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BACHELOR OF COMPUTER APPLICATION MASTER OF COMPUTER APPLICATION INTEGRATED – SEMESTER ONE

First Semester			
S. No.	**Name of Subject**	**Credits**	**Total Marks**
1	Foundation Course in Environmental Science	2	100
2	Programming Fundamentals Using C	5	100
3	Principle of Management	4	100
4	Database Management System	4	100
5	Discrete Mathematics	4	100
6	English Grammar & Composition	4	100
Total		**23**	

Subject Name: FOUNDATION COURSE IN ENVIRONMENTAL SCIENCE

Unit 1: The Multidisciplinary nature of environmental studies Definition; Scope and importance, Need for public awareness.

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems

a. Forest resources: Use and Over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
b. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
c. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
e. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies.
f. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources.

Equitable use of resources for sustainable lifestyles.

Unit 2: Ecosystems:

- Concept of an ecosystem.

- Structure and function of an ecosystem.

- Producers, consumers and decomposers.

- Energy flow in the ecosystem.

- Ecological succession. - Food chains, food webs and ecological pyramids.

- Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Biodiversity and its Conservation

a. Introduction-Definition: genetic, species and ecosystem diversity.
b. Biogeographical classification of India.
c. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
d. Biodiversity at global, National and local levels.
e. India as a mega-diversity nation.
f. Hot-spots of biodiversity.
g. Threats to biodiversity: habital loss, poaching of wildlife, man-wildlife conflicts.
h. Endangered and endemic species of India.
i. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit 3: Environmental Pollution:

- Causes, effects and control measures of: -

a. Air pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

- Role of an individual in prevention of pollution.

- Pollution case studies.

- Disaster management: floods, earthquake, cyclone and landslides.

Social Issues and the Environment

- From Unsustainable to Sustainable development.

- Urban problems related to energy.

- Water conservation, rain water harvesting, watershed management.

- Resettlement and rehabilitation of people; its problems and concerns. Case studies.

- Environmental ethics: Issues and possible solutions.

- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.

- Wasteland reclamation.

- Consumerism and waste products.

- Environment Protection Act.

- Air (Prevention and Control of Pollution) Act.

- Water (Prevention and Control of Pollution) Act.

- Wildlife Protection Act. - Forest Conservation Act.
- Issues involved in enforcement of environmental legislation.
- Public awareness.

Unit 4: Human Population and the Environment

- Population growth, variation among nations.
- Population explosion-Family welfare Programme.
- Environment and human health.
- Human Rights.
- Value Education.
- HIV/AIDS.
- Women and Child Welfare.
- Role of information Technology in Environment and human health.
- Case Studies.

Unit 5: Field Work (Practical)

- Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain.
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc.

Subject Name: PROGRAMMING FUNDAMENTALS USING C

Unit-I

1. **Introduction to computer system:** Introduction, Characteristics of computer, Drawbacks of computers, Generations of Computers
2. **Computer Organization:** Architecture of Computer System
3. **Number System:** Introduction, Commonly Used Number System, Decimal, Binary, Octal, Hexadecimal, Converting from one number system to another
4. **Binary Arithmetic:** Introduction, Binary Addition, Subtraction, Multiplication, Division, Representations of characters, BCD Code, EBCDIC, ASCII, Fixed Point Representation, Floating Point Representation
5. **Algorithms and Flowchart:** Algorithms, Characteristics of algorithms, Flowchart, Different Symbols used in Flowcharts.
6. **Computer Languages:** Machine Language, Advantages of Machine Language, Disadvantages of Machine Language, High Level Language, Assembly Language, Software, Type of Software, System Software, Application Software
7. **Input-output Devices:** Introduction, Offline Input Devices, Online Input Devices, Punched Cards, Keyboards, Mouse, Touch Pad, Light Pen, Scanner
8. **Storage Devices:** Introduction, Primary Memory, RAM, DRAM, ROM, PROM, EPROM, Cache Memory, Secondary Memory, Magnetic Tape, floppy, Hard Disk, CD-ROM
9. **Operating System:** Introduction, Type of Operating System, Batch Processing Operating System, Single-user Operating System, Multi-User Operating System, Multi-Processing Operating System, Real Time Operating System, DOS, Functions of DOS
10. **Viruses:** Introduction, Types of Viruses, Antivirus

Unit-II

1. **An introduction to C:** History of C, Feature of C, Structure of a C program, Variables and Data Types, Arithmetic Expressions
2. **Components of C Language:** Character Set, C token, Data Type in C, Operators, Type Casting, Data Conversion
3. **Input / Output Functions:** Formatted Input / Output functions, The print function, The scanf Function, Unformatted Input / Output Function, Character Input / Output Function, String Input / Output Functions
4. **Conditional Statement:** Introduction, If-else statement, Nesting If-else Statement, The switch Statement
5. **Looping:** Introduction, While Loop, Do While Loop, Nesting Loop, The Break Statement, The Continious Statement
6. **Arrays in C:** Array, Two Dimensional Arrays, Passing Array as Parameters, String, Some Library Function for String Handling
7. **Function:** Modular Programming, Top-Down Approach, Structured Programming, function with no Argument and no Return Value, Function Prototype, Storage class in C, Declaring Variables of Specified Storage Classes, Local and Global Variables.
8. **Pointer in C:** Pointer, Passing Pointers as Parameters, Dynamic Memory Allocation, Pointer to Pointer, Pointer to Function.
9. **Structure and Union:** Structure, Array of Structure, Pointer to Structure, Nested Structure, Structure and Function, Difference between Structure and Union.
10. **File Handling in C:** Introduction, Difference between Text and Binary File, Basic File Handling Functions, File Input / Output.
11. **Preprocessor:** Introduction, Functions of a C Preprocessor.

Subject Name: PRINCIPLE OF MANAGEMENT

Unit-I

Planning and Organizing Management

1. **Definitions of Management:** Its Nature and Purpose, Management as a Science and art, the Elements of Science, Patterns of Management Analysis-Systems Approach to Operational Management. Function of Managers. Management and Society - Social Responsibility and Ethics with Reference to India and EN India. Operating in a pluralistic Society, Social Responsibility of Managers, and ethics in Managing. A Broad Overview of the Different Forms of Business Enterprises in India.
2. **Nature and Purpose of Planning:** Types of Plans; Steps in Planning Process - A Rational Approach to Goal Achievement. Objectives - The Nature of Objectives, Evolving Concepts in Management by Objectives (MBO), the Process of MBO, Setting Objective, Benefits and Weakness of MBO. The Nature and Purpose of strategies Planning Process , The TOWS Matrix, The Portfolio Matrix , Major Kinds of Strategies and policies, The Three Generic Competitive Strategies by Porter, Effective Implementation of Strategies , Premising and forecasting. Decision Making - The Importance and Limitations of Rational Decision Making, Evaluation of Alternatives, Selecting an Alternative, Programmed and Non-Programmed Decision , Decision Making Under Certainty , Uncertainty and risk, Modern Approaches to Decision Making under Uncertainty, Evaluating the Important for a Decision , Other Actor in Decision Making, Decision Support System , Systems Approach and Decision Making.
3. **Nature and Purpose of Organizing:** Formal and Informal Organization, Organizational Division - The Department, Organization Levels and the span of management, factors Determining an

Effective span, organization Environment for Entrepreneur and Entrepreneur, The Structure and process of Reorganizing.

Department by Simple Members, by time, by Enterprise function, by Territory or Geography, by Customer, By Process or Equipment, and by Product. Matrix Organization, Strategic Business Units, Choosing the Pattern of Departmentation. Authority and Power, Line and staff concepts, Functional Authority, Benefits and Limitations of staff, Decentralization and Delegation of Authority, art of Delegation, Balance as a key to Decentralization.

Unit-II

Functional Methodology

1. **Human Resource Management and Selection :** Definition of Staffing, Defining the managerial job, Systems Approach to HRM- an Overview the Staffing function, Situational Factors Affecting Staffing , Selecting - Matching the Person with the job, Systems Approach , Position Requirements and job Design, Skills and Personal Characteristics Required by Managers, matching Qualifications with position Requirements, Selection-Process, Techniques and Instruments, Orienting and Socializing New Employees. Performance Appraisal -- Purposes and user of appraisal, Problem of Management Appraisal choosing The Appraisal Criteria, Traditional Trait Appraisals, Apprising Managers against Verifiable Objectives, Appraising Managers As Managers, Rewards and Stress of Managing, Formulating the Career Strategy. Manager Development Process and Training, Approaches to Managers Development, On -The- Job training and internal and external Training, Managing Changes, Organizational Conflict, Organizational Development.

   Controlling The Basis Control Process: Critical Control points and Standards, Control as a Feedback System, real-time Information and control Feed Forward Control, requirements for Effective Controls. Budget- Traditional non-budgetary Control Devices, Time-even Network analysis, information technology, use of Computers in handling information, Challenges created by information technology. Control of Overall Performance, budget Summaries and report, Profit and loss Control, Control through return on investment, Direct Control v/s Preventive Control, Developing Excellent Mangers.

Subject Name: DATABASE MANAGEMENT SYSTEM

1. **Basic - Concepts of Database Systems:** Database Schema, Instance and Database state, The Three-Schema Architecture, Data Independence, DBMS Languages, and People Deal with Databases.
2. **Entry - Relationship Model:** The E- R Model, Entity Relationship Diagram, Composite versus Atomic Attributes, Role Names Recursive Relationships, Constraints on Relationship Types.
3. **Data Models and Its Implementation:** The Hierarchical Data Model, the Network Data Model, Network Modeling Concepts, the Relational Model.
4. **Introduction to Relational Model:** CODD'S 12 Rules for a fully relational DBMS, Basic Concepts of Relational Model, Referential Integrity Constraints, Enforcing Integrity Constraints.
5. **Oracle: A Relational Database Management System** Oracle System Structure,. Oracle Server, Oracle Database Structure, Oracle Schema Objects, Oracle Data Dictionary.
6. **Structured Query Language: SQL:** Three Parts of SQL, Sub-Queries, Referential Integrity, Some Other SQL Command.
7. **Procedural Language/ Structured Query Language:** PL/SQL Runtime Architecture (PL/SQL Engine), Procedure, Parameters, Packages, Cursors, Triggers.
8. **Relational Algebra and Relational Calculus:** Relational- Oriented Operation, Set-Oriented Operations and Union Compatibility, Aggregate Function and Grouping, Tuple Relation Calculus.
9. **Normalizing Database:** Benefits of Normalization, Function Dependency, the Domain Key Normal Form.

10. **Database Design and Tuning:** The Database Design Process, Requirements and Analysis, Choice of DBMS, Logical Database Design, Database Implementation and Tuning.
11. **Transaction Processing:** Concurrency Control, Recoverability.
12. **Query Processing and Query Optimization:** Query Processing, Query Optimization, Heuristics Rules in Query Optimization, Information used in Cost Function.
13. **Database Recovery Techniques:** Classification of Transaction Failures, Recovery Techniques Base on Deferred Update, Recovery Techniques Base on Immediate Update, Buffer Management.
14. **Concurrency Control Techniques:** The Acid Test for Transaction Management, Binary Locks, Serializability by Two-Phase Locking, Deadlock Problem.
15. **Data Warehousing:** Data Warehouse Definition, Data Form Legacy Systems, Decision- Support and Executive Information Systems.
16. **Data Mining and Web Mining:** Data Mining Techniques, Future Direction of Data Mining, Data Mining Techniques for Web Searching.
17. **Object- Oriented Database:** History Of OODBMS, Need for Abstract Data Types, O-O Features in SQL3, Hypertext Databases.
18. **Distributed Database:** Structure of Distributed Database, Design of Distributed Database, Advantage of Distributed Database, DDBMS Prototypes.

Subject Name: DISCRETE MATHEMATICS

1. **Relations:** Type of relations, Closure Properties, Equivalence Relations, Matrix representation of relations, Representation of relations as graphs, Partial Ordering relations, n –ARY relations.
2. **Logic and Propositional Calculus:** Introduction, Propositions and Compound Propositions, Basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Algebra of Propositions, Conditional and Biconditional statements, Arguments, Logical Implication, Propositional Functions Quantifiers, Negation of Quantified Statements, Normal Forms.
3. **Vectors and Matrices:** Introduction, Vectors, Matrices, Matrix Addition and Scalar Multiplication, Transpose, Square Matrices, Nonsingular Matrices, Inverses, Determinants, Eigen values and Eigen vectors
4. **Graph Theory:** Basic terminologies of graph theory, Multi- graphs and weighted graphs, Paths and circuits, Planar graphs, Complete graphs, Regular graphs, Bipartite graphs, Sub graphs, Isomorphic and Homeomorphic graphs, Coloring covering and portioning, Directed graphs, Trees and rooted trees, Spanning trees and cut sets ,Enumeration of graphs theoretic algorithm and application.
5. **Ordered Sets and Lattices:** Introduction, Ordered Sets, Hasse Diagrams of Partially Ordered Sets, Isomorphic (Similar) Ordered Sets, Well- Ordered Sets, Lattices, Bounded Lattices, Distributive Lattices, Complements, Complemented Lattices.
6. **Algebraic Systems:** Introduction, Operations, Semi-groups, Groups, Sub Groups, Normal Subgroups, and Homeomorphisms, Integral Domains and Fields, Polynomials Over a Field.

Subject Name: ENGLISH GRAMMAR & COMPOSITION

Unit 1: English Grammar

1. **An Introduction to Part of Speech :** Verb, Tenses, Voice, Direct and Indirect Forms of Speech.
2. Prepositions
3. List of Appropriate Preposition Used
4. Sentence
5. Synthesis of Sentences
6. Transformation of Sentences
7. Syntax

8. Punctuation
9. **Vocabulary :** Antonyms and Synonyms, Similar Words Distinguished, One Word Substitutions, More about words, Idioms & Phrases, Idioms.
10. **Common Error :** Some fundamental Rules for Correction, Sentences with error.
11. Comprehension (with answers)

Unit 2 : Composition

1. Paragraph Writing
2. Letter writing
3. Essay Writing
4. The Essays