SEMESTER SECOND

MATHEMATICS –II
(BMCI201)

SECTION-A
MATRIX ALGEBRA

Matrix algebra- Matrices, types of matrices, operations on matrices, determinants (without properties), minors, cofactors, adjoint and inverse of a matrix, Elementary transformations in a matrix Rank of a matrix, solution of simultaneous equations using Crammer‟s rule and matrix inversion method.

SECTION-B
STATISTICS & APPLICATIONS OF LOGARITHMS

Statistics- Introduction to statistics, measures of central tendency - mean, median and mode, measures of dispersion, mean deviation, standard deviation and coefficient of variation.

Applications of Logarithms- Problems related to compound interest, depreciation and Annuities.

SECTION-C
DIFFERENTIAL CALCULUS

Introduction to differentiation, derivative of a function of one variable, power functions, sum and product of two functions, function of a function, differentiation by method of substitution, maxima and minima.

SECTION-D
INTEGRAL CALCULUS

Indefinite Integral, Integration by substitution, Integration by parts, Integration by partial fractions, Definite Integral. Numerical Integration: Trapezoidal rule, Simpson‟s 1/3 rule, Simpson‟s 3/8 rule.

ENVIRONMENTAL SCIENCE
(EVSC101)

SECTION-A

Introduction: Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness.

Natural Resources: Natural Resources and associated problems, use and over exploitation, case studies of forest resources and water resources.

Ecosystems: Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, ecological pyramids-biodiversity and importance. Hot spots of biodiversity

Environmental Pollution: Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measure of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster Management : Floods, earthquake, cyclone and landslides.

SECTION-B

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 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

SYSTEM ANALYSIS & DESIGN
(BMCI202)

SECTION-A
System Development Life Cycle*:* System Definition, characteristics, elements & types of system, Phases of SDLC, Information gathering tools, Structured Analysis tools, Role of System Analyst.

SECTION-B
System Design: Process and stages of systems design, Input / Output and file design, Documentation (User Manual, Design Documentation, Training Manual), Case Study techniques in system design.

SECTION-C
System testing: Unit Testing, System Testing, Integration Testing, Alpha & Beta Testing, Acceptance Testing, Regression Testing.

SECTION-D
System Implementation: System implementation Process, Implementation methods, System maintenance, Post implementation maintenance.

OOPS USING C++
(BMCI203)

SECTION-A

Introduction: Object oriented programming approach, characteristics of object orientated languages, Bridging C & C++ (Overview of C Concepts).
Structures and Unions: Declaration of structures, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, structure with pointers, functions & structures, Unions, Structure/Union Versus Class in C++.
Class Declaration: Data Members, Member Functions, Private and Public Members, Data Hiding and Encapsulation, Array within a class.

SECTION-B

Class Function Definition: Member Function definition inside the class and outside the class, Friend Function, Inline Function, Static Members & Functions, Scope Resolution Operator, Private and Public Member Functions, Nesting of Member Functions. Creating Objects, Accessing class data members, Accessing member functions, Arrays of Objects, Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.
Constructors and Destructors: Declaration and Definition, Default Constructors, Parameterized Constructors, Constructor Overloading, Copy Constructors. Destructors: Definition and use.

SECTION-C

Inheritance - Extending Classes Concept of inheritance, Base class, Derived class, Defining derived classes, Visibility modes : Private, public, protected; Single inheritance : Privately derived, Publicly derived; Making a protected member inheritable, Access Control to private and protected members by member functions of a derived class, Multilevel inheritance, Nesting of classes.
Function Overloading & Operator Overloading: Binary & Unary.

SECTION-D

Polymorphism: Definition, early Binding, Polymorphism with pointers, Virtual Functions, late binding, pure virtual functions.
Input/output files: Streams, buffers & iostreams, header files, redirection, file input and output.

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DATABASE MANAGEMENT SYSTEM (BMCI204)

SECTION A

An overview of DBMS: Concept of File Processing Systems and database systems, Database Administrator and his responsibilities. Physical and Logical data independence.

Three level Architecture of Database System: the external level, conceptual level and the internal level.

SECTION B

Introduction to Data Models: Entity Relationship Model, Hierarchical, Network and Relational Model. Comparison of Network, Hierarchical and Relational Model.

SECTION C

Relational data Model: Relational database, relational algebra and calculus, SQL dependencies, functional dependency, multi-valued dependency and join, normalization.

SECTION D

Database protection: Recovery, Concurrency Management, Database Security, Integrity and Control, Disaster Management

Distributed databases: Structure of a distributed database, design of distributed databases.

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SOFTWARE LAB-III (OOPS using C++)
(BMCI205)

This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI204)

SECTION – A
Structures: Definition, declaration, scope, functions
Union: Definition, declaration, scope, functions
Class: Definition, declaration, members, scope of members.

SECTION – B
Class Function: definition (Inside class, outside class), in-line functions, static function, friend functions, scope of functions (public, private), and nesting of member functions
Class Data members: creating objects, accessing member functions, array of objects, objects as arguments (Pass by value, pass by reference)
Constructor and destructor: creating default constructor, parameterized constructor, copy constructor, destructor

SECTION – C
Inheritance: base class, derived class, visibility mode (public, private, protected), single inheritance, multi-level inheritance, multiple inheritance, nesting of classes, access control to functions(with different scope),
Function overloading and overriding, operator overloading,

SECTION – D
Early binding, late binding, virtual functions, pure virtual functions
Input/output files: streams, buffers and io-streams, various input-output functions, processing files using class functions

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SOFTWARE LAB-IV (Database Management Systems) (BMCI206)

This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI205)

Familiarization with MS Access: Features, Elements, Parts of MS Access Window, Creating and Saving Database, and Tables.
Using Queries: Running various DDL and DML commands using SQL, Creating Views
Open Source Databases Software's-SQL Cipher, MYSQL,SQLite
Introductory Practicals on using Crystal Report