Regulation: R20	III / IV - B.Tech. II - Semester

COMPUTER SCIENCE AND DESIGN

SCHEME OF INSTRUCTION & EXAMINATION
(With effect from 2021-22 admitted Batch onwards)

Course Code	Course Name	Category	Cr	L	T	P	Int. Marks	Ext. Marks	Total Marks
B20AM3201	Computer Networks	PC	3	3	0	0	30	70	100
B20CD3201	Automata theory and Compiler Design	PC	3	3	0	0	30	70	100
B20AM3203	Software Engineering	PC	3	3	0	0	30	70	100
#PE-II	Professional Elective -II	PE	3	3	0	0	30	70	100
#OE-II	Open Elective-II	OE	3	3	0	0	30	70	100
B20CD3204	Computer Networks Lab	PC	1.5	0	0	3	15	35	50
B20AM3209	Algorithms for Efficient Coding Lab	PC	1.5	0	0	3	15	35	50
B20CD3205	Internet Of Things Lab	PC	1.5	0	0	3	15	35	50
B20CD3206	MERN Stack Technologies-Module I (Skill oriented course)	SOC	2	1	0	2	--	50	50
B20MC3201	Employability Skills	MC	0	3	0	0	--	--	--
B20HS3204	*Gender Sensitization	HS	0	2	0	0	--	--	--
	TOTAL		**21.5**	**21**	**0**	**11**	**195**	**505**	**700**

	Course Code	Course
#PE-II	B20CD3202	Deep Learning
	B20CD3203	CNS (Cryptography & Network Security)
	B20AM3206	Distributed Systems
	B20CS3207	Network Programming
#OE-II	Student has to study one Open Elective offered by CE or ECE or EEE or ME or S&H from the list enclosed.	

***Note:** Gender Sensitization is a Self-Learning noncredit Audit Course

Code	Category	L	T	P	C	I.M	E.M	Exam
B20AM3201	**PC**	**3**	**--**	**--**	**3**	**30**	**70**	**3 Hrs.**

COMPUTER NETWORKS

(Common to AIML & CSD)

Course Objectives: Students are expected

1	To study the basic taxonomy and terminology of the computer networking and enumerate the layers of OSI model and TCP/IP model.
2	To study data link layer concepts, design issues, and protocols.
3	To study MAC layer Random Access Protocols, LAN.
4	To gain knowledge on Network layer and Routing Algorithms.
5	To learn Transport layer services, and protocols.
6	To acquire knowledge of Application layer protocols.

Course Outcomes: At the end of the course students will be able to

S. No.	Outcome	Knowledge Level
1	Illustrate the OSI reference model, TCP/IP, and Digital transmission techniques	K3
2	Demonstrate Data Link Layer protocols	K3
3	Compare and contrast MAC protocols, various types of LANs	K3
4	Summarize various network layer services and Routing algorithms	K3
5	Implement Transport layer and application layer protocols	K3

SYLLABUS

UNIT-I (10 Hrs)	Introduction: Introduction to Computer Networks, Network Models (protocols): OSI reference model, TCP/IP reference model. Network topologies, types of networks (LAN, MAN, WAN). Physical layer: Data and Signals, Digital signals, Digital transmission (Digital-to-Digital, Analog-to-Digital), multiplexing (FDM, TDM), Transmission media.
UNIT-II (8 Hrs)	Data Link Layer: Error Detection & Correction: types of errors, Error Detection (Parity, CRC, Check Sum), Error Correction (Using hamming distance), Data Link Layer services: framing, flow control, error control. Error & Flow control mechanisms: stop and wait, Go back N and selective repeat, High Level Data Link Control (HDLC).
UNIT-III (10 Hrs)	Medium access control: Random access: Aloha, Slotted Aloha, CSMA, CSMA/CD, and CSMA/CA, Local area networks: Ethernet, Types of ethernet (Token Ring, Fast Ethernet, Gigabit Ethernet), Personal Area Network: Bluetooth (Architecture), Wireless LANS: IEEE 802.11(Architecture, MAC sub layer).

UNIT-IV (8 Hrs)	Network layer: Network Layer Services, IPV4 Address, Subnetting, Super-netting, Classless addressing, Internet Protocol (IP, ARP, DHCP, ICMP), IPV6 Address format, Routing algorithms: Distance vector, Link state, Network Address Translation (NAT).
UNIT-V (8 Hrs)	Transport layer: UDP (User Datagram, Services, Applications), TCP (TCP Services, features, Segment, Connection establishment and termination, sliding window, flow, and congestion control), Application Layer: Application Layer services and protocols including www, DNS, SMTP, POP, FTP, Telnet, HTTP, Firewalls.
TEXTBOOK:	
1.	Data Communication and Networking, Behrouz A. Forouzan, McGraw Hill, 5th Edition, 2017.
REFERENCE BOOKS:	
1.	Data and Computer Communications, William Stallings, Pearson, 10th Edition, 2013.
2.	Computer Networks, Andrew S. Tanenbaum, David J. Wetherall, Pearson Education India; 5th edition, 2013.
3.	Computer Networks: A Systems Approach, LL Peterson, BS Davie, Morgan-Kauffman, 5th Edition, 2011.
4.	Computer Networking: A Top-Down Approach JF Kurose, KW Ross, Addison-Wesley, 5th Edition, 2009.

Code	Category	L	T	P	C	I.M	E.M	Exam
B20CD3201	**PC**	**3**	**0**	**0**	**3**	**30**	**70**	**3 Hrs.**

AUTOMATA THEORY AND COMPILER DESIGN

(For CSD)

Course Objectives:

1	To learn fundamentals of Regular and Context Free Grammars and Languages.
2	To understand the relation between Contexts free Languages, PDA.
3	To study the various phases in the design of a compiler.
4	To understand the design of top-down and bottom-up parsers.
5	To understand syntax directed translation schemes and approaches to generate code for atarget machine.

Course Outcomes: At the end of the course Students will be able to

S. No	Outcomes	Knowledge level
1	Design an automata for given language and equality regular expressions	K4
2	Design various parse trees using parsing algorithms for the given grammar	K4
3	Construct various forms of intermediate code generation.	K3
4	Apply techniques to generate optimized and improve performance in code storage	K3
5	Design algorithms for code generation	K4

SYLLABUS

UNIT-I (10 Hrs)	**Formal Language and Regular Expressions:** Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis
UNIT-II (10 Hrs)	**Context Free grammars and parsing:** Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL (1) parsing Bottom-up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.
UNIT-III (10 Hrs)	**Semantics**: Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow Statements Context Sensitive features – Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNIT-IV (10 Hrs)	**Run time storage**: Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation. **Code optimization**: Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.
UNIT-V (14Hrs)	**Code generation**: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.
Text Books:	
1.	Introduction to Automata Theory, Languages and Computation, J. E. Hopcroft, R.Motwani and J. D. Ullman, 3rd Edition, Pearson, 2008.
2.	Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.
Reference Books:	
1.	Louden: "Compiler Construction, Principles & Practice", 1st Edition, Thomson Press, 2006.
2.	Tremblay J P, Sorenson G P: "The Theory & Practice of Compiler writing", 1st Edition, BSP publication, 2010.
3.	Theory of Computation, V. Kulkarni, Oxford University Press, 2013

Code	Category	L	T	P	C	I.M	E.M	Exam
B20AM3203	**PC**	**3**	**0**	**0**	**3**	**30**	**70**	**3 Hrs.**

SOFTWARE ENGINEERING

(Common to AIML & CSD)

Course Objectives:

1.	Give exposure to phases of Software Development, common process models including Waterfall, the Unified Process, and elements of the Agile Process.
2.	Give exposure to a variety of Software Engineering practices such as Requirements Analysis and Specification.
3.	Give exposure to Software Design Techniques.
4.	Give exposure to various Software Quality Assurance and Testing strategies.

Course Outcomes: At the end of the course Students will be able

S. No	Outcome	Knowledge Level
1.	Understand different software process models and their significance.	K2
2.	Distinguish various requirements identification procedures.	K3
3.	Demonstrate different methods for requirement analysis modeling.	K3
4.	Illustrate various aspects of system design and software architectures.	K2
5.	Apply software quality assurance and testing strategies.	K3

SYLLABUS

UNIT-I (11 Hrs)	The Nature of Software, The Unique Nature of WebApps, Software Engineering, The Software Process, Software Engineering Practice, Software Myths. A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Agility, Agility and the Cost of Change, Agile Process, Extreme Programming (XP), Other Agile Process Models.
UNIT-II (8 Hrs)	Requirements Engineering, Establishing the Groundwork, Eliciting Requirements, Developing Use Cases, Building the Requirements Model, Negotiating Requirements, Validating Requirements, Requirements Analysis.
UNIT-III (9 Hrs)	Scenario-Based Modeling, UML Models That Supplement the Use Case, Data Modeling Concepts, Class-Based Modeling, Requirements Modeling Strategies, Flow-Oriented Modeling, Creating a Behavioral Model, Patterns for Requirements Modeling, Requirements Modeling for Web Apps.
UNIT-IV (13 Hrs)	Design within the Context of Software Engineering, The Design Process, Design Concepts, The Design Model, Software Architecture, Architectural Genres, Architectural Styles,

	Assessing Alternative Architectural Designs, Architectural Mapping Using Data Flow, Components, Designing Class-Based Components, Conducting Component-Level Design, Component-Level Design for Web Apps, Designing Traditional Components, Component- Based Development.
UNIT-V (9Hrs)	Elements of Software Quality Assurance, SQA Tasks, Goals & Metrics, Statistical SQA, Software Reliability, A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Test Strategies for Object-Oriented Software, Test Strategies for Web Apps, Validation Testing, System Testing, The Art of Debugging, Software Testing Fundamentals, Internal and External Views off Testing, White-Box Testing, Basis Path Testing.

Text Books:	
1.	Software Engineering: A Practitioner's approach, Roger S Pressman, 7th edition McGraw Hill Higher Education (2009)
2.	Software Engineering, Ian Sommerville, 9th edition. Pearson (2017)
Reference Books:	
1.	Software Engineering, A Precise Approach, PankajJalote, Wiley India, 2010.
2.	Software Engineering, Ugrasen Suman, Cengage (2012)
e-Resources:	
1.	https://nptel.ac.in/courses/106/105/106105182/

Code	Category	L	T	P	C	I.M	E.M	Exam
B20CD3203	**PC**	**3**	**0**	**0**	**3**	**30**	**70**	**3 Hrs**

CNS (CRYPTOGRAPHY AND NETWORK SECURITY)

(For CSD)

Course Objectives: Students are expected to learn

1.	Overview of the computer security and classical encryption techniques.
2.	Working principles and utilities of various cryptographic algorithms including symmetric key cryptography and public key cryptography algorithms.
3.	Design issues and working principles of hashing, message digest algorithms and various authentication protocols
4.	Various secure communication protocols standards.
5.	Concepts of firewalls and block chain technology.

Course Outcomes: At the end of the course students will be able to

S. No	Outcome	Knowledge level
1.	Understand Information Security goals, classical encryption techniques and acquire fundamental knowledge on the concepts related to cryptography.	K2
2.	Compare and apply different encryption and decryption techniques to solve problems related to confidentiality.	K3
3.	Apply the knowledge of cryptographic hash functions and Illustrate the performance of different message digest algorithms for verifying the integrity and authentication.	K3
4.	Describe various network security protocols.	K3
5.	Explore the Importance of system security through firewalls and block chain technology.	K3

SYLLABUS

UNIT-I (08 Hrs)	**Introduction to Cryptography**: Security Attacks, Services & Mechanisms, Symmetric Cipher Model, Substitution and Transposition Techniques. **Block Ciphers**: Traditional Block Cipher Structure, Block Cipher Design Principles.
UNIT-II (12Hrs)	**Symmetric Key Cryptography**: Data Encryption Standard (DES), Advanced Encryption Standard (AES), IDEA, Block Cipher Modes of Operations. **Public Key Cryptography**: Principles, Public Key Cryptography Algorithms, Euler's Theorem, RSA Algorithm, Diffie-Hellman Key Exchange.
UNIT-III (12 Hrs)	**Cryptographic Hash Functions**: Application of Cryptographic Hash Functions, SHA and MD5 Algorithms, Message Authentication Functions, HMAC & CMAC. Digital Signatures: DSS,

	DSS with RSA. **User Authentication**: Remote User Authentication Principles, Kerberos
UNIT-IV (10 Hrs)	**Electronic Mail Security**: Pretty Good Privacy (PGP) And S/MIME. **IP Security**: IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload. **Transport Level Security**: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS).
UNIT-V (10 Hrs)	**Firewalls**: Characteristics, Types of Firewalls, Placement of Firewalls, Firewall Configuration, Trusted Systems. **Blockchain Technology**: Introduction to Blockchain Technology Fundamentals, how blockchain works-Shared Ledger, Permissions, Concensus, Smart contracts

Text Books:	
1	Cryptography and Network Security- William Stallings, Pearson Education, 7th Edition
2	Cryptography, Network Security and Cyber Laws – Bernard Menezes, Cengage Learning, 2010 edition.
Reference Books:	
1.	Cryptography and Network Security- Behrouz A Forouzan, Debdeep Mukhopadhyaya, Mc GrawHill, 3rd Edition, 2015.
2.	Network Security Illustrated, Jason Albanese and Wes Sonnenreich, MGH Publishers, 2003.
3.	Computer Graphics: Principles and Practice, John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley, 3rd Edition, Addison- Wesley Professional, 2013.
4.	Mathematical and computer programming techniques for computer graphics, Peter Comninos, Springer, 2010.
5.	Blockchain Fundamentals- Ravindhar vadapalli, https://www.researchgate.net/publication/345045424_
e-Resources:	
1.	https://nptel.ac.in/courses/106/105/106105031/ lecture by Dr. Debdeep Mukhopadhyay IIT Kharagpur [Video Lecture]
2.	https://nptel.ac.in/courses/106/105/106105162/ lecture by Dr. Sourav Mukhopadhyay IIT Kharagpur [Video Lecture]
3.	https://www.mitel.com/articles/web-communication-cryptography-and-network-security web articles by Mitel Power Connections.

Code	Category	L	T	P	C	I.M	E.M	Exam
B20CD3204	**PC**	**--**	**--**	**3**	**1.5**	**15**	**35**	**3Hrs**

COMPUTER NETWORKS LAB

(For CSD)

Course Objectives: Students are expected

1.	Understand and apply different network commands
2.	Analyze different networking functions and features for implementing optimal solutions
3.	Apply different networking concepts for implementing network solution
4.	Implement different network protocols

Course Outcomes: Students will be able to

S. No	Outcome	Knowledge level
1.	Implement data link layer framing methods like error control and flow control.	K3
2.	Examines and implement the various Routing algorithms.	K3
3.	Develop client-server applications using sockets.	K3

LIST OF PROGRAMS

1.	Implement the data link layer framing methods such as character stuffing and bit stuffing
2.	Write a C program to develop a DNS client server to resolve the given hostname.
3.	Implement on a data set of characters the three CRC polynomials – CRC-12, CRC-16 and CRC-CCIP
4.	Implement Dijkstra's algorithm to compute the shortest path in a graph.
5.	Write a C program to perform sliding window protocol.
6.	Take an example subnet of hosts. Obtain broadcast tree for it
7.	Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm.
8.	Write a client-server application using TCP.
9.	Get the MAC or Physical address of the system using Address Resolution Protocol?
10.	Simulate the Open Shortest Path First (OSPF) routing protocol based on the cost assigned to the path.

Textbooks:

1.	"Computer Networks", Andrew S. Tanenbaum, David J. Wetherall, Pearson Education India; 5th edition, 2013
2.	"Data Communication and Networking", Behrouz A. Forouzan, McGraw Hill, 5th Edition,2017.
3.	"Java Network Programming", Elliotte Rusty Harold , Fourth Edition, Orielly 2013.

Reference Books:

1.	"An Introduction to Computer Networking", Kenneth C. Mansfield Jr and James L. Antonakos

	Pearson Education Asia.
2.	“Computer Networking, A Top-Down Approach Featuring the Internet’James F. Kuross, Keith W. Ross, Third Edition, Addison Wesley, 2004.

Code	Category	L	T	P	C	I.M	E.M	Exam
B20AM3209	PC	0	0	3	1.5	15	35	3 Hrs.

ALGORITHMS FOR EFFICIENT CODING LAB

(Common to AIML & CSD)

Course Objective:

1. To develop efficient coding for implementing advanced trees and algorithms with various inputs.

Course Outcomes: At the end of the course Students will be able to

S. No	Outcome	Knowledge Level
1.	Develop programs to find optimal solutions for various problems using different algorithm strategies.	K3
2.	Analyze time complexity of various algorithm design techniques	K4
3.	Develop programs to implement advanced trees and pattern matching algorithms	K3

List of Experiments:

Implement and analyze the following Algorithms using Divide and Conquer

1. Binary Search
2. Merge Sort
3. Quick Sort

Implement following Algorithms using Greedy Method

4. Minimum-cost spanning tree
5. Single Source Shortest Path (Dijkstra's)

Implement following Algorithms using Dynamic programing

6. Optimal binary search trees
7. Traveling salesperson problem

Implement following Algorithms using Backtracking

8. N-Queens problem
9. Graph Coloring problem

Implement following Tree Operations

10. AVL Tree
11. Splay Tree

Implement following Pattern Matching Algorithms.

12. KMP Algorithm
13. RK Algorithm

TEXTBOOKS:

1. Fundamentals of Computer Algorithms 2nd edition by Ellis Horowitz, SartajSahni, S. Rajasekharan, university press, 2008
2. Advanced Data Structures – Peter Brass, Cambridge University Press, 2008

Course Code	Category	L	T	P	C	I.M	E.M	Exam
B20CD3205	PC	--	--	3	1.5	15	35	3 Hrs.

INTERNET OF THINGS LAB

(For CSD)

Course Objectives:

1.	To know how to use various hardware components and Protocols in IoT applications
2.	To Know how to develop various IoT applications

Course Outcomes: At the end of the course Students will be able to

S. No	Outcome	Knowledge Level
1.	Use sensors, actuators, Arduino and Raspberry pi in IoT applications	K3
2.	Design and Develop various IoT applications.	K4

SYLLABUS

1.	To interface Bluetooth with Raspberry Pi/Arduino and write a program to send sensor data to smart phone using Bluetooth.
2.	To interface Bluetooth with Raspberry Pi/Arduino and write a program to to turn ON/OFF LED when '1'/'0' is received from smart phone using Bluetooth.
3.	Application of WiFi in IoT Systems
4.	App design for WiFi application to ON/OFF Light
5.	Use of various network protocols in IoT systems
6.	Application of 802.15.4 Zigbee in IoT Systems.
7.	Design a simple IoT System comprising sensor, Wireless Network connection, Data Analytics
8.	Design and Interface ESP32 with DC motor using L298 motor driver
9.	Experiment on connectivity of Rasberry Pi with existing system components.

Text Books:

1.	Internet of Things: Architecture, Design Principles and Applications, Rajkamal, McGraw Hill Higher Education. 2017
2.	Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 1st edition, 2014.

Reference Books:

1.	Designing the Internet of Things, Adrian McEwen and Hakim Cassimally, Wiley, 1st edition, 2014.
2.	Getting Started with the Internet of Things CunoPfister,Oreilly. 2011
3.	Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD),2014.

e-Resources:

1.	Introduction to Internet of Things, https://swayam.gov.in/nd1_noc20_cs66/preview
2.	An Introduction to Programming the Internet of Things(IoT) specialization, https://www.coursera.org/specializations/iot

Code	Category	L	T	P	C	I.M	E.M	Exam
B20CD3206	**SOC**	**1**	**0**	**2**	**2**	**--**	**50**	**3 Hrs.**

MERN STACK TECHNOLOGIES-MODULE I
(Skill Oriented Course)
(For CSD)

Course Objective:

1.	The core concepts of frontend and dynamic, responsive development for web applications.

Course Outcomes: At the end of the course Students will be able to

S. No	Outcome	Knowledge Level
1.	Develop static web pages using HTML & CSS elements	K4
2.	Develop dynamic web pages and validate them using JavaScript	K4
3.	Develop I/O Intensive Web Pages using NodeJS	K4

List of Experiments:

1.	**HTML 5:** Introduction to Web, Overview of Web Technologies, HTML - Introduction, HTML - Need, Platform-independency, DOCTYPE Declaration, Types of Elements, HTML Elements – Attributes, Paragraph Element, Division and Span Elements, List Element, Link Element, Character Entities, HTML5 Global Attributes, Creating Table Elements, Table Elements : Colspan/ Rowspan Attributes, border, cellspacing and cellpadding attributes, Creating Form Elements, Input Elements - Attributes, Color and Date Pickers, Select and Data list Elements, Editing Elements, Media. **CSS:** Introduction CSS, Applying CSS to HTML, Selectors, Properties and Values, CSS Colors and Backgrounds, CSS Box Model, CSS Margins, Padding, and Borders, CSS Text and Font Properties
2.	**JAVASCRIPT:** Why we need JavaScript, What is JavaScript, Environment Setup, Working with Identifiers, Type of Identifiers, Primitive and Non Primitive Data Types, Operators and Types of Operators, Types of Statements, Non - Conditional Statements, Types of Conditional Statements, If and Switch Statements, Types of Loops, Types of Functions, Declaring and Invoking Function, Arrow Function, Function Parameters, Nested Function, Built-in Functions, Variable Scope in Functions, Working With Classes, Creating and Inheriting Classes, In-built Events and Handlers, Working with Objects, Types of Objects, Creating Objects, Combining and cloning Objects using Spread operator, Destructuring Objects, Browser and Document Object Model, Creating Arrays, Array Methods.
3.	**NodeJS:** What is NodeJs, Functions, Buffer, Modules & Types, Core Modules, Local Modules, Modules Exports

	What is NPM?, Installing Packages Locally, Installing package globally, Adding dependency in package Json, Updating packages Creating Web Server, Sending Requests, Handling HTTP requests, File System - Read File, Writing a File, Opening a File, Deleting a File, Writing a file asynchronously, Other I/O Operations Debugging Node JS Application Core Node JS Debugger
4.	**ExpressJS:** Event Emitter class, Inheriting Events, Returning event emitter Express JS, Configuring Routes, Working with Express Serving Static Resources, Serving Static Files, Working with Middle Ware
5.	**TypeScript:** TypeScript Overview, Intro to TypeScript, Tooling and Environment, Creating a TypeScript Project TypeScript, Type System, Enums, Functions, Interfaces and Classes, Modules, Generics, Mapped Types, Conditional Types, Decorators, Type Definitions, Configuration
Text Books:	
1.	Programming the World Wide Web, 8th Edition Robet W Sebesta, Pearson, 2015.
2.	WebTechnologies,1st Edition 7th impression, Uttam K Roy, Oxford, 2012.
3.	Beginning MERN Stack: Build and Deploy a Full Stack MongoDB, Express, React, Node.js App, by Greg Lim, 2021
References:	
1.	https://www.javatpoint.com/mern-stack
2.	https://blog.logrocket.com/mern-stack-tutorial/

Code	Category	L	T	P	C	I.M	E.M	Exam
B20MC3201	**MC**	**3**	**--**	**--**	**--**	**--**	**--**	**3 Hrs.**

EMPLOYABILITY SKILLS

(Common to AIDS, AIML, CSBS, CSD, CSE, ECE & IT)

Part-A: Verbal Ability

Course Objectives:

1.	To introduce concepts required in framing grammatically correct sentences and identifying errors While using Standard English.
2.	To familiarize the learner with high frequency words as they would be used in their professional career.
3.	To inculcate logical thinking in order to frame and use data as per the requirement
4.	To acquaint the learner of making a coherent and cohesive sentences and paragraphs for composing a written discourse.
5.	To familiarize students with soft skills and how it influences their professional grow.

Course Outcomes: The students will be able to

S.No	Outcome	Knowledge Level
1	Detect grammatical errors in the text/sentences and rectify them while answering their competitive/company specific tests and frame grammatically Correct sentences while writing.	K3
2	Answer questions on synonyms, antonyms and other vocabulary-based Exercises while attempting CAT, GRE, GATE and other related tests.	K3
3	Use their logical thinking ability and solve questions related to analogy, Syllogisms, and other reasoning-based exercises.	K3
4	Choose the appropriate word/s/phrases suitable to the given context in order to make the sentence/paragraph coherent.	K3

SYLLABUS

UNIT-I	Spotting Errors, Sentence Improvement
UNIT-II	Synonyms, Antonyms, Frequently Confused Words, Foreign Phrases, Idioms and Phrasal Verbs, Collocations.
UNIT-III	Foreign Phrases, Idioms and Phrasal Verbs, Collocations, Analogies, Odd One Out
UNIT-IV	Sentence completion, Sentence Equivalence, Close Test
UNIT-V	Reading Comprehension, Para Jumbles

Text Books:	
1.	Oxford Learners,, Grammar–Finder by John Eastwood, Oxford Publication.
2.	RS Agarwal books on objective English and verbal reasoning
3.	English Vocabulary in Use-Advanced, Cambridge University Press
4.	Collocations In Use, Cambridge University Press
5.	Soft Skills & Employability Skills by Samina Pillai and Agna Fernandez, Cambridge University Press India Pvt .Ltd.
6.	Soft Skills, by Dr.K.Alex, S. Chand & Company Ltd., New Delhi
Reference Books:	
1.	English Grammar in Use by Raymond Murphy, CUP
2.	Websites: Indiabix,800score, official CAT, GRE and GMAT sites
3.	Material from IMS, Career Launcher and Time institutes for competitive exams
4.	The Art of Public Speaking by Dale Carnegie
5.	The Leader in You by Dale Carnegie
6.	Emotional Intelligence by Daniel Golman
7.	Stay Hungry Stay Foolish by Rashmi Bansal
8.	I have a Dream by Rashmi Bansal.
Part-B: Quantitative Aptitude-I	
Course Objectives:	
1.	To familiarize students with basic problems on numbers and ratios problems.
2.	To enrich the skills of solving problems on time, work, speed, distance and also Measurement of units.
3.	To enable the students to work efficiently on percentage values related to shares, profit and Loss problems.
4.	To inculcate logical thinking by exposing the students to reasoning related questions.
5.	To inculcate logical thinking by exposing the students to reasoning related questions.

Course Outcomes: The students will be able to

S.No.	Course Outcome	Knowledge Level
1.	The students will be able to perform well in calculating on number problems and various units of ratio concepts	K3
2.	The students will be able to solve problems on time and distance and units related solutions	K3
3.	The students will become adept in solving problems related to profit and loss, in specific, quantitative ability	K3
4.	The students will present themselves well in the recruitment process using analytical and logical skills which he or she developed during	K3

	the course as they are very important for any person to be placed in the industry	
5.	The students will earn to apply Logical thinking to the problems of Syllogisms and be able to effectively attempt competitive examinations like CAT, GRE, GATE for further studies	K3
SYLLABUS		
UNIT-I	Numbers, LCM and HCF, Chain Rule, Ratio and Proportion Importance of different types of numbers and uses of them: Divisibility tests, finding remainders in various cases, Problems related to numbers, Methods to find LCM, Methods to find HCF, applications of LCM, HCF. Importance of chain rule, Problems on chain rule, Introducing the concept of ratio in three Different methods, Problems related to Ratio and Proportion	
UNIT-II	Time and work, Time and Distance Problems on manpower and time related to work, Problems on alternate days, Problems on hours of working related to clock, Problems on pipes and cistern, Problems on combination of the some or all the above, Introduction of time and distance, Problems on average speed, Problems on Relative speed, Problems on trains, Problems on boats and streams, Problems on circular tracks, Problems on polygonal tracks, Problems on races.	
UNIT-III	Percentages, Profit Loss and Discount, Simple interest, Compound Interest, Partnerships, shares and dividends. Problems on percentages-Understanding of cost price, selling price, marked price, discount, percentage of profit, percentage of loss, percentage of discount, Problems on cost price, selling price, market price, discount. Introduction of simple interest, Introduction of compound interest, Relation between simple interest and compound interest, Introduction of partnership, Sleeping partner concept and problems, Problems on shares and dividends, and stocks.	
UNIT-IV	Introduction, number series, number analogy, classification, Letter series, ranking, directions Problems of how to find the next number in the series, Finding the missing number and related sums, Analogy, Sums related to number analogy, Ranking of alphabet, Sums related to Classification, Sums related to letter series, Relation between number series and letter series, Usage of directions north, south, east, west, Problems related to directions north, south, east, west.	
UNIT-V	Data sufficiency, Syllogisms Easy sums to understand data sufficiency, Frequent mistakes while doing data sufficiency, Syllogisms Problems.	
Text Books:		
1.	Quantitative aptitude by RS Agarwal	
2.	Verbal and nonverbal reasoning by RS Agarwal	

3.	Puzzles to puzzle you by shakunatala devi.
References:	
1.	Barrons by Sharon Welner Green and IraK Wolf (Galgotia Publications pvt. Ltd.)
2.	Websites: m4maths, Indiabix, 800score, official CAT, GRE and GMAT sites
3.	Material from IMS, Career Launcher and Time,, institutes for competitive exams
4.	Books for CAT by Arun sharma.
5.	Elementary and Higher algebra by HS Hall and SR Knight.
Websites:	
1.	www.m4maths.com
2.	www.Indiabix.com
3.	www.800score.com
4.	Official GRE site
5.	Official GMAT site

Code	Category	L	T	P	C	I.M	E.M	Exam
B20CEOE04	**OE**	**3**	**--**	**--**	**3**	**30**	**70**	**3Hrs.**

BUILDING SERVICES

(Offered by-CE)

(Offered to AIDS, CSBS, CSE, ECE, EEE, IT & ME)

Course Objectives:

1	Introduce the various electro-mechanical systems that are found in modern buildings
2	Explain the role of various Mechanical, Electrical, Plumbing, Firefighting systems in providing occupant comfort, safety and security in their working and living environment.
3	Emphasize the role of resource conservation in reducing the impact of built environment by integration of renewable energy, resource recycling and biophilic design.

Course Outcomes: At the end of the course Students will be able to

S.No	Outcome	Knowledge Level
1	Identify the functional requirements of various types of buildings and rooms in buildings.	K2
2	Apply the significance of fire safety systems and their regular audit in buildings.	K3
3	Develop the Layout of plumbing and drainage systems for different types of buildings	K3
4	Summarise the various lighting, ventilation and acoustic design elements in buildings.	K2
5	Propose the resource conservation strategies for buildings such as rainwater harvesting and Solar Energy utilization.	K2

SYLLABUS

UNIT-I (8 Hrs)	**Introduction** Types of buildings, functional requirements – Role of building Service professionals. **Vertical Transportation** Lifts: Different types of lifts and its uses – Component parts of Lift – Lift Well, Travel, Pit, Hoist way, Machine, Buffer, Lift Car, landing, door, Call indicators, Design Provisions for basic size calculations of enclosure space. Escalators: Different types of escalators and their uses – Components, space calculation, safety measures Ramp: Necessity, gradient calculation, special features to aid movement of physically handicapped and elderly.
UNIT-II (8Hrs)	**Fire Safety** Fire protection requirements for multi-storeyed building. Causes of fire in buildings. Fire detection and fighting systems. Working principles of various fire protection systems. Safety

	requirements in various types of buildings – Fire resistant design and materials – Fire inspection – Provisions for evacuation.
UNITIII (8Hrs)	**Plumbing systems for water supply and sanitation** Types and function of plumbing fixtures, sizes, capacities, traps, interceptors. Storage of water, hot and cold-water supply systems. Drainage systems – One Pipe System, Two Pipe Systems, Vents and purpose of venting, wastewater reclamation.
UNIT-IV (8Hrs)	**Lighting - Ventilation and Acoustics** Natural and electrical lighting, Different lighting schemes, direct light, diffuse light, glare. Different control mechanisms for achieving comfortable light conditions. Lumen and Lux considerations in selecting luminaires. Natural Ventilation and Mechanical Ventilation. Concept of Thermal comfort, Cooling Degree Days, Air changes. Building Acoustics, Acoustic design of buildings and appropriate materials selections
UNIT-V (8Hrs)	**Natural Resource Conservation** Rainwater Harvesting. Components – Catchments, gutters, conduits, filters, storage, recharge or storage structures. Potential of RWH for various locations and building roof and landscape designs. – Domestic Hot Water from Solar Water heaters – Basics of heat transfer, passive and direct heating systems, sizing, cost benefit analysis of using solar water heaters

Textbooks:	
1	The A – Z of practical building construction and it Management, Mantri, Sandeep, Satya Prakashan, New Delhi
2	Plumbing Design and Practise, Deolalikar, S.G. McGraw hill, New Delhi
3	Principle of Fire Safety Engineering: Understanding Fire and Fire Protection, Akhil Kumar Das, PHI Learning Pvt. Ltd. New Delhi
4	Textbook Of Refrigeration And Air-Conditioning, R S Khurmi, S.Chand Publishers
Reference Books:	
1	National Building Code Part 1, 4, 8, 9 Bureau of Indian Standards
2	IS 12783 (Part 1) Code of Practise for plumbing in multistoried buildings, Bureau of Indian Standards
3	2008 Uniform Plumbing Code – India , Bureau of Indian Standards