Program: BCA
Semester: Third
Course: Object Oriented Programming with C++
Course Code: 3C.201

L	T	P	C
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Course Objective:

- Use C++ features that replace C constructs to make C++ a safer and more flexible programming language
- Correctly use the features offered by C++ for Object-Oriented Programming
- Write class components that protect data integrity and produce classes that are re-usable and maintainable
- Design class responsibilities and relationships with the aim of maximizing class cohesion and minimizing class dependencies
- Use the generic programming features of C++
- Design and implement reliable and maintainable object-oriented applications of moderate complexity composed of several classes.

Unit I:

History & features: It's need & requirement, procedure oriented programming versus object oriented programming, basic concepts object oriented programming, object oriented languages.
Beginning with C++: Concepts & structure of C++programming, concepts of structure.
Objects & classes: Specifying a class, Defining member functions, Access specifiers (public, private) Arrays within a class, Creating objects, memory allocation for objects, static data & member function, Arrays of objects, objects as function argument.

Unit II:

Constructors and Destructors: Concept of Constructor, Types of constructors (Default, Parameterized, copy,), Overloaded Constructors (Multiple Constructor), Construct or with default argument, Destructors .Function overloading, Operator overloading (overloading unary & binary operators), rules for overloading operators.
Inheritance: Concepts of inheritance, Derived classes, Member declaration (Protected), Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance), Virtual base classes, Abstract classes, Constructors in derived classes, Member classes.

Unit III:

Pointers in C++: Concepts of pointer (Pointer declaration, pointer operator, address operator, pointer expressions, and pointer arithmetic), Pointers & functions (Call by value, call by reference, pointer to functions, passing function to another function), Pointers in arrays (Searching, insertion & deletion), Pointers to string (Searching, finding length, comparison, concatenation, reverse), Pointers & objects (Pointers to objects, this pointer, and pointer to derived classes).

Unit IV:

Polymorphism: Concepts of polymorphism, types of polymorphism,function Overloading &function overriding, Virtual function, Static & dynamic binding. Basic function of I/O system basics & File Processing: Stream classes, using formatted & unformatted functions, using manipulator to format I/O, Basics of file system, opening & closing a file, reading & writing character from a file(get() ,put(), getline (), write(), Command line arguments.

Suggested Readings:

1. C++ & Graphics by Vijay Mukhi's
2. Turbo C++ by Robert Lafore.
3. Mastering C++.
4. C++ Programming Language by Schaum's outline series.
5. M.Litvin & G.Litvin- Programs with C++ and Datastructures-Vikas Publishing Home, New Delhi, 2005.
6. S.Sahni- Data Structures, Algorithms and Applications in C++, 2ndEdn. UniversitiesPress, India, 2005.

Program: BCA
Semester: Third
Course: Object Oriented Programming with C++ Lab
Course Code: 3C.201

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Course Objective:

- To apply the concepts of data encapsulation, inheritance, and polymorphism to large-scale software
- To be able to discuss different data structures to represent real world problems
- To acquire the concepts of Graphical User Interfaces
- To design and develop programs with Graphical User Interfaces capabilities
- To be able to design various ways of algorithms to solve the problems.
- To explain the principles of the object oriented programming paradigm specifically including abstraction, encapsulation, inheritance and polymorphism

Program:
1. Simple C++ Programs to Implement Various Control Structures.
   a. If statement
   b. If – else statement
   c. Switch case statement
2. Programs to Implement
   a. For loop
   b. While loop
   c. do while loop
3. Programs to implement the concept of Class.
4. Programs to Understand Structure.
5. Programs to Understand Union.
6. Programs to Implement Recursion.
7. Programs to Implement Inline Functions.
8. Programs to Understand Different Function Call Mechanism.
   a. Call by Value
   b. Call by Reference
9. Programs to Implement Constructors.
10. Programs to Implement Destructors.
11. Programs to Understand
    a. Friend Function
    b. Friend class
12. Programs to Implement Single inheritance.
13. Programs to Implement Multilevel inheritance
14. Programs to Implement Multiple inheritance
15. Programs to Implement Hierarchical inheritance
16. Programs to Understand Pointer Arithmetic.
17. Programs to Implement
    a. Function Overriding
    b. Function Overloading
18. Program to work with file
    a. Open & Close a file
    b. Use of get( ), put( ), getline( ), write()

Program: BCA
Semester: Third
Course: Database Management Systems
Course Code: 3C.202

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Course Objective:

- Understand and evaluate the role of database management systems in information technology applications within organizations;
- Recognize and use contemporary logical design methods and tools for databases;
- Derive a physical design for a database from its logical design;
- Implement a database solution to an information technology problem;
- Understand the SQL data definition and SQL query languages;
- Have been introduced to the alternative design techniques utilized for Management Reporting applications.
- Develop sophisticated queries to extract information from large datasets.

Unit I:

Introduction to DBMS, architecture, administration roles, data dictionary, Traditional models, three-level architecture, hierarchical model, network model and relational model. Relational model – definitions and properties, keys integrity rules, relational algebra, joins, set operations, Tuple relational calculus and Domain relational calculus. SQL constructs, PL/SQL, Query & its optimization techniques. Singled valued functional dependencies. Database design, conceptual, logical and physical models, ER diagram and model, normal forms (1, 2, 3, BCNF). Storage structure- Sequential, Indexed Sequential. B+ tree – creation, insertion & deletion. Indexing- Primary, Secondary, Multi Level.

Unit II:

Relational databases. Relational Data Integrity- Candidate keys and related matters: CaPrimary and alternate keys. Foreign keys, foreign key rules, nulls. Candidate keys and nulls, foreign key and nulls. The SQL Language: Data definition, retrieval and update operations.Table expressions conditional expressions, embedded SQL. Views: Introduction, what are views for, data definition, data manipulation, SQL support.

Unit III:

Network model: basic concepts, data structure diagrams, DBTG CODASYL model, DBTG data retrival facility, DBTG update facility, DBTG set processing facility, mapping networks to file, networks system. Hierarchical model: basic concepts, tree structure diagrams, data retrieval facility, update facility, virtual records, mapping hierarchical to files, hierarchical system.

Unit IV:

File and system structure: overall system structure, file organisation, logical and physical file organization, sequential and random, hierarchical, inverted, nullist, indexing and hashing, B-tree index files.

Suggested Readings:

1. Data Base System Concepts, Silverchatz, Korth & Sudarshan, MH.
2. Data Base Management Systems, Majumder & Bhattacharyya, TMH
3. Oracle PL/SQL Programming,Feuerstein, SPD/O'REILLY
4. Fundamentals of Data Base Mgmt. System , Vig & Walia, ISTE/EXCEL
5. Data Base Management Systems,Leon, VIKAS
6. Data Base Processing:Fundamentals, Design & Implementation, Kroenke,PHI

Program: BCA
Semester: Third
Course: Database Management Systems Lab
Course Code: 3CP.202

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Course Objective:

- Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations.
- Design different views of tables for different users and to apply embedded and nested queries.
- Design and implement a database for a given problem according to well known design principles that balance data retrieval performance with data consistency.

Program:

1. **Database Schema for Emp_Details**
    Emp(Eid, Ename, Age, Dept, Salary, Adress, City, State)

    For the above schema, perform the following—

    a) Create the table with the appropriate data types and integrity constraints
    b) Insert around 10 records in the **Emp** table
    c) List all the employee names whose age is 40 years.
    d) List all the employee names with their City name, whose salary is greater than 30000.
    e) List the details of employees whose basic salary is between Rs. 10,000 and 25,000.
    f) Display the names of only those employees who belong to Mumbai.
    g) List the details for an employee whose Eid=5
    h) Create a view which lists out the Eid, Ename and Dept.
    i) List the names of employees having salary greater than Rs. 10000 or first alphabet of his name is 'B'.
    j) Delete the records of those employees whose salary is greater than Rs. 25000.

2. **Database Schema for Std_Details**
    Std(Roll_no, Name, Age, Dept, Course, Semester, Fee, Result)

    For the above schema, perform the following—

    a) Create the tables with the appropriate data types and integrity constraints
    b) Insert around 10 records in the **Std** table
    c) Create a view which lists out the Roll_no and Name.
    d) Create a view which will show the student names and their result.
    e) List the students who have exactly five letters in their name.
    f) Find out the total fee paid by the students.
    g) Create a view which will display the table in ascending order with the names of student.

h) Display the names of students having at least five characters in their name.
i) Add a penalty of Rs. 1500 in the fee of second student
j) Create a view which will display the student details belonging to either Delhi, Mumbai or Kolkata.

3. **Database Schema for Sports_Details**
   Player(Reg_no, Name, Age, Sports_name, Fee)

For the above schema, perform the following—

a) Create the tables with the appropriate data types and integrity constraints
b) Insert around 10 records in the **Player** table.
c) Change the name of the fifth player to 'Ramesh'.
d) List the players who play tennis or cricket.
e) Create a view which will display the player names and fee in descending order with their names.
f) Delete all the player's records whose age is below 20 years.
g) Count total number of rows in the table.
h) Add a new column **Address** to the existing table.
i) Delete all the details from the table **Player**.
j) Drop the table from its database.

4. **Database Schema for Student_Library scenario**

   Std(Std_no, Std_name)
   Membership(Mem_no, Std_no)
   Book(book_no, book_name, author)
   Iss_rec(iss_no, iss_date, Mem_no, book_no)

For the above schema, perform the following—

a. Create the tables with the appropriate data type and integrity constraints
b. Insert around 10 records in each of the tables
c. List all the student names with their membership numbers
d. Give a list of books taken by student with std_no as 7.
e. List the details of students who borrowed book whose author is 'Floyd'.
f. List all the issues for the current date with student and book names
g. List the book details which are issued as of today
h. Give a count of how many books have been bought by each student
i. Create a view which lists out the iss_no, iss _date, std_name, book name
j. Create a view which lists the daily issues-date wise for the last one week.

5. Database Schema for a Customer_Sale scenario
   Customer(cust id, cust_name)
   Item(item_id, item_name, price)
   Sale(bill_no, cust_id, item_id, qty_sold)

For the above schema, perform the following—

a) Create the tables with the appropriate data types and integrity constraints
b) Insert around 10 records in each of the tables
c) List the total Bill details with the quantity sold, price of the item and the final amount
d) List the details of the customer who have bought a product which has a price>500
e) List all the bills for the current date with the customer names and item numbers
f) Give a count of how many products have been bought by each customer
g) Give a list of products bought by a customer having cust_id as 5
h) List the item details which are sold as of today
i) Create a view which lists out the bill_no, bill_date, cust_id, item_id, price, qty_sold, amount
j) Create a view which lists the daily sales date wise for the last one week

Program: BCA
Semester: Third
Course: Software Engineering Techniques
Course Code: 3C.203

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Course Objective:

- Design a solution to a given problem using one or more design patterns and implement the design in a programming language.
- Apply software testing and quality assurance techniques at the module level, and understand these techniques at the system and organization level.
- Understand common lifecycle processes including waterfall (linear), incremental approaches (such as Unified process), and agile approaches.
- Work collaboratively in a small team environment to develop a moderate-sized software system from conceptualization to completion, including requirements elicitation, system modeling, system design, implementation, unit and system testing, integration, source code management configuration management, and release management.
- Prepare technical documentations and make presentations on various aspects of a software development project, including the technical aspects (architecture, design, quality assurance) as well as the managerial aspects (planning, scheduling, and delivery).

Unit I:

Introduction to Software Engineering: Definition, Software Engineering Paradigms, waterfall method, prototyping, interactive enhancement, The Spirit model, Fourth Generation Technique Software Metrics: Role of Metrics and measurement, Metrics for software productivity and quality, Measurement software, size–oriented metrics, function oriented metrics, Metrics for software quality, Integrating metrics within the software engineering process.

Unit II:

Software Requirement Specification (SRS): Problem analysis, structuring information, Data flow diagram and data dictionary, structured analysis, Characteristics and component of (SRS), Metrics of SRS, function point, Number of errors and found, change request frequency.

Unit III:

Planning a Software Project: Cost estimation, uncertainties in cost estimation, Single variable model, COCOMO model, On software size estimation, Project scheduling and milestones, Software & Personal Planning, Rayleigh curve, Personal Plan, Quality Assurance Plan, Verification & Validation (V & V), inspection & review. System Design: Design Objectives, Design Principles, problem, Partitioning, Abstraction, Top Down and Bottom–up techniques, Structure Design, Structure Charts, Design Methodology, Design Review, Automated Cross Checking, , total number of modular, number of parameters.

Unit IV:

Detailed Design: Module specification, Specifying functional module, specifying data abstraction, PDL and Logic/Algorithim Design. Coding: Coding by Top–down and Bottom–up, Structured Programming, Information Hiding, Programming style, Internal Documentation. Testing: Level of testing, Test cases and test criteria. Psychology of Testing, Functional Testing, Structural Testing.

Suggested Readings:

1. Software Engineering, Roger S. Pressman.
2. Integrated Approach to Software Engineering, Pankaj Jalote

Program: BCA
Semester: Third
Course: E-Commerce
Course Code: 3C.221

L	T	P	C
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Course Objective:

- Demonstrate an understanding of the foundations and importance of E-commerce
- Demonstrate an understanding of retailing in E-commerce by: analyzing branding and pricing strategies, using and determining the effectiveness of market research.
- Analyze the impact of E-commerce on business models and strategy
- Describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.
- Describe the infrastructure for E-commerce
- Describe the key features of Internet, Intranets and Extranets and explain how they relate to each other.
- Discuss legal issues and privacy in E-Commerce and assess electronic payment systems
- Recognize and discuss global E-commerce issues

Unit I:

Introduction to Electronic Commerce : What is E-Commerce (Introduction and Definition) Main activities E-Commerce Goals of E-Commerce Technical Components of E-commerce Functions of E-commerce Advantages and Disadvantages of E-commerce Scope of E-commerce Electronic commerce Applications Electronic commerce and Electronic Business C2C,C2G , G2G , B2G , B2P,B2A, B2A, C2A, B2B,B2C)

Unit II:

Building own website : Reasons for building own website Benefits of website Bandwidth requirements Cost, Time, Reach Registering a Domain Name Web promotion Target email , Banner Exchange , Shopping Bots **Internet and Extranet :**Definition of Internet Advantages and Disadvantages of the Internet Component of a Intranet Information technology structure Development of a Intranet Extranet and Intranet Difference Role of Intranet in B2B Application

Unit III:

Electronic payment System : Introduction   Types of Electronic payment system   Payment types Traditional payment Value exchange system Credit card system Electronic funds transfer Paperless bill Modern payment cash Electronic cash

Unit IV:

Technology Solution : Protecting Internet Communications Encryption Symmetric Key Encryption Public key Encryption Public Key Encryption using digital signatures Digital Envelopes Digital Certificates Limitations to Encryption solutions. **E-com Security :** E-commerce security environment Security threats in E-com environment   Malicious code and unwanted programs   Phishing and identity theft   Hacking and cyber vandalism   Credit card fraud/Theft   Spoofing   Denial of service(DOS) Distributed denial of service(dDOS)

Suggested Readings:
1. E-Commerce- Kenneth C.Laudon and Carol Guercio Traver
2. E-Commerce by --Kamlesh K Bajaj and Debjani Nag
3. Internet marketing and E-commerce-Ward Hanson and Kirthi Kalyanam
4. E-Commerce Concepts , Models , Strategies by -- G.S.V Murthy

Program: BCA
Semester: Third
Course: Disaster Management**
Course Code: 14B.201

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Course Objective:

- Develop an understanding of the key concepts, definitions a key perspectives of All Hazards Emergency Management
- Understand the Emergency/Disaster Management Cycle
- Have a basic understanding for the history of Emergency Management
- Develop a basic under understanding of Prevention, Mitigation, Preparedness, Response and Recovery
- Develop a basic understanding for the role of public a private partnerships.

Unit I:

Understanding Disasters: Understanding the concepts and definitions of disaster, hazard, vulnerability, risk, importance, dimensions & scope of Disaster Management, Disaster Management cycle and disaster profile of India.

Unit II:

Types, Trends, Causes, Consequences and Control of Disaster: Geological Disasters (earthquakes, landslides, tsunami, mining);Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves); Biological Disasters (epidemics, pest attacks, forest fire); Technological Disasters (chemical, industrial, radiological, nuclear, bomb threat, explosion) and Man-made Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters; terrorist attack, , sudden shooting);Global Disaster Trends–Emerging Risks of Disasters–Climate Change and Urban Disasters; Financial emergency(risk of eviction, risk in arrears, sudden health emergency, family emergency, unexpected loss of income).

Unit III:

Prevention and Mitigation of Disaster :Disaster Mitigation: meaning and concept, Disaster Mitigation Strategies Emerging Trends in Disaster Mitigation, Mitigation management, Role of Team and Coordination. Disaster Preparedness: Concept & Nature, Disaster Preparedness Plan, Preventions. Roles & Responsibilities of Different Agencies and Government, Technologies for Disaster Management. Early Warning System; Preparedness, Capacity Development; Awareness during Disaster.

Unit IV:

Applications of Science and Technology for Disaster Management & Mitigation: Geo-informatics in Disaster Management (RS, GIS, GPS and RS) Disaster Communication System (Early Warning and Its Dissemination) Land Use Planning and Development, Regulations, Disaster Safe Designs and Constructions, Structural and Non Structural Mitigation of Disasters.

Suggested Reading:

1. Disaster Management- J. P. Singhal, Laxmi Publications.
2. Disaster Management - Dr. Mrinalini Pandey, Wiley India Pvt. Ltd.
3. Disaster Science and Management- Tushar Bhattacharya, McGraw Hill Education (India) Pvt. Ltd.
4. Disaster Management: Future Challenges and Opportunities - Jagbir Singh, K W Publishers Pvt. Ltd.

Program: BCA
Semester: Third
Course: Communication and Soft Skills
Course Code: 40B.201

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Course Objective: The aim is to develop students' soft skills, communication, leadership and teamwork skills; and personal development skills using practical approach and exposure of students to the realities of the world.

- To enhance Leadership – assessing the requirements of a task, identifying the strengths/weaknesses within the team, utilising the diverse skills of the group to achieve the set *objectives*.
- To improve *Communication* – demonstrating clear briefing and listening /speaking skills.
- To make them realize that effective *communication* and interpersonal skills are crucial to increase employment opportunities and to compete successfully in the business environment.
- The *course* aims to cause a basic awareness about the significance of *soft skills* in professional and inter-personal *communications and* facilitate an all-round development of personality. Hard or technical skills help securing a basic position in one's life and career. But only *soft skills* can ensure a person retain it, climb.

UNIT I: COMMUNICATION SKILLS
  - Introduction
  - Role of Communication in Today's World
  - Objective of Communication
  - Process of Communication
  - Elements of Communication
  - Essentials of Communication
  - Barriers/ Factors Inhibiting Communication
  - Flow of Communication
  - Verbal Mode of Communication

Unit II: COMMUNICATION NETWORK
  - Non Verbal Mode of Communication
  - Kinesics/Body Language, proxemics , chronemics, para lingual
  - Style in Technical Communication
  - Communication Skills; Reading, Writing, Speaking, Listening & Talking

Unit III: GRAPHICS
  - Introduction
  - Planning of Graphics
  - Placing of Graphics
  - Construction of Graphics
  - Types of Graphics(textual ,visual, tables, bar Charts, pie charts, line charts, organizational charts, flow charts, maps & Pictographs)

Unit IV: TELEPHONIC CONVERSATION SKILLS

➢ Introduction
➢ Stages in Telephonic Conversation
➢ Listening & Speaking Skills
➢ Telephonic Skills
➢ Problems in Telephonic Conversation
➢ Intensive Listening

Suggested Books & Readings:

- Monippally, Matthukutty. M. 2001. *Business Communication Strategies.* 11th Reprint. Tata McGraw-Hill. New Delhi
- Swets, Paul. W. 1983. *The Art of Talking So That People Will Listen: Getting Through to Family, Friends and Business Associates.* Prentice Hall Press. New York
- Lewis, Norman. 1991. *Word Power Made Easy.* Pocket Books
- Sen , Leena .Communication Skills ; Eastern Economy Edition
- Ghanekar , Dr. Anjali . Essentials of Business Communication Skills ; Everest Publishing House
- David Green . *Contemporary English Grammar, Structure & Composition* ; MacMillan
- Dictionary; Oxford
- Dictionary ; Longman

Websites

- www.tatamcgrawhill.com/digital_solutions/monippally
- www.dictionary.cambridge.org
- www.wordsmith.org
- www.edufind.com
- www.english_the_easy_eay.com
- www.englishclub.com
- www.english_grammar_lessons.com
- www.wikipedia.org/wiki/english_grammar