AQAR – QUALITATIVE METRIC

2022 - 2023

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 Outcomes (POs)

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 (PSOs)

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 (COs)

Course Code	Course Title	Nature of the Course (Local/ National/ Regional/Global)	Course Description	Course Outcomes
19B1CC1	Programming in C	National	To introduce and form a firm foundation in programming. To stress the importance of clarity , simplicity and the efficiency in writing programs	CO1: Identify the basic concepts needed for program development CO2: Apply the basic concepts and develop program to find solutions for simple problems CO3: Design programs to solve complex problems by using suitable control statements CO4: Analyze the problem and design efficient program using functions 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 Utilize various features in C to various situations	CO1 : Develop algorithms to find solutions for simple problems CO2 :Analyze the source code and rectify errors if any and bring out necessary solution CO3 : Utilize proper control statements to find solution for a given problem CO4 : Develop source code using arrays to handle volume of data CO5 : Design source code for console applications
19B1NME1	Animation Techniques (NME)	National	To offer a job oriented course and	CO1 :Create a movie with simple animation using built-in

			teach them to design animated applications	animation techniques. CO2: Create a movie with improved animation and background using Frame by frame animation. CO3: Design a movie with many scenes using motion tween technique and multilayer concept. CO4: Design a complex movie with more objects and enhanced animation using symbols. CO5: Design a interactive animation using buttons and movie clip symbols.
19B2CC3	Programming in C++	National	To introduce Object Oriented	CO1: Compare Procedure-oriented programming and the evolution

			Programming concepts using C++ and improve their OOP Skill.	of Object oriented programming CO2: Identify basic concepts of OOP, benefits and its applications. CO3: Write object oriented programs using classes and objects. CO4: Design object oriented programs that can focus on reusability – Inheritance. CO5: Utilize runtime polymorphism with pointers and virtual functions and File concepts.
19B2CC4	LAB – II (Programming in C++)	National	To enable the learner to write, debug and test the programs written using OOP	CO1: Write programs using Object oriented programming paradigm – Encapsulation (Classes and objects), Polymorphism and

				Inheritance. CO2: Apply various features like constructors and destructors, overloading- function and operators CO3: Utilize different types of inheritance to suit different applications. CO4: Design to write programs using Object oriented programming paradigm that enables runtime polymorphism using pointers and virtual functions. CO5: Apply Object oriented programming paradigm for flat file organization. (Sequential and Random

				access
19B2AC2	Computer System Architecture **(ALLIED -II)**	National	To understand the organization and design of basic digital computer. To understand the procedure for implementing the arithmetic algorithm in digital hardware. To discuss the techniques that computers use to communicate with I/O devices and Memory.	CO1 :Outline the structure of a basic computer system and explain the role of functional units CO2 : Explain the instruction cycle according to the type and addressing mode of the instruction CO3 : Design the control logic circuit for various digital circuits such as registers, memory and adder - logic circuit of a basic computer system CO4 :Identify the memory requirement of a CPU, select the memory chips and design a

				mapping circuit 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. CO2: Create a movie with improved animation and background using Frame by frame animation. CO3: Design a movie with many scenes using motion tween technique and multilayer concept.

				CO4: Design a complex movie with more objects and enhanced animation using symbols. 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 CO2 : Analyse the data structures for effective use in problem solving CO3 : Design and develop efficient algorithms in terms of Space and Time CO4: Troubleshoot algorithms 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 CO2 : Compile and Execute programs using required data structures CO3 : Implement the algorithms using C++ CO4 : Debug programs
19B3SB1	**Skill Based Elective-** Internet Programming Paper: I Introduction To Internet	National	To facilitate the students to explore the basics of internet. To introduce how data can be shared and accessed thru'	CO1: Discuss the way in which internet is used, classify the different types of connections. CO2: Describe the working of web browsers and demonstrate searching the web using effective web browsing tips

			internet	CO3: Design a simple web site and discuss the method for web hosting. CO4: Identify internet addressing and various internet protocols used for the communication. CO5: Explain the tips and techniques for managing the e-mails and protecting the privacy.
19B4CC7	Relational Database System Concepts	National	To impart complete understanding of Relational database concepts and its usage in the real world applications To encapsulate the	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

			implementation of database system concepts in SQL	computing. CO2: Assess how SQL evolves as the communication language to access the data. CO3: Discuss functional dependencies and various forms of normalization in maintaining the integrity of data. CO4: Prepare E-R diagram which represents the data their relationship. CO5: Demonstrate implementation of the relational operators in SQL, Boolean and Arithmetic operators, Pattern matching techniques and Utilize group,

				date and time functions to handle complex queries.
19B4CC8	LAB - IV (Visual Programming)	National	Programs to be written using IDE for window applications	CO1 : Write simple programs in VB CO2 : Compile, Debug and Execute programs in VB CO3 : Design and simulate simple game applications CO4: Write programs for the data base applications CO5 : Write programs using menu editors and MDI forms
19B4SB2	**Skill Based Elective**- Internet Programming Paper: II Web Designing	National	To teach the basic concept of designing a Web page.	CO1 : Create simple web page using physical tags CO2 : Present the information in standard form in a web page using structure tags supported

	UsingHTML and WORDPRESS			by the browsers CO3 : Design the layout for a web page using browser support tags CO4 : Develop a web site with the provision to go around all pages CO5 : Design layout for a web document using frames
19B5CC9	Programming in JAVA	National	To understand the fundamental concepts of object-oriented programming and be familiar with the basic language constructs and the	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. CO2: Design, write, compile, execute, test, and debug

			core APIs provided by Java.	object-oriented programs in Java. CO3: Develop well-documented and structured event handling programs using Applet CO4: Identify the use of Java in a variety of technologies and on different platforms. CO5: Implement GUI based client applications and TCP/ IP and UDP based Network programs
19B5CC10	Operating System Concepts	National	To develop critical thinking, inquiring, technology skills to describe and to paraphrase what operating systems	CO1: Explain what operating systems are, what they do and how they are designed and constructed. CO2: Describe the services an operating system provides to

			are, what they do and how they are designed & construct.	users, processes and other systems CO3: Outline the process concept and assess the methods for process scheduling,Inter-process communication and deadlock handling. CO4: Assess the management of various resources – Process, Memory, Information and Devices and the effective utilization. CO5: Describe the various security threats and attacks and the countermeasures to them.
19B5CC11	LAB-V (Programming in	National	To develop error-free, well-	CO1: Design, write, compile, execute, test, and debug

	JAVA)		documented , structured Java programs and to compile, execute, test, and debug the same	object-oriented programs in Java. CO2 : Write packages, access specifies and interfaces in a program CO3: Write programs to handle exception and implement Multithreading CO4 : Develop simple graphical user interfaces for Java Applications and Applets using GUI components such as labels, buttons and Layout Manager CO5: Create Java event-handling model to respond to events arising from the GUI components

19B5CC12	Project - I	National	The project work motivates them and also gives insights about Software Development.	CO1: Analyze. Plan and Design a software system CO2: Apply Project Management, Requirement analysis and other Software engineering concepts CO3 : Exhibit the skill of documenting . CO4: Simulate and test the project with real-time data. 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. CO2: Plan for building efficient and reliable software. CO3: Analyze the challenges of small

			all concepts and techniques.	to large scale software development. CO4: Identify suitable model for various kind of projects. 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. CO2: Apply lists, tuples, and dictionaries in python programs CO3: Identify the structure and components of a python program.

				CO4: Analyze the design philosophy that emphasizes code readability, notably using significant whitespace. 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 knowledge	CO1: Explain the data extraction and transformation techniques. CO2. List the association rule mining techniques and understand association mining to correlation analysis,

				constraint based association mining. CO3. Describe operational database, warehousing and multidimensional need of data base to meet industrial needs. CO4. Explain the components of warehousing, classification methods and clustering analysis. 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. CO2: Write Programs using Control Statements and Loop

				Structures. CO3: Describe the concept of Array and String Functions. CO4: Explain the concepts of structure and File. CO5: Demonstrate the concept of pointers and solve the problem using pointers
19B5MEP2	WEB DEVELOPMENT 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 enhance the knowledge of the students in effective webpage designing. • To provide skills to sharply focus on needed information to be presented in a website. • To improve the quality of the students by giving strong base in fundamental and advanced

			to plan and design effective web pages with different text formatting and images to create website.	concepts. • To give courage to face the real-world scenarios as it is practical oriented • 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 Paper: III – Client Side Programming Using JAVA SCRIPT& CSS	National	To understand the JavaScript language To alter, show, hide and move objects on a web page	CO1 : Design a website with boosted styles using style sheets CO2 : Design uniform layout for all pages of a website through tags and style sheets CO3 : Create a webpage with menu bar to navigate through different pages of a website. CO4 : Create a dynamic webpage

				using java script CO4 : Create a webpage with a facility to collect and validate data
19B5SB4	**Skill Based Elective**- Internet Programming 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. CO2: Discuss and use Web Forms with Standard Controls. CO3 : Apply validations to standard controls of web form. CO4 : Design and develop web applications using navigation controls. 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 CO2: Create Remote methods and apply it in J2EE applications using RMI CO3: Develop Server side Java Applications using Servlet and JSP CO4: Design programs with Data Base Connectivity using JDBC CO5: Identify the type of Java Messaging Service
19B6CC14	Data Communications and Networking	National	To provide detailed knowledge and understanding in	CO1 : Explain the structure of internet according to OSI model

			the concepts of internet model of telecommunications and networking.	CO2 : Analyse the capacity, efficiency and the usage of different transmission medium CO3 : Outline the different switching techniques used for data transmission CO4 :Explain the various error and flow control algorithms used for effective communication CO5 : Outline the various addressing used for communication between source and destination through internet CO6 : Compare the format of data transmission using TCP and UDP protocols

				CO7 : Explain the standard algorithms used for data security
19B6CC15	LAB-VI (J2EE Programming)	National	te program for network chatting	CO1: Write program for network chatting CO2: Write programs to access Data Base using JDBC CO3: Create remote methods in Remote Server and write Client program to access it CO4: Develop Server side Java Applications using Servlet CO5: Develop Server side Java Applications using JSP
19B6CC16	Project – II (Outside)	National	Analyze, Plan and Design a software	CO1: Analyze. Plan and Design a software system

			system	CO2: Apply Project Management, Requirement analysis and other Software engineering concepts CO3 : Exhibit the skill of documenting . CO4: Simulate and test the project with real-time data. CO5: Acquire presentation skills
19B6ME4	**Major Elective – II** Computer Graphics	National	Acquire, articulate, and apply specialized terminology and knowledge relevant to graphic design including relationships to	CO1: Identify the basic concepts used in computer graphics. CO2: Analyze different output primitives. CO3: Explain the techniques of transformations and three dimensional graphics with

			other disciplines and to contemporary global issues.	display methods. CO4: Discuss the importance of viewing and clipping. 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 CO2: Describe White box testing and Black box testing CO3: Discuss integration testing and its types CO4: Explain Performance and Regression testing CO5: Discuss Internationalization Testing and Ad-hoc testing

				procedures
19B6ME6	Cloud Computing	National	Define cloud computing and related concepts	CO1. Define cloud computing and related concepts CO2. Explain the key dimensions of the challenges of Cloud Computing CO3. Discuss the assessment of the economics , financial, and technological implications for selecting cloud computing for an organization CO4. Describe the benefits of cloud computing and to understand different layers of the cloud technologies, practical solutions CO5. Explain the challenges of

				cloud computing and determine the suitability of in-house v/s hosted solutions
19B6ME7	**Major Elective – III** 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 CO2 : Identify heuristics for a given problem CO3 : Explain the various search techniques CO4 : Explain predicate logic CO5 : Describe the fundamentals of Game Playing, NLP, NN and Expert Systems
19B6ME8	Mobile Computing using Android	National	This Course provides overview of coverage of various wireless networks	CO1:Explain Pervasive Computing CO2:Identify different operating

			and explains how different stations work with agents to connect mobile world. .	systems CO3:Discuss the importance of Security CO4:Explain Internet Protocols CO5:Describe different Gateways
19B6ME9	Big Data Fundamentals	National	Explain the fundamental concepts of Big data	CO1: Explain the fundamental concepts of Big data CO2: Describe Big data Adoption and Planning CO3: Explain Big data Storage Concept CO4: Utilize Big data and Processing Concepts CO5: Demonstrate Big Data Analysis Techniques.

19B6SB5	**Skill Based Elective**- Internet Programming Paper: V - Server Side Programming Using PHP	National	To understand and write PHP code, and use it to build dynamic web pages To further their knowledge of web application development with PHP	CO1: Explain fundamental concepts of PHP . CO2: Identify and use array and array related functions CO3: Design and Develop Form with PHP Code. CO4: Develop File operations. CO5: Demonstrate Data Manipulation commands in MYSQL
19B6SB6	**Skill Based Elective-** Internet Programming Paper: Vi -Web Services Development	National	To Know about Web Services that convert application into a Web-application To understand the	CO1: Define the Web Services that convert application into a Web-application CO2: Analyze the differences between HTML and XML CO3: Apply XML markup language

	Using XML		differences between HTML and XML	for transferring data CO4: Create and validate XML documents CO5: Discuss Simple Object Access Protocol in detail