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Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
Object Oriented Programming in C++ (Major)	BCA-301	L	T	J	EST	CAT	Total
		3	1	0	70	30	100

Course Objective	The aim of this course is to learn object oriented features and programming concepts of C++.

Units	Contents (*Theory*)	Hours /week
I	**Introduction:** Procedure-oriented programming, Concepts of Object-oriented programming, Structure of C++ program. Tokens, Keywords, Identifiers and constants, Basic Data Types, User-defined data types, Derived data Types, Symbolic constants, Declaration of variables, Operators in C++, Scope resolution operator, Memory management operators, Manipulators, Type cast operator, Expressions and their types, Operator overloading, Operator precedence, Control structures.	8
II	**Functions:** The main function, Function prototyping, Call by Reference, Return by Reference, Inline functions, Default arguments, const arguments, Function overloading.	8
III	**Classes and Objects:** Specifying a Class, Defining member functions, Making an Outside function Inline, Nesting of member functions, Private member functions, Arrays within a Class, Static data members, Static member functions, Arrays of Objects, Objects as function arguments, friendly functions, Returning Objects, const member functions, Pointers to members.	8
IV	**Constructors and Destructors:** Constructors, Parameterized constructors, Multiple constructors in a class, Constructors with default arguments, Dynamic initialization of objects, copy constructor, Dynamic constructor, Constructing Two-dimensional arrays, Destructors.	8
V	**Inheritance and Polymorphism:** Programming concepts and types. Console I/O Operations: C++ streams, C++ stream classes, Unformatted I/O operations, Formatted I/O operations, managing output with manipulators.	8

Text Books/ Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
E. Balagurusamy	Object Oriented Programming with C++ -	6th Edition	Tata McGraw-Hill Publishing
Robert Lafore	OOPS and C++	4th Edition	Course Sams Publishing
Stephen Prata	C++ primer plus	6th Edition	Addison-Wesley Professional
Al Stevens.	Teach yourself C++	5th Edition, 1997	Wiley

COURSE OUTCOMES: Students will be able to	
CO1	Understand the concepts of Object-oriented programming, data types, variables, Operators, Control structures.
CO2	Describe inline functions in C++.
CO3	Apply the concepts of Object-Oriented programming.
CO4	Illustrate the process of data file manipulations using C++
CO5	Use exception handling in C++ programs.

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Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
Data Base Management System (Minor)	BCA-302	L	T	J	EST	CAT	Total
		3	1	0	70	30	100

Course Objective	The objective of this course is to learn fundamentals of data models and to represent a data base system using ER diagrams, study of SQL and relational data base design.

Units	Contents (*Theory*)	Hours /week
I	**Database Concepts:** Data, Information & Knowledge, Introduction to Database Management System (DBMS): Database Concepts, characteristics of data in database, Advantages of DBMS, Overview of Database Models: Hierarchical Model, Network Model, Relational Model and Object Oriented Model. Three levels of Database Architecture: Conceptual, Physical and Logical levels. Entity Relationship Model: Entity, Attributes, Relationships, E-R Modeling Symbols.	8
II	**Relational DBMS:** RDBMS Terminology, Relational Data Structure, Data Integrity, Codd's Rule, Overview of Relational Algebra and Relational Calculus, Relational Database Design: Primary Keys, Foreign Keys, Candidate Keys, Relationships, Normalization, Purpose of Normalization, First Normal Form, Second Normal Form, Third Normal Form.	8
III	**SQL:** SQL Data Types and Literals, DDL, DML, DQL, DCL, DAS, TCS, SQL operators, Creating Database, Creating, Modifying and Deleting Tables, Creating View, Indexes, Queries: Insert, Select, Update, Where Clause, Having Clause, Sub-Queries, Order By, Grouping, Creating Variables, Functions: Aggregate and Scalar, Joins, Unions, Triggers, Procedures.	8
IV	**Transactions:** Transaction concept, Transaction Properties, Transaction States, **Concurrency Control:** Concurrency Control Schemes - Lock Based Protocols, Time stamp Based Protocols, Deadlock handling, User Defined Transactions.	8
V	**Database Security:** Data Security Risks, Data security requirements, Database Users, Database Backup, Database Recovery: Types of database Failures, Recovery Techniques -Deferred Update, Database Privileges – System Privileges and Object Privileges, Overview of Data Storage Devices.	8

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Text Books/ Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Silberschatz, Korth & Sudarshan	Database System Concepts	7th ed., 2018	McGraw Hill, New York
S. K. Singh	Database Systems, Concepts, Design and Applications	2011	Dorling Kindersley (India)
Raghu Rama krishnan, Johannes Gehrke	Database Management Systems	2nd ed., Release, 2001	McGraw-Hill
Elmsari, Navathe	Fundamentals of Database Systems	5th Edition	Pearson Education

COURSE OUTCOMES: Students will be able to	
CO1	Understand database concepts and database management system software
CO2	Understand RDBMS and Normalization.
CO3	Write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
CO4	Understand Transactions
CO5	Identify database failures and understand database privileges.

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Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
Accounting and Management Control (GEC)	BCA-303	L	T	J	EST	CAT	Total
		3	1	0	70	30	100

Course Objective	The objective of this course is to introduce problems of financial accounting such as measuring and reporting issues related to assets and liabilities and preparing the financial statements.

Units	Contents (Theory)	Hours /week
I	Meaning and objects of accounting, accounting concepts and conventions, accounting equations, rules of Journalizing; Cash-book, Ledger posting, preparation of trial balance.	8
II	Trading Account, profit and loss account and balance sheet with adjustments relating to closing stock, outstanding expenses, prepaid expenses, accrued income depreciation, bad debts, provision for bad debts.	8
III	Inventory pricing, FIFO and LIFO methods; Simple problems of funds flow statement, cost volume, profit analysis.	8
IV	Standard costing, computation of material and labour variances, budgetary control, preparation of cash budget and flexible budget.	8
V	Management control and its characteristics, goals and strategies, structure and control. Responsibility centers and control centers: concepts of Responsibility centers, revenue centers, profit centers and investment centers.	8

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Text Books/ Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
S P Jain and K L Narang	Fundamentals of Accounting	2017	Kalyani Publishers
B S Raman	Fundamentals of Accounting	2017	Universal Publications
R Venkata Raman and Srinivas	Accounting for Managers	2017	Himalaya Publishing House
S.N. Maheshwari & S.K. Gupta	Introduction to Accounting	2016	Vikas Publisher

COURSE OUTCOMES: Students will be able to	
CO1	Demonstrate knowledge in setting up a computerized set of accounting books for a "for profit" entity.
CO2	Learn relevant financial accounting career skills.
CO3	Develop decision making skills in the financial analysis context.
CO4	Identify and analyze financial accounting problems and opportunities in real life situations.
CO5	Use accounting information as a tool in applying solutions for managerial problems, evaluating the financial performance, and interpreting the financial structure.

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Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Soft Skills & Entrepreneurship (SEC)	BCA-304	3	1	0	70	30	100

Course Objective	The objective of this course is to make the students aware of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration and practice.

Units	Contents (*Theory*)	Hours /week
I	**Introduction:** Process of Communication, Language as a Tool, Levels of Communication, Communication Networks, Importance of Technical Communication. Definition of Noise, Classification of Barriers. **Know Thyself:** Introduction to Soft skills-Self discovery-Developing positive attitude-Improving perceptions-Forming values.	8
II	**Impact of Technology:** Software for Creating Messages, Software for Writing Documents, Software for Presenting Documents, Transmitting Documents, Effective use of Available Technology. **Interpersonal Skills:** Developing interpersonal relationship, Team building, group dynamics, Net working-Improved work relationship.	8
III	**Communication Skills:** Introduction, Types of Listening, Traits of good Listener, Active versus passive listening, implications of effective listening. Art of listening, Art of reading, Art of speaking, Art of writing, Art of writing, e-mails, email etiquette.	8
IV	**Effective Presentation Skills:** Introduction, Defining purpose, Analyzing Audience and Locale, Organizing Contents, preparing outline, Visual Aids, Understanding Nuances of Delivery, Kinesics, Proxemics, Paralinguistic's, Chronemics, Sample speech. **Corporate Skills:** Developing body language, Practicing etiquette and mannerism, Time management-Stress management.	8

V	**Job Skills:** Writing resume, Interview skills-Group discussion, Group Discussion types, Group discussion as part of selection process, Mock interview-Mock GD , Goal setting , Career planning.	**8**

Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Meena. K and V. Ayothi	Soft Skills : A Road Map to Success	2013	P.R. Publishers & Distributors
Alex K.	Soft Skills – Know Yourself & Know the World	2012	S. Chand & Company LTD
M. Ashraf Rizivi	Effective Technical Communication	2009	Tata McGraw Hill
Meenakshi Raman and Sangeeta Sharma	Technical Communication - Principles and Practices	2010	Oxford University Press

COURSE OUTCOMES: Students will be able to	
CO1	Effectively communicate through verbal/oral communication and improve the listening skills.
CO2	Write precise briefs or reports and technical documents.
CO3	Actively participate in group discussion / meetings / interviews and prepare & deliver presentations.
CO4	Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.
CO5	Prepare resume for the job as well as job skills will be developed.

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Name of Paper & Category	Paper Code	Theory					
		Credit			**Marks**		
Linux & Shell Programming (SEC)	**BCA-305**	**L**	**T**	**J**	**EST**	**CAT**	**Total**
		3	1	0	70	30	100

Course Objective	The objective of this course is to make the students aware of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration and practice

Units	Contents (*Theory*)	Hours /week
I	**Linux:** An introduction – Linux Commands: Directory Oriented Commands – File Oriented Commands – Process Oriented Commands – #Communication Oriented Commands# – General Purpose Commands.	**8**
II	**Pipes and Filters:** Pipe – redirection – Filters – Vi Editor : Starting Vi modes – insert, delete and replace commands – #Search Commands# – Redo, Undo Commands.	**8**
III	**Shell Programming:** Shell script – Shell variables – escape mechanisms - Shell meta characters – #control statements# – iterative statements.	**8**
IV	**Shell scripts – System Administration:** system administrator – booting and shutting down the system – adding and deleting a user.	**8**
V	**The C Shell:** Setting variables – input – loops – MySQL and PHP : MYSQL – working with mysql – operators – data types – creating a table – inserting and selecting values – updating and altering a table – dropping a table – #PHP# – First example – variables.	**8**

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Text Books/ Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Mohamed Ibrahim	Linux – A Practical Approach, By Firewall	2005	Media publications
Richard Petersen	Linux – The Complete Reference	Sixth Edition	Tata McGRAW Hill

COURSE OUTCOMES: Students will be able to	
CO1	Understand the basic commands of Linux operating system and can write shell scripts.
CO2	Create file systems and directories and operate.
CO3	Create processes background and fore ground etc..by fork() system calls.
CO4	Create shared memory segments, pipes, message queues and can exercise inter process communication.
CO5	Explain C Shell & MySQL.

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Name of Paper & Category	Paper Code	Practical				
		Credit		Marks		
		P	J	ESP	CAP	Total
Programming Lab in C++ (Major)	**BCA-306**	2	-	70	30	100

Contents (Practical):-

1. Write a C++ program to calculate the average of three numbers.
2. Write a C++ program to find the biggest of three numbers.
3. Write a C++ program to find minimum and maximum of two numbers using functions.
4. Write a C++ program to check the given number is palindrome or not
1. Write a C++ program to sum of all even and odd numbers.
2. Write a C++ program to perform arithmetic operations using classes and objects.
3. Write a C++ program to define a student class with user name, to name, total, average for "n" students.
4. Write a C++ program to illustrate the use of static member function.
5. Write a C++ program to find the mean value using friend function..
6. Write a C++ program to show the use of copy constructor.
7. Write a C++ program to implement multiple inheritances.
8. Write a C++ program to read a string with get line function.
9. Write a C++ program to implement processing shopping list using a class with arrays as data members.
10. Write a C++ program to show the use of over loaded constructor.
11. Write a C++ program to construct variables at run time using dynamic initialization.
12. Write a C++ program to demonstrate single inheritance.
13. Write a C++ program to implement multilevel inheritance.
14. Create a project using object oriented features and file handling in C++.

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Name of Paper & Category	Paper Code	Practical				
		Credit		Marks		
Programming Lab in DBMS (Minor)	**BCA-307**	**P**	**J**	**ESP**	**CAP**	**Total**
		2	-	70	30	100

Contents (Practical):

1. Write a query to create information of 'employees' (table name) in an organization with field Emp_id, EName, Salary, Commission, Hire_date, Address.
2. Write a Query to selective insertion only for Name and salary. (We assume that NOT NULL constraint apply is not on other fields).
3. Write a Query to display Name and Salary of employees table where salary is equal 5000.
4. Write a Query to display total income of every employee.
5. Write a Query to display employees name in descending order with salary.
6. Write a Query to display salary of employees between 40,000 to 50,000.
7. Display the Ename, which is start with j, k, l or m.
8. Write a PL/SQL for select, insert, update and delete statements.
9. Display name, hire date of all employees using SQL.
10. Display details of first 5 highly paid employees in SQL.
11. Write a data base trigger, which should not delete from Emp table if the day is Sunday.
12. Solving the case studies using ER Data Model (design of the database) & implement a Mini Project for the any problem taken by you.