

DEPARTMENT OF INFORMATION TECHNOLOGY GOVERNMENT DEGREE  
COLLEGE BARAMULLA

**NAAC Re-Accredited Grade 'A'**  
**College with potential for Excellence**



---

---

Fourth Semester  
(Academic Session 2022-23)

Major/Minor

*MajorCT-1*

COURSE TITLE	Object Oriented Programming with C++
COURSE CODE	BITC2422M
SEMESTER	3 <sup>rd</sup>
COURSE TYPE	MAJOR/MINOR
CREDITS	06(4+2 credits)

**COURSE OBJECTIVES:**

- Introduce basic concepts of object oriented programming language.
- To understand the concept of objects and classes..
- To understand the way of writing and creating programs using OOP
- Implementation of all the concepts of OOP .

**UNIT-I: Introduction to OOP and C++**

**15 Hrs**

Introduction to object oriented approach (OOA) and object oriented programming (OOP), concept of object and class.

**Features of OOP**-Encapsulation, Abstraction, Inheritance and Polymorphism. Advantages of OOP over structured programming.

Introduction to C++ with general basic features of operators and control structure (if, if-else, switch-case, while, do-while, for, etc.)

**UNIT-II: Classes, Objects and Functions.**

**15 Hrs**

**Classes**-specifying class, defining member functions and member variables, scope resolution operator, access specifiers and accessing class members, friend class, static class members.

**Objects**-Dynamic allocation operators (New and Delete), arrays of objects, object as function argument and functions returning objects, object assignment.

**Functions**-Inline functions, friend functions. Default arguments, reference variables.

Constructors-parameterized, multiple constructors in a class, copy constructor, destructor.

Function overloading, operator overloading (unary, binary).

**UNIT-III: Inheritance, Pointers and Polymorphism.**

**15 Hrs**

**Inheritance**-Defining derived classes. Inheritance types-single, multilevel, multiple, hierarchical and hybrid inheritance. Virtual base classes.

**Pointers**-Pointer to objects, this pointer, pointer to derived class.

**Polymorphism**-Virtual functions, pure virtual functions, abstract classes.

**UNIT-IV: Templates and Exception Handling.**

**15 Hrs**

**Templates**-Overview, Generic functions and generic classes.

**Exception handling**-Introduction, the keywords (try, catch and throw), multiple catch statements, catching all exceptions, rethrowing an exception.

**Note:** *The Practical Component shall be based on the Unit-I to Unit-IV*

**60Hrs**

**Books:**

1. "Object oriented programming with C++" by E Balaguruswamy
2. "The complete reference C++" by Herbert Schildt
3. Object oriented programming in C++" by Robert Lafore
4. C++ Primer, Lippman, Lajoie, Moo, 5th Edition, Addison Wesley
5. Object-Oriented programming with C++, M. T. Somashekara, D. S. Guru, H. S.Nagendraswamy, K. S. Manjunatha

MAJOR 2(CT-2)

COURSE TITLE	DATABASE MANAGEMENT SYSTEM(DBMS)
COURSE CODE	BITC1422M
SEMESTER	4 <sup>TH</sup>
COURSE TYPE	MAJOR 1 (CT-1)
CREDITS	4+2=6 CREDITS

**UNIT-I Introduction to Database Management System**

**15 Hrs**

**Introduction:** Traditional File processing system, drawback of traditional file processing system, evolution of data base system, advantages & disadvantages of DBMS. Basic concepts, database and database users, characteristics of database, the three level architecture for a DBMS, components of a DBMS, classification of DBMS users, DBMS facilities, structure of a DBMS.

**UNIT-II Database Models**

**15 Hrs**

**Data model classification:** Network and Hierarchical models, data modeling using the entity relationship approach, relational model, relational database, relation algebra& tuple calculus.

**UNIT-III Normalization**

**15 Hrs**

**Database decomposition:** Lossless join property, relational data base design, functional dependencies.

**Normalization for relational database:** Normal forms(1NF, 2NF, 3NF, 4NF, BCNF, 5NF).

**UNIT-IV Structured Query Language (SQL)**

**15 Hrs**

**Relational database manipulation:** SQL-A relational database language, data definition in SQL, data manipulation in SQL, views and queries in SQL, specifying constraints and indexes in SQL(ORACLE),creating triggers, stored procedures, functions & cursors in PL/SQL.

**Note: *The Practical Component shall be based on the Unit-I to Unit-IV***

**60 Hrs**

**REFERENCES:**

1. Date, C.J., "An Introduction to Database System", Narosa publications house, n. Delhi
2. Elmasri and Navathe, "Fundamentals of Database System", Addison Wesley, N.Y.
3. BipinDesai, "An Introduction to Database Concepts", Galgotia publications, N. Delhi

MAJOR 3(CT-3)

COURSE TITLE	DATA COMMUNICATION AND NETWORKING
COURSE CODE	BITC3422M
SEMESTER	4 <sup>TH</sup>
COURSE TYPE	MAJOR 3(CT-3)
CREDITS	4+2=6 CREDITS

**THEORY: 4 CREDITS; MAX. MARKS: 60 MIN. MARKS: 24**

**UNIT-I Introduction to Data Communication**

**15 Hrs**

**Data communication concepts:** introduction to data communication, data communication model, data communication modes (simplex, half-duplex, full duplex).

**Characteristics of signals:** (Amplitude, frequency, period, wavelength, S/N ratio), bandwidth & channel capacity, Nyquist law for noiseless channel and Shannon's, law for noisy channel, data rate v/s baud rate.

**UNIT-II Media in Data Communication**

**15 Hrs**

**Data communication media:** guided transmission media- twisted pair cable, coaxial cable, optical fiber cable (single mode, multimode step index fiber, multimode step index fiber, multimode graded index fiber).

Unguided transmission media (wireless) - radio waves, infrared waves.

**UNIT-III Networking concepts**

**15 Hrs**

Goals and Application of Networks, Classification of Networks: LAN, MAN, & WAN, Network Topologies: (Mesh, Star, Bus, and Ring topologies).

LAN Technologies: Ethernet, FDDI, CSMA/CD, Virtual Local Area Network (VLAN).

**UNIT-IV Network Models and Switching Techniques**

**15 Hrs**

**Switching Techniques:** Circuit Switching, Message Switching & Packet Switching, Multiplexing.

**Network standards & Protocols:** OSI Reference Model, TCP/IP Model and their Comparison. Connection oriented and Connectionless Approaches.

**PRACTICAL: 2 Credits; MAX. MARKS: 30 ; MIN. MARKS: 12**

**Note: *The Practical Component shall be based on the Unit-I to Unit-IV***

**BOOKS RECOMMENDED:**

1. "Data and Computer Communications" by William Stallings.
2. "Data Communication & Networking" by Behrouz AForouzan.
3. "Computer Networks" by Andrew Tanenbaum.
1. "Data communications and networks" by Godbole
1. Data & Computer Communication-- William Stallings
2. Data Communications and Networking –Behrouz A. Forouzan
3. Computer Networks—Andrew Tanenebaum