

Course Objectives

I SEMESTER

COURSE 1 : ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Hours: 5hrs/week

Credits: 4

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Learning outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
 2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
 3. To Explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.
 4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical
 5. principles can be used to explain and predict phenomena in different contexts.
 6. To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.
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I Semester

Course 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Hours: 5 hrs/week

Credits: 4

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Learning outcomes:

Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.

To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations.

Understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.

Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nanosensors. Explore the effects of chemical pollutants on ecosystems and human health.

Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

5 Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite)..

II Semester

Course 3: Problem Solving using C

Credits -3

Course Objectives

1. To explore basic knowledge on computers
2. Learn how to solve common types of computing problems.
3. Learn to map problems to programming features of C.
4. Learn to write good portable C programs.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Understand the working of a digital computer and Fundamental constructs of Programming
 2. Analyze and develop a solution to a given problem with suitable control structures
 3. Apply the derived data types in program solutions
 4. Use the 'C' language constructs in the right way
 5. Apply the Dynamic Memory Management for effective memory utilization
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II Semester
Course 4: Digital Logic Design
Credits -3

Course Objectives

To familiarize with the concepts of designing digital circuits.

Course Outcomes

Upon successful completion of the course, the students will be able to

1. Understand how to Convert numbers from one radix to another radix and perform arithmetic operations.
 2. Simplify Boolean functions using Boolean algebra and k- maps
 3. Design adders and subtractors circuits
 4. Design combinational logic circuits such as decoders, encoders, multiplexers and demultiplexers.
 5. Use flip flops to design registers and counters.
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III Semester
Course 5: Object Oriented Programming using Java
Credits -3

Course Objectives

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object-oriented programming concepts in Java.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Understand the basic concepts of Object-Oriented Programming and Java Program Constructs
 2. Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch
 3. Demonstrate various classes in different packages and can design own packages
 4. Manage Exceptions and Apply Threads
 5. Create GUI screens along with event handling
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III Semester
Course 6: Data Structures using C
Credits -3

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Understand various Data Structures for data storage and processing.
 2. Realize Linked List Data Structure for various operations
 3. Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.
 4. Understand and implement various searching & sorting techniques.
 5. Understand the Non-Linear Data Structures such as Binary Trees and Graphs
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III Semester
Course 7: Computer Organization
Credits -3

Course Objectives

To familiarize with organizational aspects of memory, processor and I/O.

Course Outcomes

Upon successful completion of the course, the students will be able to

1. Identify different types of instructions
 2. Differentiate between micro-programmed and hard-wired control units.
 3. Analyse the performance of hierarchical organization of memory.
 4. Summarize different data transfer techniques.
 5. Demonstrate arithmetic operations on fixed- and floating-point numbers and illustrate concepts of parallel processing.
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III Semester
Course 8: Operating Systems
Credits -3

Course Objectives

To gain knowledge about various functions of an operating system like memory management, process management, device management, etc.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

1. Demonstrate knowledge and comprehension of operating system functions.
 2. Analyze different process scheduling algorithms and apply them to manage processes and threads effectively
 3. Create strategies to prevent, detect, and recover from deadlocks, and design solutions for inter-process communication and synchronization problems.
 4. Compare and contrast different memory allocation strategies and evaluate their effectiveness
 5. Evaluate disk scheduling algorithms while implementing OS security measures
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IV Semester
Course 9: Database Management Systems
Credits -3

Learning Objectives:

To familiarize with concepts of database design

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

1. Differentiate between database systems and file based systems
 2. Design a database using ER model
 3. Use relational model in database design
 4. Use SQL commands for creating and manipulating data stored in databases.
 5. Write PL/SQL programs to work with databases.
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IV Semester
Course 10: Object Oriented Software Engineering
Credits -3

Course Objective:

To introduce Object-oriented software engineering (OOSE) - which is a popular technical approach to analyzing, designing an application, system, or business by applying the object-oriented paradigm and visual modeling.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

1. Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modeling Language (UML) basics, in the development of software solutions.
 2. Analyze and specify software requirements, develop use cases and scenarios, apply object-oriented analysis and design (OOAD) principles
 3. Familiar with the concept of test-driven development (TDD) and its practical implementation
 4. Analyze and Evaluate Software Maintenance and Evolution Strategies
 5. Apply Advanced Object-Oriented Software Engineering Concepts
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IV Semester
Course 11: Data Communication and Computer Networks
Credits -3

Course Objectives

To provide students with a comprehensive understanding of networking principles, protocols, and technologies, enabling them to design, analyze, and evaluate efficient and reliable network solutions.

Course Outcomes

Upon successful completion of the course, a student will be able to:

1. Understand and apply network applications, hardware, software, and reference models for network communication.
 2. Design and analyze data link layer protocols, multiple access protocols, and wireless LAN technologies.
 3. Design routing algorithms, congestion control algorithms, and evaluate network layer protocols for internetworking.
 4. Analyze transport service, transport protocols, and evaluate UDP and TCP in the internet.
 5. Understand and evaluate application layer protocols, including DNS, email, WWW, and network management protocols.
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V Semester
Course 12: Web Interface Designing Technologies
Credits -3

Learning Objectives:

To enable students to understand web architecture, develop aesthetic websites, create static and dynamic web pages, implement user interactivity, and gain proficiency in installing and utilizing WordPress and plugins

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

1. Understand and appreciate the web architecture and services along with its basic building blocks
 2. Gain knowledge about various components of a website related to aesthetics
 3. Demonstrate skills regarding creation of a static website and addition of dynamic behavior to a website
 4. Get experience on making user-interactive web pages.
 5. Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.
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V Semester
Course 13: Web Applications Development using PHP & MYSQL
Credits -3

Learning Objectives:

To enable students to understand open-source tools to create dynamic web pages, implement user interactivity, and gain proficiency in developing web sites

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

1. Write simple programs in PHP.
 2. Understand how to use regular expressions, handle exceptions, and validate data using PHP.
 3. Apply In-Built functions and Create User defined functions in PHP programming.
 4. Write PHP scripts to handle HTML forms.
 5. Know how to use PHP with a MySQL database and can write database driven web pages.
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V Semester
Course 14 A: Internet of Things
Credits -3

Learning Objectives:

To enable students to understand basic IoT constructs, create IoT solutions to real world problems using IoT

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

1. Understand various concepts, terminologies and applications of IoT
 2. Learn how to build IoT devices with development boards
 3. Understand various Wireless protocols for IoT
 4. Learn how to use various sensors and actuators & develop IoT solutions using Arduino
 5. Develop and Connect IoT with Cloud Platforms.
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V Semester
Course 14 B: Foundations of Data Science
Credits -3

Learning Objectives:

To enable students to develop IoT solutions for real-world problems

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

1. Identify the need for data science and understand various data collection strategies
 2. Understand about NoSQL and Descriptive Statistics
 3. Apply Numpy methods to process the data in an array.
 4. Summarize and Compute Descriptive Statistics using Pandas.
 5. Apply powerful data manipulations visualization using Pandas
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V Semester

Course 15 A: IoT Applications Development and Programming

Theory

03 hours /Week

Credits -3

Learning Objectives:

To enable students to develop IoT solutions for real-world problems

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

1. Understand the Basic Concepts of Internet of Things
 2. Learn various Sensors and their associative protocols
 3. Learn the Single Board Computers for development of IoT
 4. Build the IoT devices with the Node-RED without Complex coding
 5. Develop various IoT real-time applications
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V Semester

Course 15 B : Application Development using Python

Credits -3

Learning Objectives:

To enable students to develop IoT solutions for real-world problems

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

1. Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
 2. Demonstrate proficiency in handling Strings and File Systems.
 3. Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
 4. Interpret the concepts of Web Programming and GUI in Python
 5. Apply concepts of Python programming in various fields related to IOT, Web Services and Databases in Python.
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ADIKAVI NANNAYA UNIVERSITY:: RAJAHMAHENDRAVARAM
B Sc Computer Science Syllabus(w.e.f: 2020-21 A.Y)

B Sc	Semester :V(Skill Enhancement Course - Elective)	Credits: 4
Course: 6A	Web Interface Designing Technologies	Hrs/Wk: 4

Learning Outcomes: Students after successful completion of the course will be able to:

1. Understand and appreciate the web architecture and services.
 2. Gain knowledge about various components of a website.
 3. Demonstrate skills regarding creation of a static website and an interface to dynamic website.
 4. Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.
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ADIKAVI NANNAYA UNIVERSITY:: RAJAHMAHENDRAVARAM
B Sc Computer Science Syllabus(w.e.f: 2020-21 A.Y)

B Sc	Semester :V(Skill Enhancement Course - Elective)	Credits: 4
Course: 7A	Web Applications Development using PHP& MYSQL	Hrs/Wk: 4

Learning Outcomes:

Students after successful completion of the course will be able to:

1. Write simple programs in PHP.
 2. Understand how to use regular expressions, handle exceptions, and validate data using PHP.
 3. Apply In-Built functions and Create User defined functions in PHP programming.
 4. Write PHP scripts to handle HTML forms.
 5. Write programs to create dynamic and interactive web based applications using PHP and MYSQL.
 6. Know how to use PHP with a MySQL database and can write database driven webpages.
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