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 – IV

POs, PSOs & COs

DEPARTMENT OF COMPUTER SCIENCE

2023-2026

(With effect from the academic year 2024-2025)

Programme Educational Objectives (PEOs)

PEOs	Upon completion of M.Sc Computer Science Degree Programme, the graduates will be able to:	Mapping with Mission
PEO1	apply scientific and computational technology to solve socio ecological issues and pursue research.	**M1, M2**
PEO2	continue to learn and advance their career in industry both in private and public sectors	**M4 & M5**
PEO3	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)

POs	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	**PEO3**

	development.	

Programme Specific Outcomes (PSOs)

PSOs	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**

K**1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6– Create**

SEMESTER I

CORE COURSE II: 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

SPECIFIC VALUE ADDED COURSE : DIGITAL FORENSICS

Course Code: SP231V02

On the Successful Completion of the Course, the Student will be able to:		
1	understand the origin of forensic science	**K2**
2	analyze the computer investigations	**K4**
3	validate data acquisitions	**K5**
4	practice and apply digital forensic tools.	**K3**
5	create a model Forensic Tool based on available tools.	**K6**

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

SEMESTER II

CORE COURSE III: DATA MINING AND WAREHOUSING

COURSE CODE: SP232CC1

On the successful completion of the course, student will be able to:		
1	understand the basic data mining techniques and algorithms	**K1, K2**
2	understand the Association rules, Clustering techniques and Data warehousing contents	**K2, K3**
3	compare and evaluate different data mining techniques like classification, prediction, Clustering and association rule mining	**K4, K5**
4	design data warehouse with dimensional modeling and apply OLAP operations	**K5, K6**
5	identify appropriate data mining algorithms to solve real world problems	**K6**

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

SEMESTER II

CORE COURSE IV: ADVANCED JAVA PROGRAMMING

COURSE CODE: SP232CC2

On the successful completion of the course, student will be able to:		
1	understand the advanced concepts of Java Programming	**K1,K2**
2	understand JDBC and RMI concepts	**K2,K3**
3	apply and analyze Java in Database	**K3,K4**
4	handle different event in java using the delegation event model, event listener and class	**K5**
5	design interactive applications using Java Servlet, JSP and JDBC	**K5,K6**

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

SEMESTER II

CORE COURSE LAB II: ADVANCED JAVA PROGRAMMING LAB

COURSE CODE: SP232CP1

On the successful completion of the course, student will be able to**:**		
1	understand the implement concepts of Java using HTML forms, JSP&JAR	**K1,K2**
2	must be capable of implementing JDBC and RMI concepts	**K3,K4**
3	able to write Applets with Event handling mechanism	**K4,K5**
4	create interactive web based applications using servlets and jsp	**K5,K6**
5	able to do Socket programming	**K2, K6**

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

SEMESTER II

ELECTIVE COURSE III: A) ADVANCED OPERATING SYSTEMS

COURSE CODE: SP232EC1

On the successful completion of the course, student will be able to:		
1	understand the design issues associated with operating systems	**K1,K2**
2	master various process management concepts including scheduling, deadlocks and distributed file systems	**K3,K4**
3	prepare Real Time Task Scheduling	**K4,K5**
4	analyze Operating Systems for Handheld Systems	**K5**
5	analyze Operating Systems like LINUX and iOS	**K5,K6**

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

SEMESTER II

ELECTIVE COURSE III: B) MOBILE COMPUTING

COURSE CODE: SP232EC2

On the successful completion of the course, student will be able to:		
1	understand the need and requirements of mobile communication	**K1,K2**
2	focus on mobile computing applications and techniques	**K2,K3**
3	demonstrate satellite communication in mobile computing	**K4**
4	analyze about wireless local loop architecture	**K5,K6**
5	analyze various mobile communication technologies	**K6**

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

SEMESTER II

ELECTIVE III: c) BLOCKCHAIN TECHNOLOGY

COURSE CODE: SP232EC3

On the successful completion of the course, student will be able to:		
1	demonstrate blockchain technology and crypto currency	**K1,K2**
2	understand the mining mechanism in blockchain	**K2**
3	apply and identify security measures, and various types of services that allow people to trade and transact with bitcoins	**K3,K4**
4	apply and analyze Blockchain in health care industry	**K4,K5**
5	analyze security, privacy, and efficiency of a given Blockchain system	**K5,K6**

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

SEMESTER II

ELECTIVE COURSE IV: a) ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

COURSE CODE: SP232EC4

On the successful completion of the course, student will be able to:		
1	demonstrate AI problems and techniques	**K1,K2**
2	understand machine learning concepts	**K2,K3**
3	apply basic principles of AI in solutions that require problem solving, inferer knowledge representation, and learning	**K3,K4**

4	analyze the impact of machine learning on applications	**K4,K5**
5	analyze and design a real-world problem for implementation and understand the dynamic behavior of a system	**K5,K6**

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

SEMESTER II

Elective Course IV: b) WEB SERVICES

COURSE CODE: SP232EC5

On the successful completion of the course, student will be able to:		
1	understand web services and its related technologies	**K1,K2**
2	understand XML concepts	**K2,K3**
3	analyze on SOAP and UDDI model	**K4,K5**
4	demonstrate the road map for the standards and future of web services	**K5**
5	analyze QoS enabled applications in web services	**K5,K6**

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

SEMESTER II

ELECTIVE COURSE IV: c) ROBOTIC PROCESS AUTOMATION FOR BUSINESS

COURSE CODE: SP232EC6

On the successful completion of the course, student will be able to:		
1	demonstrate the benefits and ethics of RPA	**K1,K2**
2	understand the Automation cycle and its techniques	**K2**
3	draw inferences and information processing of RPA	**K3,K4**
4	implement& Apply RPA in Business Scenarios	**K5**
5	analyze on Robots& leveraging automation	**K5,K6**

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

SEMESTER II

Skill Enhancement Course I: Practical: Data Mining Lab using R

COURSE CODE: SP232SE1

On the successful completion of the course, student will be able to:		
1	write programs using R for Association rules, Clustering techniques	**K1,K2**

2	implement data mining techniques like classification, prediction	**K2,K3**
3	use different visualizations techniques using R	**K4,K5**
4	apply different data mining algorithms to solve real world applications	**K5,K6**

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

SEMESTER – I & II

LIFE SKILL TRAINING – I ETHICS

Course Code: PG23LST1

On completion of this course the student will be able to		
1	understand deeper insight of the meaning of their existence.	**K1**
2	recognize the philosophy of life and individual qualities	**K2**
3	acquire the skills required for a successful personal and professional life.	**K3**
4	develop as socially responsible citizens.	**K4**
5	create a peaceful, communal community and embrace unity.	**K3**

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze;

SEMESTER III

CORE COURSE V : DIGITAL IMAGE PROCESSING

Course Code: SP233CC1

On the successful completion of the course, students will be able to:		
1.	understand the fundamentals of Digital Image Processing	**K1,K2**
2.	understand the mathematical foundations for digital image representation, image acquisition, image transformation, and image enhancement	**K2,K3**
3.	apply, design and implement and get solutions for digital image processing problems	**K3,K4**
4.	apply the concepts of filtering and segmentation for digital image retrieval	**K3,K5**
5.	explore the concepts of Multi-resolution process and recognize the	**K5,K6**

	objects in an efficient manner	

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

SEMESTER III
CORE COURSE VI : CLOUD COMPUTING
Course Code: SP233CC2
Course Outcomes

On the successful completion of the course, students will be able to:		
1.	understand the concepts of cloud and its architecture	**K1, K2**
2.	use and analyse the architecture and services of cloud	**K3, K4**
3.	manage schedules, events and projects	**K2,K4**
4.	collaborate cloud for Event & Project Management	**K4, K5**
5.	apply and create the cloud simulator tools and virtual machines	**K3, K6**

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

SEMESTER III

CORE LAB COURSE III : DIGITAL IMAGE PROCESSING LAB Using MATLAB
Course Code: SP233CP1

On the successful completion of the course, student will be able to:		
1	write programs in MATLAB for image processing using the techniques	**K1, K2**
2	able to implement image enhancements and restoration techniques	**K2, K3**
3	capable of using compression techniques in an Image	**K3, K4**
4	able to manipulate the image and segment it	**K4, K5**
5	able to implement the image processing techniques using MATLAB	**K5, K6**

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

SEMESTER III
CORE - RESEARCH PROJECT
Course Code: SP233RP1

On the successful completion of the course, students will be able to:		
1.	learn to manage software projects, adhering to timelines and adapting to challenges.	**K1**
2.	understand ethical considerations in computing and collaborate effectively with peers and advisors	**K2**
3.	conduct independent software development, from formulating problems to implementing solutions	**K2**
4.	communicate their project outcomes through written reports and oral	**K3, K5**

	presentations	
5.	develop critical thinking skills, analyzing software performance and drawing informed conclusions	**K4, K6**

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

SEMESTER III
ELECTIVE COURSE V : a) INTRODUCTION TO RESEARCH METHODOLOGY IN COMPUTER SCIENCE
Course Code: SP233EC1

On the successful completion of the course, students will be able to:		
1	perform exploratory data analysis	**K1, K2**
2	select and apply different research approaches and methodologies	**K2, K3**
3	construct and document an appropriate research design	**K3, K4**
4	validate the reliability	**K5, K6**
5	apply the appropriate computer tools in each stage of research	**K6**

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

SEMESTER III
ELECTIVE COURSE V : b) DATA SCIENCE AND ANALYTICS
Course Code :SP233EC2

On the successful completion of the course, students will be able to:		
1	understand the concept to data science and its techniques	**K1, K2**
2	review data analytics	**K2, K3**
3	apply and determine appropriate Data Mining techniques using R to real time applications	**K3, K4**
4	analyze and evaluate clustering algorithms	**K5, K6**
5	create a machine learning environment using AI	**K6**

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

SEMESTER III
ELECTIVE COURSE V : c) SOFT COMPUTING

Course Code: SP233EC3

On the successful completion of the course, students will be able to:		
1.	implement machine learning through neural networks	**K1, K2**
2.	apply genetic algorithms to solve optimization problem	**K3, K4**
3.	understand fuzzy concepts and develop a fuzzy expert system to derive decisions	**K2, K6**
4.	learn and evaluate fuzzy logic and its applications.	**K3, K5**
5.	know the applications of soft computing to solve problems in varieties of application domains.	**K2, K6**

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

SEMESTER - III
SKILL ENHANCEMENT COURSE II : CLOUD COMPUTING LAB
Course Code:SP233SE1

On the successful completion of the course, students will be able to:		
1	configure various virtualization tools such as Virtual Box, VMware workstation.	**K1, K3**
2	design and deploy a web application in a PaaS environment.	**K2, K6**
3	learn how to simulate a cloud environment to implement new schedulers.	**K4**
4	install and use a generic cloud environment that can be used as a private cloud.	**K5, K6**
5	manipulate large data sets in a parallel environment.	**K3, K6**

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

SEMESTER III
SPECIFIC VALUE ADDED COURSE : SET/NET COACHING FOR COMPUTER SCIENCE
Course Code: SP233V01

On the successful completion of the course, students will be able to:		
1	recall mathematical knowledge for reasoning, logical thinking and data interpretation and understand concept of internet	**K1, K2**
2	understand the sustainable goals and apply skills for higher education systems	**K2, K3**
3	analyze technical concepts in digital Systems, DBMS,operating systems etc.	**K4**
4	able to evaluate the estimation problems in software engineering	**K5**
5	learn skills to solve problems in computer science and can create new technology based on IoT	**K5, K6**

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

SEMESTER – III
SPECIFIC VALUE ADDED COURSE : SCRIPT USING JAVASCRIPT
Course Code: SP233V02

On the Successful Completion of the Course, the Student will be able to:		
1	recall fundamentals concepts of programming language and apply theoretical concepts to practical scenarios with confidence.	**K1,K3**
2	gain a deeper understanding of web development concepts such as DOM	**K2**
3	analyze a solid foundation for exploring other technologies such as front-end frameworks	**K4**
4	enhances and evaluate students' employability and opens up opportunities in the tech industry	**K5**
5	build a wide range of applications, from interactive websites to server-side applications..	**K6**

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

SEMESTER – III
SELF LEARNING COURSE : 3D ANIMATION AND MODELLING USING BLENDER
Course Code: SP233SL1

On the Successful Completion of the Course, the Student will be able to:		
1	understand foundational animation principles and apply these principles such as timing, spacing, squash and stretch, anticipation, and follow-through to create believable motion	**K2,K3**
2	analyze to proficient in navigating the interface of industry-standard 3D animation software	**K4**
3	create keyframe animations for object properties such as position, rotation, and scale to produce basic animated sequences with smooth transitions and controlled timing.	**K6**
4	configure render settings and output animations to various formats suitable for different platforms and purposes, demonstrating proficiency in the rendering process	**K5**
5	prepare to pursue further studies in 3D animation or related fields or enter the industry as entry-level animators or 3D artists.	**K4,K5**

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

SEMESTER IV
CORE COURSE VII : BIG DATA ANALYTICS
Course Code: SP234CC1

On the successful completion of the course, students will be able to:		
1	learn and explore the fundamental concepts of big data analytics	**K1, K2**
2	understand the various search methods and apply visualization techniques.	**K2, K3**
3	apply and analyze the big data using intelligent techniques	**K3, K4**
4	use and evaluate various techniques for mining data stream.	**K3, K5**
5	understand the analytics process in simple terms and supporting useful methods in its application.	**K6**

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

SEMESTER IV
CORE COURSE VIII: SOFTWARE PROJECT MANAGEMENT
Course Code: SP234CC2

On the successful completion of the course, students will be able to:		
1	explain project management in terms of the software development process	**K1, K2**
2	describe the responsibilities of IT project managers	**K2, K3**
3	implement communication, modeling, construction & deployment practices in software development	**K3, K4**
4	apply project management concepts and techniques to an IT project	**K5, K6**
5	integrate project frameworks into the operations of their organisation.	**K6**

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

SEMESTER IV
CORE LAB COURSE IV: WEB APPLICATION DEVELOPMENT LAB
Course Code: SP234CP1

On the successful completion of the course, student will be able to:		
1	understand and implement the basic HTML tags to create static webpages	**K1, K2**
2	capable of using hyperlinks, frames, images, tables, in a webpage	**K2, K3**

3	able to write dynamic web applications using HTML forms and analyse them	**K3, K4**
4	must be able to write dynamic web applications in PHP and HTML tags using XAMPP.	**K5**
5	develop an interactive web applications.	**K6**

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

SEMESTER IV

ELECTIVE COURSE VI : a) WIRELESS SENSOR NETWORKS

Course Code: SP234EC1

On the successful completion of the course, students will be able to:		
1	learn and understand the channel encoding and modulation mechanism	**K1, K2**
2	use the contention free and contention based MAC protocols	**K3**
3	analyse the QoS based routing protocols	**K4**
4	evaluate the challenges, design goals and architecture of wireless sensor networks	**K5, K6**
5	develop protocols for sensor networks and network layer.	**K6**

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

SEMESTER IV

ELECTIVE COURSE VI : b) BIO INFORMATICS

Course Code: SP234EC2

On the successful completion of the course, students will be able to:		
1	learn and recall different biological databases, tools and modeling networks	**K1**
2	understand and apply algorithms for searching the biological databases.	**K2, K3**
3	predict and analyse gene and protein secondary structure.	**K3, K4**
4	categorize sequence alignment methods.	**K5**
5	create molecular models.	**K6**

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

SEMESTER - IV

ELECTIVE COURSE VI : c) NETWORK SECURITY AND CRYPTOGRAPHY

Course Code: SP234EC3

On the successful completion of the course, students will be able to:		
1	recognize and understand the process of the cryptographic algorithms	**K1, K2**
2	compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication	**K3,K4**
3	apply and analyze appropriate security techniques to solve network security problem	**K3, K4**
4	explore suitable cryptography algorithms	**K5**
5	evaluate different digital signature algorithms to achieve authentication and design secure applications	**K5, K6**

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

SEMESTER IV
ELECTIVE COURSE VII : a) PRINCIPLES OF PROGRAMMING LANGUAGES
Course Code: SP234EC4

On the successful completion of the course, students will be able to:		
1	remember and recall technical project reports and present them orally among the user.	**K1**
2	understand and design program to evaluate simple expressions and logical operations.	**K2, K5**
3	communicate computer science concepts, designs, and solutions effectively and professionally.	**K2, K3**
4	demonstrate and analyse the concept of pointer and perform I/O operations.	**K4, K5**
5	develop and implement programs with suitable modules to solve the given problem.	**K6**

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

SEMESTER IV
ELECTIVE COURSE VII : b) ADVANCED DATABASE SYSTEMS
Course Code: SP234EC5

On the successful completion of the course, students will be able to:		
1	learn and recall the relational databases and uses of PL/SQL	**K1**

2	understand and apply Schema, ER- Model, normalization, transaction, concurrency, and recovery on tables using SQL and PL/SQL.	**K2, K3**
3	analyze and manage relational & distributed, database, transaction, concurrency control and query languages	**K4**
4	assess and evaluate databases based on models and Normal Forms.	**K4, K5**
5	design and construct tables and manipulate it effectively using PL/SQL database objects	**K5, K6**

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

SEMESTER IV
ELECTIVE COURSE VII : c) PRINCIPLES OF COMPILER DESIGN
Course Code: SP234EC6

On the successful completion of the course, students will be able to:		
1	acquire knowledge about compiler tools to meet the requirements of the realistic constraints of compilers	**K1, K2**
2	understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table	**K2, K3**
3	implement the compiler using syntax-directed translation method	**K3, K4**
4	able to analyse and design symbol table organization and different techniques used in that.	**K4, K5**
5	evaluate the target machine's run time environment, its instruction set for code generation and techniques used for code optimization	**K5, K6**

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

SEMESTER IV
SKILL ENHANCEMENT COURSE III : SOFT SKILL DEVELOPMENT LAB
Course Code: SP234SE1

On the successful completion of the course, student will be able to:		
1	effectively communicate through verbal/oral communication and improve the listening skills	**K1 &K2**
2	write precise briefs or reports and technical documents.	**K2**
3	actively participate in group discussion / meetings / interviews and prepare & deliver presentations.	**K3&K6**
4	become more effective individual through goal/target setting, self-motivation	**K4**

	and practicing creative thinking.	
5	function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality	**K5&K6**

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

SEMESTER – IV

SELF LEARNING COURSE : WEB DESIGNING WITH BOOTSTRAP AND JQUERY

Course Code: SP234SL1

On the Successful Completion of the Course, the Student will be able to:		
1	understand the basics of Bootstrap Environment for web projects	**K2**
2	analyze the usage of Bootstrap Layout Components	**K4**
3	apply Bootstrap Navigation Elements	**K3**
4	illustrate and evaluate the usage of jQuery	**K5**
5	summarize the concept of JSON and create an application using jQuery	**K6**

SEMESTER – III & IV

LIFE SKILL TRAINING – II - VALUES

Course Code: PG23LST2

On completion of this course the student will be able to		
1	recognize the perception of life and lead a positive life	**K1**
2	understand relationship with family, friends and the society	**K2**
3	develop as socially responsible citizens.	**K3**
4	assess goals, fix targets and value life	**K4**
5	create a peaceful, communal community and embrace unity.	**K6**

K1-Remember; **K2**-Understand; **K3**-Apply; **K4 – Analyse; K6**- Create