BCA III Sem/II Year

Syllabus for the Session 2024-25 (ODD Semester)

Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Object Oriented Programming using C++**	**Course Code:**	**BCA0301T**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
◉ Core	○ Major	○ Minor	○ Elective	○ Co-curricular	○ Vocational

Course Objectives	1. To learn object-oriented programming paradigms and structure of C++. 2. To learn & implement various programming problems in C++. 3. To learn & implement advanced programming concepts in C++ 4. To learn error handling technique in C++ and improve problem solving ability.
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*	
Course Outcome (CO)	**Attributes**
CO1	Know basic knowledge of object-oriented modelling, structure of object-oriented programming language using C++ and its application in computer science.
CO2	Understand basic concepts & Design and develop various programming problems using basic concepts of C++.
CO3	Learn and implement advance programming concepts of C++ like Inheritance, operator overloading, etc.
CO4	Learn and implement exception handling mechanism for debugging in C++.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Introduction to OOP and C++:** Introduction to Object Oriented Concepts, Advantages of OOP, Need of object-oriented programming, Characteristics of object-oriented languages. **C++ Programming Basics:** Basic program structure, Input/output using cin/cout, Pre-processor Directives, Comments, Integer, Character, Float data types, Manipulators, Operators, Library functions.	**15**	**CO1**
Unit 2	**Functions:** Basic of functions, Passing arguments to and returning values from functions, Reference Arguments, Overloaded functions, Inline functions, Default Arguments, Friend function, Variable and Storage classes, Call by value and Call by reference. **Objects and Classes:** Using class and object, Constructors, Destructor, Objects as function arguments.	**15**	**CO2**
Unit 3	**Arrays Operator Overloading:** Array Fundamentals, Arrays as class member data, Arrays of objects, Strings, Overloading Unary and Binary operators, Data conversion, Pitfalls of overloading and Conversion. **Inheritance:** Derived class and their constructs, Inheritance levels, Public and Private Inheritance, Overriding member functions.	**15**	**CO3**

Unit 4	**Pointers:** Pointers in C++, Pointer to Functions, Pointer to objects, new-delete. **Virtual Functions:** Virtual, Static function, this pointer. Error Handling: Try –Catch, Block, Finally, Throws.	**15**	**CO4**

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	3	1		2	2	2	1		2
CO2	3	2	3	3	2	1		1	1	2	1	
CO3	2	2	2	2		2		2	2	2	2	1
CO4	3	3	3	3	3		1	3	2	3	1	

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. E. Balagrusamy, "Object oriented programming in C++", TMH, 2020. 2. A.R. Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.
Reference Books	1. S.B. Lippman & J. Lajoie, " C++ Primer", 3rd Edition, Addison Wesley, 2000. 2. D. Parasons, "Object Oriented Programming using C++", BPB Publication.
e-Learning	• https://www.w3schools.com/cpp/ • https://onlinecourses.nptel.ac.in/noc19_cs38/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

Course created by: **Signature:**	**Approved by:** **Signature:**

Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Object Oriented Programming using C++ Lab**	**Course Code:**	**BCA0301P**	**Type:**	**Practical**
Credits	**02**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
◉ Core	○ Major	○ Minor	○ Elective	○ Co-curricular	○ Vocational

Course Objectives	1. To write programs for object-oriented programming paradigms and structure of C++. 2. To solve various programming problems in C++. 3. To implement advanced programming concepts in C++ 4. To apply error handling technique in C++ and improve problem solving ability.

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**Attributes**
CO1	Create programs of object-oriented modelling, structure of object-oriented programming language using C++.
CO2	Design and develop various programming problems using basic concepts of C++.
CO3	Develop programs to implement advance programming concepts of C++ like Inheritance, operator overloading, etc.
CO4	Demonstrate exception handling mechanism for debugging in C++.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	• Mid-term Practical Examination: 12 Marks • Experiment –Writing - 05 • Execution of Program - 05 • Practical File Record - 04 • Viva-Voce - 04

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	1. Demonstration C++ Program Structure. 2. Program illustrating input/ output functions. 3. Program illustrating Classes and Objects. 4. Program illustrating use of Function, Inline Function.	**13**	**CO1**
Unit 2	1. Program illustrating Static Member functions & Friend function. 2. Program illustrating use of Function Overloading. 3. Program illustrating use of Constructor and types of Constructor. 4. Program illustrating Constructor Overloading.	**15**	**CO2**
Unit 3	1. Program illustrating Simple Array. 2. Program illustrating 1-D & 2-D Array. 3. Program illustrating Pointers. 4. Program illustrating Inheritance and types of Inheritance.	**17**	**CO3**
Unit 4	1. Program illustrating use of Virtual functions. 2. Program illustrating Exception Handling. 3. Program implementing Search algorithms.	**15**	**CO4**

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	3	1	3		2	2	2		1
CO2	3	2	3	3		2	2	1	1	2	1	
CO3	2	2	2	2	2	2		3	2	1	1	
CO4	3	3	2	3		3	1	2	2	3		1

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. E. Balagrusamy, "Object oriented programming in C++", TMH, 2020. 2. A.R. Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.
Reference Books	1. S.B. Lippman & J. Lajoie, " C++ Primer", 3rd Edition, Addison Wesley, 2000. 2. D. Parasons, "Object Oriented Programming using C++", BPB Publication.
e-Learning	• https://www.w3schools.com/cpp/ • https://www.w3resource.com/cpp-exercises/basic/index.php

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester	12	**Section A:** Contains **04** practical questions out of which **03** questions are to be attempted. Each question carries **08 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Experiment –Writing	05	Will be decided by subject teacher
Execution of Program	05	Will be decided by subject teacher
Practical File Record	04	Practical file to be made on experiments and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

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Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Database Management System**	**Course Code:**	**BCA0302T**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
◉ Core	○ Major	○ Minor	○ Elective	○ Co-curricular	○ Vocational

Course Objectives	1. To learn the basic knowledge of Database Management System and various types of data models. 2. To learn the concept and syntax of ER Diagram and the extended ER features. 3. To learn various constraints and writing SQL queries and Normalization. 4. To learn the various issues in transaction processing.

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**Attributes**
CO1	Understanding database concepts and database management system software.
CO2	Understanding major DBMS components and their functions.
CO3	Model an application's data requirements using conceptual modelling tools like ER diagrams and design database schemas based on the conceptual model.
CO4	Write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Introduction to Databases:** Database System versus File System, **DatabaseSystem Concepts and Architecture:** Data Models, Schemas, and Instances,Three schema architecture and Data Independence, Classification of Database Management Systems, Advantage of Database System.	**15**	**CO1**
Unit 2	**Entity-Relationship Model:** Basic Concepts, Constraints, **Keys:** Primary Key, Super key, Candidate key, Entity Types, Entity Sets, Design issues, Entity- Relationship Diagram, Relations, Relationship types, Roles and Structural Constraints, Weak Entity sets. **Introduction to the Relational Model:** Relational data model concepts, integrityconstraints: entity integrity, Referential integrity, Keys constraints and Domain constraints.	**15**	**CO2**
Unit 3	**SQL:** Data Definition, Constraints, Schema Changes in SQL, SQL Data types, Basic Queries in SQL, Insert, Delete and Update Statements in SQL, Group by, order by, having clauses with examples. **Aggregate function**: sum, avg, count, max, min. **Data Normalization:** Functional dependencies, Normal form concepts and Types: First Normal Form, Second Normal Form, Third Normal form.	**15**	**CO3**
Unit 4	**Transaction Processing:** Transaction system, Transaction concepts: Transaction execution and Problems, Transaction execution and control	**15**	**CO4**

	with SQL, Transaction properties, Concurrency control, locking Techniques for concurrency control.		

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	1	2		1	2	2	2	1	
CO2	1	2	3	3	1	2		1	1	1		1
CO3	3	3	3	2			2	2	2		2	
CO4	2	2	2		2	3		3	2	3		2

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. "Database System Concepts" by Abraham Silberschatz and S Sudarshan 2. "Introduction to Database Management Systems" by Kahate.
Reference Books	1. "An Introduction to Database Systems" by Bipin Desai. 2. "Fundamentals of Database Systems" by R Elmasri and S Navathe.
e-Learning	• https://www.guru99.com/dbms-tutorial.html • https://onlinecourses.nptel.ac.in/noc19_cs46/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

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Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Database Management System Lab**	**Course Code:**	**BCA0302P**	**Type: Practical**	**Practical**
Credits	**02**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
◉ Core	○ Major	○ Minor	○ Elective	○ Co-curricular	○ Vocational
Course Objectives	1. To learn the basic knowledge of Database Management System and various types of data models. 2. To create ER Diagram and the extended ER features for real world problems. 3. To design and write SQL queries and Normalization. 4. To implement the transaction processing.				
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*					
Course Outcome (CO)	**Attributes**				
CO1	Creating and altering Databases, tables and writing a query using SQL DML/DDL commands.				
CO2	Implementing the constraints like Primary key, Foreign key, Unique Key, Null, Not null and various relational algebra operations.				
CO3	Using Aggregate functions in SQL with the concept of Grant and Revoke commands.				
CO4	Implementing the various joins, sub-queries, set theory commands and Data constraints.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks				

Unit	Topic	Session	Mapped CO
Unit-I	**1.** Creating database and using database.	**15 Hrs**	**CO1**
	2. Creating tables.		
	3. Insertion, Deletion, Updating and Retrieval of data.		
Unit-II	**4.** Arithmetic operations, Logical operations, and Pattern matching.	**15 Hrs**	**CO2**
	5. Concept of Grouping (Group by clause, Having Clause).		
	6. Use Aggregate function in query.		
Unit-III	**7.** Granting permissions (Grant, Revoke).	**15 Hrs**	**CO3**
	8. Write commands for Joins, Union and Intersection.		
	9. Concept of Sub-query.		
Unit-IV	**10.** Concept of Data constraints (Unique Key, Primary Key, Foreign Key).	**15 Hrs**	**CO4**
	11. Creating Views and Indexes.		
	12. Introduction to PL/SQL.		
	Total Session	**60**	

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	1		2		1	1	1		
CO2	1	2	3	3	2				2	1		1

CO3	3	3	3	2		2		2	2	2	2	1
CO4	2	2	2		2			2	3	3	2	2

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. "Database System Concepts" by Abraham Silberschatz and S Sudarshan 2. "Introduction to Database Management Systems" by Kahate.
Reference Books	1. "An Introduction to Database Systems" by Bipin Desai. 2. "Fundamentals of Database Systems" by R Elmasri and S Navathe.
e-Learning	• https://www.w3resource.com/sql-exercises/ • https://notesformsc.org/dbms-exercises/ •

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester	12	**Section A:** Contains **04** practical questions out of which **03** questions are to be attempted. Each question carries **08 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

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Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Software Engineering**	**Course Code:**	**BCA0303T**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
○ Core	◉ Major	○ Minor	○ Elective	○ Co-curricular	○ Vocational

Course Objectives	1. Be agile software developers with a comprehensive set of skills appropriate to the needs of the dynamic global computing-based society. 2. Capable of team and organizational leadership in computing project settings 3. To have a broad understanding of ethical application of computing-based solutions to societal and organizational problems. 4. Acquire skills and knowledge to advance their career, including continually upgrading professional, communication, analytic, and technical skills.

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**Attributes**
CO1	To understand about designing model and practical implementation.
CO2	To take decision of project planning on the basis of cost evaluation.
CO3	To understand risk identification and management.
CO4	To use various tools for software design development.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Software Product:** Software Engineering Fundamentals, Definition of Software Products. **Software Life Cycles Models:** Waterfall Model, Prototype Model, Iterative Model, Evolutionary Model, and Spiral Model. **Requirements and Specification:** Value of a good SRS, Requirement process, Requirement specification, Desirable characteristics of SRS. Components of SRS.	**14**	**CO1**
Unit 2	**Software Design Principles:** Software design and its activities, Characteristics of a good software design, Cohesion, Coupling, Functional Independence, Function- oriented vs. object-oriented design approach, Data Flow Diagram (DFD), Data Dictionary.	**16**	**CO2**
Unit 3	**Software Testing:** The Testing concept, Testing Process, Black Box testing and White Box Testing. **Software quality assurance:** Quality concept, Software quality assurance, ISO 9000and SEI CMM and their Comparison.	**15**	**CO3**
Unit 4	**Software Maintenance:** Management of Maintenance, Maintenance Process and Models, Business Process Reengineering, Reverse Engineering and Reengineering, Risk Management.	**15**	**CO4**

CO-PO and PSO Mapping

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	2	1	2	1	2	1			1		
CO2	1	1	2	2		2	3	2	2		1	1

CO3	3	2	3	2	2	1	2	1	2	2	1	1
CO4	2	3	2	3	2	3	3					

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. R. Pressman, "Software Engineering", TMH. 2. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa.
Reference Books	1. Rajib Mall, "Fundamentals of Software Engineering", PHI. 2. Pankaj Jalote, "Software Project Management in Practice", Pearson Education.
e-Learning	• https://www.tutorialspoint.com/software_engineering/index.htm • https://nptel.ac.in/courses/106105182

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

Course created by: **Signature:**	**Approved by:** **Signature:**

Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Computer System Architecture**	**Course Code:**	**BCA0304T**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
○ Core	○ Major	◉ Minor	○ Elective	○ Co-curricular	○ Vocational

Course Objectives	1. To have a thorough understanding of the basic structure and operation of a digital computer. 2. Remember and understand the basics of computer architecture, organization and Design. 3. An ability to understand the functions of various hardware components and their building blocks 4. In depth understanding of Central Processing Unit & I/O organization.

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**Attributes**
CO1	Understand basic structure of a computer system.
CO2	Learn basic computer organization and design.
CO3	Learn organization of the peripheral devices, the interface between these devices to the system.
CO4	Understand the architecture of a basic computer, its registers, bus system and the interaction flow among them.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Basic Structure of a Computer System**, Arithmetic Logic Unit, Control Unit, Bus Structure, Von Neumann Architecture.	15	CO1
Unit 2	**Basic Computer Organization and Design**: Register Transfer Language, Arithmetic and Logical, micro-operations, Shift micro-operation.Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference instructions, input-output and interrupt.	15	CO2
Unit 3	**Central Processing Unit**: Micro programmed control, Control memory, address sequencing, General Register organization, stack organization, Instruction formats, addressing modes, Data transfer and manipulation, Program Control, RISC, CISC.	15	CO3
Unit 4	**Input Output Organization**: Peripheral devices, I/O interface, Asynchronous data transfer, Strobe Control, Handshaking Modes of Transfer, Priority Interrupt, Direct Memory Access, Input-Output Processor, and Serial Communication.	15	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	1					1	1		1
CO2	1	2	2		1	2	3	2	2		1	
CO3	2	3	3	2	1		2	1		2		1
CO4	2	2	2			3	3		2	1	1	

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. M. Mano, "Computer System Architecture", Pearson Education, New Jersey, 2017, 3rd Ed. 2. W. Stallings, "Computer Organization and Architecture Designing for Performance", Prentice Hall of India, 2015, Tenth Edition.
Reference Books	1. M. Mano, "Digital Design", Pearson Education, New Jersey, 2018, Sixth Edition.
e-Learning	• https://onlinecourses.nptel.ac.in/noc23_cs67/preview • https://www.javatpoint.com/computer-organization-and-architecture-tutorial

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

Course created by: **Signature:**	**Approved by:** **Signature:**

Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Accounting & Financial Management**	**Course Code:**	**BCAE0301T**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
○ Core	○ Major	○ Minor	◉ Elective	○ Co-curricular	○ Vocational

Course Objectives	1. To develop the participants" knowledge and competence to effectively evaluate. 2. To make sound decisions concerning the operational, investing and financing activities of a firm within the specific contexts of the participants" organizations. 3. To learn financial management. 4. To understand Budgetary Control and Fund Flow Statements.

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**Attributes**
CO1	Demonstrate a critical understanding and the ability to use and interpret financial and non-financial information in management planning and decision making, in operational control, and performance evaluation.
CO2	Recognize and apply the appropriate techniques and tools used by managers in complex domains of decision making.
CO3	Demonstrate a critical understanding of nature of the information provided by the accounting system of a company and systematically evaluate the characteristics of this information that make it most useful for decision making.
CO4	Demonstrate a comprehensive understanding of the key role of financial management in making sound financial decisions such as fund raising and investing.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Accounting**: Meaning, Objective, Scope and Uses of Accounting, Types of Accounting, Fundamentals of Accounting: Concept and Conventions, Meaning of GAAP and IFRS, Books of Accounts: Journal, Ledger, Trial Balance, Profit and Loss Account and Balance Sheet, Accounting for Cash: Cash Book.	**12**	**CO1**
Unit 2	**Financial Management**: Meaning, Objective, Importance and Scope of Financial Management, Finance Functions and Various Decisions: Investment Decisions, Finance Decisions, Dividend Decisions, Capital Budgeting Decisions, Analysis of Financial Statement, Ratio Analysis: Liquidity, Solvency, Profitability and Efficiency Ratio, Cost Volume Profit Analysis (Break Even Analysis).	**18**	**CO2**
Unit 3	**Cost Accounting**: Meaning, Nature, Need, Elements of Cost, Cost Classification and Allocation of Costs, Absorption and Marginal Costing.	**15**	**CO3**

Unit 4	**Budgetary Control and Fund Flow Statements**: Budgetary Approach to Financial Planning, Different types of Budgets, Performance Budgeting, Zero Base Budgeting, Capital Budgeting, Definition, Meaning and Preparation, Cash Flow Statements: Definition, Meaning and Preparation.	**15**	**CO4**

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2					1	1		
CO2		2	2		1	2	3	2	2	2		
CO3	2	3	3	2			2	1	2	2		
CO4		2	2		2	3	3		2	1		

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. Kulkarni and Satyaprasad , "Financial Management", Himalaya Publishing House. 2. P.C. Tulsion , "Accountancy", Tata McGraw Hill.
Reference Books	1. NandDhameja and K.S. Sastry, "Finance and Accounting", Wheeler Publishing. 2. Prof (Dr.) Mansoor Ali, Ganpat Rai, "Elements and Management Accounting", New Delhi
e-Learning	• https://www.tutorialspoint.com/accounting_basics/index.htm • https://onlinecourses.swayam2.ac.in/cec19_cm04/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

Course created by: **Signature:**	**Approved by:** **Signature:**

Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**E-Commerce**	**Course Code:**	**BCAE0302T**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
○ Core	○ Major	○ Minor	◉ Elective	○ Co-curricular	○ Vocational
Course Objectives	1. To introduce the information systems for business and management. 2. To familiarize students with organizational and managerial foundations of systems, 3. To learn the fundamental concepts of electronic data interchange. 4. To asses security related issues in E-commerce.				
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*					
Course Outcome (CO)	**Attributes**				
CO1	Understand the basic concepts and technologies used in the field of management information systems.				
CO2	Understand the different types of management information systems.				
CO3	Understand the processes of developing and implementing information systems.				
CO4	Aware of the ethical, social, and security issues of information systems.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks				
Session Details	**Topic**			**Hours**	**Mapped CO**
Unit 1	**E-commerce and its Technological Aspects:** Overview of developments in Information Technology and Defining E-Commerce: The scope of E commerce, Electronic Market, Internet Commerce, Benefits and limitations of E-Commerce, Produce a generic framework for E-Commerce, Architectural framework of Electronic Commerce, Web based E Commerce Architecture.			**12**	**CO1**
Unit 2	**Consumer Oriented E Commerce E-Retailing:** Traditional retailing and e retailing, Benefits of e retailing, Key success factors, Models of e retailing, Features of e retailing. E services: Categories of e-services, Web-enabled services, match making services, Information-selling on the web, e entertainment, Auctions and other specialized services. Business to Business Electronic Commerce.			**18**	**CO2**
Unit 3	**Electronic Data Interchange:** Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment. **Digital economy:** Identify the methods of payments on the net-Electronic Cash, cheques and credit/debit cards on the Internet.			**15**	**CO3**

Unit 4	**Security & Issues in E Commerce:** Security Policy, Social and Political issues in E-Commerce, Basic Ethical Concepts, Analysing Ethical Dilemmas, Candidate Ethical principles, the Concept of Privacy, Legal protections Intellectual Property Rights: Types of Intellectual Property protection, Governance.	**15**	**CO4**

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	2					1	2		
CO2		2	2	3	3	2	3	2		2		
CO3	2	3	3	2			2	1	1	3		
CO4		2	2	3	1	3	3		1	2		

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. Elias. M. Awad, "Electronic Commerce", Prentice-Hall of India Pvt Ltd. 2. Ravi Kalakota, Andrew B. Whinstone, "Electronic Commerce-A Manager's guide", Addison-Wesley.
Reference Books	1. Efraim Turban, Jae Lee, David King, McMichael Chung, "Electronic Commerce–A Managerial Perspective", Addison-Wesley. 2. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
e-Learning	• https://www.geeksforgeeks.org/e-commerce/ • https://onlinecourses.swayam2.ac.in/nou21_cm14/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

Course created by: **Signature:**	**Approved by:** **Signature:**

Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Human Values and Business Ethics**	**Course Code:**	**BCAC0301T**	**Type:**	**Theory**
Credits	**03**			**Total Sessions Hours:**	**45 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
○ Core	○ Major	○ Minor	○ Elective	◉ Co-curricular	○ Vocational

Course Objectives	1. To build fundamental knowledge of the interplay of markets, ethics, and law, 2. To understand various challenges faced by individual to counter unethical issues. 3. To learn core concepts for business ethics. 4. Look at core concepts for a morally articulate solution evolver to management issues and sustainable development for a better environment.
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*	
Course Outcome (CO)	**Attributes**
CO1	Understand the interplay of markets, ethics, and law.
CO2	Understand the basic factor related to business ethics.
CO3	Develop understanding sustainable development for a better environment.
CO4	Exhibit ethical values in society.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Human Values**- Introduction- Values, Characteristics, Types, Developing Value system in Indian Organisation , Values in Business Management , value based Organisation , Trans –cultural Human values in Management. Swami Vivekananda's philosophy of Character Building, Gandhi's concept of Seven Sins, APJ Abdul Kalam view on role of parents and Teachers.	11	CO1
Unit 2	**Human Values and Present Practices** – Issues: Corruption and Bribe, Privacy Policy in Web and Social Media, Cyber threats, Online Shopping etc. Remedies UK Bribery Act, Introduction to sustainable policies and practices in Indian Economy.	12	CO2
Unit 3	**Principles of Ethics: Secular and Spiritual Values in Management**- Introduction- Secular and Spiritual values, features, Levels of value Implementation. Features of spiritual Values, **Corporate Social Responsibility**- Nature, Levels, Phases and Models of CSR, Corporate Governance. CSR and Modern Business Tycoons Ratan Tata, Mukesh Ambani and Bill Gates.	11	CO3
Unit 4	**Holistic Approach in Decision making**- Decision making, the decision making process, The Bhagavad Gita: Techniques in Management, Dharma and Holistic Management. Discussion through Dilemmas – Dilemmas in Marketing and Pharma Organisations, moving from Public to Private –	11	CO4

	monopoly context , Dilemma of privatisation, Dilemma on standardization ,Dilemma on Quality standards.		

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1		1	1	2	3		1			2		
CO2	1		2	3	3	2	3	2	1	1		
CO3	2			2	2	2	2	2		2		
CO4		2	2	3	1	3	3		1	1		

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. A foundation course in Human Values and Professional Ethics by RR. Gaur, R. Sangal et.al 2. JUSTICE: What's the Right Thing to Do? Michael J. Sandel.
Reference Books	1. Human Values by A. N. Tripathi New Age International
e-Learning	• https://vit.ac.in/files/Ethics_Manual.pdf • https://nptel.ac.in/courses/109104068

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	**30**	

Course created by: **Signature:**	**Approved by:** **Signature:**

Department of Computer Science
Era University, Lucknow
Course Outline
Effective from: 2023-24

Name of the Program	**Bachelor of Computer Application (BCA)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Data Analytics**	**Course Code:**	**BCAV0301P**	**Type:**	**Practical**
Credits	**02**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**100 Marks**		**End Term Exam:**	-
○ Core	○ Major	○ Minor	○ Elective	○ Co-curricular	◉ Vocational
Course Objectives	1. Building fundamental knowledge of the Spread sheet processing 2. Apply analysis techniques to datasets in Excel 3. Learn how to use Pivot Tables in Excel 4. Learn how to prepare charts in Excel				
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*					
Course Outcome (CO)	**Attributes**				
CO1	Understand the concept of spread sheet.				
CO2	Explore the various elements of the spread sheet.				
CO3	Apply data analysis functions on any given data.				
CO4	Demonstrate PivotTable and Charts for data summarization.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks Internal Examination: 70 Marks				

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Introduction to Spreadsheets:** About Excel & Microsoft, Uses of Excel, Excel software, Spreadsheet window pane, Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, the Ribbon, File Tab and Backstage View, Formula Bar, Workbook Window, Status Bar, Task Pane, Workbook & sheets	14	CO1
Unit 2	**Columns & Rows:** Selecting Columns & Rows, Changing Column Width & Row Height, Autofitting Columns & Rows, Hiding/Unhiding Columns & Rows, Inserting & Deleting Columns & Rows, Cell, Address of a cell, Components of a cell – Format, value, formula, Use of paste and paste special, Sorting, Filtering. **Essential Excel Data Analysis Functions:** Concatenate, Len(), Days(), Sumifs(), Averageifs(), Countsifs(), Counta(), Vlookup(), Hlookup(), If(), Iferror(), Find/Search, Left/Right, Rank() **Data Tab:** What-if Analysis, Data Validation, Remove Duplicates, Data consolidation	16	CO2
Unit 3	**PivotTables:** Creating PivotTables, Manipulating a PivotTable, Using the PivotTable Toolbar, Changing Data Field, Properties, Displaying a PivotChart, Setting PivotTable Options, . Adding Subtotals to PivotTables	15	CO3
Unit 4	**Spreadsheet Tools:** Moving between Spreadsheets, Selecting Multiple Spreadsheets, Inserting and Deleting Spreadsheets Renaming Spreadsheets, Splitting the Screen, Freezing Panes, Copying and Pasting Data between Spreadsheets, Hiding , Protecting worksheets	15	CO4

	Spreadsheet Charts: Creating Charts, Different types of chart, Formatting Chart Objects, Changing the Chart Type, Showing and Hiding the Legend, Showing and Hiding the Data Table,		

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	3				1	2	1	
CO2	1	2	3	3	3	2	3	2	2	1	1	
CO3	2	1	2	2	2		2	1	2	2		1
CO4	2	2	3	3	1	3	3		3	2		1

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. Excel: Quick Start Guide from Beginner to Expert (Excel, Microsoft Office) by William Fischer. 2. Building Financial Models with Microsoft Excel, by K. Scott Proctor
Reference Books	1. Excel 2016 Bible, by John Walkenbach
e-Learning	• https://www.w3schools.com/EXCEL/index.php • https://onlinecourses.nptel.ac.in/noc22_mg35/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	**Section A:** Contains **05** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **01 Marks.** **Section B:** Contains **02** descriptive questions and each question carries 2 marks. **Section C:** Contains **04** descriptive questions out of which **03** questions are to be attempted. Each question carries **05 Marks**. ***50% of the marks obtained in the mid semester examination will be added to the internal assessment.***
Quiz Test	04	Contains **04 descriptive questions.** Each question carries **01** Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Internal Exam	70	**Section A:** Contains **06** Questions out of which **05** questions are to be attempted. Each question carries **10 Marks.** **Viva-voce: 20 Marks**
Total Marks	**100**	

Course created by: **Signature:**	**Approved by:** **Signature:**