# AQAR – QUALITATIVE METRIC

## 2023 - 2024

## Criterion 1 - Curricular Aspects

**1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme specific outcomes (PSOs) and Course Outcomes (COs), of the Programmes offered by the Institution.**

**NAME OF THE PROGRAMME: B.Sc. Computer Science** **Programme Code: UACS**

**Programme Outcomes:**

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| **PO 1** | Subject Proficiency- Our graduates will be academic, digital and information literates, creative, inquisitive, innovative and desirous for the "more" in all aspects. |
| **PO 2** | Professional Growth- They will be efficient individual and team performers, exhibiting progress, flexibility, transparency and accountability in their professional work. |
| **PO 3** | Managerial Skills - The graduates will be effective managers of all sorts of real – life and professional circumstances, making ethical decisions, pursuing excellence within the time framework and demonstrating apt leadership skills. |
| **PO 4** | Needs of the Society- They will engage locally and globally evincing social and environmental stewardship demonstrating civic responsibilities and employing right skills at the right moment. |

## Programme Specific Outcomes:

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| **PSO 1** | Develop professionally competent citizens by applying the scientific knowledge of Computer Science with the ability to think clearly, rationally and creatively to support in evolving solutions to the social/public/scientific issues with responsible democratic participation. |
| **PSO 2** | Enterprising resourcefulness to identify, plan, formulate, design and evaluate solutions for complex computing problems that address the specific needs with appropriate consideration for Societal, Cultural, Environmental and Industrial domains. |
| **PSO 3** | Holistic development to ignite the lateral thinking ability in problem solving, acquisition of new skills, open-minded and organized way of facing problems with self-awareness and evolving analytical solutions. |
| **PSO 4** | Create and initiate innovations effectively and communicate efficiently with the computing community and society at large to bridge the gap between computing industry and academia. |
| **PSO 5** | Through Digital Literacy, understand, assess and commit to professional and ethical principles, norms and responsibilities of the cyber world and the ability for work efficacy as a part of a team and engage effectively with diverse stakeholders. |
| **PSO 6** | Ability and willingness to embark on new ventures and initiatives with critical thinking and desire for more continuous learning focusing on life skills. |

## Course Outcomes:

| Course Code | Course Title | Nature of the Course (Local/ National/ Regional/ Global) | Course Description | Course Outcomes |
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| 23B1CC1 | Python Programming | National | Python is an interpreted, high-level, general-purpose programming language. It provides program constructs that enable clear programming on both small and large scales | CO1: Learn the basics of python, Do simple programs on python.<br>CO2: Solve problems requiring the writing of well-documented programs in the Python language, including use of the logical constructs of that language. CO3: Implementing the use of arrays and strings in various application.<br>CO4:Identify the structure and components of a python program. Implement Modular programs using Functions and Modules.<br>CO5: Apply lists, tuples, and dictionaries to develop robust programs in python. |

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| | | | | Usage of File handlings in python, Concept of reading and writing files, Do programs using files. |
| 23B1CC2 | Lab II : Python Programming | National | This course focuses on imparting the practical knowledge of using Python Language for problem solving with basic constructs and functions. Also it aims to provide a clear understanding of the compound data using lists, tuples and dictionaries. | CO1:Write programs using basic programming constructs.<br>CO2: Express different Decision Making statements and Functions.<br>CO3: Implement Arrays and Strings, Math functions.<br>CO4: Develop applications using Functions and modules.<br>CO5: Write programs that List and Tuple in Python programs. |
| 23B1GE2 | Web Development | National | This Course introduces basic web design using Hypertext Markup Language (HTML). And this course provides | CO1: Create simple web page using physical tags<br>CO2: Present the information in standard form in a web page using structure tags supported by the browsers |

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| | | | knowledge to plan and design effective web pages with different text formatting and images to create website. | CO3: Design the layout for a web page using browser support tags<br>CO4: Develop a web site with Tables and list of items<br>CO5: Grouping and Formatting tables, – Formatting text with tables. |
| Skill Enhancement Course (NME) 23B1SE1 | Web Designing using HTML | National | This Course introduces basic web design using Hypertext Markup Language (HTML). And this course provides knowledge to plan and design effective web pages with different text formatting and images to create website | CO1: Create simple web page using physical tags<br>CO2: Present the information in standard form in a web page using different formatting tags CO3: Design the layout for a web page using image and links<br>CO4: Develop a web site with a list of items<br>security.<br>CO5: Grouping and Formatting tables, – Formatting text with tables.. |
| 23B1FC | Problem Solving Techniques | National | This course aims to provide basic knowledge to understand the Fundamental Concepts of | CO1: Study the basic knowledge of Computers.<br>Analyze the programming languages.<br>CO2: Study the data types and arithmetic operations. |

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| | | | Computer Science and Methodology of solving problems. | Know about the algorithms. Develop program using flow chart and pseudo code.<br>CO3: Determine the various operators.<br>Explain about the structures. Illustrate the concept of Loops<br>CO4: Study about Numeric data and character-based data. Analyze about Arrays.<br>CO5: Explain about DFD Illustrate program modules Creating and reading Files |
| 23B2CC3 | Data Structures and Algorithms | National | This course aims to impart fundamental knowledge on application of data structures in problem solving and about predefined algorithms | CO1: Identify data structures needed to solve specific problems<br>CO2: Analyze the data structures for effective use in problem solving<br>CO3: Design and develop efficient algorithms in terms of Space and Time<br>CO4: Troubleshoot algorithms<br>CO5: Analyze time complexity of algorithms |

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| 23B2CC4 | Practical II: Data Structures using C++ | National | This practical course is to provide students the laboratory skill to apply all that they have learnt in the Major Core Theory course 23B2CC3. The lab work goes in parallel with the theory course. | CO1: Write efficient programs consuming less memory<br>CO2: Compile and Execute programs using required data structures<br>CO3: Implement the algorithms using C++<br>CO4: Debug programs |
| 23B2EC1 | Elective Course (Discipline Specific) –<br>Object Oriented Programming in C++ | National | This course introduces the student to object-oriented programming through a study of the concepts of program specification and design, and algorithm development. | CO1:Compare Procedure-oriented programming and the evolution of Object oriented programming<br>CO2: Identify basic concepts of OOP, benefits and its applications.<br>CO3: Write object oriented programs using classes and objects.<br>CO4:Design object oriented programs that can focus on reusability – Inheritance<br>CO5:Utilize runtime polymorphism with pointers and virtual functions and File concepts |

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| 23B2EC2 | Computer System Architecture | National | This course aims to impart knowledge about internal architecture of a computer system and the techniques used to connect various input/output system with the computer. | CO1:Outline the structure of a basic computer system and explain the role of functional units<br>CO2: Explain the instruction cycle according to the type and addressing mode of the instruction<br>CO3: Design the control logic circuit for various digital circuits such as registers, memory and adder - logic circuit of a basic computer system<br>CO4: Identify the memory requirement of a CPU, select the memory chips and design a mapping circuit<br>CO5: Explain the structure and the usage of various interfacing devices needed for connecting peripheral devices with the CPU |
| 23B2SE2 | Skill Enhancement Course (NME)<br>Web Designing using HTML | National | This Course introduces basic web design using Hypertext Markup Language (HTML). And this course provides knowledge to plan and design | CO1: Create simple web page using physical tags<br>CO2: Present the information in standard form in a web page using different formatting tags<br>CO3: Design the layout for a web page using image and links |

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| | | | effective web pages with different text formatting and images to create website. | CO4: Develop a web site with a list of items<br>CO5: Grouping and Formatting tables, – Formatting text with tables. |
| 23B2SE3 | Skill Enhancement Course (Discipline Specific)<br><br>Web Designing Using HTML & CSS | National | To provide an overview of the markup language – HTML and to facilitate the learner to equip the knowledge to develop web based applications. | CO1: Create simple web page using physical tags<br>CO2Present the information in standard form in a web page using structure tags supported by the browsers<br>CO3: Design the layout for a web page using browser support tags<br>CO4: Develop a web site with Tables and list of items<br>CO5:Grouping and Formatting Rows – Formatting text with tables. |
| 19B3CC5 | Data Structures and Algorithms | National | To inculcate the skill of developing an algorithm with the apt Data Structures. | CO1 : Identify data structures needed to solve specific problems<br>CO2 : Analyse the data structures for effective use in problem solving<br>CO3 : Design and develop efficient algorithms in terms of Space and Time |

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| | | | | CO4: Troubleshoot algorithms<br>CO5 : Analyse time complexity of algorithms |
| 19B1CC1 | Programming in C | National | To introduce and form a firm foundation in programming.<br>To stress the importance of clarity , simplicity and the efficiency in writing programs | CO1: Identify the basic concepts needed for program development<br>CO2: Apply the basic concepts and develop program to find solutions for simple problems<br>CO3: Design programs to solve complex problems by using suitable control statements<br>CO4: Analyze the problem and design efficient program using functions<br>CO5: Use array and structure to handle volume of data |
| 19B1CC2 | LAB –I (Programming in C) | National | Improve the skill of writing programs in C<br>Utilize various features in C to various situations | CO1 : Develop algorithms to find solutions for simple problems<br>CO2 :Analyze the source code and rectify errors if any and bring out necessary solution<br>CO3 : Utilize proper control statements to find solution for a given problem |

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| | | | | CO4 : Develop source code using arrays to handle volume of data<br>CO5 : Design source code for console applications |
| 19B1NME1 | Animation Techniques (NME) | National | To offer a job oriented course and teach them to design animated applications | CO1 :Create a movie with simple animation using built-in animation techniques.<br>CO2: Create a movie with improved animation and background using Frame by frame animation.<br>CO3: Design a movie with many scenes using motion tween technique and multilayer concept.<br>CO4: Design a complex movie with more objects and enhanced animation using symbols.<br>CO5: Design a interactive animation using buttons and movie clip symbols. |
| 22B2CC3 | Python Programming | National | To understand why python is a useful scripting language for developers,<br>To learn how to design and | CO1: Understand python as a useful scripting language for developers.<br>CO2: Solve problems requiring the writing of well-documented programs in the Python language, including use of the logical constructs of that language.<br>CO3: |

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| | | | program python applications.<br>To build real-world applications using OOPS .<br>. | Apply lists, tuples, and dictionaries to develop robust programs in python<br>CO4: Identify the structure and components of a python program.<br>CO5: Apply object-oriented programming concepts to develop dynamic interactive Python applications. |
| 22B2CC4 | LAB – II (Programming Python) | National | To enable the learner to write, debug and test the programs written using Python | CO1: Write programs using basic programming constructs<br>CO2: Express different Decision Making statements and Functions.<br>CO3: Implement Math functions, Strings, List and Tuple in Python programs<br>CO4: Interpret Object oriented programming in Python & File handling operations.<br>CO5: Write programs that enhances reusability – Inheritance |
| 19B2AC2 | Computer System Architecture **(ALLIED -II)** | National | To understand the organization and design of basic digital computer.<br>To understand the procedure for | CO1 :Outline the structure of a basic computer system and explain the role of functional units<br>CO2 : Explain the instruction cycle according to the type and addressing mode of the instruction |

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| | | | implementing the arithmetic algorithm in digital hardware.<br>To discuss the techniques that computers use to communicate with I/O devices and Memory. | CO3 : Design the control logic circuit for various digital circuits such as registers, memory and adder - logic circuit of a basic computer system<br>CO4 :Identify the memory requirement of a CPU, select the memory chips and design a mapping circuit<br>CO5 : Explain the structure and the usage of various interfacing devices needed for connecting peripheral devices with the CPU |
| 19B2NM2 | Animation Techniques (NME) | National | To offer a job oriented course and teach them to design animated applications | CO1 :Create a movie with simple animation using built-in animation techniques.<br>CO2: Create a movie with improved animation and background using Frame by frame animation.<br>CO3: Design a movie with many scenes using motion tween technique and multilayer concept.<br>CO4: Design a complex movie with more objects and enhanced animation using symbols. |

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| | | | | CO5: Design a interactive animation using buttons and movie clip symbols. |
| 19B3CC5 | Data Structures and Algorithms | National | To inculcate the skill of developing an algorithm with the apt Data Structures. | CO1 : Identify data structures needed to solve specific problems<br>CO2 : Analyse the data structures for effective use in problem solving<br>CO3 : Design and develop efficient algorithms in terms of Space and Time<br>CO4: Troubleshoot algorithms<br>CO5 : Analyse time complexity of algorithms |
| 19B3CC6 | LAB –III (Data Structures in C++) | National | Programs to be written using OOP concepts to implement data structures. | CO1 : Write efficient programs consuming less memory<br>CO2 : Compile and Execute programs using required data structures<br>CO3 : Implement the algorithms using C++<br>CO4 : Debug programs |
| 22B3SB1 | **Skill Based Elective-** Internet Programming<br>Paper: I Web | National | This course aims to impart skills to design and develop web pages using HTML and to | CO1: Create simple web page using physical tags<br>CO2: Present the information in standard form in a web page using structure tags supported by the |

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| | Designing using HTML and CSS | | design website using open source package. | browsers<br>CO3: Design the layout for a web page using browser support tags<br>CO4: Develop a web site with tables and lists<br>.CO5: Enhance the webpage style through style sheets. |
| 19B4CC7 | Relational Database System Concepts | National | To impart complete understanding of Relational database concepts and its usage in the real world applications<br>To encapsulate the implementation of database system concepts in SQL | CO1: Explain basic architecture, major components behind relational databases, various set operations and their implementation in RDBMS and key advantages of using RDBMS in real world computing.<br>CO2: Assess how SQL evolves as the communication language to access the data.<br>CO3: Discuss functional dependencies and various forms of normalization in maintaining the integrity of data.<br>CO4: Prepare E-R diagram which represents the data their relationship.<br>CO5: Demonstrate implementation of the relational operators in SQL, Boolean and Arithmetic operators, Pattern matching techniques and Utilize group, |

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| | | | | date and time functions to handle complex queries. |
| 22B4CC8 | LAB - IV<br>**LAB IV – RDBMS & Data Analytics using Spreadsheets** | National | This course provides practical knowledge in PL/SQL programming, utilizing the services provided by Oracle database in a stored procedure perspective. This course also provides knowledge to perform data analysis using Excel's most popular features. | CO1 : Enhance Programming skills and techniques.<br>CO2 : Formulate complex queries using SQL<br>CO3 : Ability to analyze data is a powerful skill that helps you make better decisions<br>CO4:<br>Identify the basic principles of a Pivot Table and Recognize how to use Pivot Table and Pivot chart<br>CO5 :<br>Use Excel's powerful functions to efficiently transform mountains of raw data into clear insights |
| 19B4SB2 | **Skill Based Elective**-<br>Internet Programming Paper: II Client Side | National | This course aims to impart skills to design web sites and to develop web applications through scripting | CO1 : Design a dynamic web page using JavaScript<br>CO2 : Design uniform layout for all pages using JavaScript<br>CO3 : Create a webpage with menu bar to navigate through different pages |

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| | Programming using Java Script | | languages. | of a website.<br>CO4 : Create a dynamic webpage using java script<br>CO5 : Create a dynamic webpage using DOM |
| 19B5CC9 | Programming in JAVA | National | To understand the fundamental concepts of object-oriented programming and be familiar with the basic language constructs and the core APIs provided by Java. | CO1: Explain the fundamental concepts of object-oriented programming and acquire programming skills using the basic language constructs and the core APIs provided by Java.<br>CO2: Design, write, compile, execute, test, and debug object-oriented programs in Java.<br>CO3: Develop well-documented and structured event handling programs using Applet<br>CO4: Identify the use of Java in a variety of technologies and on different platforms.<br>CO5: Implement GUI based client applications and TCP/ IP and UDP based Network programs |
| 19B5CC10 | Operating System | National | To develop critical thinking, | CO1: Explain what operating systems are, what they do and how they are |

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| | Concepts | | inquiring, technology skills to describe and to paraphrase what operating systems are, what they do and how they are designed & construct. | designed and constructed.<br>CO2: Describe the services an operating system provides to users, processes and other systems<br>CO3: Outline the process concept and assess the methods for process scheduling, Inter-process communication and deadlock handling.<br>CO4: Assess the management of various resources – Process, Memory, Information and Devices and the effective utilization.<br>CO5: Describe the various security threats and attacks and the countermeasures to them. |
| 19B5CC11 | LAB-V (Programming in JAVA) | National | To develop error-free, well-documented , structured Java programs and to compile, execute, test, and debug the same | CO1: Design, write, compile, execute, test, and debug object-oriented programs in Java.<br>CO2 : Write packages, access specifies and interfaces in a program<br>CO3: Write programs to handle exception and implement Multithreading<br>CO4 : Develop simple graphical user |

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| | | | | interfaces for Java Applications and Applets using GUI components such as labels, buttons and Layout Manager<br>CO5: Create Java event-handling model to respond to events arising from the GUI components |
| 19B5PR1 | Project - I | National | The project work motivates them and also gives insights about Software Development. | CO1: Analyze. Plan and Design a software system<br>CO2: Apply Project Management, Requirement analysis and other Software engineering concepts<br>CO3 : Exhibit the skill of documenting .<br>CO4: Simulate and test the project with real-time data.<br>CO5: Acquire presentation skills |
| 19B5ME1 | **Major Elective – I** Software Engineering | National | Creating students with knowledge to solve real-world problems by providing thorough understanding of | CO1: Explain the basic concepts and techniques.<br>CO2: Plan for building efficient and reliable software.<br>CO3: Analyze the challenges of small to large scale software development. |

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| | | | all concepts and techniques. | CO4: Identify suitable model for various kind of projects.<br>CO5: Explain the concept of time management, managerial and technical skill required by human resources. |
| 19B5ME2 | Python Programming | National | Python is an interpreted, high-level, general-purpose programming language. it provides constructs that enable clear programming on both small and large scales. | CO1: Understand python is a useful scripting language for developers.<br>CO2: Apply lists, tuples, and dictionaries in python programs<br>CO3: Identify the structure and components of a python program.<br>CO4: Analyze the design philosophy that emphasizes code readability, notably using significant whitespace.<br>CO5: Discuss the object orienting style or techniques of programming that encapsulates code within objects |
| 19B5ME3 | Data Mining And Data Warehousing | National | To introduce analysis &extraction of | CO1: Explain the data extraction and transformation techniques.<br>CO2. List the association rule mining |

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| | | | knowledge | techniques and understand association mining to correlation analysis, constraint based association mining.<br>CO3. Describe operational database, warehousing and multidimensional need of data base to meet industrial needs.<br>CO4. Explain the components of warehousing, classification methods and clustering analysis.<br>CO5. Identify and discuss the Business analysis, query tools and application, OLAP etc |
| 19B5MEP1 | Programming With C (**Elective Offered to Physics**) | National | To introduce and form a firm foundation in programming | CO1: Explain the Fundamentals of C programming language.<br>CO2: Write Programs using Control Statements and Loop Structures.<br>CO3: Describe the concept of Array and String Functions.<br>CO4: Explain the concepts of structure and File.<br>CO5: Demonstrate the concept of pointers and solve the problem using pointers |

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| 19B5MEP2 | WEB DEVELOPMENT<br>Major Elective – Offered To Physics | National | This Course introduces basic web design using Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS). And this course provides knowledge to plan and design effective web pages with different text formatting and images to create website. | •To enhance the knowledge of the students in effective webpage designing.<br>•To provide skills to sharply focus on needed information to be presented in a website.<br>•To improve the quality of the students by giving strong base in fundamental and advanced concepts.<br>•To give courage to face the real-world scenarios as it is practical oriented<br>•To inculcate the ability to explain, analyze, identify and define the technology required to build and implement a web site. |
| 19B5SB3 | **Skill Based Elective**-Internet Programming<br>Paper: III – Client Side Programming Using JAVA SCRIPT& CSS | National | To understand the JavaScript language<br>To alter, show, hide and move objects on a web page | CO1 : Design a website with boosted styles using style sheets<br>CO2 : Design uniform layout for all pages of a website through tags and style sheets<br>CO3 : Create a webpage with menu bar to navigate through different pages of a website.<br>CO4 : Create a dynamic webpage |

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| | | | | using java script<br>CO4 : Create a webpage with a facility to collect and validate data |
| 19B5SB4 | **Skill Based Elective**- Internet Programming<br>Paper: IV – Server Side Programming Using ASP.NET | National | Defline basic concepts of NET FrameWork3.5, Architecture of .NET Frame Work and Components of .NET FrameWork . | CO1 : Define the Basic Concepts, Architecture and Components of .NET FrameWork.<br>CO2: Discuss and use Web Forms with Standard Controls.<br>CO3 : Apply validations to standard controls of web form.<br>CO4 : Design and develop web applications using navigation controls.<br>CO5 : Write basic SQL commands and develop web applications with DML operations using SQL commands. |
| 19B6CC13 | J2EE Programming | National | To Understand J2EE as an architecture and platform for building and deploying web-based, n-tier enterprise applications. | CO1: Explain J2EE Architecture and Standard Services used<br>CO2: Create Remote methods and apply it in J2EE applications using RMI<br>CO3: Develop Server side Java Applications using Servlet and JSP<br>CO4: Design programs with Data Base Connectivity using JDBC |

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| 19B6CC14 | Data Communications and Networking | National | To provide detailed knowledge and understanding in the concepts of internet model of telecommunications and networking. | CO1 : Explain the structure of internet according to OSI model<br>CO2 : Analyse the capacity, efficiency and the usage of different transmission medium<br>CO3 : Outline the different switching techniques used for data transmission<br>CO4 :Explain the various error and flow control algorithms used for effective communication<br>CO5 : Outline the various addressing used for communication between source and destination through internet<br>CO6 : Compare the format of data transmission using TCP and UDP protocols<br>CO7 : Explain the standard algorithms used for data security |
| 19B6CC15 | LAB-VI (J2EE Programming) | National | gram for network g | CO1: Write program for network chatting<br>CO2: Write programs to access Data |

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| | | | | Base using JDBC<br>CO3: Create remote methods in Remote Server and write Client program to access it<br>CO4: Develop Server side Java Applications using Servlet<br>CO5: Develop Server side Java Applications using JSP |
| 19B6PR2 | Project – II (Outside) | National | Analyze, Plan and Design a software system | CO1: Analyze. Plan and Design a software system<br>CO2: Apply Project Management, Requirement analysis and other Software engineering concepts<br>CO3 : Exhibit the skill of documenting .<br>CO4: Simulate and test the project with real-time data.<br>CO5: Acquire presentation skills |
| 19B6ME4 | **Major Elective – II**<br>Computer Graphics | National | Acquire, articulate, and apply specialized terminology and knowledge relevant to graphic | CO1: Identify the basic concepts used in computer graphics.<br>CO2: Analyze different output primitives.<br>CO3: Explain the techniques of |

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| | | | design including relationships to other disciplines and to contemporary global issues. | transformations and three dimensional graphics with display methods.<br>CO4: Discuss the importance of viewing and clipping.<br>CO5: Explain the fundamentals of animation and virtual reality |
| 19B6ME5 | Software Testing | National | To introduce the software development life cycle to develop error-free quality software. | CO1: Explain various testing processes and continuous quality improvement<br>CO2: Describe White box testing and Black box testing<br>CO3: Discuss integration testing and its types<br>CO4: Explain Performance and Regression testing<br>CO5: Discuss Internationalization Testing and Ad-hoc testing procedures |
| 19B6ME4 | **Major Elective – II**<br>Computer Graphics | National | Acquire, articulate, and apply specialized terminology and knowledge relevant to graphic design including | CO1: Identify the basic concepts used in computer graphics.<br>CO2: Analyze different output primitives.<br>CO3: Explain the techniques of transformations and three |

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| | | | relationships to other disciplines and to contemporary global issues. | dimensionalgraphics with display methods.<br>CO4: Discuss the importance of viewing and clipping.<br>CO5: Explain the fundamentals of animation and virtual reality |
| 19B6ME5 | Software Testing | National | To introduce the software development life cycle to develop error-free quality software. | CO1: Explain various testing processes and continuous quality improvement<br>CO2: Describe White box testing and Black box testing<br>CO3: Discuss integration testing and its types<br>CO4: Explain Performance and Regression testing<br>CO5: Discuss Internationalization Testing and Ad-hoc testing procedures |
| 19B6ME7 | **Major Elective – III**<br>Introduction to Artificial Intelligence | National | To orient towards the latest concepts of the emerging technology. | CO1 : Differentiate AI method of problem solving from normal method<br>CO2 : Identify heuristics for a given problem<br>CO3 : Explain the various search techniques |

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| 19B6ME8 | Mobile Computing using Android | National | This Course provides overview of coverage of various wireless networks and explains how different stations work with agents to connect mobile world.<br>. | CO1:Explain Pervasive Computing<br>CO2:Identify different operating systems<br>CO3:Discuss the importance of Security<br>CO4:Explain Internet Protocols<br>CO5:Describe different Gateways |
| 19B6ME9 | Big Data Fundamentals | National | Explain the fundamental concepts of Big data | CO1: Explain the fundamental concepts of Big data<br>CO2: Describe Big data Adoption and Planning<br>CO3: Explain Big data Storage Concept<br>CO4: Utilize Big data and Processing Concepts |

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| 19B6SB5 | **Skill Based Elective**- Internet Programming<br>Paper: V - Server Side Programming Using PHP | National | To understand and write PHP code, and use it to build dynamic web pages<br>To further their knowledge of web application development with PHP | CO1: Explain fundamental concepts of PHP .<br>CO2: Identify and use array and array related functions<br>CO3: Design and Develop Form with PHP Code.<br>CO4: Develop File operations.<br>CO5: Demonstrate Data Manipulation commands in MYSQL |