# Holy Cross College (Autonomous), Nagercoil

**Kanyakumari District, Tamil Nadu.**

**Accredited with $A^+$ by NAAC - IV cycle – CGPA 3.35**

Affiliated to

## Manonmaniam Sundaranar University, Tirunelveli

## Semester I & II

## POs, PSOs & COs

### DEPARTMENT OF COMPUTER SCIENCE

## 2023-2026

**(With effect from the academic year 2023-2024)**

## DEPARTMENT OF COMPUTER SCIENCE


# Programme Educational Objectives (PEOs)

| PEO | Upon completion of M.Sc Computer Science Degree Programme, the graduates will be able to: | Mapping with Mission |
|---|---|---|
| **PEO-1** | apply scientific and computational technology to solve socio ecological issues and pursue research. | M1, M2 |
| **PEO-2** | continue to learn and advance their career in industry both in private and public sectors | M4 & M5 |
| **PEO-3** | develop leadership, teamwork, and professional abilities to become a more cultured and civilized person and to tackle the challenges in serving the country. | M2, M5 & M6 |

# Programme Outcomes (POs)

| PO | Upon completion of M.Sc. Degree Programme, the graduates will be able to: | Mapping with PEOs |
|---|---|---|
| PO1 | apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. | **PEO1 & PEO2** |
| PO2 | carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication. | **PEO1, PEO2 & PEO3** |
| PO3 | develop a multidisciplinary perspective and contribute to the knowledge capital of the globe. | **PEO 2** |
| PO4 | develop innovative initiatives to sustain ecofriendly environment | **PEO1, PEO 2** |

| | | |
|---|---|---|
| PO5 | through active career, team work and using managerial skills guide people to the right destination in a smooth and efficient way. | **PEO 2** |
| PO6 | employ appropriate analysis tools and ICT in a range of learning scenarios, demonstrating the capacity to find, assess, and apply relevant information sources. | **PEO1, PEO 2 & PEO3** |
| PO7 | learn independently for lifelong to execute professional, social and ethical responsibilities promoting sustainable development. | **PEO3** |

## Programme Specific Outcomes (PSOs)

| **PSO** | **Upon completion of M.Sc. Degree Programme, the graduates will be able to:** | **Mapping with POs** |
|---|---|---|
| **PSO 1** | apply profound knowledge to analyze and design software and systems containing hardware and software components of varying complexity. | **PO1** |
| **PSO 2** | apply mathematical model, algorithmic principles, and computer science theory in the design of real-time applications | **PO2** |
| **PSO 3** | apply knowledge of computing to produce effective designs and solutions for specific problems. | **PO4 & PO7** |
| **PSO 4** | identify, analyze, design, optimize and implement system solutions using appropriate algorithms of varying complexity. | **PO5& PO6** |
| **PSO 5** | work in multidisciplinary teams in small- and large-scale projects by utilizing modern software tools and emerging technologies to develop complex products for the societal needs. | **PO3** |

## Mapping of PO'S and PSO'S

| POs | PSO1 | PSO 2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **PO 1** | S | S | M | S | S |
| **PO 2** | S | M | S | S | S |
| **PO 3** | S | M | M | S | M |
| **PO4** | S | S | M | S | S |
| **PO5** | S | S | S | M | S |
| **PO6** | M | S | S | M | S |
| **PO7** | S | S | M | S | S |

**Course Outcomes**

## SEMESTER I

### CORE COURSE I: ANALYSIS & DESIGN OF ALGORITHMS

**Course Code: SP231CC1**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | get knowledge about algorithms and determines their time complexity. | **K1, K2** |
| 2 | gain good understanding of Greedy method and its algorithm. | **K2, K3** |
| 3 | able to describe about graphs using dynamic programming technique. | **K3, K4** |
| 4 | demonstrate the concept of backtracking &branch and bound technique. | **K5, K6** |
| 5 | explore the traversal and searching technique and apply it for trees and graphs. | **K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

## SEMESTER I

### CORE COURSE 1I: OBJECT ORIENTED ANALYSIS AND DESIGN & C++

**Course Code: SP231CC2**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | understand the concept of object-oriented development and modelling techniques | **K1, K2** |
| 2 | gain knowledge about the various steps performed during object design | **K2, K3** |
| 3 | abstract object-based views for generic software systems | **K3** |
| 4 | link OOAD with C++ language | **K4, K5** |
| 5 | apply the basic concept of OOPs and familiarize to write C++ program | **K5, K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

# SEMESTER I

## CORE LAB COURSE– I: ALGORITHM AND OOPS LAB

**Course Code: SP231CP1**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| **1** | understand the concepts of object oriented with respect to C++ | **K1, K2** |
| **2** | able to understand and implement OOPS concepts | **K3, K4** |
| **3** | implementation of data structures like Stack, Queue, Tree, List using C++ | **K4, K5** |
| **4** | application of the data structures for Sorting, Searching using different techniques. | **K5, K6** |
| **5** | create an application using inheritance | **K5, K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

# SEMESTER I

## ELECTIVE COURSE I: a) PYTHON PROGRAMMING

**Course Code: SP231EC1**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | understand the basic concepts of Python Programming | **K1, K2** |
| 2 | understand File operations, Classes and Objects | **K2, K3** |
| 3 | acquire Object Oriented Skills in Python | **K3, K4** |
| 4 | develop web applications using Python | **K5** |
| 5 | develop Client Server Networking applications | **K5, K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

# SEMESTER I

## ELECTIVE COURSE I: b) MULTIMEDIA AND ITS APPLICATIONS

**Course Code: SP231EC2**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | understand the basic concepts of Multimedia | **K1, K2** |
| 2 | demonstrate multimedia authoring tools | **K2, K3** |
| 3 | analyze the concepts of Sound, Images, Video &Animation | **K3, K4** |
| 4 | apply and analyze the role of Multimedia in Internet and real time applications | **K5** |
| 5 | analyze multimedia applications using HDTV | **K5, K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

# SEMESTER I

## ELECTIVE COURSE I: c) EMBEDDED SYSTEM

**Course Code: SP231EC3**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | understand the concept of 8051 microcontroller | **K1, K2** |
| 2 | understand the Instruction Set and Programming | **K2, K3** |
| 3 | analyze the concepts of RTOS | **K3, K4** |
| 4 | analyze and design various real time embedded systems using RTOS | **K5** |
| 5 | debug the malfunctioning system using various debugging techniques | **K5, K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

## SEMESTER I

## ELECTIVE COURSE II: a) ADVANCED SOFTWARE ENGINEERING

**Course Code: SP231EC4**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | understand about Software Engineering process | **K1, K2** |
| 2 | understand about Software project management skills, design and quality management | **K2, K3** |
| 3 | analyze on Software Requirements and Specification | **K3, K4** |
| 4 | analyze on Software Testing, Maintenance and Software Re-Engineering | **K4, K5** |
| 5 | design and conduct various types and levels of software quality for a software project | **K5, K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

## SEMESTER I

## ELECTIVE COURSE II: b) INTERNET OF THINGS

**Course Code: SP231EC5**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | understand about IoT, its Architecture and its Applications | **K1, K2** |
| 2 | understand basic electronics used in IoT & its role | **K2, K3** |
| 3 | develop applications with C using Arduino IDE | **K4** |
| 4 | analyze about sensors and actuators | **K5, K6** |
| 5 | design IoT in real time applications using today's internet &wireless technologies | **K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

## SEMESTER I

## ELECTIVE COURSE II: c) CRITICAL THINKING, DESIGN THINKING AND PROBLEM SOLVING

**Course Code: SP231EC6**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| 1 | understand the concepts of Critical thinking and its related technology | **K1, K2** |
| 2 | focus on the explicit development of critical thinking and problem solving skills | **K2, K3** |
| 3 | apply design thinking in problems | **K3, K4** |
| 4 | make a decision and take actions based on analysis | **K4, K5** |
| 5 | analyze the concepts of Thinking patterns, Problem solving & Reasoning in real time applications | **K5, K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

## SEMESTER I

## ELECTIVE LAB COURSE I: PYTHON PROGRAMMING LAB

**Course Code: SP231EP1**

| **On the successful completion of the course, student will be able to:** | | |
|---|---|---|
| **1** | write programs in Python using OOPS concepts | **K1, K2** |
| **2** | to understand the concepts of File operations and Modules in Python | **K3, K4** |
| **3** | implementation of lists, dictionaries, sets and tuples as programs | **K4, K5** |
| **4** | to develop web applications using Python | **K5, K6** |
| **5** | develop the programs using polymorphism | **K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

## SEMESTER I

### SPECIFIC VALUE ADDED COURSE I: WEBSITE CREATION

**Course Code: SP231V01**

| On the successful completion of the course, student will be able to**:** | | |
|---|---|---|
| 1 | develop the skill & knowledge of Web page design. | **K1,K3** |
| 2 | understand and can function either as an entrepreneur or can take up jobs in the multimedia | **K2,K4** |
| 3 | create a Web site development studio. | **K5,K6** |
| 4 | develop the concept of web publishing | **K5,K6** |
| 5 | create attractive web pages | **K6** |

**K1** - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

## SEMESTER – I

## LIFE SKILL TRAINING – I ETHICS

**Course Code : PG23LST1**

| **Course Outcomes** | **On completion of this course the student will be able to** | |
|---|---|---|
| **CO1** | understand deeper insight of the meaning of their existence. | K1 |
| **CO2** | recognize the philosophy of life and individual qualities | K2 |
| **CO3** | acquire the skills required for a successful personal and professional life. | K3 |
| **CO4** | develop as socially responsible citizens. | K4 |
| **CO5** | create a peaceful, communal community and embrace unity. | K3 |