FYMCA SEMESTER-I	
Name Of Subject:	Data Structures and Algorithms
Course Objectives:	
1	To study the representation, implementation of basic data structures
2	To develop the ability to synthesize and analyze algorithms
3	To study applications of Data Structure in solving real life problems
Course Outcomes:	
CO1	Explain the Complexity of Algorithms & fundamentals of Data Structures.
CO2	Describe representation & application of Linked List
CO3	Write programs that uses stacks, queues.
CO4	Apply nonlinear data structure trees to solve mathematical problems.
CO5	:Explain representations & the applications of graphs.
CO6	Implement different searching and sorting algorithms.
Name Of Subject:	Object Oriented Programming
Course Objectives:	
1	To study basics of Object Oriented Programming (OOP).
2	To understand object-oriented concepts such as data abstraction, encapsulation, inheritance, dynamic binding, and polymorphism.
3	To use the object-oriented paradigm in program design.
4	Provide programming insight using OOP constructs.
5	To lay a foundation for advanced programming.
6	To develop an ability to write programs in C++ for problem solving
Course Outcomes:	
CO1	Explore the basics of OOP
CO2	Analyze the strengths of object oriented programming
CO3	Design and apply OOP principles for effective programming
CO4	Develop programming application using object oriented programming language C++
CO5	Achieve applicability of OOP
CO6	Percept the utility of OOP for advanced programming

Name Of Subject:	Software Engineering & Project Management
Course Objectives:	
1	To understand software development and software lifecycle process models
2	To know methods of capturing, specifying, visualizing and analysing software requirements.
3	To introduce principles of agile software development, the SCRUM process and agile practices
4	To learn about project planning, execution and tracking.
5	To understand project management through life cycle of the project.
6	To know leadership and understand its role and importance in successfully managing IT projects
Course Outcomes:	
CO1	Choose and apply appropriate lifecycle model of software development
CO2	Analyze software requirements by applying various modelling techniques
CO3	Describe principles of agile development, discuss the SCRUM process and distinguish Agile process model from other process models
CO4	Describe project schedule and cost estimation
CO5	Understand IT project management through life cycle of the project and future trends in IT Project Management.
CO6.	Define ethics and understand its importance in project leadership.
Name Of Subject:	Information Systems and Engineering Economics
Course Objectives:	
1	To prepare the students to get knowledge of Management Functions, Organisational Structures and understanding of Information Systems.
2	To prepare the students to get aware about Information Systems and Project Management using latest trends.
3	To prepare the students to Management Information Systems Applications.
4	To expose the students to the managerial Decision Support Systems issues relating to Information Systems and apply appropriate tools.
5	To impart basic Banking and financial Accounting knowledge that is required for a Career as software Developer.
Course Outcomes:	
CO1	Understand the need, usage and importance Management Functions, Organisational structure and Information Systems.
CO2	Understand the Information Systems, Project Management, Managing Data resources, Knowledge Management, Business Process Integration and Enterprise Systems.
CO3	Understand the Management Information Systems Applications using in an Organization.
CO4	Elaborate Managerial Decision Making Models and applying to Business Intelligence.
CO5	Implement the basic Accounting concepts in the banking and financial applications
CO6	Apply the basic concepts of cost accounting in real world problem

Name Of Subject:	Data Structures and Algorithms Laboratory
Course Objectives:	
1	To study the representation, implementation of basic data structures
2	To study various linear & non liner data structures
3	To implement applications of Data Structure in solving real life problems
4	To study various searching & sorting algorithms
5	To implement various searching & sorting techniques.
Course Outcomes:	
CO1	Implement elementary data structures such as Arrays, linked lists
CO2	Implement representation & application of Linked List
CO3	Demonstrate practical knowledge on the applications of stacks, queues
CO4	Implement nonlinear data structure trees to solve mathematical problems.
CO5	Implement representations & the applications of graphs.
CO6	Implement different searching and sorting algorithms.
Name Of Subject:	Python Programming Laboratory
Course Objectives:	
1	Describe the core syntax and semantics of Python programming language.
2	Discover the need for working with the strings and functions.
3	Illustrate the process of structuring the data using lists, dictionaries, and tuples.
4	Infer the Object-oriented Programming concepts in Python.
5	
Course Outcomes:	
CO1	Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
CO2	Express proficiency in the handling of strings and functions.
CO3	Articulate the Object-Oriented Programming concepts using Python.
CO4	Create Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
CO5	Design program using string manipulation functions.
CO6	Implement OOP‟s concept in Python.

Name Of Subject:	Business Communication Lab
Course Objectives:	
1	To understand the concept, process and importance of communication.
2	To develop an integrative approach where reading, writing, presentation skills are used together to enhance ability to communicate and write effectively.
3	To create awareness about Methods and Media of communication.
4	To improve job seeking skills.
Course Outcomes:	
CO1	Apply business communication strategies and principles to prepare effective communication for domestic and international business situations
CO2	Identify ethical, legal, cultural, and global issues affecting business communication.
CO3	Utilize analytical and problem solving skills appropriate to business communication.
CO4	Participate in team activities using collaborative work skills.
CO5	Select appropriate organizational formats and channels used in developing and presenting business messages.
CO6	Communicate via electronic mail, Internet, and other technologies.
CO7	Deliver an effective oral business presentation

FYMCA SEMESTER-II

Name Of Subject:	Database Management System
Course Objectives:	
1	To understand the fundamental concepts of database management. These concepts include aspects of database design, database languages, and database-system implementation.
2	To provide a strong formal foundation in database concepts, technology and practice.
3	To give systematic database design approaches covering conceptual design, logical design and an overview of physical design.
4	Be familiar with the basic issues of transaction processing and concurrency control.
5	To learn and understand various Database Architectures and Applications.
6	To learn a powerful, flexible and scalable general purpose database to handle big data.
Course Outcomes:	
CO1	Design E-R Model for given requirements and convert the same into database tables.
CO2	Use database techniques such as SQL & PL/SQL.
CO3	Use modern database techniques such as NOSQL.
CO4	Explain transaction Management in relational database System.
CO5	Describe different database architecture and analyses the use of appropriate architecture in real time environment.
CO6	Students will be able to use advanced database Programming concepts Big Data – HADOOP

Name Of Subject:	Computer Network
Course Objectives:	
1	To understand the fundamental concepts of networking standards, protocols and technologies
2	To learn different techniques for framing, error control, flow control and routing.
3	To learn role of protocols at various layers in the protocol stacks
4	To learn network programming.
5	To develop an understanding of modern network architectures from a design and performance perspective.
Course Outcomes:	
CO1	Analyze the requirements for a given organizational structure to select the most appropriate networking architecture, topologies, transmission mediums, and technologies.
CO2	Demonstrate design issues, flow control and error control.
CO3	Analyze data flow between TCP/IP model using Application, Transport and Network Layer protocols.
CO4	Illustrate applications of Computer Network capabilities, selection and usage for various sectors of user community.
CO5	Illustrate Client-Server architectures and prototypes by the means of correct standards and technology.
CO6	Demonstrate different routing and switching algorithms.

Name Of Subject:	Java Programming
Course Objectives:	
1	To learn the core concept of Java programming
2	To introduce the working environment of Java Program using the multithreading and file handling
3	To get acquainted the purpose of applet and AWT in Java programming
4	To study the use of database connectivity in Java Programming
5	To gain knowledge of Java Servlet and JSP concept in Java
Course Outcomes:	
CO1	Describe the core concept of Java programming
CO2	Discover the need for working with the multithreading and file handling
CO3	Illustrate the purpose of applet and AWT in Java programming
CO4	Indicate the use of database connectivity using Java Programming
CO5	Articulate the networking concepts in Java
CO6.	Implement Java Servlet and JSP concept in Java

Name Of Subject:	Operating System
Course Objectives:	
1	To introduce basic concepts and functions of modern operating systems
2	To understand the concept of process and thread management.
3	To understand the concept of concurrency control
4	To understand the concept of disk scheduling and File management.
5	To understand various Memory Management techniques
6	To understand the features of LINUX operating system
Course Outcomes:	
CO1	Fundamental understanding of the role of Operating Systems.
CO2	To understand the concept of a process and thread.
CO3	To apply the concept of process scheduling.
CO4	To apply the concept of process synchronization, mutual exclusion and the deadlock
CO5	To realize the concept of disk scheduling and File system
CO6	To understand the various memory management techniques.

Name Of Subject:	Elective I- Artificial Intelligence
Course Objectives:	
1	To present an overview of artificial intelligence (AI) principles and approaches.
2	Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning.
3	To understand Natural language processing and Expert systems
Course Outcomes:	
CO1	Describe the modern view of AI as the study of agents that receive precepts from the Environment and perform actions.
CO2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
CO3	Describe the use of various search techniques
CO4	Develop knowledge of decision making methods
CO5	Explain about AI techniques for logical planning
CO6	Explain the concept of Expert systems

Name Of Subject:	Elective I (Cyber Security)
Course Objectives:	
1	To prepare students with the technical knowledge and skills needed to protect and defend computer systems and networks.
2	To develop students that can plan, implement, and monitor cyber security mechanisms to help ensure the protection of information technology assets.
3	To develop graduates that can identify, analyze, and remediate computer security breaches
Course Outcomes:	
CO1	Analyze and evaluate the cyber security needs of an organization.
CO2	Conduct a cyber security risk assessment.
CO3	Measure the performance and troubleshoot cyber security systems.
CO4	Implement cyber security solutions.
CO5	Be able to study cyber security, information assurance, and cyber/computer forensics software/tools.
CO6	Identify the key cyber security vendors in the marketplace.
Name Of Subject:	Operating System Lab
Course Objectives:	
1	To introduce and learn Linux commands required for administration.

2	To learn shell programming concepts and applications.
3	To demonstrate the functioning of OS basic building blocks like processes, threads
4	To demonstrate the functioning of OS concepts in user space like concurrency control (process synchronization, mutual exclusion & deadlock) and file handling in LINUX.
5	To aware paging simulation
6	To demonstrate the functioning of OS concepts in kernel space like embedding the system call in any LINUX kernel.
Course Outcomes:	
CO1	Understand the basics of Linux commands and program the shell of Linux.
CO2	Develop various system programs for the functioning of operating system.
CO3	Implement basic building blocks like processes, threads
CO4	Develop various system programs for the functioning of OS concepts in user space like concurrency control and file handling in Linux.
CO5	Implement page replacement algorithm.
CO6	Develop the system program for the functioning of OS concepts in kernel space like embedding the system call in any Linux kernel.
Name Of Subject:	Java Programming Laboratory
Course Objectives:	
1	To learn the core concept of Java programming
2	To introduce the working environment of Java Program using the multithreading and file handling
3	To get acquainted the purpose of applet and AWT in Java programming
4	To study the use of database connectivity in Java Programming
5	To gain knowledge of Java Servlet and JSP concept in Java
Course Outcomes:	
CO1	Describe the core concept of Java programming
CO2	Discover the need for working with the multithreading and file handling
CO3	Illustrate the purpose of applet and AWT in Java programming
CO4	Indicate the use of database connectivity using Java Programming
CO5	Articulate the networking concepts in Java
CO6	Implement Java Servlet and JSP concept in Java
Name Of Subject:	Project Base Learning
Course Objectives:	

	To identify and solve problems considering social, ethical and legal issues
	To enhance analytical and computational skills
	To inculcate leadership and managerial skills through team work
	To understand software/system development life cycle
	To gain insight of testing and deployment of applications
Course Outcomes:	
CO1	Able to analyze and solve problems by applying programming knowledge
CO2	Prepare requirements and Design Documents
CO3	Develop Inter-personal and leadership qualities
CO4	Demonstrate system with results and interpretation
CO5	Describe software testing methods
CO6	Design and develop technical documentation

SYMCA SEMESTER-I	
Name Of Subject:	**Data Science**
Course Objectives:	
1	To understand the need of Data Science and Big Data
2	To learn about the Data Evolution and understanding the data
3	To learn Data Preprocessing Techniques and machine learning algorithms required for Data Science.
4	To visualize data and use for communicating stories from data.
Course Outcomes:	
CO1	Explain flow process for data science problems.
CO2	Elaborate data preprocessing and warehouse
CO3	Utilize various classification techniques for commercially available datasets
CO4	Implement association rule mining for commercially available datasets.
CO5	Apply standard clustering methods for commercially available datasets.
CO6	Compare appropriate data visualization method for effective visualization of data.
Name Of Subject:	**Web Technologies**
Course Objectives:	
1	To learn the fundamentals of web essentials and markup languages
2	To use the Client side technologies in web development
3	To use the Server side technologies in web development
4	To understand the web services and frameworks
Course Outcomes:	
CO1	Design web-based application using client-side Technology.
CO2	Develop the structure of web sites using XML components.
CO3	Analyze current client-side web technologies: JavaScript in detail.
CO4	Apply recent client-side web technologies: Angular JS in detail.
CO5	Apply the server side technologies for web development
CO6	Create the effective web applications for business functionalities using ASP.NET
Name Of Subject:	**Cloud Computing**
Course Objectives:	
1	To study fundamental concepts of cloud computing
2	To learn various data storage methods on cloud

3	To understand the implementation of Virtualization in Cloud Computing
4	To learn the application and security on cloud computing
5	To understand the advanced technologies in cloud computing
Course Outcomes:	
CO1	Understand the different Cloud Computing environment
CO2	Use appropriate data storage technique on Cloud
CO3	Analyze virtualization technology
CO4	Develop and deploy applications on Cloud
CO5	Apply security in cloud applications
CO6.	Use advance techniques in Cloud Computing
Name Of Subject:	**Machine Learning**
Course Objectives:	
1	To study fundamentals of machine learning
2	To acquaint with various machine learning algorithms
3	To become aware of various logic based and algebraic models in machine learning
4	To study trends in machine learning
Course Outcomes:	
CO1	Understand basic concepts of Machine Learning.
CO2	Understand classification concepts.
CO3	Apply different regression and generalization techniques.
CO4	Apply various logic Based and algebraic algorithms for real world applications.
CO5	Use probabilistic models for machine learning
CO6.	Understand trends In Machine Learning
Name Of Subject:	**Software Testing and Quality Assurance**
Course Objectives:	
1	To know the importance of software testing and quality assurance
2	To study white box and black box testing techniques
3	To get acquainted with various testing types
4	To study tools used for automation testing
Course Outcomes:	
CO1	Illustrate different approaches of quality management, assurance, and quality standard to software system
CO2	Create test plan, test cases and defect repository using case study.

CO3	Apply the concept of white box and block box testing techniques
CO4	Analyze various testing types
CO5	To analyze recent automation tools for software testing.
CO6.	Apply software testing automation concepts using Selenium
Name Of Subject:	**Web Technologies Lab**
Course Objectives:	
1	To understand the principles and methodologies of web-based applications development process.
2	To understand popularly used scripting languages to develop web applications.
3	To understand current client-side web technologies.
4	To understand current server-side web technologies.
Course Outcomes:	
CO1	Design web-based application using client-side Technology.
CO2	Develop the structure of web sites using XML components.
CO3	Analyze current client-side web technologies: JavaScript in detail.
CO4	Understand recent client-side web technologies: Angular JS in detail.
CO5	Understand current server-side web technologies and uses.
CO6	Analyze ASP.NET in detail.
Name Of Subject:	**Computer Laboratory**
Course Objectives:	
1	Introduce basic concepts of software testing and get aware of white box and block box testing techniques
2	To learn the importance of software quality and assurance software systems development.
3	Know in details automation testing and tools used for automation testing.
4	To acquire skills to solve complex real world problems related to decision support.
Course Outcomes:	
CO1	Implement white box and block box testing techniques for any software systems
CO2	Create Test plan and test cases using case studies.
CO3	Apply automation testing using tools
CO4	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
CO5	Design and develop machine learning model for a real time applications
CO6	Implement an architectural design for IoT for specified requirement
CO7	Interpret the importance of Computational Intelligence for solving the different problems

Name Of Subject:	**Data Science Laboratory**
Course Objectives:	
1	To learn basics about Data Analytics Tool for Data Science
Course Outcomes:	
CO1	Describe framework of any Data Analytics Tool
CO2	Write basic applications using the fundamentals of any Data Analytics Tool
CO3	Apply Modeling techniques using any Data Analytics Tool.
CO4	Implement Mining techniques using any Data Analytics Tool
CO5	Employ data analysis using graphs.
CO6	Implement Data Visualization
Name Of Subject:	**Project Based Learning –II (Mini Project- II)**
Course Objectives:	
1	To develop critical thinking and problem solving ability by exploring and proposing solutions to realistic /social Problems.
2	To understand software/system development life cycle
3	To provide every student the opportunity to get involved either individually or as a group so as to develop team skills and learn professionalism
4	To develop an ecosystem that promotes entrepreneurship and research culture among the students
Course Outcomes:	
CO1	Identify the real life problem from societal need point of view
CO2	Choose and compare alternative approaches to select most feasible one
CO3	Analyze and synthesize the identified problem from technological perspective
CO4	Design the reliable and scalable solution to meet challenges
CO5	Inculcate the habit of lifelong learning.
CO6	Design and develop technical documentation

SYMCA SEMESTER-II	
Name Of Subject:	**Major Project**
Course Objectives:	
1	To expose students to product development cycle using industrial experience, use of state of art technologies.
2	Evaluate the various validation and verification methods.
3	To Work in TEAM and learn professionalism
4	To consolidate the work as furnished report.
5	To apply communication skills to effectively promote ideas, goals or products.
Course Outcomes:	
CO1	Learn team work and professionalism.
CO2	Learn team work and professionalism.
CO3	Apply communication and presentation skills
CO4	Recognize the importance of documentation.
Name Of Subject:	**Seminar on Major Project**
Course Objectives:	
1	Develop skills of technical presentation
2	Prepare documentation
3	Perform literature survey
Course Outcomes:	
CO1	Analyze recent topic or emerging trends
CO2	Summarize literature survey
CO3	Identify, understand and discuss current real-world issues.
CO4	Suggest future scope for the topic
CO5	Use professional ethics
CO6	Develop proficiency in presentation skills and written communication