B.TECH

SEMESTER II	
EST 102 PROGRAMMING IN C	
CO 1	Analyze a computational problem and develop an algorithm/flowchart to find its solution
CO 2	Write readable C programs with arrays, structure or union for storing the the data to be processed
CO 3	Divide a given computational problem into a number of modules and develop a readable Divide a given computational problem into a number multi-function C programs.
CO4	Write readable C programs which use pointers for array processing and parameter passing
CO5	Develop readable C programs with files for reading input and storing output.
SEMESTER III	
CST 201 DATA STRUCTURES	
CO 1	Design an algorithm for a computational task and calculate the time/space complexities of that algorithm
CO 2	Identify the suitable data structure (array or linked list) to represent a data item required to be processed to solve a given computational problem and write an
CO 3	required to be processed to solve a given computational problem and write an algorithm to find the solution of the computational problem.
CO4	Store a given dataset using an appropriate Hash Function to enable efficient access of
CO5	Write readable C programs which use pointers for array processing and parameter passing.
CO6	Develop readable C programs with files for reading input and storing output
CST 205 OBJECT ORIENTED PROGRAMMING USING JAVA	
CO 1	Write Java programs using the object oriented concepts - classes, objects,constructors, data hiding, inheritance and polymorphism
CO 2	Utilise datatypes, operators, control statements, built in packages & interfaces, Input/Output Streams and Files in Java to develop programs mechanism
CO 3	Write application programs in Java using multithreading and database connectivity
CO4	Write Graphical User Interface based application programs by utilising event handling features and Swing in Java
CSL 201 DATASTRUCTURES LAB	
CO 1	Write a time/space efficient program using arrays/linked lists/trees/graphs to provide necessary functionalities meeting a given set of user requirements.
CO 2	Write a time/space efficient program to sort a list of records based on a given key in the record
CO 3	Examine a given Data Structure to determine its space complexity and time complexities of operations on it
CO4	Design and implement an efficient data structure to represent given data
CO5	Write a time/space efficient program to convert an arithmetic expression from one notation to another (

Dr. K Vijayakumar
Principal
Thejus Engineering College
Vellarakkad P.O., Erumapetty
Thrissur - 680 584

CO 6	Write a program using linked lists to simulate Memory Allocation and Garbage Collection
CSL 203 OBJECT ORIENTED PROGRAMMING LAB	
CO 1	Implement the Object Oriented concepts - constructors, inheritance, method overloading & overriding and polymorphism in Java
CO 2	Implement programs in Java which use datatypes, operators, control statements, built in packages & interfaces, Input/Output streams and Files
CO 3	Implement robust application programs in Java using exception handling
CO4	Implement application programs in Java using multithreading and database connectivity
CO5	Implement Graphical User Interface based application programs by utilizing event handling features and Swing in Java
	SEMESTER IV
CST 202 COMPUTER ORGANISATION AND ARCHITECTURE	
CO 1	Recognize and express the relevance of basic components, I/O organization and pipelining schemes in a digital computer
CO 2	Explain the types of memory systems and mapping functions used in memory systems
CO 3	Demonstrate the control signals required for the execution of a given instruction
CO4	Illustrate the design of Arithmetic Logic Unit and explain the usage of registers
CO5	Explain the implementation aspects of arithmetic algorithms in a digital computer
CO6	Develop the control logic for a given arithmetic problem
CST 204 DATABASE MANAGEMENT SYSTEMS	
CO 1	Summarize and exemplify fundamental nature and characteristics of database systems
CO 2	Model real word scenarios given as informal descriptions, using Entity Relationship diagrams.
CO 3	Model and design solutions for efficiently representing and querying data using relational model
CO4	Demonstrate the features of indexing and hashing in database applications
CO5	Discuss and compare the aspects of Concurrency Control and Recovery in Database
CST 206 OPERATING SYSTEMS	
CO 1	Explain the relevance, structure and functions of Operating Systems in computing devices.
CO 2	Illustrate the concepts of process management and process scheduling mechanisms employed in Operating Systems.
CO 3	Model and design solutions for efficiently representing and querying data using relational model
CO4	Explain any one method for detection, prevention, avoidance and recovery
CO5	Discuss and compare the aspects of Concurrency Control and Recovery in Database
CSL 204 OPERATING SYSTEM LAB	
CO 1	Illustrate the use of systems calls in Operating Systems.
CO 2	Implement Process Creation and Inter Process Communication in Operating Systems.
CO 3	Implement Fist Come First Served, Shortest Job First, Round Robin and Priority-based CPU Scheduling Algorithms.
CO4	Illustrate the performance of First In First Out, Least Recently Used and Least Frequently Used Page Replacement Algorithms.
	SEMESTER V
CST 301 FORMAL LANGUAGE AND AUTOMATA THEORY	
CO 1	Classify a given formal language into Regular, Context-Free, Context Sensitive, Recursive or Recursively Enumerable
CO 2	Explain a formal representation of a given regular language as a finite state automaton, regular grammar, regular expression and Myhill-Nerode relation
CO 3	Design a Pushdown Automaton and a Context-Free Grammar for a given context-free language
CO4	Design Turing machines as language acceptors or transducers.
CO5	Explain the notion of decidability.
CST 303 COMPUTER NETWORKS	
CO 1	Explain the features of computer networks, protocols, and network design models

Dr. K Vijay...
Prin...
Thejus Engineering ...
Vellarakkad P.O., Eranispetty
Thrissur - 680 584

CO 2	Describe the fundamental characteristics of the physical layer and identify the usage in network communication
CO 3	Explain the design issues of data link layer, link layer protocols, bridges and switche
CO4	Select appropriate routing algorithms, congestion control techniques, and Quality of Service requirements for a network
CO 5	Illustrate the functions and protocols of the network layer, transport layer, and application layer in inter-networking
CO6	Illustrate wired LAN protocols (IEEE 802.3) and wireless LAN protocols (IEEE 802.11)
CST 305 SYSTEM SOFTWARE	
CO 1	Distinguish softwares into system and application software categories.
CO 2	Identify standard and extended architectural features of machines.
CO 3	Identify machine dependent features of system software
CO4	Identify machine independent features of system software.
CO5	Design algorithms for system softwares and analyze the effect of data structures.
CO6	Understand the features of device drivers and editing & debugging tools
CST 309 MANAGEMENT OF SOFTWARE SYSTEM	
CO 1	Demonstrate Traditional and Agile Software Development approaches
CO 2	Prepare Software Requirement Specification and Software Design for a given problem
CO 3	Justify the significance of design patterns and licensing terms in software development, prepare testing, maintenance and DevOps strategies for a project.
CO4	Make use of software project management concepts while planning, estimation, scheduling, tracking and change management of a project, with a traditional/agile framework
CO5	Utilize SQA practices, Process Improvement techniques and Technology advancements in cloud based software models and containers & microservices
CSL 331 SYSTEM SOFTWARE AND MICROPROCESSOR LAB	
CO 1	Develop 8086 programs and execute it using a microprocessor kit.
CO 2	Develop 8086 programs and, debug and execute it using MASM assemblers
CO 3	Develop and execute programs to interface stepper motor, 8255, 8279 and digital to analog converters with 8086 trainer kit
CO4	Implement and execute different scheduling and paging algorithms in OS
CSL 333 DATABASE MANAGEMENT SYSTEM LAB	
CO 1	Design database schema for a given real world problem-domain using standard design and modeling approaches
CO 2	Construct queries using SQL for database creation, interaction, modification, and updation
CO 3	Design and implement triggers and cursors
CO 4	Implement procedures, functions, and control structures using PL/SQL
CO 5	Perform CRUD operations in NoSQL Databases
CO6	Develop database applications using front-end tools and back-end DBMS.
SEMESTER VI	
CST 302 COMPILER DESIGN	
CO 1	Explain the phases in compilation process(lexical analysis, syntax analysis, semantic analysis, intermediate code generation, code optimization and code generation) and model a lexical analyzer
CO 2	Model language syntax using Context Free Grammar and develop parse tree representation using leftmost and rightmost derivations
CO 3	Compare different types of parsers(Bottom-up and Top-down) and construct parser for a given grammar
CO4	Build Syntax Directed Translation for a context free grammar, compare various storage allocation strategies and classify intermediate representations
CO5	Illustrate code optimization and code generation techniques in compilation
CST 304 COMPUTERGRAPHICS AND IMAGE PROCESSING	
CO 1	Describe the working principles of graphics device
CO 2	Illustrate line drawing, circle drawing and polygon filling algorithms
CO 3	Demonstrate geometric representations, transformations on 2D & 3D objects, clipping algorithms and projection algorithms
CO4	Summarize visible surface detection methods

Dr. K Vijayakumar
Principal
Thejus Engineering College
Vellarakkad P.O., Erumapetty
Thrissur - 680 584

CO5	Summarize the concepts of digital image representation, processing and demonstrate pixel relationships
CO6	Solve image enhancement and segmentation problems using spatial domain technique
CST 306 ALGORITHM ANALYSIS AND DESIGN	
CO 1	To attain basic concept about C++, data types and selection statement.
CO 2	To provide adequate knowledge for coding in C ++ using looping statements and arrays
CO 3	To have a basic idea about functions and variables
CO4	To provide knowledge about structure and class in C++ coding
CO5	To give awareness about transidental equations and their implementation to analyse basic engineering problem
CO 6	To give awareness about functional approximation and linear algebric equation and their implementation to analyse basic engineering problem
CST 372 DATA AND COMPUTER COMMINUCATION	
CO 1	To introduce the principles and practice of Highway Engineering
CO 2	To enable students to have a strong analytical and practical knowledge of geometric design of highways.
CO 3	To introduce pavement design concepts, material properties, construction methods and to design highway pavements.
CO4	To understand the principles of traffic engineering and apply this for efficient management of transportation facilities
CO5	To introduce the principles Airport Engineering.
CST 308 COMPREHENSIVE COURSE WORK	
CO 1	To develop ability to critically analyse and evaluate a variety of management practices in the contemporary context
CO 2	To understand and apply a variety of management and organisational theories in practice
CO 3	To be able to mirror existing practices or to generate their own innovative management competencies, required for today's complex and global workplace
CO4	To be able to critically reflect on ethical theories and social responsibility ideologies to create sustainable organisations
CSL 332 NETWORKING LAB	
CO 1	Use network related commands and configuration files in Linux Operating System
CO 2	Develop network application programs and protocols.
CO 3	Analyze network traffic using network monitoring tools.
CO4	Design and setup a network and configure different network protocols.
CO5	Develop simulation of fundamental network concepts using a network simulator.
CSD 334 MINIPROJECT	
CO 1	Identify technically and economically feasible problems
CO 2	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes
CO 3	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques
CO4	Prepare technical report and deliver presentation
CO5	Apply engineering and management principles to achieve the goal of the projec
SEMESTER VII	
CST 401 ARTIFICIAL INTELLIGENCE	
CO 1	Explain the fundamental concepts of intelligent systems and their architecture.
CO 2	Illustrate uninformed and informed search techniques for problem solving in intelligent systems.
CO 3	Solve Constraint Satisfaction Problems using search techniques.
CO4	Represent AI domain knowledge using logic systems and use inference techniques for reasoning in intelligent systems
CO5	Illustrate different types of learning techniques used in intelligent systems
CO6	
CST 463 WEB PROGRAMMING	

Dr. K Vijayakumar
Principal
Thejus Engineering College
Vellarakkad P.O., Erumapetty
Thrissur - 680 584

CO 1	Use HyperText Markup Language (HTML) for authoring web pages and understand the fundamentals of WWW
CO 2	Construct and visually format responsive, interactive web pages using CSS and JavaScript
CO 3	Construct websites using advanced sever side programming tool PHP
CO 4	Develop dynamic web applications using PHP and perform MySQL database operations
CO 5	Explain the importance of object exchange formats using JSON and the MVC based web application development frameworks
CSL 411 COMPILER LAB	
CO 1	Implement lexical analyzer using the tool LEX
CO 2	Implement Syntax analyzer using the tool YACC
CO 3	Design NFA and DFA for a problem and write programs to perform operations on it.
CO 4	Design and Implement Top-Down parsers
CO 5	Design and Implement Bottom-Up parsers.
CO 6	Implement intermediate code for expressions.
CSQ 413 SEMINAR	
CO 1	Identify academic documents from the literature which are related to her/his areas of interest
CO 2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest
CO 3	Prepare a presentation about an academic document
CO 4	Give a presentation about an academic document
CO 5	Prepare a technical report
CSD 415 PROJECT PHASE 1	
CO 1	Model and solve real world problems by applying knowledge across domains
CO 2	Develop products, processes or technologies for sustainable and socially relevant applications
CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks
CO 4	Identify technology/research gaps and propose innovative/creative solutions
CO 5	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms
CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms

	SEMESTER VIII
CST 402 DISTRIBUTED COMPUTING	
CO 1	Explain the need and use of formal methods and tools in software engineering.
CO 2	Demonstrate conceptual modelling of systems using Alloy
CO 3	Illustrate the process of proving correctness of code using Hoare-Triple based weakest precondition analysis
CO 4	Demonstrate program verification using VCC
CST 464 EMBEDDED SYSTEMS	
CO 1	Describe the characteristics of different hardware/software components of an embedded system
CO 2	Map the design of an embedded system to an appropriate computational model.
CO 3	Recommend appropriate process synchronization / communication / scheduling mechanisms for specific system scenarios.
CO 4	Describe the role of real-time operating systems in embedded devices.

Dr. K Vijayakumar
Principal
Thejus Engineering College
Vellarakkad P.O., Erumapetty
Thrissur - 680 584

CST 424 PROGRAMMING PARADIGMS	
CO 1	Explain the criteria for evaluating programming languages and compare Imperative, Functional and Logic programming languages
CO 2	Illustrate the characteristics of data types and variables
CO 3	Comprehend how control flow structures and subprograms help in developing the structure of a program to solve a computational problem
CO 4	Explain the characteristics of Object-Oriented Programming Languages
	Compare concurrency constructs in different programming languages (
CST 476 MOBILE COMPUTING	
CO 1	Explain the various mobile computing applications, services, design considerations and architectures
CO 2	Describe the various technology trends for next generation cellular wireless networks and use the spreading concept on data transmission
CO 3	Summarize the architecture of various wireless LAN technologies
CO 4	Identify the functionalities of mobile network layer and transport layer
	Explain the features of Wireless Application Protocol
CST 448 INTERNET OF THINGS	
CO 1	Outline the fundamentals of IoT and its underlying physical and logical architectur
CO 2	Explain the hardware architectures for IoT
CO 3	Outline the Network architectures for IoT
CO 4	Implement data analytics on the IoT platforms
	Appreciate the security considerations in IoT
	Implement IoT applications using the available hardware and software
CST 404 COMPREHENSIVE COURSE VIVA	
CO 1	Model and solve real world problems by applying knowledge across domains
CO 2	Develop products, processes or technologies for sustainable and socially relevant applications
CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated task
CO 4	Identify technology/research gaps and propose innovative/creative solutions
CO 5	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms
CSD 416 PROJECT PHASE 11	
CO 1	Model and solve real world problems by applying knowledge across domains
CO 2	Develop products, processes or technologies for sustainable and socially relevant applications
CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks
CO 4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms
CO 5	Identify technology/research gaps and propose innovative/creative solutions
CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms

THEJUS ENGINEERING COLLEGE • VELLARAKKAD • THRISSUR 680 584

Dr. K Vijayakumar
Principal
Thejus Engineering College
Vellarakkad P.O., Erumapetty
Thrissur - 680 584