consumers, corporation and democracy, community and government.

UNIT III - PROFITABILITY AND PRODUCTIVITY

Social responsibility versus profitability and productivity. Growth. Professionalism as a means of social behavior.

UNIT IV - BUSINESS OBJECTIVES AND GOALS

Mission and purpose: Business definitions - objectives and goals. Environment appraisal: Concepts, components-Scanning and appraising the environment.

UNIT V - APPRAISAL

Organization appraisal: Dynamics. Capability factors. Considerations. Methods and techniques. Structuring. Planning gaps: Gap analysis. Manager audit: Significance of gaps.

SUGGESTED READINGS

1.Kazni. A . (1992). Business Policy. Tata McGraw Hill. New Delhi.

2.Johnson. G.. etal. (1994). Exploring corporate Strategy, 3rd edition. Prentice Hall of India, New Delhi.

3. Peter Lorange. (2013). Corporate Planning: An Executive Viewpoint, Primary source edition. Nabu Press

SEMESTER-IV

17CAP411 J2EE - PRACTICAL 5H - 2C

Instruction Hours / week: L: 0 T: 0 P: 5 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3 Hours

Course Objectives

Enable the student

- To understand J2EE as an architecture and platform for building
- To deploy web-based, n-tier, transactional, component-based enterprise applications
- To understand the fundamental concepts of XML and related technologies
- To acquire knowledge on how XML is currently being used in various application areas
- To know how to parse and transform XML documents via tools and through programming APIs
- To understand the EJB architecture and have a good grasp on when to use and how to use various EJB bean types and acquire relevant Java programming experience

Course Outcomes (COs)

Upon completion of this course, Students will be able to :

1. Characterize the concepts J2SE and J2EE
2. Develop Enterprise Applications using Session Bean, Entity Bean and MDB
3. Demonstrate the hierarchy of Java classes to provide software solutions using Java APIs
4. Analyze the components and patterns of Java Servlet architecture for webapplications
5. Apply systematic Java programming knowledge to connect backend and front end
6. Implement the Java Servlet to transfer data

List of Practical

1. Create a sign in form in servlets.
2. Write a servlet Program to lock a server.
3. Write a servlet program that returns list of information in table format.
4. Design a counter that counts number of times user has visited the site in current browsing session.
5. Write a program to create JDBC connectivity with Oracle Database.
6. Build a JAVA Bean for opening an applet from JAR file.
7. Write a program to create RMI client and server to invoke remove method of RMI server.
8. Design a counter in JAVA BEAN.
9. Write a program to stream contents of a file using JSP.
10. Write a program to insert a menu applet into JSP page.

SUGGESTED READINGS

1. Joseph J Bambaraetal. (2001). J2EE Unleashed, 1st Edition, Tech Media.
2. Paul J Perrone, Venkata S R R Chaganti, S .R.Venkata Krishna, R Chaganti and Tom Schwenk. (2003). J2EE Developer's Handbook, Sams Publications.
3. Rod Johnson. (2004). J2EE Development without EJB, 1st Edition, Wiley Dream Tech India, New Delhi.

4. Rod Johnson. (2004). Expert One-On-One J2ee Design and Development , John Wiley & Sons, Incorporated.
5. Jim Keogh. (2017). The Complete Reference J2EE, 1st Edition, Tata MGraw Hill Edition, New Delhi .

SEMESTER-IV

17CAP412 MOBILE COMPUTING - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To introduce an advanced element of learning in the field of wireless communication and the concepts of wireless devices and mobile computing.
- To introduce wireless communication and networking principles, that support connectivity to cellular networks, wireless internet and sensor devices.
- To understand the use of transaction and e-commerce principles over devices to support mobile business concepts
- To learn the basic concepts, aware of the GSM, SMS, GPRS Architecture.
- To understand the mobile operating system development environment such as android.
- To demonstrate the features of Android Mobile Operating System for developing Android Applications

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Gain the knowledge about various types of Wireless Data Networks and Wireless Voice Networks.
2. Analyze the architectures and the challenges of Wireless Networks.
3. Analyze the role of Wireless Protocols in Wireless Networks.
4. Know about different types of Wireless Communication Networks and their functionalities.
5. Develop Mobile Applications Using Android
6. Identify the features involved in Bluetooth technology.

List of Practical

1. Write a program to build your first Android Application “Hello World” with common activity.
2. Write a program which will implement Sub menu in android application.
3. Write a program which will implement Context menu (Floating List of Menu Items) in android application.
4. Write a program to displays the use of Relative Layout Views with different attributes.
5. Write a program to displays the use of Linear Layout Views with different attributes.

6. Write a program to implement a Custom Button and handle the display message on button press.
7. Write a program to implement the List View in your android application.
8. Write a program to implement between animations and rotate the text in your android application.
9. Write a sample program to create a progress bar for your android applications.
10. Write a program to show how to use Date picker control of ADK in your android applications.
11. Write a program which enables you to draw an image using bitmap class object.
12. Write a program which allows you to get image from web and displayed them using the Image View.

SUGGESTED READINGS

1. Ashok K Talukder and Roopa R Yuuvagal, (2005). Mobile Computing, Tata McGraw Hill
2. Publishing Company Limited.
3. R.Roger, J Lombarddo, Z Mednieks and B. Meike (2010). Android Applications Development, O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi.
4. JochenSchiller (2000). Mobile Communication, Addison Wesley.
5. Brian Fling (2009). Mobile Design and Deevelopment, O'Reilly Media, Inc
6. William C.Y.Lee (1993). Mobile Communication Design Fundamentals, John Wiley.
7. Ivan Stojmenovic, (2002). Handbook Of wireless Networks And Mobile Computing, A
8. Wiley-Interscience Publication.
9. Asoke K. Talukder, Roopa R. (2011). Mobile Computing: technology, applications, and
10. service creation, New Delhi ,Tata McGraw Hill.

SEMESTER-IV

17CAP413D DBA - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks: Internal: 40 External: 60 Total: 100**

End Semester Exam: 3 Hours

Course Objective

Enable the student

- To install and configure database
- To create users and assign roles
- To optimize schemas, tables, indexes and views
- To manage database services and clients
- To move the data from one database to another database.
- To take backup and perform recovery.

Course Outcomes(COs)

Upon completion of this course, students will be able to:

1. Design, model and install any database management systems by using Oracle database as sample.
2. Plan, design, construct, control and manage database instances, database network environment, storage structures, user security, database backup and recovery, database maintenance
3. Define and devise transaction management, concurrency control, crash recovery components
4. Examine and perform data base administration roles
5. Examine the database operations by using Oracle database system as a sample.
6. Apply the knowledge of VLDB to control the distributed databases

List of Practical

1. Demo for Globalization Support
2. Setup Listener Security
3. Configuring Recovery Manager
4. Write a program Using Recovery Manager
5. Write a program for Managing Diagnostic Sources
6. Implement Database Recovery
7. Demo for Flashback Database
8. Implement User Error Recovery
9. Write a program for Dealing with Corruption

10. Show the demo for Automated Management
11. Creating a database and do the manipulation.
12. Managing index tables

SUGGESTED READINGS

1. Bob Bryla, Kevin Loney. (2008). Oracle Database 11g DBA Handbook, McGraw-Hill Osborne.
2. Saikat Basak .(2010), Oracle DBA Concise Handbook , Ensel Software.
3. Amarnath Reddy. (2018), Oracle DBA 11g/12c – Database Administration for junior DBA.

SEMESTER-IV

17CAP413N NETWORK SECURITY - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

Course Objectives

Enable the student

- To teach fundamental aspects of security in a modern networked environment with the focus on system design aspects and cryptography in the specific context of network.
- To build protection mechanisms in order to secure computer networks.
- To write coding to encrypt "Plain Text" into "Cipher Text" and vice versa, using different encryption algorithms.
- To choose a suitable ciphering algorithm according to the required security level.
- To build cryptosystems by applying encryption algorithms,
- To build secure authentication systems by use of message authentication techniques.
- To know about the blockchain technology

Course Outcomes (Cos)

Upon completion of this course, students will be able to:

1. Classify the symmetric encryption techniques
2. Illustrate various Public key cryptographic techniques
3. Evaluate the authentication and hash algorithms.
4. Summarize the intrusion detection and its solutions to overcome the attacks.
5. Demonstrate the basic concepts of system level security
6. Apply the block chain technology for security

List of Practical

1. Write a program to convert your college name from plain text to cipher text using Transposition cipher method of encryption.
2. Write a program to convert your name from plain text to cipher text using the One Time Pads method of encryption.
3. Write a program to encrypt a paragraph using the Data Encryption Standard Algorithm.
4. Write a program to encrypt your biodata using the Advanced Encryption Standard Algorithm.
5. Write a program to decrypt the "Network Security" theory syllabus using the RSA Algorithm.

6. Write a program that takes a binary file as input and performs bit stuffing and Cyclic Redundancy Check Computation.
7. Write a program to simulate the working of Sliding-Window protocol.
8. Write a program to find the shortest path in a network using Dijkstra's Algorithm.

9. Write a program for the following chat application:

   One to One: Open a Socket connection and display what is written by one to another.

   Many to Many: Each Client Opens a Socket connection to the client server and writes to the socket. Whatever is written by one can be seen by all. Implement symmetric key cryptography.
10. Write a program to implement *International Data Encryption* Algorithm (*IDEA*).

SUGGESTED READINGS

1. Bruce Schneir .(2006). Applied Cryptography, 2nd Edition. CRC Press, New Delhi.
2. A.Menezes, P.Van Oorschot and Vanstone. (2010). Hand Book of Applied Cryptography, 2nd Edition. CRC Press, New Delhi.
3. Ankit Fadia. (2010), Network Security, 2nd Edition. McMillan India Ltd, New Delhi.
4. William Stallings. (2013). Cryptography and Network Security, 6th Edition. Pearson Education, New Delhi.

WEB SITES

1. williamstallings.com/Crypto3e.html
2. u.cs.biu.ac.il/~herzbea/book.html
3. www.flipkart.com/search-books/cryptography+and+network+security+William+ stallings+ebook

SEMESTER-IV

17CAP413S SOFTWARE TESTING – PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

Course Objectives

Enable the student

- To perform test each time they are run, thereby eliminating human error.
- To test how the software reacts under repeated execution of the same operations.
- To program sophisticated tests which bring out hidden information from the application.
- To reuse tests on different versions of an application, even if the user interfaces changes.
- To know the risks in project management system
- To know about various testing

Course Outcomes (COs)

Upon completion of this course, students will be able to

1. Test the software by applying testing techniques to deliver a product free from bugs
2. Evaluate the web applications using bug tracking tools.
3. Investigate the scenario and the able to select the proper testing technique
4. Explore the test automation concepts and tools
5. Deliver quality product to the clients by way of applying standards such as TQM, Six Sigma
6. Evaluate the estimation of cost, schedule based on standard metrics

List of Practical

1. Create a VB form with the following fields and create the database also for them. Insert 3 records. Using Win Runner tool record the above 3 transaction and test them and produce the Report. (Black box Testing).

2. Create a VB form and then add login dialog form. Using Win Runner tool check the Username and Password and produce the Report. (Security testing).

3. Create a VB form with the following fields and check the calculation is correct or not by using the test toll Win Runner. (Functional Testing) Fields – Name, Designation, Department, Basic, HRA, DA, PF and netsal.

4. Using Win Runner test tool check the database values after changing. Using Flight database. (Regression testing).

5. Write a C program for Boundary Testing.

6. Write a C program for Loop Testing.

7. Write a C program for Integration Testing.

8. Write a C program for Interface Testing.

9. Write a C program for Unit testing.

10. Write a program to do JUnit test for comparing two list of user defined objects.

Software Quality Assurance

1. To develop a banking application, perform the requirement analysis and give a quality status report.
2. Perform the system testing to develop an electricity application and give a quality status report.
3. Perform the report design and give a quality status report.
4. Develop a library management system and give a quality status report.
5. Develop a hospital management system and a quality status report and give a comparison performance report in Linux and windows operating system.

SUGGESTED READINGS

1. Boris Beizer. (2003). Software Testing Techniques, II Edn., DreamTech India, New Delhi. (UNIT – I, II, III, IV)
2. Marnie L Hutcheson. (2003). Software testing fundamentals, 1st Edison, Wiley, DreamTech India, New Delhi. (UNIT – V)
3. Burnstein. (2003).Practical Software Testing, Springer International Edison.
4. E. Kit. (1995). Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.
5. R.Rajani, and P.P.Oak.(2004). Software Testing, Tata Mcgraw Hill, New Delhi.
6. Dorothy Graham,Rex Black, and et.al(2011). Foundations of Software Testing - ISTQB Certification. 3rd Edition, Cengage Learning

SEMESTER-IV

17CAP413W XML - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To be aware of a range of XML tools (Many of them are free).
- To know how to set out an XML document
- To define custom markup language
- To understand the purpose of using DTDs and Schemas to validate XML
- To use XSLT to write a style sheet for XML document to produce multiple output
- To know about DOM

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Learn the basics of creating XML documents, transforming XML documents, and validating XML documents.
2. More specifically, you will learn the basics and history of XML and how to write your own XML documents.
3. Learn how to transform XML documents into documents of other types using XSLT.
4. Learn how to write valid XML documents based on a DTD.
5. Combine XML with existing web technologies.
6. Implement using XML Path language

List of Practical

1. Create a menu in XML.
2. Create a demo for XSLT.
3. Display XML information in Tree structure format.
4. Integrate XML in Web Applications
5. Write a program to navigate the records in the file.
6. Write a database access with XML.
7. Write a program to extract all the information about circles which are elements in a given XML document using DOM parser.
8. Write a program to extract all the information about circles which are elements in a given XML document using SAX parser.
9. Write a program to show the function of CDATA.
10. Write a program to generate XML file on the server.

11. Write a program to generate XML file from the Database
12. Write a program to load a text file into a div element with XML HTTP.
13. Write a program to create a simple application for web services.

SUGGESTED READINGS

1. Deitel & Deitel. (2008), XML How to Program . 1st Edition, Pearson Education, New Delhi.
2. Ann Novarro, Chuck white, Linda Burman. (2000). Mastering XML, 1st Edition, BPB Publi, New Delhi.
3. Steve Holzner.(2001). Inside XML, 1st Edition, TechMedia, New Delhi.

SEMESTER-IV

17CAP413B WAP- PRACTICAL 4H -2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To understand the basics of wireless voice and data communication technologies
- To build skills in working with Wireless application Protocols to develop mobile content applications.
- To understand the various wireless topology
- To describe the various routing
- To know the basic knowledge about Xgraph
- To identify the QOS parameters

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Able to understand the infrastructure to develop mobile communication systems
2. Able to characterize of different multiple access techniques in mobile communication.
3. Know about NS2 script
4. Simulate the network traffic and routing
5. Measure the performance
6. Demonstrate the OSPF routing

List of Practical

1. Demonstrate the creation of output files for Xgraph.
2. Illustrate NS2 script to send data between two nodes.
3. Create a simple simulation topology to generate TCP and UDP traffic
4. Simulate a NS2 scenario to handle link failures.
5. Write a NS2 script to handle Multicast traffic.
6. Demonstrate OSPF routing.
7. Create a simulation topology and analyze QOS parameters.
8. Demonstrate the creation of wireless topology.

SUGGESTED READINGS

1. Kamlesh N Agarwala. (2001).WAP the Net: An Introduction to Wireless Application Protocol, Laxmi Publications; First edition
2. Issariyakul, Teerawat, Hossain, Ekram . (2009).Introduction to Network Simulator NS2,Springer.

SEMESTER-V

17CAP501 PHP5 / MYSQL 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

Course Objectives

To help the students

- To get hands-on experience in scripting, debugging, testing.
- To establish a working environment for PHP web page development
- To learn to create dynamic interactive pages with PHP.
- To learn to manipulate files with PHP.
- To learn to use SQL to output reports with MySQL
- To write pseudo code for an application

Course Outcomes (Cos)

Upon completion of this course, student will be able to

1. Implement regular expressions in PHP programming including modifiers, operators, and meta characters.
2. Create PHP programs that use various PHP library functions, and that manipulate files and directories.
3. Analyze and solve various database tasks using the PHP language.
4. Create server side web applications using PHP and MySQL.
5. Analyze the structure of an E-Mail message
6. Develop the files and directories management operation

UNIT I

Creating a Simple PHP Programs: How PHP Code Works- How Online PHP Programs Run Web; Communications: Internet Protocols and HTTP: TCP/IP- The HTTP Protocol; Using Variable in PHP Issues concerning Creating Variables-Defined Constants; Operators and Expressions: PHP Operators – PHP Expressions- Operators Types- Arrays

HTML Primer: The HTML Document type definition- The Form and Input Elements; Accessing PHP and HTTP Data: Predefined Variables- Variables in HTTP Request and Response- Super Global Arrays; Links; Query Strings; HTML(Web) Forms; HTML Form Elements-HTML Form Fields(Controls) and PHP; The Concept Of State: State Maintenance-Native Sessions in PHP.

Designing PHP Program Logic: Problem Statement- Writing Pseudo Code- Boolean Logic; Conditional Or Branching Statements: if statements- Switch statements- Loops and Arrays: Loops- Arrays.

UNIT II

Testing and Debugging: Values that break your code- Basic error types; Debugging PHP Script: Understanding PHP error Massages- Syntax Errors- Logic Errors-Runtime Errors; Debugging and Handling Errors in PHP5: Preventing the display of private information-Roll your-Own Debugging tools; Form Validation: Using the Exit statement- string validation and regular expressions- validating data entry- using reg exps to check file path parameters; Handling Errors: Gracefully- Configuring PHP for error handling- Try/Catch-New in PHP5.

Development planning: Formal software Development processes – optimizing your code- Using Coding standard; Writing user-defined functions in PHP: The Structure of Functions- Switching Functions – How Values Get Inside functions; Scope of variables: Global and Local Variables-Creating Static Function Variable-Nesting-Recursion-The Include and Require Statements-Things to be careful about with include and require.

UNIT III

Files and Directories: Files and Directory Handling- Working with Files- Opening and Closing files-Getting Information about a file-reading and writing to files-Reading and writing characters in files-Reading Entire files-Random Access to file data-Getting Information on Files-Ownership and permissions; Working with files you own: Splitting the Name and path from a file-copying ,renaming and deleting files; Working with Directories: other Directory Functions –Traversing a directory hierarchy-creating a directory navigator-Building a Text Editor-Uploading Files.

Classes- Objects: Creating class- Adding a Method- Adding a Property- Protecting Access to Member Variables- Using _get and _set- Initializing objects- Destroying Objects- Inheritance-Overriding Methods- Interfaces- Encapsulation

UNIT IV

The SQL Framework- Managing databases-Creating & Managing tables- Managing indexes; Inserting & Updating data in a MYSQL database-Deleting & Retrieving data from a MySQL database; SELECT statement- Optional clauses of a SELECT statement; Creating MySQL Expressions-using operators in expressions-Comparing and Converting Data; Managing different types of data: String functions-Numeric function- Date/Time functions- Summarizing date-Summary functions.

Performing System Operations: Encryption functions- System related Functions- Query and Insert Functions; Accessing data from Multiple tables: Creating joins in your SQL statement-Creating subqueries in your SQL statements; Creating Unions that join SELECT statements.

Exporting, Copying and importing data; Managing transactions: Introducing transactions-Performing a transaction- Setting the auto commit mode and transaction isolation level- Locking Nontransactional tables

UNIT V

Connecting to MySQL from a PHP application- Inserting and updating records in table- Deleting and retrieving data from table- Creating a user Registration Script. Structure of an E-Mail Message-sending E-mail with PHP- Working with Raster Images- Manipulating Raster Images- Using Text in Images

SUGGESTED READINGS

1. Dave W.Mercer, Allan Kent, Steven D.Nowicki, Davd Mercer, Dan Squie, Wankyu Choi.(2009), Beginning PHP5. Wiley India (P) Ltd, New Delhi
2. Luke welling, Laura Thomson (2010), PHP and MySQL Web Development, 4th Edition, Pearson Education.
3. Julie Meloni (2012), Sams Teach Yourself PHP, MySQL and Apache All in One, 5th Edition, Pearson Education India.
4. Paul Dubois (2006), MySQL, 1st Edition, Tech Media, New Delhi.
5. Tim Converse & Joyce Park with Clark Morgan (2006), PHP5 & MySQL Bible, 1st Edition, John Wily, India.
6. Baron Schwartz, Peter Zaitsev, Vadim Tkachenko (2012), High Performance MySQL: Optimization, Backups, 3rd Edition, O'REILLY.

WEB SITES

1. www.php.net/
2. en.wikipedia.org/wiki/PHP
3. www.w3schools.com/PHP/DEfaULT.asP

SEMESTER-V

17CAP502 .NET PROGRAMMING 4H -4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3Hours

Course Objective

Enable the student

- Create windows forms using arrays and flow control statements.
- Learn to use the classes and namespaces in the .NET Framework class library.
- Develop Web Applications using Microsoft ASP.NET programming.
- Learn to use Basic windows controls using Visual Basic.Net
- Understand the concept of Multiple Document Interface
- Learn the architecture of .NET

Course Outcomes (Cos)

Upon completion of the course, students will be able to

1. Develop Windows based applications using Visual Basic.Net
2. Implement ADO.Net concept in VB.Net and ASP.Net applications
3. Create server side web applications using ASP.NET
4. Analyze the concept of data sources and data bound controls in VB.NET and ASP.NET
5. Demonstrate the working of ADO.Net controls for developing ASP.Net web applications
6. Design the application using ASP.NET Web Server Control

UNIT I

Introduction: Getting Started With VB.NET: The Integrated Development Environment-IDE Components-Environment Options.Visual Basic: The Language Variables-Constants-Arrays – Variables as Objects-Flow Control Statements.Working with forms: The appearance of Forms-Loading and Showing Forms-Designing Menus.

UNIT II

Basic Windows Controls: Textbox Control- ListBox, CheckedListBox-Scrollbar and TrackBar Controls-More Windows Control-The common Dialog Controls-The Rich TextBox Control - Handling Strings, characters and Dates. The TreeView and ListView Controls: Examining the Advanced Controls-The TreeView Control-The ListView Control

UNIT III

The Multiple Document Interface-Databases: Architecture and Basic Concepts-Building Database Application with ADO.NET-Programming with ADO.NET

UNIT IV

Goal of ASP.NET –ASP.NET Web Server Control-Validation Server Controls-Themes and Skins -Content Page Holder

UNIT V

Data Binding in ASP.Net: Data source Controls – Configuring data source control caching – storing connection information-Using Bound list controls with Data Source Controls – Other Data bound Controls-Data Management with ADO.Net.

SUGGESTED READINGS

1. Evangelos Petroutsos, Mastering Visual Basic.Net, BPB Publications, New Delhi.
2. Bill Evjen, Scott Hanselman, Devin Rader, Farhan Muhammad and S.Srinivasa Sivakumar (2006), Professional ASP.net 2.0, Special Edition.
3. Dave Mercer, ASP.Net Beginner's Gudie (2003), 2nd Edition McGraw Hill, New Delhi.
4. Duncan Mackenzie Kent Sharkey (2006), Sams Teach yourself Visual Basic.JNet, 1st Edtion, McGraw Hill, NewDelhi.
5. Shirish Chavan. (2007), Visual Basic.Net, 1st Edition, Pearson Education, New Delhi.

WEB SITES

1. www.microsoft.com/NET/
2. www.en.wikipedia.org/wiki/.net
3. www.w3schools.com/ngws/default.asp
4. www.vbtutot.com

SEMESTER-V

17CAP503 OPTIMIZATION TECHNIQUES 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To formulate, analyze, and solve mathematical models that represent real-world problems.
- Linear programming, network flow problems, integer programs and queuing models.
- Implement PERT concept in Computer Project Management optimization problems
- To know the optimization techniques for various management system
- To know the basic Inventoy theory
- To know about transportation model

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Formulate a real-world problem as a mathematical programming model.
2. Understand the theoretical workings of the simple method for linear programming and perform iterations of it by hand.
3. Understand the relationship between a linear program and its dual, including strong duality and complementary slackness
4. Understand the importance of optimization techniques in industrial process management
5. Understand the concept of Inventory theory in solving industry based optimization problems
6. Estimate the time and cost for the process

UNIT-I

Optimization Techniques Linear Programming: Graphical method for two dimensional problems - Central problem of linear programming various definitions - statements of basic theorems and properties - Phase I and Phase II of the simplex method - - primal and dual - dual simplex method.

UNIT-II

Transportation model: Introduction – Mathematical Formulation –Finding initial Basic Feasible solutions – Optimum solution for non degeneracy and degeneracy model - Unbalanced Transportation problems and Maximization case in Transportation problem.

The Assignment problem - Mathematical formulation of the problem – Hungarian method – Unbalanced Assignment problem- Maximization case in Assignment problem.

UNIT-III

Integer Programming: Gomory cutting plane methods - Branch and Bound method.

QueueingTheory: Introduction – Characteristics of queuing system. Poisson process and Exponential Distribution – Classification of Queues. Single server – Infinite Capacity (M/M/1):(□/FIFO), Single server – Finite Capacity (M/M/1):(N/FIFO), Multi server – Infinite Capacity (M/M/C):(□/FIFO) and Multi server – Finite Capacity (M/M/C):(N/FIFO) models

UNIT-IV

Inventory theory: Costs involved in inventory problems - single item deterministic models- economic lot size models without shortages and with shortages having production rate infinite and finite.

UNIT-V

PERT and CPM: Arrow networks - time estimates- earliest expected time, latest allowable occurrence time and slack - critical path - probability of meeting scheduled date of completion of project calculations on CPM network - various floats for activities - critical path - updating project - operation time cost trade off curve - project time cost trade off curve - selection of schedule based on cost analysis.
(Remarks: No mathematical derivations included).

SUGGESTED READINGS

1. Gillet, B.E.,(1994), "Introduction to Operations Research : A Computer Oriented Algorithmic Approach". Tata McGraw Hill, New York.
2. Gross D., and Harris. C.M (2018), "Fundamentals of Queueing Theory"(5^{th} ed.), John Wiley and Sons, New York.
3. Hillier F., and Lieberman. GJ.(1986), "Introduction to Operations Research"(4^{th} ed.), Holden Day, New York.
4. Karnbo, N.S., .(1985) "Mathematical Programming Techniques", McGraw Hill, New York.
5. KantiSwarup, Gupta, P.K., and Man Mohan (2014), "Operations Research", Sultan Chand & Sons. New Delhi.
6. Mital K. V.(2004), "Optimization Methods In Operations Research and System Analysis", New Age International (P) Ltd., New Delhi.
7. Saffer, L.R., Fitter J.B., and MeyerW.L.,(1990), The Critical Path Method,McGraw Hill. New York.

SEMESTER-V

17CAP504D DATA MINING AND DATA WAREHOUSING 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

Course Objectives

Enable the student

- To gain the knowledge of the concepts and techniques in data mining
- To understand the data mining functionalities and pattern classification.
- To understand the cleaning and clustering process of data mining.
- To gain the knowledge of data warehouse architecture in data mining process
- To know about the Multimedia database
- To know about data warehouse

Course Outcomes (Cos)

Upon completion of this course, student will be able to :

1. To understand the data mining process of voluminous data using OLAP
2. To implement the preprocessing concept in data mining applications
3. To apply the data mining algorithms on big data to extract useful data
4. To implement data mining techniques for complex data types
5. To implement Decision Support System concept in data mining for developing intelligence business applications
6. To apply the web data mining

UNIT I

Introduction to Data Mining: Motivation and importance, Data Mining, Relational Databases, Data Warehouses, Transactional Databases, Advanced Database Systems and Advanced Database Applications, Data Mining Functionalities, Pattern Classification of Data Mining Systems, Major issues in Data Mining. Pre-process the Data- Data Cleaning, Data Integration and Transformation.

UNIT II

Classification and Regression Algorithms : Naïve Bayes – Multiple Regression Analysis – Logistic Regression – k-Nearest Neighbour Classification – GMDH –Computing and Genetic Algorithms. Support Vector Machines : Linear SVM - SVM with soft margin – Linear kernel – Proximal SVM – Generating Datasets.

Cluster Analysis : Partitional Clusterings – k-medoids – Birch – DBSCAN – Optics – Graph Partitioning – CHAMELEON – COBWEB – GCLuto.

UNIT III

Mining Association rule in large Databases Association Rule Mining, Mining Single - Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel

Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Dataware houses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT IV

Mining Complex Types of Data : Mining Spatial Databases – Multimedia Databases – Time-series and Sequence Data – Text Databases – Web Data Mining – Search Engines.

UNIT V

Data Warehouse and OLAP Technology for Data Mining. What is a Data Warehouse? Multi-Dimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Development of Data Cube Technology, Data Ware housing to Data Mining Data Preprocessing Data Warehousing: Failures of past Decision Support System- Operational vs. DSS- Building blocks: features- Data warehouse and Data Mart- Overview of the Components- Metadata Architectural Components: Distinguishing Characteristics- Architectural Framework- Technical Architecture.

SUGGESTED READINGS:

1. Jiawei Han and Micheline Kamber.(2011), Data Mining Concepts and Techniques, 3rd Edition, Elsivier,India (Unit I, III, IV, V)
2. G.K.Gupta (2006), Introduction to Data Mining with Case Studies, Prentice Hall India, New Delhi (Unit – IV)
3. Soman.K.P, Shyam Divakar and V. Ajay. (2008), Insight to Data Mining- Theory and Practical, Prentice Hall India, New Delhi. (Unit – II).
4. Gupta.G.K. (2006), Introduction to Data Mining with Case Studies, Prentice Hall India, New Delhi .
5. Kantardzic, Mining Concepts, Models, Methods and Algorithms, IEEE Press – A John Wiley & Sons.
6. Paulraj Ponniah. (2008), Data Warehousing Fundamentals: A Comprehensive Guide for IT Professionals, John Wiley & Sons, New Delhi.

WEB SITES:

1. www.wikipedia.org/wiki/Data_mining
2. www.anderson.ucla.edu/faculty/jason.frand/teacher/technologies/palace/datamining.ht
3. www.thearling.com/text/dmwhite/dmwhite.htm

SEMESTER-V

17CAP504N NETWORK ARCHITECTURE AND MANAGEMENT 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3Hours

Course Objectives
Enable the student

- Understand the concepts and terminology associated with SNMP and TMN
- Understand the working of routing protocol in complex computer networks
- Gain knowledge the internal architecture of routers
- Understand the fundamentals and requirements for packet routing in computer communication network.
- Analyze the security mechanism in Computer routing process
- Understand the design metrics

Course Outcomes (Cos)
Upon completion of this course, student will be able :

1. To solve the problems in computer network system management
2. To analyze the challenges in the implementation of ATM networks
3. To implement SNMP Model in the management of computer networks
4. To configure routers using computer network software tools
5. To implement service level agreement in Computer Network management systems
6. To know the Network Management Tools and Systems

UNIT I
Introduction: Objectives - Component architectures – Reference architecture – Architectural models; Addressing and Routing Architecture: Addressing mechanisms – Routing mechanisms – Addressing strategies – Routing strategies – Architectural considerations; Network Management Architecture: Defining Network Management – Network Management Mechanism - Architectural considerations; Performance Architecture; Developing goals – Performance mechanisms – Architectural considerations

UNIT-II
Security And Private Architecture: Developing a security and privacy plan – Security and privacy Administration & Mechanism - Architectural considerations; Selecting Technologies for the Network Design: Goals – Design Concepts – Design Process – Vendor, Equipment and Service-Provider Evaluations – Network Layout – Design Traceability - Design Metrics.

UNIT-III

Case history of Networking and Management: Challenges of Information Technology Managers – Goals, organization and functions – Network and System Management – Network Management System Platform; SNMP, Broadband and TMN Management: Network Management Standards & Model – Organization, Information and Communication Model – ASN.1 – Encoding structure – Macros – Functional model; Organization and Information Model: Managed Networks – The History of Network Management – Internet Organization and standards – SNMP Model – The Organization and Information Model; Communication and Functional Model: The SNMP Communication Model – Functional Model.

UNIT-IV

SNMPv2 Management: Major changes – System architecture – Structure of Management Information – Management Information Base – SNMPv2 protocol – Compatibility; RMON: Remote monitoring – RMON1 – RMON2 – ATM remote monitoring; Broadband Network Management: ATM Networks - Network and Services – ATM Technology – ATM Network Management; Telecommunication Management Network: Operations systems – Conceptual model – Standards – Architecture – TMN Management service architecture – Integrated view of TMN – Implementation issues.

UNIT-V

Network Management Tools and Systems: Network management tools – Network statistics measurement system – Network Management Systems – System Management; Network Management Applications: Configuration Management - Fault Management - Performance Management – Security Management – Accounting Management – Report Management - Policy Based Management – Service Level Management.

SUGGESTED READINGS

1. James D. Mc CABE. (2010), Network Analysis, Architecture and Design, 3rd Edition, Morgan Kaufmann Publishers.
2. Mani Subramanian. (2012), Network Management Principles and Practice, 2nd Edition, Pearson Education Asia Pvt. Ltd.,.
3. William Stallings. (2002), SNMP, SNMPv2, SNMPv3 and RMON 1 and 2, 3rd Edition, Pearson Education Asia Pvt. Ltd.

SEMESTER-V

17CAP504S SOFTWARE PROJECT MANAGEMENT 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

Course Objective

Enable the student

- To design, select and apply the most appropriate software engineering process for developing any software project
- To implement planning for a software project and identify the risks in software planning.
- To analyze the software requirements for developing any software.
- To understand the importance of negotiation, effective work habits, leadership in the software development process.
- To identify the risks involved in software project management
- To know the organization structure to develop the software project

Course Outcomes (Cos)

Upon Completion of this course, the student Will be able to

1. Implement the concept of software effort estimation in developing software project.
2. Develop a responsible attitude towards the use of computer as well as the technology.
3. Evaluate the risks during the development of software projects
4. Understand the organization behavior in software project management.
5. Implement team management process in developing quality software
6. Monitor the software project management in various ways such as cost control, performance control, etc.,

UNIT I

Introduction-Software Project Management -Project evaluation and programme Management-An overview of Project planning- Stepwise planning-Selection of an appropriate project Approach.

UNIT II

Software effort estimation: Problems with over- and underestimates-Software effort estimation Techniques - Estimating by analogy -Albrecht function point analysis -Function points Mark II – COSMIC full function points - COCOMO 13: a parametric productivity model. Activity planning: The objectives of activity Planning-Project schedules - Projects and activities -

Sequencing and scheduling activities - Network planning models - Formulating a network model - Adding the time dimension - The forward pass - The backward pass - Identifying the critical path.

UNIT III

Risk management: Introduction to Risk - Categories of risk - A framework for dealing with risk - Risk identification - Risk assessment - Risk planning - Risk management - Evaluating risks to the schedule - Applying the PERT technique - Monte Carlo simulation - Critical chain concepts. Resource allocation :-Introduction -The nature of resources - Identifying resource requirements - Scheduling resources -Creating critical paths -Counting the cost - Being specific -Publishing the resource schedule - Cost schedules -The scheduling sequence.

UNIT IV

Monitoring and control: Creating the framework-Collecting the data- Visualizing progress- Cost monitoring -Earned value analysis-Prioritizing monitoring - Getting the project back to target - Change control. Managing people in software environments: Understanding behavior - Organization behavior: a background - Selecting the right person for the job - Instruction in the best methods - Motivation - Stress -Health and safety -Some ethical and professional concern

UNIT V

Working in teams: Becoming a team - Decision making - Organizational structures - Coordination dependencies - Dispersed and virtual teams - Communication genres - Communication plans - Leadership. Software quality: Introduction -The place of software quality in project planning - The importance of software quality - Defining software quality - ISO 9126 -Product versus process quality management -Quality management systems -Process capability models -Techniques to help enhance software quality -Testing -Quality plans

SUGGESTED READINGS

1. Bob Hughes and Mike Cotterell (2011), Software Project Management, 5th Edition, New Delhi: Tata McGraw Hill
2. Royce.(2000), Software Project Management, 1st Edition, New Delhi: Addisions Wesley.
3. Kelkar (2012), "Software Project Management", 3rd edition, Prentice Hall India,2012

WEB SITES

1. http://en.wikipedia.org/wiki/Software_project_management
2. http://www.onesmartclick.com/engineering/software-engineering.html
3. http://www.cc.gatech.edu/classes/AY2000/cs3802_fall/

SEMESTER-V

17CAP504W RUBY PROGRAMMING 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- Develop server-side Ruby scripts for publishing on the Web
- Employ control structures, methods, procs, arrays and hashes to create Ruby programs
- Distinguish and use various Ruby datatypes
- Master the use of arrays and hashes
- Use the extensive pre bundled classes
- Implement the web application using exception handling, thread, etc.,

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Use the I/O facilities of Ruby to read and write binary and text files
2. Master the use of Iterators to loop through various data structures
3. Use Exceptions in handling various run time errors
4. Create Ruby modules
5. Use the wide variety of Ruby Modules that come with the Ruby distribution
6. Use object-oriented programming conventions to develop dynamic interactive Ruby applications

UNIT I

Introduction to Ruby: Installing Ruby - THE STRUCTURE AND EXECUTION OF RUBY PROGRAMS: Lexical Structure- Syntactic Structure - Block Structure in Ruby- File Structure - Program Execution. DATA TYPES: Numbers - Text - String Literals - Character Literals - String Operators - Accessing Characters and Substrings - Iterating Strings – Arrays – Hashes – Ranges – Symbols – True & False – Ruby Documentation: RDoc and ri.

UNIT II

STATEMENTS AND CONTROL STRUCTURES: Conditionals – Loops - Iterators and Enumerable objects: custom iterators – enumerators – External iterators – Blocks: Variable scope – passing argument to blacks. Flow-altering statements like return and break- The special-case BEGIN and END statements. CLASSES : Creating and initializing class – Accessor and attributes – class methods – class variables – Defining operators. SUBCLASSING AND INHERITANCE: visibility – Overriding methods. OBJECTS: Object creation and initialization.

UNIT III

METHODS: Defining a Method, Calling a Method; Undefining methods – Methods with Exception – Operator methods and names – Method Arguments – Method objects - Defining

Attribute Accessor Methods - Dynamically Creating Methods. EXCEPTIONS AND EXCEPTION HANDLING: Hierarchy – Exception classes and objects – Raising Exception with raise – Handling Exception with rescue – Exception propagation – Else clause and ensure class.

UNIT IV

MODULES: Namespaces - Modules as Mixins - Includable Namespace Modules - Loading and Requiring Modules - Executing Loaded Code. Reflection and Meta programming: Evaluating Strings and Blocks - Querying, Setting, and Testing Variables – Regular Expressions. FILES AND DIRECTORIES: Listing and manipulating Directories and testing files. BASIC INPUT AND OUTPUT: Opening Stream – Reading from a Stream – Writing to a stream – Random Access Methods – Closing, Flusing and testing streams.

UNIT V

THREADS AND PROCESSES: Thread Life Cycle – Thread scheduling – Thread Exclusion – Deadlock. Ruby Tk: Introduction- Widgets and classes. Networks: A Very Simple Client - A Very Simple Server – Datagram - A Multiplexing Server - Fetching Web Pages. Ruby on Rails: Building a development Environment: Installation – Installing Databases – Code editors – web server Configuration – Creating an web application.

SUGGESTED READINGS:

1. Dave Thomas, Andrew Hunt (2013), Programming Ruby 1.9 & 2.0: The Pragmatic Programmers Guide, 2nd Edition, The Pragmatic Bookshelf.
2. David Flanagan, (2008), "The Ruby Programming Language", 1st Edition, O'Reilly Media.
3. Eldon Alameda (2011), "Practical Rails Projects" Apress, Berkeley, CA, USA.
4. David Black, (2006), "Ruby for Rails", Manning Publications.

WEB SITES :

1. http://www.tutorialspoint.com/ruby/ruby_tk_guide.htm
2. www.fincher.org/tips/Languages/Ruby
3. www.troubleshooters.com/codecorn/ruby/basictutorial.htm
4. www.ruby-lang.org/en/documentation/quickstart

SEMESTER-V

17CAP504B MIS FRAMEWORK 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To understand the frameworks for identifying information technology applications
- To understand the benefits of information technology applications in an organization
- To analyze the impact of information systems on organizations markets
- To understand the concept of Business Process Engineering in the Management Information System
- To understand about Socio-economic environment
- To identify the role of security systems in IT

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Analyze the major technological, organizational, behavioral, and ethical issues facing today's information systems professional.
2. Implement IT strategy in managing the information system of any organization.
3. Analyze the emerging technologies
4. Impact of emerging technologies on corporate performance.
5. Implement the principles of Business Process Engineering in improving the business of any organization
6. Analyze the critical success factors in implementing IT applications

UNIT I

Frameworks for identifying information technology applications.- Management Information System-Decision Support System- Executive Information System and Expert System.

UNIT II

Benefits of information technology applications in an organization through transaction processing, management and operational control, decision support systems, office automation, organizational communications and group work support.

UNIT III

Socio-economic environment and information systems in organization and the impact of information systems on organizations markets; frameworks for information systems planning. information systems and competitive advantage; the new strategic role of information systems: methodologies for evaluating investments in IT; frameworks and methodologies -case studies.

UNIT IV

Design of reporting system including a discussion of principles in indicator design; managing information support activity in organizations; concept of the business process re-engineering (BPR) and how IT can enable BPR.

UNIT V

Critical success factor in implementing IT applications including the need for managing the process of change illustrated through case studies of successful/failed IT projects. Critical role of security in implementing IT applications should be discussed.

SUGGESTED READINGS

1. L.M. Applegate, R.D. Austin and F.W. McFarlan.(2007), Corporate Information Strategy and Management: Text and Cases ,7th Edition, McGraw Hill.
2. P. Bocij, A. Greasley and S. Hickie(2008), Business Information Systems: Technology, Development and Management for the E-Business ,4th Edition, Prentice Hall.
3. D. Boddy, A. Boonstra and G. Kennedy(2008), Managing Information Systems: Strategy and Organisation ,3rd Edition, Prentice Hall.
4. K.C. Laudon and J.P. Laudon.(2007), Management Information Systems: Managing the Digital Firm ,10th Edition, Prentice Hall.
5. W. Robson(1997), Strategic Management and Information Systems: An Integrated Approach ,2nd Edition, Financial Times,
6. R.M. Stair and G. Reynolds (2007),Principles of Information Systems: A Managerial Approach ,International Edition, Delmar Cengage Learning.

SEMESTER-V

17CAP505D BIG DATA ANALYTICS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3Hours

Course Objective

Enable the student

- To understand the evolution and architecture of Big Data
- To learn the virtualization concept of big data
- To learn the Hadoop framework in processing big data
- To understand the concepts of big data analytics
- To define the concept of data source integration for big data processing
- To learn Hadoop distributed file system

Course Outcomes (Cos)

Upon completion of this course, the students will be able to

1. Analyze the big data analytic techniques for useful business applications.
2. Implement the concept of virtualization and abstraction in analyzing big data
3. Analyze the HADOOP and Map Reduce technologies associated with big data analytics
4. Understand the fundamentals of various bigdata analysis techniques
5. Implement the integration of data sources in operationalizing Big Data
6. Implement the text analytics using Hadoop

UNIT-I

Fundamentals of Big Data - The Evolution of Data Management Understanding the Waves of Managing Data- Defining Big Data - Big Data Management Architecture- The Big Data Journey -Big Data Types-Defining Structured Data-Defining Unstructured Data-Putting Big Data Together.

UNIT-II

Big Data Stack- Basics of Virtualization - The importance of virtualization to big data -Server virtualization - Application virtualization - Network virtualization -Processor and memory virtualization - Data and storage virtualization-Abstraction and Virtualization-Implementing Virtualization to Work with Big Data.

UNIT-III

Hadoop - Hadoop Distributed File System - Hadoop MapReduce- The Hadoop foundation and Ecosystem.

UNIT-IV

Big Data Analytics-Text Analytics and Big Data-Customized Approaches for Analysis of Big Data

UNIT-V

Integrating Data Sources-Real-Time Data Streams and Complex Event Processing-Operationalizing Big Data.

SUGGESTED READINGS

1. Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman (2013), Big Data For Dummies, Wiley India,New Delhi.
2. Paul Zikopoulos, Dirk deRoos, Krishnan Parasuraman, Thomas Deutsch, James Giles, David Corrigan (2012), Harness the Power of Big Data The IBM Big Data Platform, Tata McGraw Hill Publications, New Delhi.
3. Michael Minelli, Michele Chambers, Ambiga Dhiraj (2013). Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, Wiley Publications, New Delhi.
4. Zikopoulos, Paul, Chris Eaton (2011), Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, Tata McGraw Hill Publications, New Delhi.

WEB SITES

1. Www.oracle.com/bigdata
2. Www.planet-data.eu/sites/default/files/Big_Data_Tutorial_part4.pdf
3. Www.ibm.com/developerworks/data
4. Www.solacesystems.com
5. En.wikipedia.org/wiki/Big_data
6. Www.sap.com/solution/big-data.html

SEMESTER-V

17CAP505N DISTRIBUTED COMPUTING 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- Understand the architecture and topology of network
- Understand the design process of a distributed systems
- Examine distributed and parallel computing operating system
- Understand the need and challenges of distributed database
- Differentiate the centralized database with distributed database
- Know about distributed shared memory

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able :

1. To develop and apply knowledge of parallel and distributed computing techniques and methodologies.
2. To Apply design, development, and performance analysis on parallel and distributed applications
3. To implement the application of fundamental Computer Science methods
4. To implement the algorithms in the development of parallel applications.
5. Implement distributed shared memory concepts in distributed computing.
6. To apply Authentication methods in distributed application

UNIT – I

Introduction: Distributed Computing – Relation to multiprocessor and multi computer systems-message passing systems versus shared memory systems – primitives for distributed computing. Distributed Computations: distributed program – global state of a distributed system – models of process communications.

UNIT – II

Message ordering and Group Communication: message ordering paradigm – Asynchronous execution with synchronous communication – classification of application level multicast algorithm – distributed multicast algorithm at the network layer.

UNIT – III

System model for distributed computation – termination detection using distributed snapshots – termination detection in a faulty distributed system – Distributed mutual execution algorithm : Lamport's algorithm – Token Based algorithm – Raymond's tree-based algorithm.

UNIT – IV

DeadLock : system model – models of deadlocks – knapp's classification of distributed deadlock detection algorithms – chandy model – stable and unstable predicates – distributed algorithms for conjunctive predicates .

UNIT – V

Distributed shred memory: Abstraction – memory consistency – shared memory mutual execlution – register hierarchy and wait free simulations- issues in failure recovery – check point based recovery – Authentication: protocols – password-based authentication- authentication protocol failures.

SUGGESTED READINGS

1. Ajay. D. Kshemkalyani and Mukesh Singhal. Distributed Computing: Principles, Algorithms and Systems.
2. Uyless D. Black, (2004), "Data Communication and Distributed Networks", 3rd Edition, Prentice hall of India, New Delhi.
3. Joel M Crichlow, (1998), "An Introduction to Distributed and Parallel Computing", 1st Edition, Prentice – Hall Publication, New Delhi.

WEB SITES

1. Wikipedia.org/wiki/Distributed_computing
2. Www.webopedia.com/TERM/D/distributed_computing.html
3. Www.tech-faq.com/distributed-computing.shtml

SEMESTER-V

17CAP505S SOFTWARE METRICS 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

Course Objective

Enable the student

- To understand the basic terminology and state fundamental facts about software metrics and process models.
- To identify the essential elements of a given metric or model, describe the interrelationships among its various elements
- To understand software process assessment cycles, complexity metrics and models.
- To measure and analyze customer satisfaction in development of software
- To know the techniques to improve the software process development
- To identify how to remove the defects in the software project

Course Outcomes (COs)

Upon Completion of this course, student will be able to

1. To analyze the importance of modeling and modeling languages
2. To apply the basic quality tools in software development
3. Analyze the software process metrics in the process of software testing
4. Implement function point metrics to measure software process improvement
5. Explain the business requirements pertaining to software development
6. Assess the software project using the metrics

UNIT I

Introduction:- software quality-popular views-the role of the customer-software quality- Total quality management.Software development process models-the spiral model-itrative Devalopment process-The Cleanroom Methodology-Process Maturity Framework and Quality standards. Fundamentals of Measurement theory-Level of measurement-Reliability and validity-Measurement Errors

UNIT-II

Applying the seven basic quality tools in software development-Defact removal effectivenes-The rayaleigh model-Exponential distribution and reliability growth models-Quality management models

UNIT-III

In-process metrics for software testing-Complexity metrics and models-Metrics and lessons learned for object oriented projects-Availability metrics

UNIT-IV

Measuring and analyzing customer satisfaction-Conducting in-process quality assessments

UNIT-V

Software project assessments-Dos and Don't of software process improvement-Using function point metrics to measure software process improvement-Concluding remarks

SUGGESTED READINGS:

1. Stephen H.Kan . Metrics and Models in Software Quality Engineering (2013), Second Edition, Pearson India.
2. Norman Fenton(2014), Software Metrics: A Rigorous and Practical Approach, Third Edition (Chapman & Hall/CRC Innovations in Software Engineering and Software Development Series)
3. C. Ravindranath Pandian.(2003), Software Metrics: A Guide to Planning, Analysis, and Application,

SEMESTER-V

17CAP505W SEMANTIC WEB 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 **Marks:** Internal: **40** External: **60** Total: **100**
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To represent data from a chosen problem in XML with appropriate semantic tags obtained or derived from the ontology.
- To understand the semantic relationships among these data elements using Resource.
- To design and implement a web services application that "discovers" the data and/or other Description Framework (RDF).web services via the semantic web
- To understand the capabilities and limitations of semantic web technology for many applications.
- To know about Web ontology language
- To aggregate and reasoning social network data

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Analyze fundamental concepts, advantages and limits of the semantic web
2. Implement ontologies in the context of developing semantic web
3. Implement RDF framework and associated technologies for developing semantic web
4. Implement semantic Web Tools like Jena and SPARL for developing architecture for semantic web
5. Analyze the social network data
6. Implement the problem using the web ontology language

UNIT I

Introduction : Introduction to the Syntactic web and Semantic Web – Evolution of the Web – The visual and syntactic web – Levels of Semantics – Metadata for web information - The semantic web architecture and technologies –Contrasting Semantic with Conventional Technologies –Semantic Modeling - Potential of semantic web solutions and challenges of adoption

UNIT II

Ontological Engineering: Ontologies – Taxonomies –Topic Maps – Classifying Ontologies – Terminological aspects: concepts, terms, relations between them – Complex Objects –Subclasses and Sub-properties definitions – Upper Ontologies – Quality – Uses - Types of terminological resources for ontology building – Methods and methodologies for building ontologies – Multilingual Ontologies -Ontology Development process and Life cycle – Methods for Ontology Learning – Ontology Evolution – Versioning

UNIT III

Structuring And Describing Web Resources :Structured Web Documents - XML – Structuring – Namespaces – Addressing – Querying – Processing - RDF – RDF Data Model – Serialization Formats- RDF Vocabulary –Inferencing - RDFS – basic Idea – Classes – Properties- Utility Properties – RDFS Modeling for Combinations and Patterns- Transitivity

UNIT IV

Web Ontology Language :OWL – Sub-Languages – Basic Notions -Classes- Defining and Using Properties – Domain and Range – Describing Properties - Data Types – Counting and Sets- Negative Property Assertions – Advanced Class Description – Equivalence – Owl Logic.

UNIT V

Semantic Web Tools And Applications :Development Tools for Semantic Web – Jena Framework – SPARL –Querying semantic web - Semantic Wikis - Semantic Web Services – Modeling and aggregating social network data - Ontological representation of social relationships, Aggregating and reasoning with social network data Understand semantic web basics, architecture and technologies

SUGGESTED READINGS

1. Grigoris Antoniou, Frank van Harmelen. 3rd Edition (2012), A Semantic Web Primer.,MIT Press, USA
2. Liyang Yu (2011), "A Developer's Guide to the Semantic Web", First Edition ,Springer.
3. John Hebeler, Matthew Fisher, Ryan Blace and Andrew Perez-Lopez (2009), "Semantic Web Programming", First Edition Wiley.
4. Robert M. Colomb(2007), "Ontology and the Semantic Web", Volume 156 Frontiers in Artificial Intelligence and Applications (Frontier in Artificial Intelligence and Applications), IOS Press.
5. Dean Allemang and James Hendler(2011), "Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL, Second Edition, Morgan Kaufmann..
6. Karin Breitman, Marco Antonio Casanova and Walt Truszkowski,(2010), "Semantic Web: Concepts, Technologies and Applications (NASA Monographs in Systems and Software Engineering)", Springer.

SEMESTER-V

17CAP505B TAXATION PRACTICES 4H - 4C

Instruction Hours / week: L: 4 T: 0 P: 0 Marks: Internal: **40** External: **60 Total: 100**
End Semester Exam: 3Hours

COURSE OBJECTIVES

Enable the student

- To learn the concept of various taxation practices
- To understand Excise duty, VAT, Service tax etc. and tax planning for reducing tax liability legally.
- To understand the procedures of collection and recovery of tax
- To learn the central sales calculation in India
- To understand the wealth tax
- To define the various tax

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Analyze the procedures in Assessing firms and associations
2. Analyze the need for assessing the undivided families
3. Apply the advance payment procedures in the taxation practices
4. Apply the procedure for registration and cancellation in central sales taxation
5. Learn various components related to the theme of tax liability determination
6. Analyze the wealth tax

UNIT I

Assessment of undivided families: Meaning. Basic conditions. Taxable income. Partitions. Tax planning. Assessment of firms and associations: Scheme of taxation, types, treatment of losses. Tax planning.

UNIT II

Assessment of companies: Types, profits, depreciation, tax planning, Section 80. Bonus issues, dividend policy. Return of income and assessment procedure: Types of assessment. Time limits. Reassessment. Cooperatives.

UNIT III

Collection and recovery of tax: Deduction at source, rates, advance payment. Modes of recovery. Refund. Appeals and revision. Penalties.

UNIT IV

Wealth Tax: Chargeability, valuation, return, appeals, revisions, payment and recovery, gift tax: chargeability, rebate, assessment, appeals, revisions, payment and recovery.

UNIT V

Central sales tax: Concept of sale and purchase. Inter-state trade. Inter-state export and import trade. State sale tax: Assessing authority. Single, multiple point tax. Procedure for registration and cancellation. Returns, payment, appeals and revisions.

SUGGESTED READINGS

1. Central and State tax acts.
2. Singhania, VK.(1996), **"Taxman Direct** Taxes", Taxman, New Delhi.

SEMESTER-V

17CAP511 PHP5/MYSQL -PRACTICAL 5H - 2C

Instruction Hours / week: L: 0 T: 0 P: 5 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

Course Objectives

To help the students

- To get hands-on experience in scripting, debugging, testing.
- To establish a working environment for PHP web page development
- To learn to create dynamic interactive pages with PHP.
- To learn to manipulate files with PHP.
- To learn to use SQL to output reports with MySQL
- To write pseudo code for an application

Course Outcomes (Cos)

Upon completion of this course, student will be able to

1. Implement regular expressions in PHP programming including modifiers, operators, and meta characters.
2. Create PHP programs that use various PHP library functions, and that manipulate files and directories.
3. Analyze and solve various database tasks using the PHP language.
4. Create server side web applications using PHP and MySQL.
5. Analyze the structure of an E-Mail message
6. Develop the files and directories management operation

List of Practical

1. Design an online loan application form.
2. Design a form to submit your resume in net.
3. Design an application for Library Management System
4. Design form for online reservation in air ways.
5. Design form for online shopping
6. Design an application for creating an online Advertisement.
7. Design an application for student Information System.

8. Design an application to display cookies information.
9. Write a program for display environment variables in MySQL.
10. Write a program to count web page hits.
11. Design an email form that validates the inputs, produces errors when inputs are typed incorrectly, and send an email to you when submitted.
12. Design an application to upload multiple files

SUGGESTED READINGS

1. Dave W.Mercer, Allan Kent, Steven D.Nowicki, Davd Mercer, Dan Squie, Wankyu Choi.(2009), Beginning PHP5. Wiley India (P) Ltd, New Delhi
2. Luke welling, Laura Thomson (2010), PHP and MySQL Web Development, 4th Edition, Pearson Education.
3. Julie Meloni (2012), Sams Teach Yourself PHP, MySQL and Apache All in One, 5th Edition, Pearson Education India.
4. Paul Dubois (2006), MySQL, 1st Edition, Tech Media, New Delhi.
5. Tim Converse & Joyce Park with Clark Morgan (2006), PHP5 & MySQL Bible, 1st Edition, John Wily, India.
6. Baron Schwartz, Peter Zaitsev, Vadim Tkachenko (2012), High Performance MySQL: Optimization, Backups, 3rd Edition, O'REILLY.

SEMESTER-V

17CAP512 .NET PROGRAMMING - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

Course Objective

Enable the student

- Create windows forms using arrays and flow control statements.
- Learn to use the classes and namespaces in the .NET Framework class library.
- Develop Web Applications using Microsoft ASP.NET programming.
- Learn to use Basic windows controls using Visual Basic.Net
- Understand the concept of Multiple Document Interface
- Learn the architecture of .NET

Course Outcomes (Cos)

Upon completion of the course, students will be able to

1. Develop Windows based applications using Visual Basic.Net
2. Implement ADO.Net concept in VB.Net and ASP.Net applications
3. Create server side web applications using ASP.NET
4. Analyze the concept of data sources and data bound controls in VB.NET and ASP.NET
5. Demonstrate the working of ADO.Net controls for developing ASP.Net web applications
6. Design the application using ASP.NET Web Server Control

List of Practical

VB.Net

1. Write a Program to perform various string manipulation functions.
2. Using windows application form, create a form, place controls and manipulate data.
3. Write a program to create inventory control using class library.
4. Write a program to create Web Services Using Vb.Net.
5. Write a program to create a screen saver using controls
6. Create an ActiveX program with simple example.
7. Using windows Application: Design Employee Details, use Sql Server as back end and also use checked list box.

ASP.Net

1. Write a program to create an on-line quiz using content page holder.
2. Write a program to retrieve Cookies information.
3. Write a program to count web page hits.
4. Write program to retrieve environment variables browser capability information.
5. Write a program for database connectivity to retrieve student information

SUGGESTED READINGS

1. Evangelos Petroutsos, Mastering Visual Basic.Net, BPB Publications, New Delhi.
2. Bill Evjen, Scott Hanselman, Devin Rader, Farhan Muhammad and S.Srinivasa Sivakumar (2006), Professional ASP.net 2.0, Special Edition.
3. Dave Mercer, ASP.Net Beginner's Gudie (2003), 2nd Edition McGraw Hill, New Delhi.
4. Duncan Mackenzie Kent Sharkey (2006), Sams Teach yourself Visual Basic.JNet, 1st Edtion, McGraw Hill, NewDelhi.
5. Shirish Chavan. (2007), Visual Basic.Net, 1st Edition, Pearson Education, New Delhi.

SEMESTER-V

17CAP513D DATA MINING - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks:** Internal: **40** External: **60** Total: **100**

End Semester Exam: 3 Hours

Course Objectives

Enable the student

- To gain the knowledge of the concepts and techniques in data mining
- To understand the data mining functionalities and pattern classification.
- To understand the cleaning and clustering process of data mining.
- To gain the knowledge of data warehouse architecture in data mining process
- To know about the Multimedia database
- To know about data warehouse

Course Outcomes (Cos)

Upon completion of this course, student will be able to :

1. To understand the data mining process of voluminous data using OLAP
2. To implement the preprocessing concept in data mining applications
3. To apply the data mining algorithms on big data to extract useful data
4. To implement data mining techniques for complex data types
5. To implement Decision Support System concept in data mining for developing intelligence business applications
6. To apply the web data mining

List of Practical

1. Use the following learning schemes, with the default settings to analyze the weather data (in weather.arff). For test options, first choose "Use training set", then choose "Percentage Split" using default 66% percentage split. Report model percent error rate

2. Using iris dataset preprocess and classify it with J4.8 and Naïve Bayes Classifier. examine the tree in the Classifier output panel

3. Using the datasets *ReutersCorn-Train* and *ReutersGrain-Train*. Classify articles using binary attributes and word count attributes.

4. Apply any two association rule based algorithm for the supermarket analysis

5. Using weka Experimenter perform comparison analysis of J48, oneR and ID3 for vote dataset

6. Using Weka Experimenter perform comparison analysis of Naïve Bayes with different datasets

7. Apply ZeroR, OneR, and J48, to classify the Iris data in an experiment using 10 train and test runs, with 66% of the data used for training and 34% used for testing.

8. Using Weka Knowledge flow Sett up a flow to load an ARFF file (batch mode) and perform a cross-validation using J48 (WEKA's C4.5 implementation).

9. Draw multiple ROC curves in the same plot window, using J48 and RandomForest as classifiers.

10. Use any three clustering algorithm on Vehicle data set and find best among them

11. Perform Preprocessing, feature selection and apply any one of the algorithm each from clustering, Association and classification to find their performance

12. Examine the performance of different filters for the breast cancer dataset

SUGGESTED READINGS:

1. Jiawei Han and Micheline Kamber.(2011), Data Mining Concepts and Techniques, 3rd Edition, Elsivier,India (Unit I, III, IV, V)
2. G.K.Gupta (2006), Introduction to Data Mining with Case Studies, Prentice Hall India, New Delhi (Unit – IV)
3. Soman.K.P, Shyam Divakar and V. Ajay. (2008), Insight to Data Mining- Theory and Practical, Prentice Hall India, New Delhi. (Unit – II).
4. Gupta.G.K. (2006), Introduction to Data Mining with Case Studies, Prentice Hall India, New Delhi .
5. Kantardzic, Mining Concepts, Models, Methods and Algorithms, IEEE Press – A John Wiley & Sons.
6. Paulraj Ponniah. (2008), Data Warehousing Fundamentals: A Comprehensive Guide for IT Professionals, John Wiley & Sons, New Delhi.

SEMESTER-V

17CAP513N NETWORK SIMULATOR - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

Course Objectives
Enable the student

- Understand the concepts and terminology associated with SNMP and TMN
- Understand the working of routing protocol in complex computer networks
- Gain knowledge the internal architecture of routers
- Understand the fundamentals and requirements for packet routing in computer communication network.
- Analyze the security mechanism in Computer routing process
- Understand the design metrics

Course Outcomes (Cos)
Upon completion of this course, student will be able :

1. To solve the problems in computer network system management
2. To analyze the challenges in the implementation of ATM networks
3. To implement SNMP Model in the management of computer networks
4. To configure routers using computer network software tools
5. To implement service level agreement in Computer Network management systems
6. To know the Network Management Tools and Systems

List of Practical
1. Simple router configuration.
2. Access and utilize the router to set basic parameters.
3. Connect, configure, and verify operation status of a device interface.
4. Implement static and dynamic addressing services for hosts in a LAN environment.
5. Identify and correct common problems associated with IP addressing and host configurations.
6. Describe basic routing concepts (including: packet forwarding, router lookup process).
7. Configure, verify, and troubleshoot RIPv2.
8. Perform and verify routing configuration tasks for a static or default route given.
9. Configure, verify and troubleshoot DHCP and DNS operation on a router.
10. Configure and verify a PPP connection between routers.

SUGGESTED READINGS

1. James D. Mc CABE. (2010), Network Analysis, Architecture and Design, 3rd Edition, Morgan Kaufmann Publishers.
2. Mani Subramanian. (2012), Network Management Principles and Practice, 2nd Edition, Pearson Education Asia Pvt. Ltd.,.
3. William Stallings. (2002), SNMP, SNMPv2, SNMPv3 and RMON 1 and 2, 3rd Edition, Pearson Education Asia Pvt. Ltd.

SEMESTER-V

17CAP513S SOFTWARE DEVELOPMENT PRACTICAL USING MOODLE 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Internal: 40 External: 60 Total: 100
End Semester Exam: 3 Hours

Course Objective

Enable the student

- To design, select and apply the most appropriate software engineering process for developing any software project
- To implement planning for a software project and identify the risks in software planning.
- To analyze the software requirements for developing any software.
- To understand the importance of negotiation, effective work habits, leadership in the software development process.
- To identify the risks involved in software project management
- To know the organization structure to develop the software project

Course Outcomes (Cos)

Upon Completion of this course, the student Will be able to

1. Implement the concept of software effort estimation in developing software project.
2. Develop a responsible attitude towards the use of computer as well as the technology.
3. Evaluate the risks during the development of software projects
4. Understand the organization behavior in software project management.
5. Implement team management process in developing quality software
6. Monitor the software project management in various ways such as cost control, performance control, etc.,

List of Practical

Prepare a more detailed, organized and easy-to-read documentation, for any application software, which should describe the following using Moodle tool:

1. User Requirement Documentation (USD)
2. Requirement Analysis Documentation. (RAD)
3. User Interfaces Specification. (UIS)
4. Object Oriented Design (OOD) or Low Level Design (LLD)
5. Code Documentation (CD)
6. Testing Documentation (TD)
7. User's Guide (UG)

SUGGESTED READINGS

1. Bob Hughes and Mike Cotterell (2011), Software Project Management, 5th Edition, New Delhi: Tata McGraw Hill
2. Royce.(2000), Software Project Management, 1st Edition, New Delhi: Addisions Wesley.
3. Kelkar (2012), "Software Project Management", 3rd edition, Prentice Hall India,2012

SEMESTER-V

17CAP513W RUBY ON RAILS (PRACTICAL) 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 **Marks: Internal: 40 External: 60 Total: 100**
End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- Develop server-side Ruby scripts for publishing on the Web
- Employ control structures, methods, procs, arrays and hashes to create Ruby programs
- Distinguish and use various Ruby datatypes
- Master the use of arrays and hashes
- Use the extensive pre bundled classes
- Implement the web application using exception handling, thread, etc.,

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Use the I/O facilities of Ruby to read and write binary and text files
2. Master the use of Iterators to loop through various data structures
3. Use Exceptions in handling various run time errors
4. Create Ruby modules
5. Use the wide variety of Ruby Modules that come with the Ruby distribution
6. Use object-oriented programming conventions to develop dynamic interactive Ruby applications

List of Practical

1. Write a ruby program to perform basic array and hash operations
2. Write a code to choose random numbers and find the behaviour of the number
3. Develop a program which gets raised when you handle an exception
4. Write a ruby code to display grade sheet of students using case.
5. Write a ruby program to evaluate polynomial.
6. Write a ruby program to draw box and fill with special characters.
7. Write a program to copy each line from input file to output file.
8. Write a program to create a button and fill the button with colors.
9. Write a program to create different color balls and make it bounce on window.
10. Write ruby program to display notebook widget.

11. Develop a ruby program to manipulate text with font color and images.
12. Write ruby program to create a main thread and execute multiple process through the main thread.
13. Write a ruby code to display color pallet and open dialog with the help of tk controls.
14. Design an application form using tk classes and validate all fields on Rails framework.

SUGGESTED READINGS:

1. Dave Thomas, Andrew Hunt (2013), Programming Ruby 1.9 & 2.0: The Pragmatic Programmers Guide, 2nd Edition, The Pragmatic Bookshelf.
2. David Flanagan, (2008), "The Ruby Programming Language", 1st Edition, O'Reilly Media.
3. Eldon Alameda (2011), "Practical Rails Projects" Apress, Berkeley, CA, USA.
4. David Black, (2006), "Ruby for Rails", Manning Publications.

WEB SITES :

1. http://www.tutorialspoint.com/ruby/ruby_tk_guide.htm
2. www.fincher.org/tips/Languages/Ruby
3. www.troubleshooters.com/codecorn/ruby/basictutorial.htm
4. www.ruby-lang.org/en/documentation/quickstart

SEMESTER-V

17CAP513B MIS - PRACTICAL 4H - 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Internal: 40 External: 60 Total: 100

End Semester Exam: 3 Hours

COURSE OBJECTIVES

Enable the student

- To build knowledge about decision support system (DSS) which is a computer program application
- To analyze business data and presents it so that they can make business decisions more easily
- To help the students to distinguish it from an "operational application" that collects the data in the course of normal business operation
- To know about expert system in management
- To identify Group Decision in Support Systems (GDSS) and Decision Conferencing.
- To manage the organization in an efficient way

COURSE OUTCOMES (COs)

Upon completion of this course, student will be able to :

1. Discuss today's turbulent business environment and describe how organizations survive and even excel in such an environment.
2. Discuss the need for computerized support of managerial decision making.
3. Describe the conceptual foundation of the decision support system (DSS)
4. Describe the business intelligence (BI) methodology and relate them each other.
5. List the major tools of computerized decision support and major issues in implementing computerized decision support systems.
6. Define the conceptual foundations of decision making.

List of Practical

1. Create a set of slides with sound and animation using power point and to select various styles of slides from slide template.

2. Prepare an organization chart for a company and a college using power point.

3. To perform comparative study of your UG degree subject marks and create a various styles of graph using excel.

4. To perform student and hostel fee particulars in a worksheet. Analysis the results using excel.

5. To create a word document for salary preparation and access the calculation, graph from excel using OLE.

6. Apply the mail merge concept using word.
7. Design organizational hierarchy chart
8. Design power point Presentation to market a product
9. Create Tables for Inventory Control
10. Design Animation power point Presentation with audio and video to advertise a product.

SUGGESTED READINGS

1. L.M. Applegate, R.D. Austin and F.W. McFarlan.(2007), Corporate Information Strategy and Management: Text and Cases ,7th Edition, McGraw Hill.
2. P. Bocij, A. Greasley and S. Hickie(2008), Business Information Systems: Technology, Development and Management for the E-Business ,4th Edition, Prentice Hall.
3. D. Boddy, A. Boonstra and G. Kennedy(2008), Managing Information Systems: Strategy and Organisation ,3rd Edition, Prentice Hall.
4. K.C. Laudon and J.P. Laudon.(2007), Management Information Systems: Managing the Digital Firm ,10th Edition, Prentice Hall.
5. W. Robson(1997), Strategic Management and Information Systems: An Integrated Approach ,2nd Edition, Financial Times,
6. R.M. Stair and G. Reynolds (2007),Principles of Information Systems: A Managerial Approach ,International Edition, Delmar Cengage Learning.