

FIRST SEMESTER

Code No.	Paper	L	T/P	Credits	Marks Internal	Marks External
THEROY PAPERS						
BCA 101	Mathematics – I	3	1	4	25	75
BCA 103	Technical Communication	3	0	3	25	75
BCA 105	Introduction to Programming Language using C	3	1	4	25	75
BCA 107	Introduction to Computers & IT	3	1	4	25	75
BCA 109	Physics	3	1	4	25	75
PRACTICALS						
BCA 151	Practical – I C Prog. Lab	0	6	3	40	60
BCA 153	Practical – II IT Lab	0	6	3	40	60
BCA 155*	Communication Skills	2	0	2	100	-----

Subject Name: Technical Communication

Subject Code: BCA 103

Course Objective:

- 1) To have a basic understanding of the correct use of English Language.
- 2) To improve oral as well as written communication skills.

Course Outcomes:

CO1: Students will be able to understand and apply knowledge of human and language processes as they occur across various contexts

CO2: Students will describe knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others.

CO3: Students will be able to effectively apply orally and in writing.

CO4: Students will be able to find, use, and analyze primary academic writing associated with the communication discipline.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	-	-	1	3	3	1	2	3	3		3
CO2	3	2		1	3	3	1	1	2	1		2
CO3	3	1	2	2	1	1	-	-	1		1	1
CO4	2	2	1	2	2	3			2	3		2

Subject Name: Introduction to Programming Language using C

Subject Code: BCA 105

Course Objective:

- 1) To be able to build own logic for a given problem and finally develop one's own programs.
- 2) To understand the syntax and the semantics of C programming language.

Course Outcomes:

CO1: Student will be able to Understand of computer programming language concepts.

CO2: Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.

CO3: -able to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.

CO4: -Develop confidence for self education and ability for life-long learning

PO	PO1 Know ledge	PO2 Analys is	PO3 Desig n	PO4 Deve lop	PO5 Mod ern Tools	PO6 Socie ty	PO7 Environ ment	PO8 Ethic s	PO9 Team work	PO10 comm unicati on	PO11 Projec t mana geme nt	PO12Li fe long learnin g
CO												
CO1	3	3			1	-	-		-		-	1
CO2	2	2	1	1	-	-	-	-	-		-	1
CO3	2	2	3	2	-	-	-	-	-		1	1
CO4	3	3	3	2	2	-			2	-	2	2

Subject Name: Introduction to computers & IT

Subject Code: BCA 107

Course Objectives:

- 1) Discuss the evolution of computers in different generations
- 2) Classify computers in different categories based on their capabilities.
- 3) Describe the major components of computers and information technology applications:Hardware, software, data, processes, computer networks and people.
- 4) Demonstrate an understanding of the importance of algorithms in the development of IT applications.

Course Outcomes:

After completion of the course, student will be able to:

CO1: Describe computer fundamental, Input output devices and emerging technology.

CO2: Design flowcharts, block diagrams and hands-on experience on office automation.

CO3: Apply different Number systems and Boolean algebra for digital representation in a computer system.

CO4:Classify and compare various types of networks network standards and communication software

CO-POMapping:

PO	PO1 Kn ow led ge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethi cs	PO9 Tea m work	PO10 com munic ation	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	1	1	1	3	1			1			2
CO2	3	2	3	2	3				2		3	3
CO3	3	1	2	2	2				1			
CO4	3	2	3	2	3	2			2			2

Subject Name: Physics

Subject Code: BCA 109

Course Objectives:

- To get the knowledge about the basic laws of nature such as motion, work, power and energy
- To study the electrostatics, semiconductors and devices

Objectives

- To get the knowledge about the basic laws of nature such as motion, work, power and energy
- To study the electrostatics, semiconductors and devices

Course Outcomes:

CO1: Demonstrate a rigorous understanding of the core theories & principles of physics, which includes mechanics, Electricity, Electrostatics, electromagnetism, Modern Physics.

CO 2: Understand the set of physical laws, describing the motion of bodies, under the influence of system of forces.

CO 3 Understand physical properties of molecule the chemical bonds between atom as well as molecular dynamics.

CO4: Understand the concept of Electric field, electric potential, magnetic field and magnetic potentials

CO 5: Use the principle of superposition and law of Gauss to calculate electric field Intensity

CO 6: Determine Electric potential of charge distributions and hence specify electric field intensity

CO7: Understand the basic properties of conductors and capacitors

CO8: Calculate the magnetic fields due to currents using Biot-Savart and Ampere laws.

CO 9: Understand Diamagnets, Paramagnets and Ferro magnets.

CO10: Understand the basics of PN junction diode, Zener diode and their applications

Subject Name: C Prog Lab

Subject Code: BCA 151

Course Objective :

- 1) To be able to build own logic for a given problem and finally develop one's own programs
- 2) To understand the syntax and the semantics of C programming language.

Course Outcomes:-

CO 1: Student will able to learning process helps in deep understanding the concepts of C language.

CO 2 : Students will able to Developing programs using control statements, Arrays and Strings.

CO3: Student will able to Enabling effective usage of arrays, structures, functions and pointers.

CO4 : Student will able to Implementing the files and command line arguments.

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	3	3	3	3	1	3		2			2
CO2	3	2	3	2	3	3			2		3	3
CO3	3	3	3	3	2	1			1			-
CO4	3	3	3	2	3	3			3	3		2

Subject Name: IT Lab

Subject Code: BCA 153

Course Objectives:

- 1) The objective of the course is to introduce the concepts of computer fundamental
- 2) Efficient use of computer applications and its technology in a business environment

Course Outcomes:

After completion of the course, student will be able to:

CO1: Demonstrate the basic technicalities of creating Word documents for office use.

CO2: Create and design a spreadsheet for general office.

CO3: Apply the basic technicalities of creating a PowerPoint presentation.

CO4: Demonstrate the practices in data & files management.

CO-PO Mapping

PO	PO1 Knowl edge	PO2 Anal ysis	PO3 Desi gn	PO4 Dev elop	PO5 Mor der n Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethi cs	PO9 Tea m wor k	PO10 com muni catio n	PO11 Proje ct man age ment	PO12 Life long learni ng
CO												
CO1	3	1	1	1	3	1			1		3	2
CO2	2	2	3	2	3	1			2		2	3
CO3	2	1	2	2	2	1			1		2	
CO4	2	2	3	2	3	1			2		2	2

Subject Name: Communication Skills

Subject Code: BCA 155

Course Objective:

- 1) To enable the students to develop their communication skills effectively.
- 2) To familiarize students with the English Language and vocabulary.
- 3) To understand the role of communication in personal & professional success.

On completion of the course, students will be able to:

CO1: Explain correct use of English Language and improve the Communication Skills of the students.

CO2: Develop and integrate the use of four language skills: a) Reading b) Writing c) Listening d) Speaking

CO3: Improve Presentation skills training courses provide strategies to plan, structure and deliver powerful presentations.

CO4: Learn how to structure presentations in order to deliver effective messages as well as receive the coaching to dramatically improve your personal presentation.

PO	PO1 Knowle dge	PO2 Anal ysis	PO 3 De sig n	PO4 Devel op	PO5 Mod ern Tools	PO6 Socie ty	PO7 Envir onme nt	PO8 Ethic s	PO9 Team work	PO10 com munic ation	PO11 Proje ct mana geme nt	PO12 Life long learni ng
CO												
CO 1	2	2	2	1	1	2	1	-	2	2	-	2
CO 2	3	1	1	2	-	-	1	-	-	2	-	-
CO 3	3	1	1	2	-1	-	1	-	2	1	-	2
CO 4	2	2		1	1	-	1	-	2	2	-	2

SECOND SEMESTER

Code No.	Paper	L	T/P	Credits	Marks Internal	Marks External
THEROY PAPERS						
BCA 102	Mathematics – II	3	1	4	25	75
BCA 104	Principles of Management	3	0	3	25	75
BCA 106	Digital Electronics	3	1	4	25	75
BCA 108	Data Structure Using C	3	1	4	25	75
BCA 110	Database Management System	3	1	4	25	75
PRACTICALS						
BCA 152	Practical – III DS Lab	0	6	3	40	60
BCA 154	Practical – IV DBMS Lab	0	6	3	40	60
BCA 156*	Cyber Ethics	2	0	2	100	-----
	Total	17	16	27	305	495

SubjectName: Mathematics - II

SubjectCode: BCA 102

Course Objectives:

- 1) To understand conceptual and physical design of a database.
- 2) To know basic database backup and recovery.
- 3) To get familiar with propositional logic

Course Outcomes:

CO1: To understand the basic functionality of sets theory and operations carried out in set theory

CO:2 To explain the different representation and implementation of sets in advanced methodologies in algebraic system and principle of Duality.

CO3: To interpret the structure of graphs ,categorise the structure of graphs and basic operations carried on graphs in relation to advance concepts of graph coloring

CO4: To describe and further evaluate the propositional logic in mathematics in reference to the applications in advanced utilities.

CO-POMapping

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3					3			1	2	3	2
CO2	3			2		2			2	2		3
CO3	2	2			1				1		3	2
CO4	3	3			2				2	1		3
CO4	2	2		2		2	2	1	2	2		2

Subject Name: Principles of Management

Subject Code: BCA 104

Course Objectives:

- 1) To get the knowledge about the important management concepts & their application
- 2) To have an insight of various functional departments in an organization.
- 3) To make students well versed with programming in java.

Course Outcome:

On completion of this course, the students will be able to

CO1. Identify the relation with the functions and levels of management

CO2. Comprehend the contemporary management practices with the basic concepts of management

CO3. To assess different theories of management so as to relate it to current management challenges

CO4. Understand individual and group behavior and implications of organizational behavior on the working style of management

CO5. Explore the concept of organizational behavior such as personality, perception, attitude and correlate with the organizations.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	3					3			1	2	3	2
CO2	3			2		2			2	2		3
CO3	2	2			1				1		3	2
CO4	3	3			2				2	1		3
CO4	2	2		2		2	2	1	2	2		2

Subject Name: Digital Electronics

Subject Code: BCA 106

Course Objectives:

- 1) To learn about the design principles of different digital electronic circuits.
- 2) To study the applications of above circuits.

Course Outcomes:

After undergoing the course, students will be able to

CO1: Explain the basics of logic circuits and logic families and solve problems related to Boolean algebra.

CO2 : Describe digital number system conversions and Analyse combinational circuits and their parameters.

CO3: Distinguish and Design combinational and sequential circuits.

CO4: Describe memory devices for a computer system and Compare and Design synchronous and asynchronous circuits.

CO-PO Mapping:

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learnin g
CO												
CO1	3	3	2	1	1				1			1
CO2	2	3	3	2					1			1
CO3	1	1	2	3	3				1			2
CO4	1	1	3	3	2				1			1

Subject Name: Data Structures using C

Subject Code: BCA 108

Course Objective :

- 1) Understand the use and working of the various data structures.
- 2) Learn to be able to build own algorithms and pseudocodes for the various applications of the basic data structures.

Course Outcomes:-

CO 1: Student will be able to Understanding the use of basic data structures.

CO 2: Student will be able to demonstrate algorithms and its correctness.

CO 3: Student will be able to design/develop different methods for traversing trees

CO 4: Student will be able to execute searching and sorting techniques on data.

PO	PO1 Knowl edge	PO2 Analys is	PO3 Desig n	PO4 Deve lop	PO5 Mor dern Tools	PO6 Socie ty	PO7 Environ ment	PO8 Ethic s	PO9 Team work	PO10 comm unicati on	PO11 Projec t mana gemen t	PO12Li fe long learnin g
CO												
CO1	2	1	1									1
CO2	2	2	-									1
CO3	2	2	2	1	1						1	1
CO4	3	3	3	3	2				2		2	2

Subject Name: Database Management System

Subject Code: BCA 110

CourseObjectives:

- 1) To understand difference between storing data in FMS and DBMS and advantages of DBMS.
- 2) To understand conceptual and physical design of a database.
- 3) To understand RDBMS and queries to design database and manipulate data in it.
- 4) To know basic database backup and recovery.

CourseOutcomes:

After completion of the course, student will be able to:

CO1: Illustrate the concept of Database Management System and Describe the E R model.

CO2: Create query optimization plan using query pre-processing and optimization, SQL and PL/SQL

CO3: Apply Relational Algebra, Relational Calculus, Dependency, Functional Decomposition and normalization process for problem solution.

CO4: Describe the concept of Transaction Processing and elaborate Concurrency control and Failure Recovery.

CO-PO Mapping:

PO	PO1 Knowledge	PO2 Analysis	PO3 Design	PO4 Develop	PO5 Modern Tools	PO6 Society	PO7 Environment	PO8 Ethics	PO9 Team work	PO10 communication	PO11 Project management	PO12L lifelong learning
CO												
CO1	3	1	3	1	2				1			2
CO2	2	2	3	3	3				2		3	3
CO3	2	2	2	3	3				1		1	3
CO4	2	2	3	3	3				2		1	2

Subject Name: DS Lab

Subject Code: BCA 152

Course Objective :-

- 1) Understand the use and working of the various data structures.
- 2) Learn to be able to build own algorithms and pseudocodes for the various applications of the basic data structures.

Course Outcomes:

CO:1. Students will Be able to design and analyse the time and space efficiency of the data structure .

CO:2. Students will Be capable to identify the appropriate data structure for given problem .

CO:3. Student will Have practical knowledge on the applications of data structures.

CO 4: Students will be able to perform searching & sorting operation on data .

PO	PO1 Knowled ge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	3	3	3	3	1	3		2			2
CO2	3	2	3	2	3	3			2		3	3
CO3	3	3	3	3	2	1			1			-
CO4	3	3	3	2	3	3			3	3		2

Subject Name: DBMS Lab

Subject Code: BCA 154

CourseObjective:

- 1) The objective of this lab course is to understand the practical applicability of database management system concepts.
- 2) The objective of this lab is Working on existing database systems, designing of database, creating relational database, analysis of table design.

Course Outcomes

After completion of the course, student will be able to:

CO1: Demonstrate an understanding of the relational data model.

CO2: Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.

CO3: Formulate, using relational algebra, solutions to a broad range of query problems.

CO4: Formulate, using SQL, solutions to a broad range of query and data update problems

CO-PO-Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethi cs	PO9 Tea m work	PO10 com munic ation	PO11 Proje ct mana gemen t	PO12L ife long learn ing
CO												
CO1	3	1	1	1	3	3			1		3	2
CO2	2	2	3	2	3	3			2		2	3
CO3	2	1	2	2	2	1			1		2	
CO4	2	2	3	2	3	3			2		2	2

**THIRD SEMESTER
THIRD SEMESTER EXAMINATION**

Code No.	Paper	L	T/P	Credits	Marks Internal	Marks External
THEORY PAPERS						
BCA 203	Computer Architecture	3	1	4	25	75
BCA 205	Front End Design Tool VB.Net	3	1	4	25	75
BCA 207	Principles of Accounting	3	0	3	25	75
BCA 209	Object Oriented Programming using C++.	3	1	4	25	75
PRACTICALS						
BCA 251	Practical – V .NET Lab	0	6	3	40	60
BCA 253	Practical – VI C++ Lab	0	6	3	40	60
BCA 255*	Software Development Skills	2	0	2	100	-----
	Total	17	16	27	305	495

Subject Code: BCA 201

Subject Name: Computer Architecture

Subject Code: BCA 203

Course Objectives:

- 1) To learn the design of Control Unit and ALU of a typical computer
- 2) To learn about the memory, input –output organization of a typical computer
- 3) To learn the concepts of pipelining and vector processing.

Course Outcomes:

After undergoing the course, students will be able to

CO1: Describe the operations and language of the register transfer, micro operations and input- output organization.

CO2: Demonstrate the working of central processing unit and RISC and CISC architecture and pipelining.

CO3: Elaborate advanced concepts of computer architecture and Analyse the design issues in terms of speed, technology, cost and performance.

CO4: Classify and Compare various types of primary and secondary memories available for a computer system.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	2	2	1	1						1	
CO2	3	3	2	2	2						2	1
CO3	2	2	2	3	2		1				2	2
CO4	3	2			2		1				1	1

Subject Name: Front End Design Tool VB.Net

Subject Code: BCA 205

Course Objectives:

- 1) To get the Knowledge about different Object Oriented Features.
- 2) To understand disconnected architecture of .Net.

Course Outcomes:

CO1: The student will be able to get the basic knowledge about .net framework ,client server architecture and memory management .

CO2: The students will implement the user defined and predefined controls to make the gui applications.

CO3: The students will get the basic knowledge about the looping structure exit and entry controlled loops.

CO4: The student will understand the connectivity between front end and back end using the ado .net and further implement the report using the crystal report

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	3											
CO2	2		2		2							
CO3	3	1	1		1							
CO4	2		2		2							

Subject Name: Principles of Accounting

Subject Code: BCA 207

Course Full Title	Principles of Accounting
Course Short Title	POA
Course Code	
Course Credit	03
Semester	I
Core/Generic Elective/Interdisciplinary Course/ Skill Enhancement/ Nues	Core
Course Outcomes (CO)/Learning Outcomes On successful completion of this course, the learner will be able to	
CO 1	Understand and apply accounting concepts, principles and conventions for routine monetary transaction.
CO 2	Create and Prepare Profit and Loss Account (financial statements) in accordance with the schedule –III of the New companies Act 2013
CO 3	Understand AS- 06 Revised and to recognize application of depreciation policy for asset types
CO 4	Understanding about the capital structure and Apply accounting concept (Going concern concept in share trading process)
CO 5	Understanding Regulation procedure for capital market

PO	PO1 Knowl edge	PO2 Analys is	PO3 Desig n	PO4 Deve lop	PO5 Mor dern Tools	PO6 Socie ty	PO7 Environ ment	PO8 Ethic s	PO9 Team work	PO10 comm unicati on	PO11 Projec t mana gemen t	PO12Li fe long learnin g
CO												
CO1	2	1	1		2	3			1			2
CO2	2	2	3		2	3			2			1
CO3	1	1	2		2	1			1			-
CO4	1	2	3		1	3			2			2

Subject Name: Object Oriented Programming Using C++

Subject Code: BCA 209

Course Objective:

- 1) To gain knowledge of objects, Class, Data Abstraction, Encapsulation, Inheritance, Polymorphism and Dynamic Binding.
- 2) To know about constructing programs using Bottom-up design approach.
- 3) To be capable of designing a system based on programming language C++.

Course Outcomes:

After undergoing the course, students will be able to:

CO1: Articulate the principles of object-oriented problem solving and outline the essential features and elements of C++ programming language.

CO2: Develop program using the concept of classes and objects.

CO3: Demonstrate proficiency in polymorphism and inheritance and its techniques.

CO4: Develop programs using concepts of generic programming, explain concepts of files and exception handling.

CO-PO Mapping:

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	1	1	1	1				1			1
CO2	3	1	2	3	3				1			2
CO3	3	2	2	3	3				2			2
CO4	2	3	3	3	3				3		1	2

Subject Name: V.Net Lab

Subject Code: BCA 251

Course Objective:

- 1) To understand different features of Visual Basic.Net IDE
- 2) To be capable of developing applications using GUI Programming.

Course Outcomes:

After undergoing the course, students will be able to:

CO1: Implement basic features of .Net framework, client server architecture and memory management issues.

CO2: Create projects using Visual Basic.Net IDE and implement the user defined and predefined controls to make the GUI applications using VB.Net Programming Language.

CO3: Construct window applications and implement Object oriented features.

CO4: Implement database concepts and connect front end and back end using ADO.NET and implement crystal report.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	2	1	2	2	2				1		1	1
CO2	2	1	3	3	3	1	1		2		2	2
CO3	2	1	3	3	3				2		2	2
CO4	2	1	3	3	2				1		2	1

Subject Name: C++ Lab

Subject Code: BCA 253

Course Objective:

- 1) To provide practical experience in implementing object oriented programming concepts such as objects, Class, Data Abstraction and Inheritance.
- 2) To design and develop programs using bottom up design approach in C++.

Course Outcomes:

After undergoing the course, students will be able to:

CO1: Explain the features of C++ Programming language, C++ compilers and standard libraries.

CO2: Design and develop programs using the concept of classes and objects.

CO3: Apply the concepts of polymorphism and inheritance.

CO4: Develop programs using concepts of generic programming and file handling.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethic s	PO9 Tea m work	PO10 commu nicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	2	1	1	1	1							2
CO2	2	2	2	2	2							2
CO3	2	3	3	3	3							2
CO4	2	3	3	3	3				2		2	2

Subject Name: Software Development Skills

Subject Code: BCA 255

Course Objective:

- 1) To be able to develop and evaluate software, hardware infrastructure, and network solutions to meet desired client outcomes
- 2) To work as professional maintaining high standards of practice, making ethical/legal judgments and decisions, and sustaining a professional standing through a commitment to life-long learning.

Course Outcomes:-

CO 1: Students will be able to apply Software Development Cycle to develop a software module

CO 2: Students will be able to manage a simple project and be able to contribute to a more complex project as a team member

CO 3: Students will be able to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

CO 4: Students will be able to use the techniques, skills and modern engineering tools necessary for software development.

CO PO Mapping:-

PO	PO1 Knowled ge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mod ern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	3	2	1	3				3			3
CO2	3	3	3	3	1						1	2
CO3	3	2	2	2	3					3	2	1
CO4	3	3	2	2	3	1			3	3	2	3

FOURTH SEMESTER

FOURTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits	Marks Internal	Marks External
THEROY PAPERS						
BCA 202	Mathematics – IV	3	1	4	25	75
BCA 204	Web Technologies	3	1	4	25	75
BCA 206	Java Programming	3	1	4	25	75
BCA 208	Software Engineering	3	1	4	25	75
BCA 210	Computer Networks	3	1	4	25	75
PRACTICALS						
BCA 252	Practical – VII Java Lab	0	6	3	40	60
BCA 254	Practical – VIII Web Tech Lab	0	6	3	40	60
BCA 256*	Personality Development Skills	2	0	2	100	-----
	Total	17	13	28	305	495

Subject Name: Mathematics-IV

Subject Code: BCA 202

Course Objectives:

- 1) To get the Knowledge about mathematical probability.
- 2) To get familiar with various numerical techniques.

CO1: To conjecture the concept and functionality of probability and conditional probability

CO2: To acquire the knowledge and formulate various probability distributions

CO3: To demonstrate and differentiate numerous evaluation policy of various interpolation method

CO4: To examine the functionality and understanding various methods of linear simultaneous equations

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Knowledge	Analysis	Design	Development	Modelling	Society	Environment	Ethics	Teamwork	Communication	Project Management	Life long learning	
CO												
CO1	3	1	2	1	2	1			1			2
CO	2	2	1	3	-	-			2		3	2

2												
C O 3	2	2	2	1	-	1			2		3	3
C O 4	2	2	3	2	2	3			2	2	3	3

Subject Name: Web Technologies

Subject Code: BCA 204

Course Objectives:

- 1) Students should be able to design and implement a basic website.
- 2) Students should be able to implement different navigation strategies.
- 3) Students should be able to use client-side technologies (XHTML, CSS, forms, JavaScript).
- 4) Students should be able to develop simple back-end database to support a website, and able to recognize and evaluate website organizational structure and design elements.

Course Outcomes:

CO1: The student will get the knowledge about History of internet, Search Engine.Design static websites using HTML, CSS.

CO2: The student will design interactive websites using Java Script and mySQL.

CO3: The student will design server side scripts using nodeJS and implement it using DHTML

CO4: The student will implement Web Hosting and Publishing Concepts and Naming rules, Building block of XML Document

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learn ing
CO												
CO1	3	2	2	2	2	-	1	-	-	-	-	2
CO2	2	2	3	2	1	-	1	-	-	-	1	2
CO3	2	2	3	3	3	-	1	-	-	-	-	1
CO4	2	2	2	3	2	1	-	-	-	-	1	2

Subject Name: Java Programming

Subject Code: BCA 206

Course Objectives:

- 1) To get the Knowledge about different Object Oriented Features.
- 2) To make students well versed with programming in java.
- 3) To understand and use Applet and Swing.

Course Outcomes:

After completion of the course, student will be able to:

CO1: Define object oriented programming concepts and implement in java.

CO2: Identify exception handling methods and Implement multithreading in object oriented programs.

CO3: Develop the Graphical User Interface using Swings, Applets, Interface and Package.

CO4: Design and develop web based application using java Servlets and describe connection with database using Java Database Connectivity

CO-PO Mapping:

PO	PO1 Knowledge	PO2 Analysis	PO3 Design	PO4 Develop	PO5 Modern Tools	PO6 Society	PO7 Environment	PO8 Ethics	PO9 Team work	PO10 communication	PO11 Project management	PO12L lifelong learning
CO												
CO1	3	1	2	2	2				1			2
CO2	2	2	2	3	3				2		3	2
CO3	2	3	3	3	3				2		3	3
CO4	2	3	3	3	3				2		3	3

Subject Name: Software Engineering

Subject Code: BCA 208

Course Objectives:

- 1) To gain knowledge of various software models.
- 2) To gain knowledge of various software design activities.
- 3) To learn cost estimation, software testing, Maintenance and debugging.

Course Outcomes:

CO1: The student will get the knowledge about Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models.

CO2: The student will be able to calculate Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO Models

CO3: The student will understand Cohesion & Coupling, Classification of Cohesiveness & Coupling, Layered arrangement of modules, Function Oriented Design Concep

CO4: The student will be able to calculate test cases and perform different types of testing

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	3	2	1	-	1	-	1	-	1	-	-	
CO2	3	2	2	2	-	-	1	-	-	-	-	2
CO3	2	2	3	2	1	-	1	-	-	-	-	2
CO4	3	3	2	1	2	-	1	-	-	-	-	1

Subject Name: Computer Networks

Subject Code: BCA 210

Course Objective:

- 1) The students will be exposed to different types of media, multiplexing, switched networks, the Internet, TCP/IP suite, fiber-optic communications and the state-of-art networking applications.
- 2) To understand various transmission media, their comparative study, fiber optics and wireless media.
- 3) Categories and topologies of networks (LAN and WAN) and TCP/IP) and protocol suites
- 4) Channel error detection and correction, MAC protocols, Ethernet and WLAN
- 5) To study details of IP operations in the Internet and associated routing principle.

Course Outcomes:

CO1: Student will able to describe the layers of the OSI model and TCP/IP.

CO 2: Student will be able to explain the basic taxonomy and terminology of the computer networking area.

CO 3: Student will be able to analyze performance of various communication protocols.

CO 4: Student will be able to apply mathematical foundations to solve computational problems in computer networking.

CO POMapping:-

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	2	1	-	1	-		-	1	-	-	
CO2	3	2	2	2	-	-		-	-	-	-	2
CO3	2	2	3	2	1	-		-	-	-	-	2
CO4	3	3	2	2	2	-		-	-	-	-	

Subject Name: Java Lab

Subject Code: BCA 252

Course Objectives:

- 1) To enhance the knowledge of object-oriented programming using the Java programming language
- 2) To understand the applets, files, swings and exception handling mechanisms.

Course Outcomes

After completion of the course, student will be able to:

CO1: Apply the model of object oriented programming and fundamental features of an object oriented language.

CO2: Create document and prepare a professional looking package for each business project.

CO3: Develop computer program to solve specified problems and apply Java SDK environment to create, debug and run Java programs.

CO4: Demonstrate and develop programs for inheritance, multithreading, applets, exception handling and file handling.

CO-PO Mapping

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor der n Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethi cs	PO9 Tea m wor k	PO10 com muni catio n	PO11 Proje ct man agem ent	PO12L ife long learni ng
CO												
CO1	2	1	3	3	3				1		3	2
CO2	2	2	3	2	3				2		2	3
CO3	2	1	2	2	2				1		2	
CO4	2	2	3	2	3				2		2	2

Subject Name: Personality Development Skills

Subject Code: BCA 256

Course Objective:

- 1) To develop Communication skills and positive personality traits.
- 2) To study the personality development of individuals in the micro perspective.

After undergoing the course, students will be able to:

CO1: Explain students to groom their personality.

CO2: Develop Communication skills and positive personality traits.

CO3: Building self- confidence and enhance the self- esteem and improve the overall personality of the students.

CO4: Improve skills to present individual or in group class presentations to enhance personality skills.

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mod ern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea mwo rk	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	2	2	2	1	1	-	2	--	2	2	-	2
CO2	2	3	1	2	-	-	2	--	1	3	-	1
CO3	3	2	2	2	1	-	1	--	1	2	-	2
CO4	1	1	3	3	2	-	1	--	1	2	-	1

FIFTH SEMESTER

Code No.	Paper	L	T/P	Credits	Marks Internal	Marks External
THEROY PAPERS						
BCA 301	Operating System	3	1	4	25	75
BCA 303	Computer Graphics	3	1	4	25	75
BCA 305	E- Commerce	3	1	4	25	75
***ELECTIVES (Select any One)						
BCA 307	Software Testing	3	1	4	25	75
BCA 309	Microprocessor	3	1	4	25	75
BCA 311	Advance Computer Networks	3	1	4	25	75
BCA 313	Web Based Programming	3	1	4	25	75
BCA 315	Business Economics	3	1	4	25	75
PRACTICALS						

BCA 351	Practical – IX CG Lab	0	8	4	40	60
BCA 355*	Summer Project/ Training	0	0	2	100	-----
BCA 357	Minor Project	---	8	4	40	60
	Total	12	20	26	280	420

Subject Name: Operating System

Subject Code: BCA 301

Aim: To introduce an operation System and describe the functionalities of Operating System.

Objectives

- To Understand the services provided by an operating system.

After Completion of this course, the students will be able to:

CO1. Remember the basic concepts of operating system.

CO2. Create the concept of primary memory, secondary memory and other storage devices.

CO3. Apply the concept of virtual memory.

CO4. Analyze C.P.U scheduling, various Scheduling criteria and Scheduling Algorithms.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	2	-	-	-	-	-	-	-	-	-	-	1
CO2	2	-	-	-	-	-	-	-	-	-	-	1
CO3	-	1	2	2	-	-	-	-	-	-	2	1
CO4	-	2	3	3	-	-	-	-	3	-	3	2

Subject Name: Computer Graphics

Subject Code: BCA 303

Course Objective:

- 1) To introduce students with fundamental concepts and theory of computer graphics.
- 2) To understand the graphics applications and its use.
- 3) To understand Basic principles and techniques for computer graphics on modern graphics hardware.

Course Outcome:

After undergoing the course, students will be able to:

CO 1. define the concept of computer graphics and mathematical foundations of it.

CO 2. Identify 2D, 3D geometrical transformation and its matrix representation.

CO3. Apply geometrical transformations for graphical problem solving.

CO4. demonstrate skills to generate computer graphics animation software.

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mod ern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 commu nicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	2	1	-	-	-	-	-	-	-	-	-	1
CO2	2	1	-	-	-	-	-	-	-	-	-	-
CO3	3	3	1	1	-	-	-	-	1	-	1	1
CO4	3	3	2	1	-	-	-	-	-	1	-	-

Subject Name: Software Testing

Subject Code: BCA 307

Aim

To understand the importance, limitations and challenges of testing process.

Objectives

- 1) To gain knowledge of various functional and structural testing techniques
- 2) To gain knowledge of various activities and levels of testing
- 3) To learn the issues in testing of object oriented and internet based applications

After completion of course student will able to do

CO1 Able to gather data to analyze and specify the requirements of a system.

CO2 Implement different types of information system in an organization like MIS & DSS and understand the phases for SDLC.

CO3 Develop and analyze data flow diagrams and explain how to develop the project budget.

CO4 Design system input/output components and environments

CO-PO Mapping:

PO	PO1 Knowled ge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 commu nicat ion	PO11 Proje ct mana geme nt	PO12Li fe long learnin g
CO												
CO1	2	2	-	-	-	-	-	1	1	-	3	1
CO2	3	2	3	3	-	-	-	-	2	-	3	2
CO3	-	-	2	3	-	-	-	-	3	-	3	2
CO4	-	-	3	3	-	-	-		3	-	3	3

Subject Name: Microprocessor

Subject Code: BCA 309

Course Objectives:

- 1) To learn architecture, addressing modes and programming of a typical 8-bit Microprocessor
- 2) To learn architecture and programming of typical 16-bit microprocessors
- 3) To learn microprocessor interfacing and applications

Course Outcomes:

After undergoing the course, students will be able to

CO1: Explain the architecture, addressing modes and instruction set of 8085 microprocessor.

CO2: Describe the methods of interfacing input output devices and memory and develop assembly language programmes for 8085 microprocessor.

CO3: Illustrate the interfacing of peripheral devices with microprocessor for designing system.

CO4: Describe architecture and instruction set of 16-bit microprocessor and compare various microprocessors.

CO-PO Mapping:

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor der n Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethi cs	PO9 Tea m wor k	PO10 com muni catio n	PO11 Proje ct man agem ent	PO12L ife long learni ng
CO												
CO1	3	2	1	1	2							1
CO2	2	3	1	1	1							2
CO3	2	2	3	3	1							
CO4	3	2	1	1	2							

Subject Name: Advance Computer Networks

Subject Code: BCA 311

Course Objectives:

- 1) To understand three basic security concepts important to information on the Internet: confidentiality, integrity, and availability.
- 2) To understand and apply the Concepts relating to the people who use that information: authentication, authorization, and no repudiation.

Course Outcomes:

After completion of the course, student will be able to:

CO1: Describe basic functionality of network and internetworking specially inclined to the data passage and error detection.

CO2: Apply advanced networking concepts and Classify and compare protocols in internetworking

CO3: Demonstrate network congestion control and basic Resource allocation in a network channel.

CO4: Categories network security protocols and key encryption methodologies for intrusion detection

CO-PO Mapping:

PO	PO1 Knowledge	PO2 Analysis	PO3 Design	PO4 Develop	PO5 Modern Tools	PO6 Society	PO7 Environment	PO8 Ethics	PO9 Team work	PO10 communication	PO11 Project management	PO12 Life long learning
CO												
CO1	3	2	1	1	2				1		1	1
CO2	2	3	1	1	1				-		1	2
CO3	2	2	3	3	1				2		-	-
CO4	3	2	1	2	2				3		3	-

Subject Name: Web Based Programming

Subject Code: BCA 313

Course Objectives:

- 1) To design and implement a basic website.
- 2) To implement different navigation strategies.
- 3) To develop simple back-end database to support a website.
- 4) To recognize and evaluate website organizational structure and design elements.

Course Outcomes:

After undergoing the course, students will be able to:

CO1: Explain the concepts of web applications, HTML and various servers.

CO2: Construct simple web pages in PHP and applying the concept of control statements, functions and arrays.

CO3: Demonstrate proficiency in working with forms, files and maintaining user state.

CO4: Create web pages by applying concepts of PHP and using database connectivity.

CO-PO Mapping:

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learnin g
CO												
CO1	3	1	1	1	1				1			2
CO2	2	2	2	2	2				1		1	2
CO3	2	2	2	3	3				2		1	2
CO4	2	3	3	3	3	2			3		2	2

Subject Name: Business Economics

Subject Code: BCA 315

Course Objectives:

- 1) To give understanding of the basic concepts and issues in business economics and their application in business decision.
- 2) To equip the students with tools and techniques of business economics to enable them to utilize its relevance in decision making.
- 3) To familiarize the concepts of demand and supply conditions
- 4) To make students understand the tools with respect to production tools with the help of isoquants
- 5) To develop understanding of the way of thinking in dealing with strategies such as costing, pricing according to the different market structures
- 6) To understand the influence of macro-economic conditions w.r.t monetary and fiscal policies
- 7) To enable students to utilize the economic tools in the understanding of the world economy export-import policies

Course Outcomes:

On completion of the course, students will be able to:

CO1: Understand the general concepts of micro and macro economics

CO2: Comprehend and analyze the impact of demand and supply conditions of the different market and assess the position of different firms

CO3: Apply the concepts of production function with the help of isoquants that will enable them to understand the various economics laws.

CO4: Analyze the real world business problems with different market structures

CO5: Understand the circular flow of income and its relationship with macroeconomics

CO6: Analyze the world trade and its implication for the macro economy

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mod ernT ools	PO6 Soci ety	PO7 Enviro nment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	1	1	2					2	2		2
CO2	3	2	1	3					3	1		3
CO3	2	1	1	3					3	1		2
CO4	3	3	1	3		3			3	2		3
CO5	2	3	3	2					1	3		1
CO6	3	3	1	1		2			1	2		3

Subject Name: CG Lab

Subject Code: BCA 351

CourseObjective:

- 1) ·To understand the graphics applications and its use.
- 2) Learn the representation and transformation of graphical images and pictures.

Course Outcome:

After undergoing the course, students will be able to:

CO1: Explain the basics of computer graphics & its applications.

CO2: Design and develop programs for drawing Computer Graphics primitives.

CO3: Implement different algorithms for line clipping,

CO4 :Develop different polygon filling ideas and rendering techniques. :

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mod ern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	1	1							1			2
CO2	2	2	3	3	2							
CO3	2	2	2	1	2							
CO4	2	2	3	2	3							2

Subject Name: Summer Project/Training

Subject Code: BCA 355

Course Objectives:

To understand conceptual and practical demonstration as per industry standards

Course Outcomes:

CO1: To understand the basic functionality of tools and techniques as per industry standards

CO:2

To interpret and demonstrate the different techniques, tools and software

module deployment required in industry

CO3:

To interpret the various issues in development of software, testing and various

other functionalities in development of software.

CO4:

To describe and further evaluate the propositional logic software deployment in

reference to the applications in advanced utilities.

CO-Po Mapping

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3		-	3			1	-	1	1	2	1
CO2	3	1	-	2		2	1	2	2	-	-	-
CO3	2	2	-	2	2	3	-	1	-	2	-	-
CO4	2	2	2	2	2		-	-	-	2	-	2

SIXTH SEMESTER

Subject Name: Data Warehousing & Data Mining

Subject Code: BCA 302

Course Objective:

- 1) This course is an attempt to provide you with the basic information about datawarehouse and their development.
- 2) This course also provides the basic conceptual background necessary to design and develop data warehouse applications.

Course Outcome:

After undergoing the course, students will be able to:

CO1. Define the concept,functionalities,and necessity of Data Mining & Data Warehousing.

CO2 . Describe the Data Warehouse architecture, implementation& its usage.

CO3. Distinguishvarious tools and techniques of Data Mining for solving real time problems.

CO4. Developfurther interest in research and designing new Data Mining techniques.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mod ern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea mwo rk	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12 Lifelon g learnin g
CO												
CO1	3	2	-	-	-	-	-	-	1	1	-	2
CO2	3	2	2	1	1	-	-	-	-	1	2	2
CO3	3	2	2	2	2	-	-	-	-	1	2	2
CO4	2	2	3	2	2	-	-	-	1	1	2	3

Subject Name: Mobile Computing

Subject Code: BCA 304

Course Objectives:

- 1) To learn the basics of Wireless voice and data communications technologies.
- 2) To build working knowledge on various telephone and satellite networks.
- 3) To build skills in working with Wireless application Protocols to develop mobile content applications
- 4) To build practical knowledge on WML and WML Script

Course outcomes:

CO1: The student will get the knowledge about Short History of Wireless Communications, Market of Mobile Communications and Multiplexing: Space Division Multiplexing, Frequency Division Multiplexing, Time Division Multiplexing, Code Division Multiplexing Concepts.

CO2: The student will be aware the concepts of Introduction to SDMA, FDMA, TDMA: Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand assigned multiple access

CO3: The student will implement WML Variables and Contexts: Variable Substitution, Setting Variables, Browser Contexts, WML Tasks and Events, WML User Interaction: Problems with Web Interaction

CO4: The student will be able to implement WML Script: Datatypes, Variables, and Conversions, Operators and Expressions:

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3											1
CO2	3	1										
CO3	2	2		2	2							
CO4	2	2		2	2							

Subject Name: Multimedia & Its Applications

Subject Code: BCA 308

Course Objectives:

- 1) To get the Knowledge about the basics concepts of multimedia and its applications.
- 2) To get the knowledge of its relevance with internet and its future aspects.

Course Outcomes:

After undergoing the course, students will be able to

CO1: Explain the types of multimedia and Describe hardware and software requirements for multimedia system.

CO2: Describe the process of digitizing of analog signals (text, graphics, sound and video) and Apply various compression techniques and algorithms.

CO3: Create a well-designed, interactive web site and Demonstrate the use of multimedia applications.

CO4: Identify issues and obstacles encountered by web authors in deploying multimedia projects.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learnin g
CO												
C302 O1	3	2	1	1		1					1	1
CO2	2	2	3	3	3						2	1
CO3	2	2	2	3	3				2		2	1
CO4	2	2	2	3	2				2		1	1

Subject Name : Bioinformatics
Subject Code : BCA 310

Course Objectives :

1. To understand Scope of Bioinformatics
2. To understand Types of Databases and their use.
3. To understand Notation and different types of Algorithms
4. To understand the basic commands in Unix and PERL

Course Outcomes :

CO1: To understand the basic functionality of bioinformatics as a discipline and challenges which the discipline is exhibiting.

CO2: To learn the Importance of databases in numerous real time application areas like nucleic acid sequence databases -and protein sequence data bases for disease diagnosis

CO3: To describe the numerous Algorithm Design Techniques specific to countering the issues in designing application specific algorithms

CO4 To examine and the assemble basic commands and functionality of UNIX , PERL used for developing applications in relation to Bioinformatics specific domain.

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learnin g
CO												
CO1	3		1	2	1	2	2	-	1	2	3	1
CO2	3	1	-	-	-	2	1	-	1	2	3	-
CO3	2	2	2	2	2	-	-	1	-	3	2	-
CO4	2	2	2	2	2	-	-	1	2	-	1	2

Subject Name: Artificial Intelligence

Subject Code: BCA 312

Course Objectives:

- 1) To familiarize the student with the concept of Artificial Intelligence
- 2) To understand knowledge representation, Logic, NLP and Learning.
- 3) To understand the development of expert systems, LISP and other related AI Programming Languages.

Course Outcomes:

After undergoing the course, students will be able to:

CO1: Establish fundamental understanding of Artificial Intelligence and its techniques.

CO2: Describe knowledge representation and approaches used and apply computable function and predicate logic.

CO3: Demonstrate proficiency in natural language, syntactic, semantic, discourse and pragmatic processing and various types of learning.

CO4: Compare and distinguish the Expert systems, shells, LISP and develop other AI Programming Languages.

CO-PO Mapping:

PO	PO1 Know ledge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learni ng
CO												
CO1	3	1	1	1		1					1	2
CO2	3	2	2	2	2	1					1	1
CO3	3	1	2	2	2	2			2		1	1
CO4	2	2	3	3	3	2			3	1	2	2

Subject Name: Network Security

Subject Code: BCA 314

Course Objective:

- 1) The course covers a broad range of security related concepts and issues that face industries today. •
- 2) The course will also examine the practical aspects of the issues involved in secure systems and networks and industry practices being adopted to protect information systems.
- 3) Students will gain the knowledge, skills and abilities to incorporate good information security practice in any organization.

Course Outcomes:-

CO 1: Students will be able to describe network security services and mechanisms.

CO 2: Students will be able to differentiation Symmetrical and Asymmetrical cryptography.

CO 3: Student will be able to demonstrate the concept of data integrity, Authentication, Digital Signatures.

CO 4: Students will be able to analyze various network security applications, IPsec, Firewall, IDS, Web security, Email security, and malicious software etc.

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	2	1	1									1
CO2	3	2	2	2					2			2
CO3	3	3	2	2	1							2
CO4	3	3	2	2	1				3		2	2

Subject Name: Network Programming

Subject Code: BCA 316

CourseObjectives:

- 1) To learn the basics of socket programming using TCP Sockets
- 2) To learn basics of UDP sockets.
- 3) To develop knowledge of threads for developing high performance scalable applications.
- 4) To learn about raw sockets.
- 5) To understand simple network management protocols & practical issues.

CourseOutcomes:

CO1: Understand the concepts of protocols, network interfaces

CO2: Develop socket interface, TCP and working knowledge of datagram and internet socket programming

CO3: Ability to implement client/server communication

CO4: Understand UDP Socket Programming

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Enviro nment	PO8 Ethi cs	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana geme nt	PO12L ife long learn ing
CO												
CO1	3	2	2	2	2				2			2
CO2	2	2	2	3	3				2		3	2
CO3	2	3	3	3	3				2		3	3
CO4	1	3	3	3	3				2		3	3

Subject Name: Linux Lab

Subject Code: BCA 352

Subject Name: Major Project

Subject Code: BCA 356

Course Objectives:

- To understand conceptual and practical demonstration as per industry standards

Course Outcomes:

CO1: To understand the basic functionality of tools and techniques as per industry standards

CO:2 To interpret and demonstrate the different techniques , tools and software module deployment required in industry

CO3: To interpret the various issues in development of software, testing and various other functionalities in development of software.

CO4: To describe and further evaluate the propositional logic software deployment in reference to the applications in advanced utilities.

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	3	2	1	1	2	1	-	1	1	1	1	1
CO2	2	3	1	1	1	-	2	2	-	1	1	2
CO3	2	2	3	3	1	1	-	-	2	2	-	-
CO4	3	2	1	1	2	3	3	1	3	3	3	-

Subject Name: Seminar

Subject Code: BCA 358

Course Objectives:

- To provide learning platform for developing ability to read critically and conceptually.
- To speak and write with discrimination.
- To understand process of literature survey, technical presentation and report preparation.

Course Outcomes:

CO1: Describe ideas, topics and activities with effective presentation.

CO2: To analyse a current topic of professional interest and present it before an audience.

CO3: To develop verbal, visual and vocal skills.

CO4: To demonstrate skills in doing literature survey, technical presentation and report preparation.

CO-PO Mapping:

PO	PO1 Knowl edge	PO2 Analy sis	PO3 Desig n	PO4 Dev elop	PO5 Mor dern Tool s	PO6 Soci ety	PO7 Environ ment	PO8 Ethic s	PO9 Tea m work	PO10 comm unicat ion	PO11 Proje ct mana gemen t	PO12L ife long learni ng
CO												
CO1	3	3	2	2	3	1		1	2	3	2	2
CO2	2	2	1	1	2	1		1	1	3	2	3
CO3	2	2	1	1	2	1		1	2	3	2	3
CO4	2	2	1	1	2	1		1	1	2	2	2