



RAAK ARTS AND SCIENCE COLLEGE

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Recognized under section 2(f) of the UGC Act, 1956.

DEPARTMENT OF COMPUTER SCIENCE

SUBJECT WISE COURSE OUTCOMES (2021 – 2024)

2021 – 2022 REGULATION (ANNAMALAI UNIVERSITY)

S.NO	TITLE OF THE PAPER	PAPER CODE	COURSE OUTCOMES
1	PROGRAMMING IN C	21UCSEC13	<p>The student will be able to understand the concepts of Constants, Variables, and Data Types, Operators and Expressions</p> <ol style="list-style-type: none">1. The student will be able to understand the concepts of Managing Input and Output Operations, Decision Making and Branching, Decision Making and Looping.2. The student will be able to understand the concepts of Arrays, Character Arrays and Strings, User Defined Functions.3. The student will be able to understand the concepts of Structure and Unions, Pointers, File Management in C.4. The student will be able to understand the concepts of Fundamental Algorithms, Factoring Methods.
2	PROGRAMMING IN C LAB	21UCSEP14	<ol style="list-style-type: none">1. Enhance the analyzing and problem-solving skills and use the same for writing programs in C.2. Write diversified solutions, draw flowcharts and develop a well-documented and indented program according to coding standards.3. Learn to debug a given program and execute the C program.
3	ENVIRONMENTAL STUDIES	21UENV517	<ol style="list-style-type: none">1. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.2. Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.3. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.



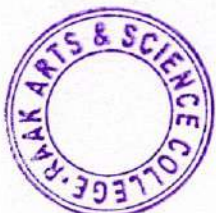

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4	C++ & DATA STRUCTURES	21UCSEC23	<ol style="list-style-type: none">1. The Student will be able to understand the concepts of object oriented programming Apply structure and inline functions.2. The student will be able to understand the concepts of the types of inheritances and applying various levels of Inheritance for real time problems Apply the OOPs concepts class and object.3. Understand Explain the file concept and exception handlings in C++4. The student will be able to understand the concepts of Stacks and Queue using array and pointers
5	C++ & DATA STRUCTURES LAB	21UCSECP24	<ol style="list-style-type: none">1. Understand the Creating and Deleting the Objects with the Concepts of Constructors and Destructors.2. Demonstrate the Polymorphism Concepts and Operator Overloading.3. Understand basic Data Structures such as Arrays, Linked Lists, Stacks, Queues, doubly Linked List and Infix to Postfix Conversion.4. Apply Algorithm for solving problems like Sorting and Searching
6	VALUE EDUCATION	21UVALE27	<ol style="list-style-type: none">1. Responsible and cooperative citizenship.2. Development of skills and imparting vocational training.3. Developing democratic way of thinking and inculcation of the spirit of National integration.4. Respect for dignity of individual and diversity in society.
7	PROGRAMMING IN JAVA	21UCSEC33	<ol style="list-style-type: none">1. Students are able to know about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes2. Students are able to Secured, well-suited for internet programming using applets and GUI-based



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8	PROGRAMMING IN JAVA LAB	21UCSEP34	<ol style="list-style-type: none">1. Understand the Creating and Deleting the Objects with the Concepts of Constructors and Destructors.2. Demonstrate the Polymorphism Concepts and Operator Overloading.3. Understand basic of AWT Controls.4. Apply Algorithm for solving problems like Sorting and Searching
9	DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION	21UCSES35	<ol style="list-style-type: none">1. Understand various types of number systems and their conversions.2. Simplify the Boolean expressions and apply the Boolean theorems through logical gates3. Design and implement variety of logical devices using combinational circuits concepts.
10	RELATIONAL DATABASE MANAGEMENT SYSTEMS	21UCSEC43	<ol style="list-style-type: none">1. Describe the database architecture and its applications Sketch the ER diagram for real world applications Uses various ER diagram for a similar concept from various sources.2. Discuss about the relational algebra and calculus Construct various queries in SQL and PL/SQL Compiles various queries in SQL, Relational Calculus and Algebra.3. Describe the various normalization forms Apply the normalization concepts for a table of data Practices a table and implement the normalization concepts.4. Explain the storage and accessing of data.
11	RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB	21UCSEP44	<ol style="list-style-type: none">1. Design and Implement a database schema for a given problem domain.2. Populate and query a database using SQL DDL/DML Commands.3. Build well formed in String Date/Aggregate Functions.4. Design and implement a database query using Joins, Sub-Queries and Set Operations.



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12	WIRELESS DATA COMMUNICATION	21UCSES46	<ol style="list-style-type: none">1. To understand the concepts of basic OSI layers.2. To understand the concepts of signals and transmission media.3. To understand the basic concepts of error detection and DLC4. To understand the Characterize of wireless transmission technologies5. To understand the concepts of Security.
13	MOBILE APPLICATION DEVELOPMENT	21UCSEC51	<ol style="list-style-type: none">1. Identify various concepts of mobile programming that make it unique from programming for other platforms2. Critique mobile applications on their design pros and cons3. Utilize rapid prototyping techniques to design4. Develop sophisticated mobile interfaces.
14	OPERATING SYSTEM	21UCSEC52	<ol style="list-style-type: none">1. Describe the basics of the operating systems, mechanisms of OS to handle processes, threads, and their communication.2. Analyze the memory management and its allocation policies.3. Illustrate different conditions for deadlock and their possible solutions.4. Discuss the storage management policies with respect to different storage management technologies5. Evaluate the concept of the operating system with respect to UNIX, Linux, Time, and mobile OS.
15	DESIGN AND ANALYSIS OF ALGORITHMS	21UCSEC53	<ol style="list-style-type: none">1. Analyze the asymptotic performance of algorithms.2. Write rigorous correctness proofs for algorithms.3. Demonstrate a familiarity with major algorithms and data structures.4. Apply important algorithmic design paradigms and methods of analysis.5. Synthesize efficient algorithms in common engineering design situations.
16	DATA MINING	21USCEE56-1	<ol style="list-style-type: none">1. Identify what kinds of technologies are used for different application.2. Manipulate data preprocessing, data Warehouse and OLAP technology3. Data cube technology: mining frequent patterns and association, classification, clustering, and outlier detection.




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17	MOBILE APPLICATION DEVELOPMENT LAB	21UCSEP54	<ol style="list-style-type: none">1. Develop mobile applications using GUI and Layouts.2. Develop mobile applications using Event Listener.3. Develop mobile applications using Databases.4. Analyze and discover own mobile app for simple needs.
18	OPERATING SYSTEM LAB	21UCSEP55	<ol style="list-style-type: none">1. Ability to develop application programs using system calls in Unix.2. Ability to implement interprocess communication between two processes.3. Ability to design and solve synchronization problems.4. Ability to simulate and implement operating system concepts such as scheduling, deadlock management, file management, and memory management.
19	SOFTWARE ENGINEERING	21UCSES57	<ol style="list-style-type: none">1. Students will be able to decompose the given project in various phases of a lifecycle.2. Students will be able to choose appropriate process model depending on the user requirements.3. Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.4. Students will be able to know various processes used in all the phases of the product.
20	OPEN-SOURCE SOFTWARE	21UCSEC61	<ol style="list-style-type: none">1. Implement various applications using build systems2. Understand the installation of various packages in open-source operating systems3. Create simple GUI applications using Gambas 34. Understand various version control systems5. Understand the kernel configuration and virtual environment



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21	PYTHON PROGRAMMING	21UCSEC62	<ol style="list-style-type: none">1. Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements. Understand2. Express proficiency in the handling of strings and functions.3. Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.4. Identify the commonly used operations involving file systems and regular expressions.5. Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.
22	PYTHON PROGRAMMING LAB	21UCSEP63	<ol style="list-style-type: none">1. Write, Test and Debug Python Programs2. Implement Conditionals and Loops for Python Programs3. Use functions and represent Compound data using Lists, Tuples and Dictionaries.4. Read and write data from & to files in Python and develop Application
23	OPEN-SOURCE SOFTWARE LAB	21UCSEP64	<ol style="list-style-type: none">1. Implement various applications using build systems2. Understand the installation of various packages in open-source operating systems3. Create simple GUI applications4. Understand various version control systems
24	CRYPTOGRAPHY	21UCSEE65-2	<ol style="list-style-type: none">1. Building blocks of cryptography.2. The application of cryptography in securing information at rest, authentication, networks, and software engineering.3. Blockchain foundations and applications4. Private and confidential computing.



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25	CLOUD COMPUTING	21UCSEE66-3	<ol style="list-style-type: none">1. Ability to understand various service delivery models of a cloud computing architecture.2. Evaluate the ways in which the cloud can be programmed and deployed.3. Understanding cloud service providers.4. Analyzing the Infrastructure as a Service in Cloud computing
26	PROJECT WORK	21UPROJ69	<ol style="list-style-type: none">1. Able to identify and formulate research problem2. Able to design and develop solution to the problem3. Able to analyze and solve the complex problems4. Able to plan, implement and execute the project5. Able to write effective technical report and demonstrate through presentation.



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TITLE OF THE PAPER	PAPER CODE	COURSE OUTCOMES
Relational Database Management System	MCS11	CO1 - Students are able to have a broad understanding of database concepts and databasemanagement system software CO2 - Students are able tohave a high-level understanding of major DBMS components and their function CO3 - Students are able tomodel an application's data requirements using conceptualmodeling tools like ER diagrams and design database schemas based on theconceptual model. CO4 - Students are able towrite SQL commands to create tables and indexes,insert/update/delete data, and query data in a relational DBMS. CO5 - Students are able toprogram a data-intensive application using DBMS
Enterprise Java Programming	MCS12	CO1 - Students are able to develop Applet Programming using various techniques CO2 - Students are able to develop applications using Abstract Window Toolkit and Events CO3 - Students are able to update and retrieve the data from the databases using JDBC- ODBC CO4 - Students are able to develop server side programs in the form of Servlets CO5 - Students are able to build up Java Applications using collections and JSP Tags.
Programming using C#.NET	MCS13	CO1 - Students are able to know the differences between desktop application and web application. CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects. CO3 - Students are able to create and manipulate GUI components in C# for windows application. CO4 - Students are able to code solutions and compile C# projects within the .NET framework. CO5 - Students are able to build the desktop application with Database.



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Practical 1: Relational Database Management System	MCS14	<p>CO1 - Students are able to have a broad understanding of database concepts and databasemanagement system software</p> <p>CO2 - Students are able tohave a high-level understanding of major DBMS components and their function</p> <p>CO3 - Students are able tomodel an application's data requirements using conceptualmodeling tools like ER diagrams and design database schemas based on theconceptual model.</p> <p>CO4 - Students are able towrite SQL commands to create tables and indexes,insert/update/delete data, and query data in a relational DBMS.</p> <p>CO5 - Students are able toprogram a data-intensive application using DBM</p>
Practical 2: Enterprise Java Programming	MCS55	<p>CO1 - Students are able to develop Applet Programming using various techniques</p> <p>CO2 - Students are able to develop applications using Abstract Window Toolkit and Events</p> <p>CO3 - Students are able to update and retrieve the data from the databases using JDBC- ODBC</p> <p>CO4 - Students are able to develop server side programs in the form of Servlets</p> <p>CO5 - Students are able to build up Java Applications using collections and JSP Tags.</p>
Practical 3: Programming using C#.NET	MCS66	<p>CO1 - Students are able to know the differences between desktop application and web application.</p> <p>CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects.</p> <p>CO3 - Students are able to create and manipulate GUI components in C# for windows application.</p> <p>CO4 - Students are able to code solutions and compile C# projects within the .NET framework.</p> <p>CO5 - Students are able to build the desktop application with Database.</p>



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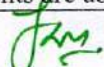


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Computer Organization	MCS77	<p>CO1 - Students are able to identify the types of instructions and the organization of registers and memory</p> <p>CO2 - Students are able to describe the translation model of assembly language to machine language.</p> <p>CO3 - Students are able to understand the micro-program by mapping the instructions.</p> <p>CO4 - Students are able to recognize the types of computer organizations.</p> <p>CO5 - Students are able to accept the better way of processing by Parallel and Vector</p>
E-Commerce	MCS88	<p>CO1 - Students are able to compute speedup, efficiency, and scaled speedup of parallel computations, given appropriate data</p> <p>CO2 - Students are able to apply Amdahl's Law to predict the maximum speedup achievable from a parallel version of a sequential program, given its execution profile</p> <p>CO3 - Students are able to analyze the efficiency of a parallel algorithm</p> <p>CO4 - Students are able to explain the relative advantages and disadvantages of mesh, hypercube, and butterfly networks with respect to diameter, bisection width, and number of edges/node</p> <p>CO5 - Students are able to explain the advantages and disadvantages of constructing parallel computers using</p>
Advanced Enterprise Java Programming	MCS99	<p>CO1 - Students are able to understand basic concepts in the embedded computing systems area;</p> <p>CO2 - Students are able to determine the optimal composition and characteristics of an embedded system;</p> <p>CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system</p> <p>CO4 - Students are able to design and program an embedded system at the basic level;</p> <p>CO5 - Students are able to develop</p>




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		hardware-software complex with the use of the National Instruments products.
Design and Analysis of Algorithm	MCS10	CO1 - Students are able to identify the types of instructions and the organization of registers and memory CO2 - Students are able to describe the translation model of assembly language to machine language. CO3 - Students are able to understand the micro-program by mapping the instructions. CO4 - Students are able to recognize the types of computer organizations. CO5 - Students are able to accept the better way of processing by Parallel and Vector
Web Application using C#.NET	MCS11	CO1 - Students are able to understand basic concepts in the embedded computing systems area; CO2 - Students are able to determine the optimal composition and characteristics of an embedded system; CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system CO4 - Students are able to design and program an embedded system at the basic level; CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.




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Practical 4: Advanced Enterprises Java Programming	MCS12	CO1 - Students are able to understand basic concepts in the embedded computing systems area; CO2 - Students are able to determine the optimal composition and characteristics of an embedded system; CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system CO4 - Students are able to design and program an embedded system at the basic level; CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.
Practical 5: Design and Analysis of Algorithm	MCS13	CO1 - Students are able to identify the types of instructions and the organization of registers and memory CO2 - Students are able to describe the translation model of assembly language to machine language. CO3 - Students are able to understand the micro-program by mapping the instructions. CO4 - Students are able to recognize the types of computer organizations. CO5 - Students are able to accept the better way of processing by Parallel and Vector
Practical 6: Web Application using c#.NET	MCS14	CO1 - Students are able to identify the types of instructions and the organization of registers and memory CO2 - Students are able to describe the translation model of assembly language to machine language. CO3 - Students are able to understand the micro-program by mapping the instructions. CO4 - Students are able to recognize the types of computer organizations. CO5 - Students are able to accept the better way of processing by Parallel and Vector



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Human Computer Interaction	MCS115	<p>CO1 - Students are able to understand basic concepts in the embedded computing systems area;</p> <p>CO2 - Students are able to determine the optimal composition and characteristics of an embedded system;</p> <p>CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system</p> <p>CO4 - Students are able to design and program an embedded system at the basic level;</p> <p>CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.</p>
Open Source Applications	MCS116	<p>CO1 - Students are able to know the differences between desktop application and web application.</p> <p>CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects.</p> <p>CO3 - Students are able to create and manipulate GUI components in C# for windows application.</p> <p>CO4 - Students are able to code solutions and compile C# projects within the .NET framework.</p> <p>CO5 - Students are able to build the desktop application with Database.</p>
Human Rights	MCS17	<p>CO1 - Students are able to identify the types of instructions and the organization of registers and memory</p> <p>CO2 - Students are able to describe the translation model of assembly language to machine language.</p> <p>CO3 - Students are able to understand the micro-program by mapping the instructions.</p> <p>CO4 - Students are able to recognize the types of computer organizations.</p> <p>CO5 - Students are able to accept the better way of processing by Parallel and Vector</p>



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Distributed Operating System	MCS18	CO1 - Students are able to understand basic concepts in the embedded computing systems area; CO2 - Students are able to determine the optimal composition and characteristics of an embedded system; CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system CO4 - Students are able to design and program an embedded system at the basic level; CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.
XML and Web Services	MCS19	CO1 - Students are able to know the differences between desktop application and web application. CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects. CO3 - Students are able to create and manipulate GUI components in C# for windows application. CO4 - Students are able to code solutions and compile C# projects within the .NET framework. CO5 - Students are able to build the desktop application with Database.
Programming using Python	MCS21	CO1 - Students are able to understand basic concepts in the embedded computing systems area; CO2 - Students are able to determine the optimal composition and characteristics of an embedded system; CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system CO4 - Students are able to design and program an embedded system at the basic level; CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.



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Practical 7: Unix	MCS22	CO1 - Students are able to understand basic concepts in the embedded computing systems area; CO2 - Students are able to determine the optimal composition and characteristics of an embedded system; CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system CO4 - Students are able to design and program an embedded system at the basic level; CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.
Practical 8: XML and Web Services	MCS23	CO1 - Students are able to develop Applet Programming using various techniques CO2 - Students are able to develop applications using Abstract Window Toolkit and Events CO3 - Students are able to update and retrieve the data from the databases using JDBC- ODBC CO4 - Students are able to develop server side programs in the form of Servlets CO5 - Students are able to build up Java Applications using collections and JSP Tags.
Practical 9: Programming using Python	MCS24	CO1 - Students are able to understand basic concepts in the embedded computing systems area; CO2 - Students are able to determine the optimal composition and characteristics of an embedded system; CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system CO4 - Students are able to design and program an embedded system at the basic level; CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.



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Block chain Technology	MCS25	CO1 - Students are able to know the differences between desktop application and web application. CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects. CO3 - Students are able to create and manipulate GUI components in C# for windows application. CO4 - Students are able to code solutions and compile C# projects within the .NET framework. CO5 - Students are able to build the desktop application with Database.
Programming using C	MCS26	CO1 - Students are able to develop Applet Programming using various techniques CO2 - Students are able to develop applications using Abstract Window Toolkit and Events CO3 - Students are able to update and retrieve the data from the databases using JDBC- ODBC CO4 - Students are able to develop server side programs in the form of Servlets CO5 - Students are able to build up Java Applications using collections and JSP Tags.
Mobile Application Development	MCS27	CO1 - Students are able to know the differences between desktop application and web application. CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects. CO3 - Students are able to create and manipulate GUI components in C# for windows application. CO4 - Students are able to code solutions and compile C# projects within the .NET framework. CO5 - Students are able to build the desktop application with Database.



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Software Project Management	MCS28	<p>CO1 - Students are able to understand basic concepts in the embedded computing systems area;</p> <p>CO2 - Students are able to determine the optimal composition and characteristics of an embedded system;</p> <p>CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system</p> <p>CO4 - Students are able to design and program an embedded system at the basic level;</p> <p>CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.</p>
Practical 1: Mobile Application development	MCS29	<p>CO1 - Students are able to develop Applet Programming using various techniques</p> <p>CO2 - Students are able to develop applications using Abstract Window Toolkit and Events</p> <p>CO3 - Students are able to update and retrieve the data from the databases using JDBC- ODBC</p> <p>CO4 - Students are able to develop server side programs in the form of Servlets</p> <p>CO5 - Students are able to build up Java Applications using collections and JSP Tags.</p>
Project with viva voce (Compulsory)	MCS30	<p>CO1 - Students are able to understand basic concepts in the embedded computing systems area;</p> <p>CO2 - Students are able to determine the optimal composition and characteristics of an embedded system;</p> <p>CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system</p> <p>CO4 - Students are able to design and program an embedded system at the basic level;</p> <p>CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.</p>




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