Notification No. 19-PSC(DR-P) of 2023 Dated: 26.05.2023

LECTURER-I COMPUTER ENGINEERING

1) COMPUTER PROGRAMMING USING "C"

1. Algorithm and Programming Development
2. Program Structure
3. Control Structures
4. Functions
5. Arrays
6. Pointers
7. Structures and Unions
8. Strings
9. Files

2) DATABASE MANAGEMENT SYSTEM (DBMS)

1. Database System Concepts and Architecture
2. Types of Data Models.
3. Normalization
4. Database Access and Security
5. MYSQL/SQL (Structured Query Language)
6. Distributed Databases

3) OPERATING SYSTEMS

1. Process Management Functions (Principles and Brief Concept): Job Scheduler, Process Scheduler, Process synchronization.
2. Memory Management Function (Principles and Brief Concept): Introduction, Single Process System, Fixed Partition Memory, System Loading, Segmentation, Swapping, Simple Paging System, Virtual Memory. I/O Management Functions (Principles and Brief Concept);
3. Dedicated Devices, Shared Devices, I/o Devices, Storage Devices, Buffering, Spooling.
4. File Management; Principles and Brief Concept, Types of File System; Simple file system, Basic file system, Logical file system, Physical file system.
5. Dead Lock; Condition for Dead lock, Dead Lock Preventions, Dead Lock Avoidance

4) DATA STRUCTURES

1. Problem solving concept, top down and bottom up design.
2. Basics of Algorithm design, time and space complexity.
3. Structured programming,
4. Concept of data types, variables and constants.
5. Concept of pointer variables and constants
6. Arrays, Linked Lists, Stacks, Queues, Graphs, Trees.
7. Search algorithm (Linear and Binary).
8. Concept of sorting, sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort, Merge Sort, Heap Sort) and their comparisons.

5) OBJECT ORIENTED PROGRAMMING USING C++

1. Fundamentals of object oriented programming – procedure oriented programming Vs. object oriented programming (OOP). Object oriented programming concepts – Classes, reusability, encapsulation, inheritance, polymorphism, dynamic binding, message passing, and data hiding.
2. Review of constructs of C used in C++ : variables, types and type declarations, user defined data types;
3. increment and decrement operators, relational and logical operators;
4. if then else clause; conditional expressions, input and output statement, loops, switch case.
5. Arrays, structure, unions, functions
6. Classes and Objects
7. Member Functions
8. Overloading Member Functions
9. Inheritance
10. Polymorphism and Virtual Functions
11. File and Streams

6) SOFTWARE ENGINEERING

1. Size factors, Quality and productivity factors, Management issues, Models: waterfall, spiral, prototyping, fourth generation techniques, s/w process, Introduction to agile technologies.
2. Cost factors, cost estimations techniques, Staffing level estimation, estimating software maintenance costs, COCOMO.
3. Problem analysis, requirement engineering, The software requirements specifications (SRS), formal specifications techniques, characteristics of a good SRS.
4. Quality assurance work through and inspections static analysis, symbolic execution unit testing, formal verifications. Black box and white box testing techniques.
5. Definition of Quality, Quality Concepts, Quality Control, Quality Assurance, SQA Activities, Software Reviews, Inspections, Walkthroughs, Formal Technical Reviews, Review Guidelines, Quality Assurance Standards, ISO 9000, ISO 9001:2000, ISO 9126, CMM, TQM, TQM principles, Six Sigma, SPICE.
6. Risk Management and Configuration Management

7) COMPUTER NETWORKS

1. Concept of network
2. Networking models
3. LAN, MAN and WAN
4. Network Services
5. Topologies
6. Concept of switching and itsTechniques
7. OSI Reference Model
8. Concept of physical and logical addressing, different classes of IP addressing, special IP address, sub netting and super netting.
9. Network connectivity Devices: NICs, Hubs, Repeaters, Multiplexers, Modems, Routers and Routing Protocols, Gateways, Amplifiers
10. Basics of Wireless: Types of Wireless Networks, Wireless MAN; Networking, Wireless LAN, Wi-Fi, WiMax(Broad-band Wireless) and Blue-Tooth technology, Mobile Adhoc Network (MANET)

8) NETWORK SECURITY

1. Network Security, Introduction to basic encryption and decryption, concept of symmetric and asymmetric key cryptography, overview of DES, RSA and PGP, Introduction to Hashing: MD5, SSL, SSH, HTTPS, Digital Signatures.
2. Computer Network Attacks: Active Attacks, Passive Attacks, Stealing Passwords, Social Engineering, Bugs and Backdoors, Authentication Failures, Protocol Failures, Information Leakage, Denial-of-Service Attacks, Botnets, Phishing Attacks.

9) Java Programming

1. Java Virtual Machine (JVM), Java In Time (JIT) compiler, JDK
2. Working with data types, control flow statements, arrays, casting, command line arguments
3. Java Classes and Memory Management
4. Interfaces and Packages
5. Exception Handling and Stream Files
6. Threads and Multi-threading
7. Java Data Base Connectivity (JDBC)

10) INTERNET AND WEB TECHNOLOGIES

1. Telephone line, cable, leased line, ISDN, VSAT, RF link
2. World Wide Web and its evolution, web page, web server, HTTP protocol. Examples of web servers.
3. Navigation Tools: Mozilla Firefox, Google Chrome, Internet Explorer
4. Uniform Resource Locator (URL). Hypertext, hyperlinks and hypermedia, URL, its registration, browsers, search engines, proxy servers
5. Basics of authentication and authorization. Introduction to firewall, SSL (Secure Socket Layer)

11) ARTIFICIAL INTELLIGENCE

1. Searching State –spaces: Use of states and transitions to model problems
2. Breadth – first, depth – first and related types of search, A * search algorithm, Use of heuristics in search.
3. Reasoning in logic: Brief revision of propositional and predicate logic. Different characterizations of reasoning.
4. Generalized modus ponens Resolution, Prolog, Forward and Backward chaining.
5. Knowledge Representation : Diversity of knowledge,
6. Inheritance hierarchies, Semantic Networks, Knowledgeable Ontology.

12) LATEST TRENDS IN COMPUTER SCIENCES

1. Introduction to Cloud Computing
2. Introduction to Data Sciences
3. Machine Learning: Introduction of knowledge, Decision tree learning algorithms.

LECTURER-I

ARCHITECTURE ASSISTANT

Module I: Architectural Principles, Philosophies and Theories

Fundamental principles of architecture, principles of composition, principles of visual design and visual perception, analyzing architecture: architectural grammar, styles and aesthetic components, creativity and meaning in design and design process, vernacular architectural forms and its cultural geography, architecture and society, modern and postmodern socio-cultural movements in architecture and related theories, works of master Architects and their philosophy.

Module II: History of Architecture and Cultural Anthropology

Architecture during early cultures, Palaeolithic and Neolithic period, settlements of pre-historic civilization, river valley cultures, pre-classical civilizations, early Christian, byzantine, Romanesque and gothic architecture, renaissance architecture, Indian architecture: Buddhist and Hindu period, Dravidian and Indo-Aryan architecture, Islamic architecture: imperial, provincial and Mughal period, colonial architecture, impact of industrial revolution, arts and crafts movement, modern architecture, Chicago school, Bauhaus school and isms in architecture, international style, post modernism, deconstruction, critical regionalism, architecture in the globalized world, works of renowned national and international architects.

Module III: Architectural Design and Practice

Basic parameters of design, anthropometric studies, built environment and space standards, architectural elements, integration of form and function, residential typologies, environment behaviour and design needs, site planning and context studies, site services and circulation systems, design standards, set back rules, coverage, campus planning, barrier free design, contemporary developments in architecture design and practice, building information system.

Architect Act and Council of Architecture regulations in professional practice and Architectural education, professional charges, tenders and contracts, valuation and arbitration, laws and legislation related to Architectural practice, role of development authorities and LSGI's, current building regulations and safety standards, FAR, FSI, density, occupancy groups, parking standards, rainwater harvesting, energy conservation and green building regulations, harmonized guidelines and standards for universal accessibility.

Module IV: Building Construction and Project Management

Building materials and fundamentals of building construction, traditional and vernacular construction practices. construction of: foundations, super structure, door and window systems, wall and floor systems, roof systems, vertical transportation systems etc., advanced structural components and its construction technology, modular construction, BIS specifications, cost effective technology, sustainable construction practices, architectural acoustics, building estimation, specification and budgeting, valuation of properties, concept of disaster preparedness, mitigation and management, disaster resilient construction techniques. Project management techniques (CPM, PERT), contracts and tenders, construction scheduling systems, project management information systems

Module V: Building Services and Structural Systems

Water supply and plumbing system, sanitation, sewerage and drainage system, liquid and solid waste management, water treatment, water harvesting, wastewater treatment, industrial and hazardous waste treatment and disposal, electrical services and illumination, ventilation and air conditioning, fire-fighting, building safety and security, services in high rise buildings. Structural behavior of various building materials, types of load bearing structures, basic concepts of structural systems, stress and strain behaviors of steel and concrete, structural properties of columns and beams, cantilevered structures, design of structural elements in wood, steel and RCC, principles of pre-stressing, construction of tall building, structural properties of retaining walls and foundations, earthquake resistant structures, advanced construction technology.

Module VI: Landscape Planning and Design

Landscape Architecture and its relevance, human relationship with nature and its evolution over time, contemporary attitudes to nature and natural systems, ecological and cultural resources, site planning philosophy, site development processes, elements and principles of landscape design, landscape engineering, landscape construction techniques, urban landscape and ecological planning principles and processes, landscape urbanism, contemporary developments trends in ecological urbanism.

Module VII: Climate and Environment Design

Climate and built form, elements of climate, micro and macro climate, climate and human comfort, thermal comfort indices, heat flow through buildings, heat transfer performances of different materials, solar systems and shading devices, natural ventilation and wind movement, day light and lighting, active and passive systems, renewable energy and its applications, climate responsive design in various tropical climates, energy modelling and energy conscious design, climate adaptation in contemporary architecture. Fundamentals of ecology, ecological processes and principles, environment and human behaviour, behavioural theories, environmental planning and environmental design principles, environmental legislation and regulations, Environment Impact Assessment (EIA), environment and climate summits, green building standards and certification systems, urban climatology, climate change and natural disasters, tropical urbanism and climate sensitive design, blue-green infrastructure and eco-cities, carbon neutral concepts and net zero cities.

Module VIII: Human Habitats and Development Theories

Evolution of human habitats, types of human settlements, settlement pattern, urbanism and urbanization theories, patterns and trends in Indian urbanization, urban culture and urban society, housing, housing policies and finance, slums and urban poverty, habitat conferences, rural development planning, rural-urban (r'urban) developments. Planning history and planning theories, pre-industrial and post-industrial cities, post-colonial and postmodern cities, urban growth theories, Globalization and urban development, economic development models, contemporary urban

development trends, sustainable development: theories, concepts and approaches, inclusive urban development. smart urban growth strategies.

Module IX: Urban Planning and Urban Design

Urban planning techniques, national and local development planning institutions, planning legislation and governance mechanisms, infrastructure development, traffic and transportation planning, urban systems management, development economics, development management,

institutional mechanisms for development planning and implementation, regional planning and resource development, planning for tourism, poverty alleviation and slum up gradation schemes, national policies and programs for urban development. Principles of urban design, urban processes shaping cities, urban form and urban space theories, urban patterns, modern and post-modern urbanism theories, urban renewal and redevelopment, ecosystem services and ecological restoration, social justice in cities, neighbourhood design principles, new urbanism, transit oriented development (TOD) principles, participatory design processes, national and international heritage conservation policies, urban conservation, resilient cities and healthy city concepts.

Geo-Informatics – Photogrammetry – definition, Classification and basic principles. Global Positioning System – Differential GPD, Concept of GPS – Types, Navigation systems and application, Spatial data institution and its social implications. Application in transportation, Planning and environmental management Spatial analysis – Vector based and Raster based GIS data modelling for urban infrastructure, urban site selection for urban development: Urban mapping – Urbanisation process, problems of urbanisation, Urban Sprawl and associated problems. Network analysis – Concept, types of analysis Application of remote sensing and GIS in Architecture. LU/ LC analysis – Site suitability analysis for various types of buildings. Computer application in Architecture

LECTURER-II, Office Managment & Computer Application

Unit I- Business Correspondence

Enquiry Letters, Order Letters, Complaints Claims and Adjustments, Sales Letters, Circulars, Official Correspondence, Banking Correspondence, Insurance Letters.

Unit II-Pitman Stenography

Unit III- a) Management meaning, Principles , Functions, Levels of Management, Handling Office Correspondence.

b) Office Management, Office (Centralization/Decentralization)

c) Professional Ethics of Office Personnel.

d) Secretarial Functioning, Types of Secretaries, Qualification, duties and responsibilities of various types of Secretaries.

e) Meetings, Types of Meetings, Notice/Invitation, Agenda, Proxy, Quorum, Motion, Resolution, Minutes Adjournment, Amendments etc.

f) Human Resource Management, Stress Management, Time Management, Personality Development (Meaning, Determinants, Importance, Techniques), Factors affecting Organizational Culture.

Unit IV- a) Nature and Scope of Business Organization, Business and Profession, Problems of starting a new business, Sole Proprietorship, Partnership, Joint Stock Companies, Private Limited Companies, Public Limited Companies.

b) Meaning and Importance of Finance, Determining the Capital Requirements, Sources of Capital- Own and Borrowed , Shares, Debentures and Banks.

c) Business Environment: Factors influencing business Environment.

d) Economic Systems: Capitalistic, Democratic, Socialistic and Mixed .

Unit V- Business Laws

1. Income Tax: Meaning and Importance . Heads of Taxable Income
2. Factories Act 1948: Introduction , Provision of Health, safety, welfare, Working hours, and leave under Factories Act.

3. Contract Act: Definition, Essentials of a valid contract, classification of Contracts, Breach of Contract, Void Contract, Quasi Contract.
4. Consumer Protection Act 1986
   Consumer complaint, Dispute, Restrictive Trade Practice, Unfair Trade Practice.
5. Information Technology Act 2000 (Cyber Laws).
6. Right to Information Act (Sources of Information Acquiring)
7. Intellectual Property Right
   Scope and Importance , Patents, trade Marks, Copy right.

Unit VI-

1. Introduction to Book-keeping And Accounting.

2. Nature of Accounts and Rules of Debit and credit.

   Journal, Ledger, Cash Book, Method of recording transactions in simple Cash Book.

3. Recording and posting of Cash Transactions.

4. Ledger and Trial Balance.

5. Rectification of Errors.

6. Final Accounts.
   a) Preparation of Profit and Loss Account.
   b) Trading Account
   c) How to Prepare Balance Sheet.

7. Depreciation
   a) Accounts for Non-Trading Concerns.
   b) Preparation of Company Accounts.

Unit VII- Computer Based Accountancy

1. Introduction:
   a)Computer Basics- Input Unit, Processing Unit, Output Unit, Storage Devices.

   b) Software- Microsoft Excel, Tally 9 ERP

2. TALLY 9.0 ERP

   a) Company Creation

   b) Ledger creation

   c) Receipt & Payments

d) Credit Note & Debt Note

e) Sales and Purchases

3. TALLY REPORTS

a) Cash Book

b) Trial Balance

c) Profit and Loss

d) Balance Sheet

e) Bank Reconcillation

4. TALLY BACKUP/RESTORE

5. Internet and Web Surfing