SEMESTER SECOND
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  
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

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.
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.
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
SOFTWARE LAB-IV (Database Management Systems)  
(BMIC206)

This laboratory course will mainly comprise of exercise on what is learnt under the paper:  
(BMIC205)

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