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**SYLLABUS**

**Edition-2015**

**DEPARTMENT OF COMPUTER APPLICATION**

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**LIST OF COURSES OFFERED**

**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 Computer Applications 3 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** |
| UC | EM-102 | Employability Skills – V | 0201 | 40 | 60 |
| 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 |
| UE | CA 623 | Data Mining and Warehousing | 3104 | 40 | 60 |
| CP 201 | Data Structure & Algorithm | 3003 | 40 | 60 |
| CA 554 | Data Structure & Algorithm Lab | 0021 | 60 | 40 |
| PE | CA 614 | Office Automation Tools | 3003 | 40 | 60 |
| CA 560 | Office Automation Lab | 0021 | 60 | 40 |
| CA 619 | Cloud computing | 3003 | 40 | 60 |
|  |  | **Total Credits** | 24 |  |  |

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**GYAN VIHAR SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**Teaching and Examination Scheme for Master’s of Computer Applications 3 Year Course**

**EFFECTIVE FROM ACADEMIC SESSION 2016-17, LATERAL ENTRY 2015-16**

**Year: II Semester: III**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE TYPE** | **Course Code** | **Course Name** | **Credits**  **LTPC** | **Weightage (in%)** |  |
| **CE** | **ESE** |
| UC | EM 201 | Employability Skills – VI | 0201 | 40 | 60 |
| PC 201 | Proficiency in Co-Curricular Activities – III | 2 |  |  |
| HS 203 | Economics and Social Science | 3003 | 40 | 60 |
| PC | CA 615 | Programming in Java | 3003 | 40 | 60 |
| CA-661 | Industrial Project oriented Java lab | 0042 | 60 | 40 |
| SM-601 | Project Training Seminar I | 0042 | 60 | 40 |
| CA 613 | Data communication & networking | 3003 | 40 | 60 |
| CA 659 | Networking lab | 0021 | 60 | 40 |
| UE | CA-518 | E-commerce | 3003 | 40 | 60 |
| CA 625 | Intellectual Property & Rights | 3003 | 40 | 60 |
| PE | CA 621 | Mobile commerce | 3104 | 40 | 60 |
| CP 307 | Computer Graphics | 3003 | 40 | 60 |
| CA-655 | Computer Graphics Lab | 0021 | 60 | 40 |
|  |  | **Total Credits** | **24** |  |  |

**Year: II Semester: IV**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE TYPE** | **Course Code** | **Course Name** | **Credits**  **LTPC** | **Weightage (in%)** |  |
| UC | **CE** | **ESE** |
| EM 202 | Employability Skills – VII | 0201 | 40 | 60 |
| PC 202 | Proficiency in Co-Curricular Activities – IV | 2 |  |  |
| PC | CA 614 | Advance Java | 3104 | 40 | 60 |
| CP 407 | Artificial intelligence | 3003 | 40 | 60 |
| CA-660 | Advance Java Lab | 0021 | 60 | 40 |
| PE-652 | Project Stage-I | 0063 | 60 | 40 |
| CA 618 | Object Oriented Analysis & Design | 3003 | 40 | 60 |
| CA-662 | OOAD Lab | 0021 | 60 | 40 |
| CA-261 | Colloquium (Group Discussion) | 0021 | 60 | 40 |
| UE | CA-622 | Software Testing | 3003 | 40 | 60 |
|  | CA 624 | Embedded system | 3003 | 40 | 60 |
| PE | CA-620 | E-banking & secure transaction | 3003 | 40 | 60 |
| CP 408 | Advanced computer architecture | 3003 | 60 | 40 |
|  |  | **Total** | **25** |  |  |

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**GYAN VIHAR SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**Teaching and Examination Scheme for Master’s of Computer Applications 3 Year Course**

**EFFECTIVE FROM ACADEMIC SESSION 2017-18, LATERAL ENTRY 2016-17**

**Year: III Semester: V**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COURSE TYPE** | **Course Code** | **Course Name** | **Credits**  **LTPC** | **Weightage (in%)** |  |
| **CE** | **ESE** |
| UC | EM 301 | Employability Skills – VIII | 0201 | 40 | 60 |
| PC301 | Proficiency in Co-Curricular Activities – V | 2 |  |  |
| PC | CA 719 | Advanced Web Development | 3003 | 40 | 60 |
| CA 703 | Analysis and Design of Algorithm | 3003 | 40 | 60 |
| CA-753 | Advanced Web Development Lab | 0021 | 60 | 40 |
| PE 701 | Project Stage-II | 0084 | 60 | 40 |
| CA-721 | Information Protection & Security | 3003 | 40 | 60 |
| SM 701 | Project Training Seminar - II | 0042 | 60 | 40 |
| UE | CA-723 | Research methodologies | 3003 | 40 | 60 |
|  | BM-517 | Accounting & Financial management | 3003 | 40 | 60 |
| PE | CA 709 | ERP System | 3104 | 40 | **60** |
|  | CA 711 | Decision support system | 3104 | 40 | 60 |
|  |  | **Total Credits** | 26 |  |  |

**YEAR-III Semester: VI**

|  |  |  |
| --- | --- | --- |
| **Course Code** | **Course Name** | **Credits**  **LTPC** |
|
|  | **Practical & Sessional:** |  |
| PT 702 | Industrial training | 00018 |
|  | **Total Credits** | **18** |

**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)**

|  |  |  |
| --- | --- | --- |
| **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)**

|  |  |  |
| --- | --- | --- |
| **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)**

|  |  |  |
| --- | --- | --- |
| **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)**

|  |  |  |
| --- | --- | --- |
| **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)**

|  |  |  |  |
| --- | --- | --- | --- |
| **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=sr_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=sr_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=sr_1_14?s=books&ie=UTF8&qid=1281202196&sr=1-14) by [Abraham Silberschatz](http://www.amazon.com/Abraham-Silberschatz/e/B000APPDZ2/ref=sr_ntt_srch_lnk_14?qid=1281202196&sr=1-14), [Henry F. Korth](http://www.amazon.com/Henry-F.-Korth/e/B001H6UQRI/ref=sr_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=sr_1_5?s=books&ie=UTF8&qid=1281202196&sr=1-5) by [Peter Rob](http://www.amazon.com/Peter-Rob/e/B001H6MMHK/ref=sr_ntt_srch_lnk_5?qid=1281202196&sr=1-5) and [Carlos Coronel](http://www.amazon.com/Carlos-Coronel/e/B001H6NK6M/ref=sr_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=sr_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=sr_ntt_srch_lnk_12?qid=1281202196&sr=1-12), [Jeffrey D. Ullman](http://www.amazon.com/Jeffrey-D.-Ullman/e/B000APLJT6/ref=sr_ntt_srch_lnk_12?qid=1281202196&sr=1-12), and [Jennifer Widom](http://www.amazon.com/Jennifer-Widom/e/B000APBU54/ref=sr_ntt_srch_lnk_12?qid=1281202196&sr=1-12)

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

|  |  |  |
| --- | --- | --- |
| **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

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

|  |  |  |
| --- | --- | --- |
| **S.No.** | **List of Experiments** | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 506 | 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)**

|  |  |  |
| --- | --- | --- |
| **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)**

|  |  |  |
| --- | --- | --- |
| **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 614 OFFICE AUTOMATION TOOLS (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **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 3. MS-Windows XP Home Edition Complete Reference

2. 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. |

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| **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)**

|  |  |  |
| --- | --- | --- |
| **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 |

**EM 201 EMPLOYABILITY SKILLS- VI**  **(L,T,P,C) = (0,2,0,1)**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Topic** | **Details** | **Contact Hours** |
| 1 | Communication | Negotiation & Reasoning, Interaction Process, Interpersonal Relationship | 5 |
| 2 | Quantitative | Number System, Ratio & Proportion, Partnership, Percentage, Profit &Loss | 5 |
| 3 | Reasoning, | Analytical Reasoning, Coding & Decoding, Series | 5 |
| 4 | Motivation | Leadership & Styles, Self Esteem, Winning strategies, | 5 |
| 5 | Preparation, presentation | Self Esteem, Preparation of CV, Writing Application, Placement Mantra | 5 |
|  |  | Total | 25 |

**HS 203  ECONOMICS AND SOCIAL SCIENCES  (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Course Contents** | **Total Contact Hours - 37** |
| I | **Introduction:** Definition meaning, nature and scope of economics. | 6 |
| **II** | **Micro Economics**: Definition, meaning and scope of Micro Economics. Importance and limitations. | 6 |
| **III** | **Concept of Demand and supply** :Utility Analysis, Law of Demand, Demand determinants, Demand Distinctions. Law of Supply, Elasticity | 7 |
| **IV** | **Introduction to social Sciences**: impact of british rule on India(Economic Social and Cultural). Indian National movement, Psysography of India. | 10 |
| **V** | **Political Economy**: Agriculture, Socio-Economic development, Challenges to Indian Decomcracy, Polical Parties and pressure groups. | 8 |
|  | Total | 37 |

**Reference Books:-**

1.Micro Economics by M.L.Sethi

2. Advance Micro Economics by M.L. Shingham

**CA 615 PROGRAMMING IN JAVA (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Overview of Java, Object Oriented Concepts in Java. Abstraction, OOP Principles and Java applications, Java features like security, portability, byte code, java virtual machine, object oriented, robust, multithreading, architectural neutral, distributed and dynamic, Data types and Keyword | 6 |
| 2 | Operators: Arithmetic, Bitwise, Relation, increment Decrement, logical, special, Assignment Control Structures, Type Casting ,Array, Java methods, Classes, Constructor, method overriding, method overloading, abstract class, Inheritance of procedures and Data, packages java. lang, java.util and their uses, java.io, basics of networking using Java,Javap,javadoc command And interface, Inner class. | 7 |
| 3 | String handling and various string functions, String Buffer, object class method toString (), hasCode (), equals (), Exception handling, multithreaded programming thread priorities, synchronization, messaging, creating and controlling of threads. New(),run(),Wait() ,join() method of thread class, Runnable thread and method ,i/o stream, garbage collection, externalization | 9 |
| 4 | Java utilities like Applets, Java applets and their use – Event Handling – AWT and working with Windows – Event Handling – Event Handling Mechanisms, Delegation Event Model, Event Class, Event Listener Interfaces, Adapter Classes, Inner Class. AWT and working with windows – AWT.Classes, Window fundamentals, frame windows, frame window in An Applet, Working with Graphics, color, fonts and text. , JAR files | 7 |
| 5 | JDBC – JDBC API, JDBC Drivers, Products, JDBC Design considerations, Two Tier and Three Tier client server model, Basic steps to JDBC, setting up a connection to database, Creating and executing SQL statements, Result set and Result set Metadata Object. | 8 |
|  | Total | 37 |

**Reference Books:**

1. The Complete Reference: Patrick Naughton and Herbert Schildt
2. Khalid Maugham LPE Publisher
3. Head First Java : Keith Sherrie

**CA 661 Industrial Project Oriented JAVA 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 615 | 02 hrs (weekly) |

**SM 601 PROJECT Training -I**  **(L,T,P,C)=(0,0,4,2)**

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| --- | --- | --- |
| **S.No.** | **List of Experiments** | **Total Contact Hrs.** |
| 1 | The Project Seminar will be conducted for the guidance of student Projects | 2Hrs Weekly |

**CA 613 DATA COMMUNICATION AND NETWORKING (L,T,P,C) = (3,0,0,3)**

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| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Network, Network Protocols, Edge, Access Networks and Physical Media, Protocol Layers and their services models, Internet Backbones, NAP’s and ISPs. | 7 |
| 2 | Application Layer: Protocol and Service Provided by application layer, transport Protocols. The world wide web. HTTP, Message formats, User Server Interaction And Web caches. FTP commands and replies. Electronic Mail, SMTP, Mail Message Formats and MIME and Mail Access Protocols DNS The internet’s directory service DNS records and Message. | 7 |
| 3 | Transport Layer: Transport Layer Service and Principles, Multiplexing and Demultiplexing applications, connectionless Transport. UDP Segment structure and UDP Checksum. Principles of Reliable Data Transfer-Go back to N and Selective Repeat. Connection Oriented Transport TCP Connection and Segment Structure, Sequence Numbers and acknowledgement numbers, Telnet, Round trip time and Timeout. TCP connection management. | 8 |
| 4 | Network Layer and Routing: Network service model, Routing principles. Link State routing Algorithm, A distant Vector routing & OSPF algorithm. Router Components; Input Prot, Switching fabric and output port. IPV6 Packet format. Point To Point Protocol (PPP), transition States, PPP Layers-Physical Layer and Data Link Layer, Link Control Protocols. LCP Packets and options. Authentication PAP and CHAP, Network Control Protocol (NCP). | 8 |
| 5 | Sonet/SDH :Synchronous Transport Signals. Physical configuration-SONET Devices, Sections, Lines and Paths. SONET Layers-Photonic Layer, section layer, Line layer, path layer and device layer relationship. Sonnet Frame format. Section Overhead, Line overhead and path overhead. Virtual Tributaries and types of VTs. | 7 |
|  | Total | 37 |

**Reference Books:**

1. [Data Communications and Networking (McGraw-Hill Forouzan Networking)](http://www.amazon.com/Data-Communications-Networking-McGraw-Hill-Forouzan/dp/0073250325/ref=sr_1_1?s=books&ie=UTF8&qid=1281202509&sr=1-1) by [Behrouz A. Forouzan](http://www.amazon.com/Behrouz-A.-Forouzan/e/B001IOBDOE/ref=sr_ntt_srch_lnk_1?qid=1281202509&sr=1-1)
2. [Introduction to Data Communications and Networking](http://www.amazon.com/Introduction-Communications-Networking-Wayne-Tomasi/dp/0130138282/ref=sr_1_5?s=books&ie=UTF8&qid=1281202509&sr=1-5) by [Wayne Tomasi](http://www.amazon.com/Wayne-Tomasi/e/B001ITYE4A/ref=sr_ntt_srch_lnk_5?qid=1281202509&sr=1-5)
3. [Networking and Data Communications](http://www.amazon.com/Networking-Data-Communications-V-Marney-Petix/dp/0835948749/ref=sr_1_18?s=STORE&ie=UTF8&qid=1281202593&sr=1-18) by [V. C. Marney-Petix](http://www.amazon.com/V.-C.-Marney-Petix/e/B001K7W3OS/ref=sr_ntt_srch_lnk_18?qid=1281202593&sr=1-18)

**CA 659 NETWORKING LAB (L,T,P,C) = (0,0,2,1)**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **List of Experiments** | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 613 | 02 hrs (weekly) |

**CA 518** **E-COMMERCE (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Contents of the Subject** | **Hours** |
| 1 | Introduction: Motivation, Forces behind E-Commerce Industry Framework, Brief history of ECommerce, Inter Organizational E-Commerce Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework, Network Infrastructure for E-Commerce Network Infrastructure for ECommerce, Market forces behind I Way, Component of I way Access Equipment, Global Information Distribution Network, Broad band Telecommunication. | 8 |
| 2 | Mobile Commerce: Introduction to Mobile Commerce, Mobile Computing Application, Wireless Application Protocols, WAP Technology, Mobile Information Devices, Web Security, Introduction to Web security, Firewalls &Transaction Security, Client Server Network, Emerging Client Server Security Threats, firewalls & Network Security. | 8 |
| 3 | Encryption: World Wide Web & Security, Encryption, Transaction security, Secret Key Encryption, Public Key Encryption, Virtual Private Network (VPM), Implementation Management Issues. | 7 |
| 4 | Electronic Payments: Overview of Electronics payments, Digital Token based Electronics payment System, Smart Cards, Credit Card I Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking. | 7 |
| 5 | Net Commerce: EDA, EDI Application in Business, Legal requirement in E -Commerce, Introduction to supply Chain Management, CRM, issues in Customer Relationship Management. | 7 |
|  | Total | 37 |

## Reference Books:-

## 1.[E-Commerce Essentials](http://www.barnesandnoble.com/w/e-commerce-essentials-kenneth-laudon/1117775411?ean=9780133544985) by [Kenneth Laudon](http://www.barnesandnoble.com/s/%22Kenneth%20Laudon%22?Ntk=P_key_Contributor_List&Ns=P_Sales_Rank&Ntx=mode+matchall)

**CA 625 INTELLECTUAL PROPERTY & RIGHTS (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| Unit | Topic | Hours |
| I | General Regime of Intellectual Property Rights , Copyright, Neighboring Rights and Industrial Designs, Concept of Property and Theories of Property - An Overview. Theories of Intellectual Property Rights. , Intellectual Property as an Instrument of Development, Need for Protecting Intellectual Property- Policy Consideration- National Perspectives and International demands. Types of Intellectual Property- Origin and Development. Geographical Indications, Layout designs of Integrated Circuits and Protection of Plant Varieties and Farmers' Rights. | 7 |
| II | Trademarks: Introduction to Trademarks ,Need for Protection of Trademarks Kinds of Trademarks ,International Legal Instruments on Trademarks , Indian Trademarks Law ,The Trade and Merchandise Marks Act, 1958 Trademarks Act, 1999 , Procedural Requirements of Protection of Trademarks , | 7 |
| III | Role of national and International Institutions FICCI, World Intellectual Property Organization (WIPO) Functions , Membership , Agreement between the WIPO and the WTO Dispute Settlement- New Treaties | 7 |
| IV | Introduction to Patent Law , Paris Convention , Patent Cooperation Treaty WTO- TRIPS Harmonization of CBD and TRIPs , Indian Patent Law ,The Patents Act, 1970 , Amendments to the Patents Act ,Patentable Subject Matter, Patentability Criteria ,Procedure for Filing Patent Applications, Patent Granting Procedure, Revocation, Patent Infringement and Remedies Relevant Provisions of the Biological Diversity Act, 2002 , Access and Benefit Sharing Issues Copyright, Neighboring Rights and Industrial Design. Commercialization of Intellectual Property Rights by Licensing, Determining Financial Value of Intellectual Property Rights. Negotiating Payments Terms in Intellectual Property Transaction | 8 |
| V | CASE STUDY /DISSERTATION/PROJECT WORK: 1)Compulsory Paper Every student shall write a Dissertation or submit a case study /project Work/Field Study Report on any area/topic pertaining to IPR involving techno-scientific and legal issues therein. | 7 |
|  | Total | 36 |

**Reference Books:**

1. David Whiteley-E-Commerce Strategy, Technology and Applications, Tata McGraw Hill.

2. Mathew Reynolds-Beginning E-commerce with visual Basic ASP, SQL Server 7.0 and MTS,

3. Shroff Publishers & Distributors Pvt. Ltd.

4. Perrone & Chaganti-Building Java Enterprise Systems with J2EE, Techmedia.

**CA 621 MOBILE COMMERCE (L,T,P,C) = (3,1,0,4)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | The Concept of Mobile Commerce, The Conceptual Background and Perspective, Defining Electronic Business and Electronic Commerce, Defining Mobile Business and Mobile Commerce, The Mobile Commerce Perspective, The Features of Mobile Commerce, The Specific Advantages of Mobile Commerce. | 7 |
| 2 | The Regulatory Framework of Mobile Commerce, The Regulatory Framework of Mobile Commerce, Regulations on Consumer- and Data Protection, Categories excluded from Mobile Commerce. | 7 |
| 3 | The Technological Framework of Mobile Commerce, Technologies for Mobile Data Transmission, The First Generation (1G), The Second Generation (2G), Global System for Mobile Communication (GSM), High Speed Circuit Switched Data (HSCSD), The 2.5 Generation (2.5G), General Packet Radio Service (GPRS), Enhanced Data-rates for Global Evolution (EDGE), The Third Generation (3G), Complementary Technologies of Data Transmission, Wireless Local Area Network (WLAN), Bluetooth, Display and Programming Standards, Wireless Application Protocol (WAP), i-mode, Future-Scenario: The fourth Generation (4G) | 7 |
| 4 | Mobile Applications & Methods of Payment, Overview of Mobile Applications, Payment Mechanisms for Utilizing Mobile Services, Mobile Commerce in Banking Sector, Definitions and Scope Issues, Services Offered in Mobile Banking, Mobile Banking Offers & Employed Mediums, Browser-based Applications, WAP Banking, i-mode Banking, Web-based Mobile Banking (PDA Banking), Messaging-based Applications, SMS Banking, MMS banking, Client-based Applications, SIM Toolkit (STK), JAVA-based Mobile Banking Clients. | 7 |
| 5 | Utility of Mobile Banking for Banks, The Outset of Banking Environment, Mobile Banking as Distribution Channel, Mobile Banking as Source of Revenue, Mobile Banking as Business Model, Mobile Banking as Image Product, Customer Acceptance of Mobile Banking, Customer Response to Service Offers, General Issues relating to Mobile Banking, Relevance of Mobile Banking, Appropriate scope of Mobile Banking | 7 |
|  | Total | 35 |

**Reference Books:**

1. The Mobile Commerce Prospects: A Strategic Analysis of Opportunities in the Banking Sector ; Research Project Mobile Commerce, Hamburg University Press, 2007

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| **CP 307** | **COMPUTER GRAPHICS (L,T,P,C) = (3,0,0,3)** |  |

|  |  |  |
| --- | --- | --- |
| **Unit** | **Content of the course** | **Hours** |
| **1** | Introduction to Raster scan displays, Storage tube displays, refreshing, flicking, interlacing, color monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball , tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc. | **6** |
| **2** | Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham’s Algorithm, Circle drawing, general method, symmetric DDA, Bresenham’s Algorithm, curves, parametric function, Beizier Method, Bsp- line Method | **7** |
| **3** | 2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite Transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D objects on 2D screen | **7** |
| **4** | Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms  Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc | 6 |
| **5** | Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia data and file formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG, Multimedia Tools, Presentation tools, Authoring tools, presentation | 7 |

**Reference Books:**

1. J.Foley, A. Van dam, S.Feiner, J.Hughes: Computer Graphics Principles and Practice. Addison Wesley.
2. D.Rogers and Adams: Mathematical Elements of computer Graphics McGraw Hill.
3. D.Hearn and Baker: Computer Graphics PHI.

**CA 655 COMPUTER GRAPHICS LAB (L,T,P,C) = (0,0,2,1)**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **List of Experiments** | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CP 307 | 02 hrs (weekly) |

**EM-202 Employability Skills – VII** **(L,T,P,C) = (0,2,0,1)**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Topic** | **Details** | **Contact Hours** |
| 1 | Communication | Role Plays - Negotiation, Listening, Interaction Process, Interpersonal Relationship | 4 |
| 2 | Quantitative | Mixture& Allegation, Simple & Compound Interest, Time and work, Pipes and cistern, Time Speed Distance, | 7 |
| 3 | Reasoning, | Blood Relations, Direction Sense, Analogies, Odd one out, Logical Reasoning, | 6 |
| 4 | Motivation | Mission, Vision ,Goal, Motivation & Types of Motivation, Practice Sessions on Leadership thru case method, | 4 |
| 5 | Preparation, presentation | Role play Presentation skills & Preparation | 4 |
|  |  | Total | 25 |

**CA 614 ADVANCE JAVA (L,T,P,C) = (3,1,0,4)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Introduction to Java Enterprise, J2EE Architecture, API JDBC,API J2EE fundamentals, J2EE multi-tier architecture, Web Applications in J2EE,Apache Tomcat5.0 Server Configuration and important file.Httpprotocal with client and server model | 7 |
| 2 | Servlets fundamentals – architecture, life cycle of a servlet, method of Servlet life cycle, initialization, javax.servlet and javax.servlet.http package and method of this package, servlets and HTML, Handling HTTP requests and Responses, retrieving data in servlet using GET and POST methods, | 8 |
| 3 | JDBC Driver , Servlets with JDBC and Inter servlet communications – JDBC, JDBC servlet, inter servlet communication, different packages of JSP and servlets. Servlet sessions management technique using cookies,URLRewritting, Hidden Form ,HttpSession methods, JDBC connection pool, servlet security | 9 |
| 4 | JSP fundamentals – architecture,JSP Life Cycle, Difference between JSP and Servlet, JSP elements( JSP Expression,JSPScriptlet ,JSP Directivies,JSP Declaration) standard –actions,(setProperities,getProperties,getParameter,setParameter,useBean,param), Implicit objects, JSP errors, JSP with JDBC connection. | 8 |
| 5 | J2ME – introduction, building MID lets, creating a user interface, event handling with commands, tickers, screens, textbox, lists and forms. | 7 |
|  | Total | 39 |

**Reference books:**

1. Head First Servlet and JSP Kethy Sierra
2. C. Horstmann and G. Cornell (Prentice-Hall).
3. P.Wang (Thomson).
4. T.Budd (Addison-Wesley).

Patrick, Naughton, Herbert

|  |  |  |
| --- | --- | --- |
| **CP 407** | **ARTIFICIAL INTELLIGENCE (L,T,P,C) = (3,0,0,3)** |  |

|  |  |  |
| --- | --- | --- |
| **Unit** | **Content** | **Hours** |
| **1** | Meaning and definition of artificial intelligence, Various types of production systems, Characteristics of production Systems Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill  Climbing, Best first Search. A\* algorithm, AO\* algorithms etc, and various types of control strategies | **6** |
| **2** | Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic Resolution, refutation, deduction, theorem proving, inferencing, monotonic and non-monotonic reasoning | **7** |
| **3** | Probabilistic reasoning, Baye's theorem, semantic networks scripts schemas, frames, conceptual dependency and fuzzy logic, forward and backward reasoning | **7** |
| **4** | Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing | **7** |
| **5** | Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems. | **7** |
|  | Total | **34** |

**Reference Books:**

1. E.Rich, K Knight-Artificial Intelligence, Tata McGraw Hills.
2. S.Russell, P.Norving-Artificial Intelligence-A Modern Approach, Pearson Education, Asia.
3. Thomas Dean-Artificial Intelligence-Theory & Practice, Pearson Education, Asia.
4. Alison Caursey - The Essence of Artificial Intelligence, Pearson Education, Asia.

**CA 660 ADVANCE JAVA LAB (L,T,P,C) = (0,0,2,1)**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **List of Experiments** | **Total Contact Hrs.** |
| 1 | The experiment will be based on the topic to covered in the syllabus of CA 614 | 02 hrs (weekly) |

**PE 652 PROJECT STAGE-I (L,T,P,C) =(0,0,6,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Development of projects discussed in minor projects | 6 hrs weekly |

**CA 618** **OBJECT ORIENTED ANALYSIS & DESIGN (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Unified Modeling Language, Basic structures and modeling classes, common modeling techniques, relationships, common mechanism, class diagrams | 7 |
| 2 | Advanced structured modeling, advanced classes and relationships, interfaces, types and roles, instances and object diagram. | 7 |
| 3 | Behavioral modeling in OO perspective | 7 |
| 4 | Object- oriented concepts and principles. Identifying the elements of an object model. Object oriented projects metrics and estimation. | 7 |
| 5 | Design for object – oriented systems. The system design process. | 7 |
|  | Total | 35 |

**Reference Books:**

Object oriented software engineering by Timothy C. Lethbridge and Robert Laganière

**CA 662 OOAD 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 618 | 02 hrs (weekly) |

**CA -261 COLLOQUIUM (GROUP DISCUSSION) (L,T,P,C) = (0,0,2,1)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Group discussion on different technical topics by small group of students | 2 hrs weekly |
| 2 | Preparing student on small and latest topic as per industry requirement. |

**CA 622** **SOFTWARE TESTING** **(L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Introduction, The Need For Testing, Different Models Of Software Development, Other Models Of Software Development, Testing In The Software Development Life Cycle, Concepts Of Testing, The Testing Mindset, Test Early, Test Often, Regression Vs. Retesting, White-Box Vs lack-Box Testing, Verification And Validation | 7 |
| 2 | Functional Testing, Alpha And Beta Testing, White Box Testing, Unit, Integration And System Testing, Acceptance Testing, Test Automation, Non-Functional Testing, Testing The Design, Usability Testing, Performance Testing | 7 |
| 3 | Test Planning, The Purpose Of Test Planning, Risk Based Testing, Software In Many Dimensions, Test Preparation, Test Scripting, Test Cases | 7 |
| 4 | Test Execution, Tracking Progress, Adjusting the Plan, Defect Management | 7 |
| 5 | Test Reporting and Metrics, Software Defect Reports, Root Cause Analysis, Metrics, Release Control, Complexity In Software | 7 |
|  | Total | 35 |

**References Books:**

1. A Software Testing Primer An Introduction to Software Testing by Nick Jenkins, 2008

**CA 624 EMBEDDED SYSTEMS (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Embedded Computing Requirements: Characteristics and applications of embedded systems; Components of Embedded Systems; challenges in Embedded System Design and design process; | 7 |
| 2 | Formalism for system design. Embedded Processors: RISC vs. CISC architectures; ARM processor – processor architecture and memory organization, instruction set, data operations and flow control; | 8 |
| 3 | SHARC processor – memory organization, data operations and flow control, parallelism within instructions; Input and output devices, supervisor mode, exception and traps; Memory system, pipelining and superscalar execution. | 7 |
| 4 | Embedded Computing Platform: CPU Bus – Bus protocols, DMA, system bus configurations, ARM bus; Timers and counters, A/D and D/A converters, Keyboards, LEDs, displays and touch screens; Design examples. | 8 |
| 5 | Embedded Software Analysis and Design: Software design pattern for Embedded Systems; Model programs – data flow graphs and control/data flow graphs; Assembly and linking; Compilation techniques; Analysis and optimization of execution time, energy, power and program size. Embedded System Accelerators: Processor accelerators, accelerated system design | 7 |
|  | Total | 37 |

**Reference Books:**

1. Computer as Components by Wayne Wolf published by Elsevier Inc

2. ARM System Developer’s Guide by Andrew S. Loss published by Elsevier Inc

3. Embedded System Design by Steve Heath published by Elsevier Inc

4. Embedded System design: A unified hardware/software Introduction by Frank Vahid & Tony Givagi published by John Wiley & Sons Inc.

**CA 620** **E-BANKING & SECURITY TRANSACTIONS (L,T,P,C) = (3,0,0,3)**

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| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Introduction, Definition of E-Banking, Various E-Channels of E-Banking, Types of E-Banking, Components of E-Banking, E-Banking Activities, Advantage of E-Banking, Disadvantages of E-banking, | 7 |
| 2 | E-Banking Support Services, Web-linking, Account Aggregation, Electronic Authentication, Website Hosting, Payments for E-Commerce, Framework of a Payment System, Payment Protocols, Macro Payment System versus Micro Payment System, Electronic Bill Payment and Presentment, Person-to-Person Payments, Wireless E-Banking | 7 |
| 3 | Wired E-banking versus Wireless E-banking, Components of a Wireless System, Handheld Devices, Connectivity, Coverage, and Gateways, Middleware Processing Engine, Transcoding, API Connection, Data System Backend, Wireless e-Banking Services, Technologies Enabling Wireless Banking, Risks in Wireless Banking, Challenges in Wireless Banking | 7 |
| 4 | E-Banking Risk, Classification based on E-banking Services, E-Banking in India, Characteristics of E-Banking, Categories of E-Banking Risks, Electronic Money , E-Payment Transaction Process , E-Cash Transaction Process , Credit Card Transaction Process , Smart Card Transaction Process , Electronic Fund Transfer (EFT), Challenges of E-Commerce Payment Systems , Secure Electronic Transaction (SET), Joint Electronic Payment Initiatives (JEPI) | 7 |
| 5 | IT ACT 2008, Electronic Security, Understanding E-Security, Importance of E-Security, Threats and Attacks, Developing a Sound E-Security Policy, E-Security Solutions, E-Security Engineering | 7 |
|  | Total | 35 |

**Reference Books:**

1. E commerce by T N Chandra
2. The E Commerce Book: Building the E empire – by Steffano Korper, Juanita Ellis
3. Banerjee and Keswani, E-Banking and Security Transactions, Genius Publications, 2009

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| **CP 408** | | | **ADVANCED COMPUTER ARCHITECTURES** | **(L,T,P,C) = (3,0,0,3)** |
| **Unit** | **Content** | | | | **Hours** |
| 1 | Introduction**:** Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Flynn’s & Fang’s Classification, Performance Metrics and Measures, Speedup Performance Laws: Multiprocessor System and Interconnection Networks; IEEE POSIX Threads: Creating and Exiting Threads, Simultane ous Execution of Threads, Thread Synchronization using Semaphore and Mutex, Canceling the Threads. | | | | 6 |
| 2 | pipelining and memory hierarchy: Basic and Intermediate Concepts, Instruction Set Principle; ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super Pipeline Design; Memory Hierarchy Design: Advanced Optimization of Cache Performance, Memory Technology and Optimization, Cache Coherence and Synchronization Mechanisms. | | | | 7 |
| 3 | Multithreaded Architectures, Distributed Memory MIMD Architectures Shared Memory MIMD Architecture, Clustering, Instruction Level Data Parallel Architecture, SIMD Architecture, Fine Grained and Coarse Grained SIMD Architecture, Associative and Neural Architecture Data Parallel Pipelined and Systolic Architectures, Vector Architectures | | | | 7 |
| 4 | Parallel Algorithms: PRAM Algorithms: Parallel Reduction, Prefix Sums, Preorder Tree Traversal, Merging two Sorted lists; Matrix Multiplication: Row Column Oriented Algorithms, Block Oriented Algorithms; Parallel Quick sort, Hyper Quick sort; Solving Linear Systems: Gaussian Elimination, Jacobi Algorithm; Parallel Algorithm Design Strategies | | | | 7 |
| 5 | Developing Parallel Computing Applications: OpenMP Implementation in ‘C’: Execution Model, Memory Model; Directives: Conditional Compilation, Internal Control Variables, Parallel Construct, Work Sharing Constructs, Combined Parallel Work-Sharing Constructs, Master and Synchronization Constructs; Run-Time Library Routines: Execution Environment Routines, Lock Routines, Timing Routines; Simple Examples in ‘C’. Basics of MPI | | | | 8 |
|  | Total | | | | 35 |

**Reference Books:**

1. Hawang & Briggs-Computer Architecture & Parallel Processing, Mc Graw Hill.
2. Subrata Das-Advanced Computer Architecture, Vol I & II.

**EM-301 EMPLOYABILITY SKILLS – VIII (L,T,P,C) = (0,2,0,1)**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Topic** | **Details** | **Contact Hours** |
| 1 | Quantitative | Permutation and combination, Clock and calendar, Data Interpretation and sufficiency, Inequalities | 5 |
| 2 | Reasoning, | Puzzles, Statement & Assumptions, Strong & Weak Arguments, Verbal and non verbal reasoning, | 5 |
| 3 | Motivation | Practice Sessions on Leadership thru case method, | 5 |
| 4 | Group Discussions & PI | Objective and Managing GD/PI, GD/PI-Technical /Mkt/HR/ IT/Gen round, Factual, Argumentative, Opinion, Abstract GDs, Practice, Mock, Recorded PI/GD. | 10 |
| 5 |  |  |  |
|  |  | Total |  |

**CA 719 ADVANCED WEB DEVELOPMENT (LTPC) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | **Asp .Net Basics:** Understanding the .Net framework – principal, feature, design, gole, Benefits of .Net framework, Event Logging, Performance Counter, Tracing, CTS, CLS, CLR, .Net class library, GIT, Type of GIT, Assemblies - version, culture,strong name, Type of Assemblies, Metadata, Manifest, MSIL, Managed and Unmanaged code, Memory Management, Garbage Collection, Security, Reflection, WPF, WCF, Window Card Space, GAC, CASPOL, REGEN, ILASM, ILDASM. DLL HELL Problem, Page life cycle. | 7 |
| 2 | **Introduction Ado.NET:** Ado.Net Basics, Ado.Net object model, Ado.Net class for OLE DB data source, SQL Server, DataSet, Data View, Data Reader, Data Adapter, Data Table, Data Column, Data Row, Difference between Ado and Ado.Net, Communication with OLEDB data source using Ado.Net. | 6 |
| 3 | **Understanding Caching:** Overview, Introduction to Caching, Client dedicated server, Reverse proxy, Absolute expiration and Relative expiration, Http Cache Policy. | 8 |
| 4 | **State Management:** Client state management- View state, Hidden field, Cookies, QueryString  Server state management- Application state, Session state, Advantage and Disadvantage of database support. | 7 |
| 5 | **Web Services and XML:** Introduction to xml, Advantage of xml, xml Element, Naming Rules, Attributes, Introduction to web service, web service Infrastructure, SOAP, UDDI, WSDL. | 7 |
|  | Total | 35 |

**Reference Books:**

1. [Beginning ASP.NET 3.5 in C# 2008: From Novice to Professional, Second Edition](http://www.amazon.com/Beginning-ASP-NET-3-5-2008-Professional/dp/1590598911/ref=sr_1_1?s=books&ie=UTF8&qid=1281203430&sr=1-1) by [Matthew MacDonald](http://www.amazon.com/Matthew-MacDonald/e/B001IGR2JC/ref=sr_ntt_srch_lnk_1?qid=1281203430&sr=1-1)
2. [ASP .NET Programming with C# & SQL Server (The Web Technologies)](http://www.amazon.com/ASP-NET-Programming-Server-Technologies/dp/1423903242/ref=sr_1_3?s=books&ie=UTF8&qid=1281203430&sr=1-3) by [Don Gosselin](http://www.amazon.com/Don-Gosselin/e/B0034Q42U6/ref=sr_ntt_srch_lnk_3?qid=1281203430&sr=1-3)
3. [Developing Web Applications with ASP.NET and C#](http://www.amazon.com/Developing-Web-Applications-ASP-NET-C/dp/0471120901/ref=sr_1_9?s=books&ie=UTF8&qid=1281203430&sr=1-9) by [Hank Meyne](http://www.amazon.com/Hank-Meyne/e/B001IXRZHE/ref=sr_ntt_srch_lnk_9?qid=1281203430&sr=1-9) and Scott Davis
4. [Beginning ASP.NET 2.0 with C# (Wrox Beginning Guides)](http://www.amazon.com/Beginning-ASP-NET-2-0-Wrox-Guides/dp/0470042583/ref=sr_1_12?s=books&ie=UTF8&qid=1281203430&sr=1-12) by Chris Hart, John Kauffman, [David Sussman](http://www.amazon.com/David-Sussman/e/B001ITYO3Q/ref=sr_ntt_srch_lnk_12?qid=1281203430&sr=1-12), and Chris Ullman

**CA 703 ANALYSIS AND DESIGN OF ALGORITHMS L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Hrs.** |
| 1 | Introduction:- algorithm definition and specification – Design of Algorithms, and Complexity of Algorithms, Asymptotic Notations, Growth of function, Recurrences. | 7 |
| 2 | Performance analysis – Elementary Data structures:- stacks and queues – trees – dictionaries – priority queues –sets and disjoint set union – graphs – basic traversal and search techniques. | 7 |
| 3 | Divide – and – conquer:- General method – binary search – merge sort – Quick sort – The Greedy method:-General method – knapsack problem – minimum cost spanning tree – single source shortest path. | 7 |
| 4 | Dynamic Programming – general method – multistage graphs – all pair shortest path – optimal binary search trees – 0/1 Knapsack – traveling salesman problem – flow shop scheduling. Backtracking:- general method – 8-Queens problem – sum of subsets – graph coloring – Hamiltonian cycles – knapsack problem – Branch and bound:- The Method – 0/1 Knapsack problem – traveling salesperson. | 7 |
| 5 | Parallel models:-Basic concepts, performance Measures, Parallel Algorithms: Parallel complexity, Analysis of Parallel Addition, Parallel Multiplication and division, parallel Evaluation of General Arithmetic Expressions, First-Order Linear recurrence. | 7 |
|  | Total | 35 |

**Reference Books:**

1. Computer **Algorithms** by Horowitz, Sahni, Rajasekaran

2. Brassard &Bratley, Fundamentals of Algorithmics

**CA 753 ADVANCED WEB DEVELOPMENT LAB**  **(L,T,P,C)=(0,0,2,1)**

|  |  |  |
| --- | --- | --- |
|  | The experiment will be based on the topic to covered in the syllabus of CA 719 | 02 hrs (weekly) |

**PE 701 PROJECT STAGE-II (L,T,P,C) =(0,0,8,4)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Development of projects discussed in minor projects | 6 hrs weekly |

**CA 721 INFORMATION PROTECTION & SECURITY (L,T,P,C) = (3,0,0,3)**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Introduction to security attacks, services and mechanism, introduction to cryptography. Conventional Encryption: Conventional encryption model, classical encryption techniques- substitution ciphers and transposition ciphers, cryptanalysis, stream and block ciphers. Modern Block Ciphers: Block ciphers principals, data encryption standard(DES), strength of DES, block cipher modes of operations, triple DES, IDEA encryption and decryption, strength of IDEA, confidentiality using conventional encryption, traffic confidentiality, key distribution, | 8 |
| 2 | Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffle-Hellman key exchange algorithm, introductory idea of Elliptic curve cryptography, Elganel encryption | 7 |
| 3 | Message Authentication and Hash Function: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions and MACS, MD5 message digest algorithm, Secure hash algorithm(SHA). | 8 |
| 4 | Digital Signatures: Digital Signatures, authentication protocols, proof of digital signature algorithm. Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good privacy (PGP), S/MIME. | 6 |
| 5 | IP Security: Architecture, Authentication header, Encapsulating security payloads, 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. | 7 |
|  | Total | 36 |

**Reference Books:**

1. 1. Atul Kahate,” Cryptography and Network Security” TMH
2. 2. William Stallings,” Cryptography and Network Security” Prentice Hall /Pearson Education

**SM 701 PROJECT TRAINING SEMINAR – II (L,T,P,C) = (0,0,4,2)**

|  |  |  |
| --- | --- | --- |
| **Units** |  | **Total Hrs.** |
| 1 | * Student presentations on various topics. * Atleast one technical paper presentation in National/International Conference/Seminar by the student. * Atleast one technical paper publication by the student in research journal/magazine of National/International repute | 2 hrs weekly |

**CA 723 RESEARCH METHODOLOGIES (L,T,P,C) = (3,0,0,3)**

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| **Units** | | **Course Contents** | **Total Contact Hrs.** |
| 1 | | **Introduction to Research Methods**  Philosophy of Science, Evolutionary Epistemology, Scientific Methods, Hypotheses Generation and Evaluation, Code of Research Ethics, Definition and Objectives of Research, Various Steps in Scientific Research, Types of Research; Research Purposes - Research Design - Survey Research - Case Study Research. | 6 |
| 2 | | **Data Collection and Sampling Design**  Sources of Data: Primary Data, Secondary Data; Procedure Questionnaire- Survey and Experiments – Design of Survey and Experiments - Sampling Merits and Demerits - Control Observations - Procedures – Sampling Errors. | 7 |
| 3 | | **Statistical Modeling and Analysis, Time Series Analysis**  Probability Distributions, Fundamentals of Statistical Analysis and Inference, Multivariate methods, Concepts of Correlation and Regression, Fundamentals of Time Series Analysis and Spectral Analysis, Error Analysis, Applications of Spectral Analysis. | 8 |
| 4 | | **Evolutionary Algorithms**  Introduction to evolutionary algorithms - Fundamentals of Genetic algorithms, Simulated Annealing, Neural Network based optimization, Optimization of fuzzy systems. | 7 |
| 5 | | **Research Reports**  Structure and Components of Research Report, Types of Report, Layout of Research Report, Mechanism of writing a research report | 8 |
|  | Total | | 36 |

**Reference Books:**

1. C.R. Kothari, Research Methodology Methods and Techniques, 2/e, Vishwa Prakashan, 2006.
2. Bendat and Piersol, Random data: Analysis and Measurement Procedures, Wiley Interscience, 2001.
3. Shumway and Stoffer, Time Series Analysis and its Applications, Springer, 2000.
4. Jenkins, G.M., and Watts, D.G., Spectral Analysis and its Applications, Holden Day, 1986.
5. Donald R. Cooper, Pamela S. Schindler, Business Research Methods, 8/e, Tata McGraw-Hill Co. Ltd., 2006.

**BM 517 ACCOUNTING AND FINANCIAL MANAGEMENT (L,T,P,C) = (3,0,0,3)**

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| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Definition of Accounting and its advantages & limitations, Scope of accounting, Branches of Accounting – Financial Accounting – Cost Accounting – Management Accounting, users of Accounting information, Methods of Accounting, Double Entry Accounting System, Types of Accounts and Rules for Debit and Credit. Cash and Credit Transaction, Cash discount and Trade discount. Preparation of Journal, Ledger and Trial Balance. Final Accounts and Accounting Ratios, Preparation of Final Accounts (Sole Proprietorship only), Preparation of Trading A/c, Profit & Loss A/c and Balance Sheet covering simple adjustments | 8 |
| 2 | Accounting Ratios: Meaning, Advantages and Limitations of Accounting ratios Computation of following ratios only. | 7 |
| 3 | Gross Profit Ratio, Net Profit Ratio, Stock Turnover Ratio, Operating Ratio, Current Ratio, Liquid Ratio, Debtors Ratio, Creditors Ratio, Return on Capital Employed, Earning Per Share, Return on shareholders’ fund. | 7 |
| 4 | Cost Accounting: Meaning and definition of Cost Accounting – its Advantages & Limitations Budgetary Control, Definitions – Advantages – Limitations, Procedure for setting up Budgetary Control, Different types of budgets, Advantages and limitations of Cash Budget and preparation of Cash Budget. | 8 |
| 5 | Marginal Costing: Meaning-Advantages- Limitations, Break Even Point, Margin of Safety, Profit Volume Ratio, Application of Marginal Costing including simple problems on make or buy and product mix.. | 7 |
|  | Total | 37 |

**Reference Books:**

1. Accounting by Steven M. Bragg

2. Accounting and financial management

**CA 709** **ERP SYSTEMS (L,T,P,C) =(3,1,0,4)**

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| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Enterprise wide information system, Custom built and packaged approaches, Needs and Evolution of ERP Systems, Common myths and evolving realities, ERP and Related Technologies, Business Process Reengineering. | 7 |
| 2 | ERP Benefits, classification, Present global and Indian market scenario,milestones and pitfalls, Forecast, Market players and profiles, Evaluation criterion for ERP product, ERP Life Cycle. | 7 |
| 3 | Analytical Hierarchy Processes (AHP), Various ERP modules and applications, Vendor selection criteria for successful ERP solution. | 7 |
| 4 | ERP implementation strategies, Success and failure factors for implementation, Hidden costs, ERP success inhibitors and accelerators, Management concern for ERP success, Useful guidelines for ERP Implementations. | 7 |
| 5 | Technologies in ERP Systems and Extended ERP, Case Studies Development and Analysis of ERP Implementations in focusing the various issues discussed in above units Learning and Emerging Issues. Concept of E-Governance : Concept, E-Governance frame work, area of application like public sector, service industry. | 7 |
|  | Total | 35 |

**Reference Books:**

1. ERP Systems , THM

**CA 711 DECISION SUPPORT SYSTEM (L,T,P,C) = (3,1,0,4)**

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| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Review of Decision making process in business and industrial environment, Quantitative techniques for decision making, Gaming and game theory, Group decision | 7 |
| 2 | Evolution of Decision Support System (DSS) Specific DSS, DSS generator and DSS Tools, Data, Model and Dialog Management System and Interfaces between them Graphical and quantitative tools to build model and model management | 7 |
| 3 | Group decision Evolution of Decision Support System (DSS) | 7 |
| 4 | Adaptive Design approach to DSS development. Accommodating cognitive style in DSS, Integrating Expert and decision support system and case studies | 7 |
| 5 | Integrating Expert and decision support system and case studies | 7 |
|  | Total | 35 |

**Reference Books:**

1. Bennry, J.L. : Building Decilsion Support System Addision, Wesley Publ,Comp- 1983
2. Sprague, R.H,& Watson, HJ (Edn.) : Decision Support System, Putting Theory and PractIces PrentIce-Hall, New Jersey, 1986.
3. Keen, P.G.W. & Mortan, M,S,S, : DecIsion Support System:An odelingional Perspective, Addision-Wesley Pub1.
4. David: Applied Decision Support System, Prentice-Hall International1989.e:

**PT 702 INDUSTRIAL TRAINING (L,T,P,C) = (0,0,1,8)**

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| **Units** | **Course Contents** | **Total Contact Hrs.** |
| 1 | Trainings as per the industrial requirements. | 18 hrs week |