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**SYLLABUS**

**Edition-2015**

**DEPARTMENT OF COMPUTER APPLICATION**

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**GYAN VIHAR SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**Teaching and Examination Scheme for Master’s of Science(IT) 2 Year Course**

**EFFECTIVE FROM ACADEMIC SESSION 2015-16**

**Year: I Semester: I**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Type** | **Course Code** | **Course Name** | **Credits****LTPC** | **Weightage (in%)** |  |
|  | **CE** | **ESE**  |
|  |   |  |   |   |   |
| UC | CA 503 | Discrete Mathematics Structure | 3003 | 40 | 60 |
|  | PC101 | Proficiency in Co-Curricular Activities– I | 2 |  |  |
| PC | CA-513 | Fundamentals of Computer & operating system | 3104 | 40 | 60 |
| CA 517 | Problem Solving using C | 3003 | 40 | 60 |
| CA 559 | C programming Lab | 0021 | 60 | 40 |
| CA 519 | System analysis and design | 3003 | 40 | 60 |
| CA-561 | System analysis and design lab | 0021 |  60 | 40  |
| UE | EC-220 | Digital Electronics | 3003 | 40 | 60 |
| CA 606 | Real time system | 3003 | 40 | 60 |
| PE | CA 516 | Management information system | 3104 | 40 | 60 |
| CA-521 | Internet & Web Designing Tools | 3003 | 40 | 60 |
| CA 563 | Web designing lab | 0021 | 60 | 40 |
|  |   | **Total Credits** | 24 |  |  |

**Year: I Semester: II**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Type** | **Course Code** | **Course Name** | **Credits****LTPC** | **Weightage (in%)** |  |
|  | **CE** | **ESE**  |
|  | EM-102 | Employability Skills – V | 0201 | 40 | 60 |
| UC | PC102 | Proficiency in Co-Curricular Activities –I I | 2 |  |  - |
| PC | CA 506 | Database Management System | 3104 | 40 | 60 |
| CA 514 | Object oriented programming & C++ | 3104 | 40 | 60 |
| CA 554 | Industrial oriented project DBMS lab | 0042 | 60 | 40 |
| CA 562 |  C++ lab | 0021 | 60 | 40 |
| CP 202 | Software engineering | 3003 | 40 | 60 |
| CA 619 | Cloud computing | 3003 | 40 | 60 |
| CA 623 | Data Mining and Warehousing | 3003 | 40 | 60 |
| PE |  CA 560 | Office automation tools | 3003 | 40 | 60 |
| CA 560 | Office automation lab | 0021 | 60 | 40 |
| CP 201 | Data Structure & Algorithm  | 3003 | 40 | 60 |
| CA 554 | Data Structure & Algorithm Lab  | 0021 | 60 | 40 |
|  |   | **Total Credits** | 24 |  |  |

**CA 503 DISCRETE MATHEMATICS STRUCTURE (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | Fundamentals: Sets & Relations- Sets, Types of Sets, Multi Sets, Operations on Sets, Relations and Properties of Relations, Representation of Relations, Equivalence Relation, Closures of Relations, recurrence relation | 6 |
| 2 | Formal logic-statement, tautologies, quantifier, predicator and validity, normal form, propositional. Logic, predicate logic, Proposition Methods of Proof-Direct Proofs, Indirect Proofs, Mathematical Induction, Method of Contradiction., Permutations and Combinations, Lattices, Pigeon Hole Principle | 7 |
| 3 | Groups: definition of semi group, subsemigroup, cyclic semigroup, homomorphism and isomorphisem, monoid, Group, abelian group, properties of group, subgroup, group homomorphism, kernel of homomorphisem, permutation group, dihedral group, cyclic group, costs, normal subgroup | 7 |
| 4 | Graphs and Tree: Basic Introduction of Graphs, Btreminilogy, types of graph-simple graph,multigraph,pseudograph,,subgraph,isomorphisem,path,circuits,cycles,connected, graph, cutest, euler path ,circuit, eulergraph,Hamilton graph. weighted graph and shortest path algo, planner graph, graph colorning, polya’s theory of enumeration | 7 |
| 5 | Finite State Machines and Languages: Grammar and Languages- Phrase structure Grammar, Types of Grammars and Languages, Finite State Machines and Languages, Minimization of Finite State Machines. | 8 |
|  | Total | 35 |

**Reference Books:-**

1. Liptschutz, Seymour, “Discrete Mathematics”, McGraw Hill.

2. Trembley, J.P & R. Manohar, “Discrete Mathematical Structure with Application to

Computer Science”, McGraw Hill.

3. Kenneth H. Rosen, “Discrete Mathematics and its applications”, McGraw Hill.

4. Deo, Narsingh, “Graph Theory With application to Engineering and Computer.Science.”,PHI.

5. Krishnamurthy, V., “Combinatorics Theory & Application”, East-West Press Pvt. Ltd., NewDelhi.

6 Kolman B., Busby R: Discrete Mathematical

**CA 513 FUNDAMENTALS OF COMPUTER & OPERATING SYSTEM (L,T,P,C) = (3,1,0,4)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitation, Types of computer, Generation of Computers, Personal Computer(PCs), Input/Output & Storage Units, Number System, Data Storage and Retrieval methods, Software and its Needs and types of Software | 7 |
| 2 | Definition and types of operating systems, Batch Systems, multi programming, time–sharing parallel, distributed and real-time systems, Operating system structure, Operating system components and services, System calls, Process Management: Process concept, Process scheduling, Cooperating processes, Threads, Inter-process communication, CPU scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real-time scheduling and Algorithm evaluation. | 8 |
| 3 | Process Synchronization and Deadlocks: The Critical-Section problem, synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, Monitors, Deadlocks-System model, Characterization, Deadlock prevention, voidance and Detection, Recovery from deadlock, Combined approach to deadlock handling. | 7 |
| 4 | Storage management: Memory Management-Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with paging, Virtual Memory, Demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrashing, Page Size and other considerations, Demand segmentation, File systems, secondary Storage Structure, File concept, access methods, directory implementation, Efficiency and performance, recovery, Disk structure, Disk scheduling methods, Disk management, Recovery, Disk structure, disk scheduling methods, Disk management, Swap-Space management, Disk reliability. | 8 |
| 5 | Protection and Security-Goals of protection, Domain of protection, Access matrix, Implementation of access Matrix, Revocation of Access Rights, language based protection, The Security problem, Authentication, One Time passwords, Program threats, System threats, Threat Monitoring, Encryption. Case study : Windows NT-Design principles, System components, Environmental subsystems, File system, Networking and program interface. | 7 |
|  | Total  | 37 |

**Reference Books:**

1. Computer Fundamentals by P.K.Sinha, BPB Publications
2. Fundamentals of information Technology and Computer Programming by V.K.Jain
3. Introduction to Computers and Information Systems by Dr. Sushila Madan, Taxmann Publications
4. Milenekovie, "Operating System Concept", McGraw Hill.
5. Petersons, "Operating Systems", Addision Wesley.
6. Dietal, "An Introduction to Operating System", Addision Wesley.
7. Tannenbaum, "Operating System Design and Implementation", PHI.
8. Gary Nutt, "Operating System, A Modern Perspective", Addision Wesley.
9. Stalling, Willium, "Operating System", Maxwell Macmillan

**CA 517 PROBLEM SOLVING USING C (L,T,P,C) = (3,0,0,3)**

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| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Introduction about program and programming language, History of C, Salient Features, Structure of a C Program, Data Types and Storage, Data Type Qualifiers, Variables, Declaring Variables, Initializing Variables, Constants, Integer Constants, Floating Point Constants, Character Constants, String Constants, Symbolic Constants, Expressions and Operators: Assignment Statements, Arithmetic Operators, Relational Operators, Logical Operators, Comma and Conditional Operators, Type Cast Operator, Size of Operator.  | 7 |
| 2 | Control Statements, Arrays and Functions: Decision Control Statements, if Statement, switch Statement, Loop Control Statements, Introduction to Arrays, Array Declaration, Syntax of Array Declaration, Size Specification, Array Initialization, Initialization of Array Elements in the Declaration, Character Array Initialization, Subscript, Processing the Arrays, Multi-Dimensional Arrays, Strings, Functions, Definition of a Function, Declaration of a Function, Function Prototypes, The Return Statement, Types of Variables and Storage Classes, Automatic Variables, External Variables, Static Variables, Register Variables, Types of Function Invoking, Call by Value, Call by Reference, Recursion | 8 |
| 3 | Pointers, Structures & Unions: Pointers and their Characteristics, Address and Indirection Operators, Pointer Type Declaration and Assignment, Pointer to a Pointer, Null Pointer Assignment, Pointer Arithmetic, Passing Pointers to Functions, A Function Returning More than One Value, Function Returning a Pointer, Arrays and Pointers, Arrays of Pointers, Pointers and Strings, Declaration of Structures, Accessing the Members of a Structure, Initializing Structures, Structures as Function Arguments, Structures and Arrays, Unions, Initializing an Union, Accessing the Members of an Union | 7 |
| 4 | C Preprocessor Directives and File Handling: The C Preprocessor, # define to Implement Constants, # define to Create Functional Macros, Reading from Other Files using # include, Conditional Selection of Code using #ifdef, Using #ifdef for different computer types, Using #ifdef to temporarily remove program statements, Other Preprocessor Commands, Predefined Names Defined by Preprocessor, Macros V s Functions, Files, File Handling in C Using File Pointers, Open a file using the function fopen ( ), Close a file using the function fclose( ), Input and Output using file pointers, Character Input and Output in Files, String Input / Output Functions, Formatted Input / Output Functions, Block Input / Output Functions, Sequential V s Random Access Files, Positioning the File Pointer | 8 |
| 5 | Graphics in C: Introduction to graphics, initialization of Graphics, Graphics Functions, Programs using Library Functions, Working with Text, Filling Patterns with Different Colors and Styles, Mouse Programming | 7 |
|  | Total  | 37 |

**Reference Books:**

1. Programming in C by E. Balaguruswamy, TMH Publications
2. Programming with C by Gottfried, Schaums, TMH Publications
3. Thinking in C by Mahapatra, PHI Publications

**CA 559 C PROGRAMMING LAB (L,T,P,C) = (0,0,2,1)**

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| --- | --- | --- |
| **S.No.** | **List of Experiments**  | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 517 | 02 hrs (weekly) |

**CA 519** **SYSTEM ANALYSIS AND DESIGN (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, man-made information systems. System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success. System Planning. | 7 |
| 2 | Initial Investigation: Determining user’s requirements and analysis, fact finding process and techniques. Feasibility study: Determination of feasibility study, Technical, Operational & Economic Feasibilities, System performance constraints, and identification of system objectives, feasibility report. Cost/Benefit Analysis of the new/proposed system | 8 |
| 3 | Structured Analysis: Tools of System Analysis Structured Design: Tools of System Design with I/O and Form Design. | 6 |
| 4 | Documentation for the new system: User Manual, system development manual, programming manual, programming specifications, operator manual. System testing & quality: System testing and quality assurance, steps in system implementation and software maintenance.  | 7 |
| 5 | System security: Data Security, Disaster/ recovery and ethics in system development, threat and risk analysis. Hardware and software procurement – In-house purchase v/s hiring and lease | 8 |
|  | Total | 36 |

**Reference Books:**

1. System Analysis Design and Development by Charles S Wasson

**CA 561 SYSTEM ANALYSIS AND DESING LAB (L,T,P,C) = (0,0,2,1)**

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| --- | --- | --- |
| **S.No.** | **List of Experiments**  | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 519 | 02 hrs (weekly) |

**EC 220 DIGITAL ELECTRONICS (L,T,P,C) = (3,0,0,3)**

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| --- | --- | --- |
| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | Number systems and different types of number systems,1’s & 2’s complement, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation,ASCII, EBCDIC codes, Gray code, Excess-3 & BCD | 6 |
| 2 | Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic Boolean Law's, Demurrage’s theorem, MAP Simplification, Minimization techniques, K -Map, Sum of Product & Product of Sum. | 8 |
| 3 | Combinational & Sequential circuits, Half Adder & Full Adder, Full subtractor Binary serial and parallel adders. BCD adder. Binary multiplier. Decoder: Binary to Gray decoder, BCD to decimal, BCD to 7-segment decoder. | 7 |
| 4 | Flip-flops - RS, D, JK & T Flip-flops, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Octal to binary, BCD to excess-3 encoder. Decoder, Idea about Arithmetic Circuits, Program Control, Instruction Sequencing. | 7 |
| 5 | Counters, Asynchronous (ripple), synchronous and synchronous decade counter, Modulus counter, skipping state counter, counter design. Ring counter. Counter applications. Registers: buffer register, shift register | 8 |
|  | Total | 36 |

**Reference Books:**

1. BARTEE**,** “Digital Computer Fundamentals ”TMH Publication
2. MALVINO**,** “ Digital Computer Electronics ”TMH Publication

 3. MORRIS MANO**,** “Computer System Architecture ”PHI Publication

 **CA 606 REAL TIME SYSTEMS (L,T,P,C) = (3,0,0,3)**

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| --- | --- | --- |
| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | Introduction: Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency. | **6** |
| 2 | Real Time Scheduling: Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round , Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST), Algorithms, Offline Versus Online Scheduling, Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems, Resources Access Control: Effect of Resource Contention and Resource Access Control (RAC), Non-preemptive | **7** |
| 3 | Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects, Multiprocessor System Environment: Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling Protocol,. | **7** |
| 4 | Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, Scheduling of Tasks with Temporal Distance Constraints, Real Time Communication: Model of Real Time Communication | **7** |
| 5 | Priority-Based Service and Weighted Round- Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time Protocols, Communication in Multicomputer System, An Overview of Real Time Operating Systems | **8** |
|  |  Total | **35** |

**Reference Books:**

1. W.S.Liu-Real-Time Systems, Pearson Education Asia.
2. Raymond A.Buhr-Introduction to Real-Time Systems, Pearson education Asia.
3. Alan Burns-Real-Time Systems and Programming Languages, Pearson Education.

**CA 516 MANAGEMENT INFORMATION SYSTEM (L,T,P,C) = (3,1,0,4)**

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| --- | --- | --- |
| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | **Introduction,** MIS concept, Definition, role & Impact of MIS, Process of management, organization structure & behavior. | 6 |
| 2 | **Basic of Management Information System** Decision Making, Information concepts, System concepts & control Types of system handling system complexity System development model | 7 |
| 3 | Development of Management Information System Requirement and implementation of MIS, Choice of information Technology for Management Information System. | 7 |
| 4 | Application of Management Information system Application in manufacturing sector using for personal management, financial management, Production Management, Material Management, Marketing Management Application in Service Sector. | 8 |
| 5 | **Enterprise Resource Planning (ERP), EMS**, ERP, Benefits implementation, EMS & MIS. **Case Studies.** | 6 |
|  | Total | 34 |

**Reference Books:**

1. W.S. Jawadekar-Management Information System, Tata McGraw Hill.
2. Loudon & Loudon-Management Information, Pearson Education Asia

**CA 521** **INTERNET & WEB DESIGNING TOOLS (L,T,P,C) = (3,0,0,3)**

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| --- | --- | --- |
| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | The Internet, Classification of Networks, Networking Models, What is Packet Switching, Accessing the Internet, Internet Protocols, Internet Protocol (IP), Transmission Control Protocol (TCP), Internet Address, Structure of Internet Servers Address, Address Space, How does the Internet work, Intranet & Extranet, Internet Infrastructure, Protocols and Services on Internet, Domain Name System, SMTP and Electronic Mail, Http and World Wide Web, Usenet and Newsgroups, FTP, Telnet, Search Engines, Web Browser | 7 |
| 2 | FrontPage: Creating Your First Web Pages, Create a Web Page, Organize a Page with Links, Lists, and Tables, Display Graphics and Photos on a Page, Layout a Page with Tables, Designing an Entire Web Site, Create a New Web Site, Develop a Site Quickly with Templates, Publish Your Site, Connect a Database to Your Site, Format Your Site Through Cascading Style Sheets, Divide a Page into Separate Frames | 8 |
| 3 | Cascading Style Sheets: Introduction, CSS and its working, Colors and backgrounds, Fonts, Text, Links, Identification and grouping of elements (class and id), Grouping of elements (span and div), The box model, The box model - margin & padding, The box model - borders, The Box model - Height and width, Floating elements (floats), Positioning of elements, Web-standards and validation | 6 |
| 4 | JavaScript: Introduction to JavaScript, JavaScript Variables and Data Types, Declaring Variables, Data Types, Statements and Operators , Control Structures, Conditional Statements, Loop Statements, Object-Based Programming, Functions, Executing Deferred Scripts, Objects, Message box in JavaScript, Dialog Boxes, Alert Boxes, Confirm Boxes, Prompt Boxes, JavaScript with HTML, Events, Event Handlers, Forms, Forms Array, String Object, Date & Time Object, Number Object | 7 |
| 5 | DHTML: Introduction, Applications of DHTML, Use of DHTML, Combining JavaScript and CSS, Working with Objects, Browser Detection, Pop Up Menus, Animating a Layer, Filters and Transitions | 8 |
|  | Total | 36 |

**Reference Books:**

1. [Pro XML Development with Java Technology: From ...](http://books.google.co.in/books?id=pQ2h64OBSSAC&dq=Web+Technologies+and+Development+reference+book&printsec=frontcover&source=in&hl=en&ei=5rFuSsHYJ8GJkQWOuLTDBQ&sa=X&oi=book_result&ct=result&resnum=11) - by Ajay Vohra, Deepak Vohra
2. [Information Technology and Economic Development](http://books.google.co.in/books?id=CimtoH4k438C&dq=Web+Technologies+and+Development+reference+book&printsec=frontcover&source=in&hl=en&ei=5rFuSsHYJ8GJkQWOuLTDBQ&sa=X&oi=book_result&ct=result&resnum=12) - by Yutaka Kurihara, Sadayoshi Takaya, Hisashi

**CA 563 WEB DESIGNING LAB (L,T,P,C) = (0,0,2,1)**

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| **S.No.** | **List of Experiments**  | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 521 | 02 hrs (weekly) |

 **EM 102 Employability Skills – V (L,T,P,C) = (0,0,2,1)**

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| --- | --- | --- | --- |
| **S.No.** | **Topic** | **Details** | **Contact Hours** |
| 1 | Communication | Role Play, Reading, Formal writing skills Listening, Interaction Process, Interpersonal Relationship | 15 |
| 2 | Attitude& Manners | Motivation, Team Building, Winning Strategy, CAN DO, | 5 |
| 3 | Preparation, presentation | Presentation skills, Preparation Skills, | 4 |
| 4 | Industry | Concept & Importance of SIP, Industrial Mentoring & Networking | 1 |

**CA 506** **DATABASE MANAGEMENT SYSTEM (L,T,P,C) = (3,1,0,4)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | Overview of DBMS, Basic DBMS terminology, data base system v/s file system, data independence. Architecture of a DBMS. | 6 |
| 2 | Introduction to data models: entity relationship model, hierarchical model: from network to hierarchical, relational model, comparison of network, hierarchical and relational models. | 8 |
| 3 | Data modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree. | 7 |
| 4 | Relational model: storage organizations for relations, relational algebra, relational calculus. Normalization: Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design. | 8 |
| 5 | Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Transaction Manager, Recovery, Concurrency control | 6 |
|  | Total | 35 |

**Reference Books:**

1. Database Management Systems by Raghu Ramakrishnan
2. [Fundamentals of Database Management Systems](http://www.amazon.com/Fundamentals-Database-Management-Systems-Gillenson/dp/0471262978/ref%3Dsr_1_4?s=books&ie=UTF8&qid=1281202196&sr=1-4) by [Mark L. Gillenson](http://www.amazon.com/Mark-L.-Gillenson/e/B001ITYYWW/ref%3Dsr_ntt_srch_lnk_4?qid=1281202196&sr=1-4)
3. [Database System Concepts](http://www.amazon.com/Database-System-Concepts-Abraham-Silberschatz/dp/0073523321/ref%3Dsr_1_14?s=books&ie=UTF8&qid=1281202196&sr=1-14) by [Abraham Silberschatz](http://www.amazon.com/Abraham-Silberschatz/e/B000APPDZ2/ref%3Dsr_ntt_srch_lnk_14?qid=1281202196&sr=1-14), [Henry F. Korth](http://www.amazon.com/Henry-F.-Korth/e/B001H6UQRI/ref%3Dsr_ntt_srch_lnk_14?qid=1281202196&sr=1-14), and S. Sudarshan
4. [Database Systems: Design, Implementation, and Management](http://www.amazon.com/Database-Systems-Design-Implementation-Management/dp/1423902017/ref%3Dsr_1_5?s=books&ie=UTF8&qid=1281202196&sr=1-5) by [Peter Rob](http://www.amazon.com/Peter-Rob/e/B001H6MMHK/ref%3Dsr_ntt_srch_lnk_5?qid=1281202196&sr=1-5) and [Carlos Coronel](http://www.amazon.com/Carlos-Coronel/e/B001H6NK6M/ref%3Dsr_ntt_srch_lnk_5?qid=1281202196&sr=1-5)
5. [Database Systems: The Complete Book (2nd Edition)](http://www.amazon.com/Database-Systems-Complete-Book-2nd/dp/0131873253/ref%3Dsr_1_12?s=books&ie=UTF8&qid=1281202196&sr=1-12) by [Hector Garcia-Molina](http://www.amazon.com/Hector-Garcia-Molina/e/B001IQXEHQ/ref%3Dsr_ntt_srch_lnk_12?qid=1281202196&sr=1-12), [Jeffrey D. Ullman](http://www.amazon.com/Jeffrey-D.-Ullman/e/B000APLJT6/ref%3Dsr_ntt_srch_lnk_12?qid=1281202196&sr=1-12), and [Jennifer Widom](http://www.amazon.com/Jennifer-Widom/e/B000APBU54/ref%3Dsr_ntt_srch_lnk_12?qid=1281202196&sr=1-12)

**CA 514** **OBJECT ORIENTED PROGRAMMING & C++** **(L,T,P,C) = (3,1,0,4)**

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| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | OOP Concepts & Introduction to C++: Objects and Classes, Data Abstraction, Encapsulation, Messaging, Modularity, Polymorphism, Inheritance, Types of Inheritance, Introduction to C++: Why Program in C++? , A Brief History of C++, Good Things About C++, Pitfalls of C++, Compiling and running C++ Program, Basic Input / Output Statements, Variables, Variable Types and Declaring Variables, Casting of Variables, Operators, Operator Precedence, Control Statements, Branching Statements (if, else, switch), Loops (for, while, do), Functions: What is a Function?, Function Basics, Parameters to Functions, Returning Values from Functions, Function Overloading, Recursion and Recursive Functions. | 7 |
| 2 | Objects & Classes, Pointers and Arrays: Object, Object Design, Declaring a Class, Using a Class (Instantiation), Constructors and Destructors, Protect your Private Parts, Inline Functions, What is a Pointer?, Pointers and Instances, Dynamic Memory Allocation, Array, Declaring, Initializing and Implementing an Array (Single, Double and Multidimensional) | 8 |
| 3 | Inheritance, Virtual Methods, and Polymorphism: What is Inheritance?, Inheritance Syntax, Types of Inheritance, Virtual Classes, Abstract Classes, Virtual Methods, Operator Overloading, Friend Functions. | 6 |
| 4 | File Handling: Input and Output with Streams, Streams, Formatting and Manipulators, Formatted Output of Integers, Formatted Output of Floating-Point Numbers, Output in Fields, Output of Characters, Strings, and Boolean Values, Formatted Input, Formatted Input of Numbers, Unformatted Input/Output, Files, File Streams, Creating File Streams, Open Modes, Closing a File, Reading and Writing Blocks, Object Persistence | 7 |
| 5 | Storage Classes and Namespaces, Storage Classes of Objects, The Storage Class extern, The Storage Class static, The Specifiers auto and register, The Storage Classes of Functions, Namespaces, The Keyword using, Exception Handling, Exception Handlers Throwing and Catching Exceptions, Nesting Exception Handling, Introduction to Templates and Containers  | 8 |
|  | Total | 36 |

**Reference Books:**

1. Object Oriented programming with C++ by E. Balaguruswami
2. Success with C++ by Kris James
3. Object Oriented programming with C++ by David Parsons
4. Programming in C++ by D. Ravichandran
5. Programming in C++ by Dewhurst and Stark
6. Mastering C++ by Venugopal, Ravishankar, Rajkumar

**CA 554 INDUSTRIAL ORIENTED PROJECT DBMS LAB** **(L,T,P,C) = (0,0,4,2)**

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| **S.No.** | **List of Experiments**  | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 504 | 2 hrs Weekly |

**CA 562 C++ LAB (L,T,P,C) = (0,0,2,1)**

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| --- | --- | --- |
| **S.No.** | **List of Experiments**  | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 514 | 02 hrs (weekly) |

**CP 202 SOFTWARE ENGINEERING (L,T,P,C) = (3,0,0,3)**

|  |  |  |
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| **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | Introduction to Software Engineering: Introduction, Definitions of Software Engineering, Program V/s. Software, Software Characteristics, Software Components, Software Applications, Software Crisis, Software Processes, Software Quality Attributes, Key challenges faced by the Software Engineering, Software Engineer, SDLC, Software System Development Methodologies, CASE tools | 7 |
| 2 | Software Project Management: Project Management Process, Feasibility Study, Software Project Planning, Project Execution, Monitoring and Control, Project Termination Analysis, SCM, Process Management Process, CMM, Risk Management Process, Software Project Planning, Scheduling a Software Project,  | 7 |
| 3 | Requirement Engineering: Introduction to Requirement Engineering, Functional Requirements, Non-Functional Requirements, Domain Requirements, Requirement Engineering Process, Software Requirements Specification (SRS) | 7 |
| 4 | Structured Analysis & Design: Data Modeling, Data Objects, Attributes And Relationships , Cardinality And Modality, Entity – Relationship Diagram , Functional Modeling, Data Flow Diagram, Logical And Physical DFDs , Leveling Of DFDs, Control Flow Diagram, Behavioral Modeling , Data Dictionary, Structured English, Decision Trees, Decision Table,Software Design Model , Conceptual and Technical Designs , Characteristics of a Good Design , Design Principles, Design Guidelines , Decomposition and Modularity | 7 |
| 5 | Quality Assurance Activities: Types of Quality Assurance Activities , Verification and Validation, Testing, Testing Fundamentals, Strategic Issues in Testing, Test Plan, Testing Principles, General Testing Strategies, Code Testing, Specification Testing, Black Box Testing, White Box Testing, Testing Process  | 7 |
|  | Total | 35 |

**Reference Books:**

1. C. Banerjee, “Software Engineering”, First Edition, Genius Publications
2. Roger, S. Pressman, “Software Engineering-A Practitioner’s Approach”, Third Edition, McGraw Hill
3. R.E. Fairley, “Software Engineering Concepts”, McGraw Hill
4. Jalote “An Integrated Approach to Software Engineering”, Narosa Publishing House.

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| **CA 619 CLOUD COMPUTING (L,T,P,C) = (3,0,0,3)** |  |
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| **Unit** | **Contents of the Course** | **Total Hrs.** |
| I | Introduction of Grid and Cloud computing, characteristics, components, business and IT perspective, cloud services requirements, cloud models, Security in public model, public verses private clouds, Cloud computing platforms: Amazon EC2,Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing. | 6 |
| II | Introduction of Grid and Cloud computing, characteristics, components, business and IT perspective, cloud services requirements, cloud models, Security in public model, public verses private clouds, Cloud computing platforms: Amazon EC2,Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing. | 7 |
| III | Virtualization technology: Definition, benefits, sensor virtualization, HVM, study of hypervisor, logical partitioning- LPAR, Storage virtualization, SAN, NAS, cloud server virtualization, virtualized data center. | 6 |
| IV | Cloud security fundamentals, Vulnerability assessment tool for cloud, Privacy and Security in cloud, Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control-Identity management, Access control, Autonomic Security, Cloud computing security challenges: Virtualization security management- virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud. | 8 |
| V | SOA and cloud, SOA and IAAS, cloud infrastructure benchmarks, OLAP, business intelligence, e-Business, ISV, Clod performance monitoring commands, issues in cloud computing. QOS issues in cloud, mobile cloud computing, Inter cloud issues, Sky computing, Cloud Computing Platform, Xen Cloud Platform, Eucalyptus, OpenNebula, Nimbus, T Platform, Apache Virtual Computing Lab (VCL), Anomaly Elastic Computing Platform. | 8 |
|  Total | 35 |

**Reference Book:**

1. Dr.Kumar Saurabh, “Cloud Computing”, Wiley India.

2. Ronald Krutz and Russell Dean Vines, “Cloud Security”, Wiley-India.

3. Judith Hurwitz, R.Bloor, M.Kanfman, F.Halper, “Computing for Dummies”, Wiley India Edition.

**CA 623** **DATA MININIG AND WAREHOUSING (L,T,P,C) = (3,0,0,3)**

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|  **Units** | **Course Contents**  | **Total Contact Hrs.** |
| 1 | Overview, Motivation(for Data Mining),Data Mining-Definition & Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data,(Binning, Clustering, Regression, Computer and Human inspection), Inconsistent Data, Data Integration and Transformation. Data Reduction:-Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation. | 7 |
| 2 | Concept Description: Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases–. | 7 |
| 3 |  What is Classification & Prediction, Issues regarding Classification and prediction,Decision tree, Bayesian Classification, Classification by Back propagation, Multilayerfeed-forward Neural Network, Back propagation Algorithm, Classification methods Knearest neighbor classifiers, Genetic Algorithm. Cluster Analysis, | 7 |
| 4 | Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting. | 7 |
| 5 |  Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse. | 7 |
|  | Total | 35 |

**Reference Books:**

1. Alex bezon,Stephen j.smith”data warehousing,data mining and olap” McGraw hill edition 2001.

2. W.H Immam” Building the data warehouse 3rd edition wiley 2003

 **CA 560 OFFICE AUTOMATION TOOLS (L,T,P,C) = (3,0,0,3)**

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| **Unit** | **Course Contents** | **Hrs.** |
| 1 | **Ms Window**: Introduction to M.S Window; Features of Window; Various version of Window & it use; Working with Window ;My computer & recycle bin; Desktop, Icon And Window Explorer; Screen description & working style of window ;Dialog Boxes & Toolbars; Working with Windows; My Computer & Recycle bin; Desktop, Icons and Windows; Dialog Boxes & Toolbars; Windows Explorer; Screen description & working Styles of Windows; Dialog Boxes & Toolbars; Working with files & Folder; Simple operations like copy, delete, moving of files and folders from one drive to another, Shortcuts & Auto starts; Accessories and Windows Settings using Control Panel, modem, printers, audio, networks, fonts, creating users, internet settings, Starts button & Program lists; Installation and Uninstalling new Hardware & Software program on your computer; | 7 |
| 2 | **Office Package-** Office activates and their software requirements, Word-processing, Spreadsheets, Presentation graphics, Database, introduction to MS Office; Introduction to MS-Word; Features & areas of use. Working with MS Word.; Menus & Commands; Toolbars & Buttons; Shortcuts Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with - Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features; Bullets, Numbering, Auto Formatting, Printing & various print options. | 8 |
| 3 | **Advanced Features of MS-Word:** Spell Check, Thesaurus, Find & Replace; Headers & Footers; Inserting - Page Numbers, Pictures, Files, Auto texts, Symbols etc.; Working with Columns, Tabs & Indents; Creations & Working with Tables including conversion to and from text; Margins & Space management in Documents; Adding Reference and Graphics; Mail Merge, Envelopes and mailing labels, Importing and Exporting to and from various formats . | 6 |
| 4 | **MS Excel:** Introduction and area of use; Working with MS- Excel.; concepts of Workbook & Worksheets; Using Wizard; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different views of Worksheets; Column Freezing, Labels, Headings, Splitting etc; Using different Features with Data and Text; Use of Formulas, calculation and function; Cell formatting including Models Shading; Working with different Chart Types ; Printing of Workbook and Worksheet with various option . | 7 |
| 5 | **MS-PowerPoint**: Introduction and area of Use; Working with MS-PowerPoint; Creating A New Presentation; Working with Presentation; Using Wizard; Slides and its different views; Inserting, Deleting and Copying of Slides; Working with notes, Handouts, Columns and lists; Adding Graphics, Sound and movies to a slide; Working with PowerPoint objects; Designing and presentation of a Slide show; Printing Presentation, nodes, Handouts with print option, Outlook Express and its features | 7 |
|  | Total | 35 |

**Reference Books:**

1. Windows XP Complete Reference, BPB Publication

2. MS-Windows XP Home Edition Complete Reference

3. MS-Office XP Complete Reference, BPB Publication

**CA 560** **OFFICE AUTOMATION LAB (L,T,P,C) = (0,0,2,1)**

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| **S.No.** | **List of Experiments**  | **Total Contact Hrs.** |
| 1 | **Introduction to MS windows**: Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer. | 2 hrs Weekly |
| 2 | Office package: Word-processing, Spreadsheet, Presentation graphics. |
| 3 | **MS Word Basics:** Working with MS Word.; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document. |
| 4 | **MS-Word lab 2:** Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Auto texts, Symbols etc. |
| 5 | **MS- Word lab 3**: Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References and Graphics. |
| 6 | **MS-Word lab 4**: Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats. |
| 7 | **MS Excel Lab 1:**  Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc. |
| 8 | **MS Excel Lab 2:**Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options. |
| 9 | **MS PowerPoint:**  Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options. |
| 10 | **MS Access**: Creation of table with primary key, fire the different queries, creation of reports. |
| **CP 201 : DATA STRUCTURES AND ALGORITHMS (L,T,P,C) = (3,0,0,3)**  |  |

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| **Unit**  | **Course Content** | **Total Contact hours** |
| 1 | Data Structure: Definition, Implementation, Operation, Application, Algorithm writing and convention. Analysis of algorithm, Complexity Measures and Notations ,Arrays: Representation of arrays (multidimensional), Address calculation using column and row major ordering. Linked Lists : Implementation, Doubly linked list, Circular linked list, unrolled linked list, skip-lists, Splices, Sentinel nodes, Application (Sparse Matrix, Associative Array, Functional Programming) | **8** |
| 2 | Stacks : Definition, Implementation, Application (Tower of Hanoi, Function Call and return, Parentheses Matching, Back-tracking, Expression Evaluation), Queues : Definition, deque, enque, priority queue, bounded queue, Implementation, Application | **7** |
| 3 | Tree: Definition of elements, Binary trees: Types (Full, Complete, Almost complete), Binary Search Tree, Traversal, (Pre, In, Post & Level order), Pruning, Grafting. Application: Arithmetic Expressions Evaluation Variations: Indexed Binary Tree, Threaded Binary Tree, AVL tree, Multi-way trees, B tree, B+ tree, Forest, Trie and Dictionary | **7** |
| 4 | Graphs: Elementary definition, Representation (Adjacency Matrix, Adjacency Lists), Traversal (BFS, DFS)Application: Spanning Tree (Prim and Kruskal Algorithm), Dijkstra's algorithm, shortest path algorithms | **6** |
| 5 | Sorting: Bubble, Selection, Insertion, Quick, Radix, Merge, Bucket, Heap, Searching: Hashing, Symbol Table, Binary Search, Simple String Searching | **6** |
|  |  Total | **34** |

**Reference Books:**

1. Aho A.V., J.E.Hopcroft. J.D.Ulman: Data Structures and Algorithms, Addison Wesley.
2. Brastrad: Algorithms, PHI.
3. Horowitz and Sawhni: Algorithms Design and Analysis, CS Press.
4. Kruse R.L.: Data structure and Program Design.PHI.
5. Tanenbaum : Data structures in C,PHI
6. Trembley & Sorenson :An Introduction to Data Structures, Mc-Graw Hill International

 **CA 554 DATA STRUCTURE & ALGORITHM LAB (L,T,P,C) = (0,0,2,1)**

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| **S.No.** | **List of Experiments**  | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CP 201 | 2 hrs Weekly |