



**MAR ATHANASIOUS COLLEGE OF ENGINEERING**  
**KOTHAMANGALAM**

**COMPUTER SCIENCE ENGINEERING DEPARTMENT**

**LIST OF COURSE OUTCOMES**

**B.TECH 2019 SCHEME**

S1	EST120	BASICS OF CIVIL & MECHANICAL ENGINEERING	1	Recalling the role of civil engineering in society and to relate various disciplines of civil engineering, building rules, regulation and building area.
			2	Explaining the different types of buildings, building components, materials and give an insight to objectives and principles of surveying.
			3	Summarize the basic infrastructural services and make students aware about the importance of green construction
			4	Analyse thermodynamic cycles and illustrate the working and features of I.C.Engines.
			5	Explain the principles of refrigeration and airconditioning, hydraulic turbines and power transmission elements.
			6	Describe the basic manufacturing, metal joining and machining processes.
S1	EST130	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits
			2	Develop and solve models of magnetic circuits
			3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
			4	Describe working of a voltage amplifier
			5	Outline the principle of an electronic instrumentation system
			6	Explain the principle of radio and cellular communication
S1	EST102	PROGRAMMING IN C	1	Develop readable* C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators
			2	Write readable C programs with arrays, structure or union for storing the data to be processed
			3	Divide a given computational problem into a number of modules and develop a readable multi-function C program by

				using recursion if required, to find the solution to the computational problem
			4	Write readable C programs which use pointers for array processing and parameter passing
			5	Develop readable C programs with files for reading input and storing output
S1	ESL 120	CIVIL & MECHANICAL WORKSHOP	1	Name and explain the use of different devices and tools used for civil engineering measurements
			2	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work
			3	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
			4	Identify Basic Mechanical workshop operations in accordance with the material and objects
			5	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
			6	Apply appropriate safety measures with respect to the mechanical workshop trades
S2	MAT102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	1	Compute the derivatives and line integrals of vector functions and learn their applications
			2	Evaluate surface and volume integrals and learn their inter-relations and applications.
			3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients
			4	Compute Laplace transform and apply them to solve odes arising in engineering
			5	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering
S2	ESL130	ELECTRICAL & ELECTRONICS WORKSHOP	1	Demonstrate safety measures against electric shocks
			2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols

			3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings
			4	Identify and test various electronic components and Assemble and test electronic circuits on boards
			5	Draw circuit schematics with EDA tools
			6	Work in a team with good interpersonal skills
S2	EST110	ENGINEERING GRAPHICS	1	Draw the projection of points and lines located in different quadrants
			2	Prepare multiview orthographic projections of objects by visualizing them in different positions
			3	Draw sectional views and develop surfaces of a given object
			4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
			5	Convert 3D views to orthographic views
			6	Obtain multiview projections and solid models of objects using CAD tools
S2	EST100	ENGINEERING MECHANICS	1	Recall principles and theorems related to rigid body mechanics
			2	Identify and describe the components of system of forces acting on the rigid body
			3	Apply the conditions of equilibrium to various practical problems involving different force system.
			4	Choose appropriate theorems, principles or formulae to solve problems of mechanics.
			5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses
S2	CYT100	ENGINEERING CHEMISTRY	1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
			2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its Applications
			3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the

				basic concept of SEM for surface characterization of nano materials
			4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering
			5	Study various types of water treatment methods to develop skills for treating waste water.
S2	CYL120	ENGINEERING CHEMISTRY LAB	1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
			2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
			3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
			4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
			5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
			6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum
S1	PHT100	ENGINEERING PHYSICS A (FOR CIRCUIT BRANCHES)	1	Compute the quantitative aspects of waves and oscillations in engineering systems
			2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments
			3	Analyze the behavior of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
			4	Classify the properties of magnetic materials and apply vector calculus to

			static magnetic fields and use Maxwell's equations to diverse engineering problems
			5 Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system
S1	PHT110	ENGINEERING PHYSICS A (FOR NON- CIRCUIT BRANCHES)	1 Compute the quantitative aspects of waves and oscillations in engineering systems
			2 Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments
			3 Analyze the behavior of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
			4 Classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems
			5 Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system
S1	PHL120	ENGINEERING PHYSICS LAB	1 Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories
			2 Understand the need for precise measurement practices for data recording
			3 Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
			4 Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics
			5 Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
S1	HUN101	LIFE SKILL	1 Define and Identify different life skills required in personal and professional life

			2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.
			3	Explain the basic mechanics of effective communication and demonstrate these through presentations.
			4	Take part in group discussions
			5	Use appropriate thinking and problem solving techniques to solve new problems
			6	Understand the basics of teamwork and leadership
S3	MAT101	LINEAR ALGEBRA AND CALCULUS	1	Solve systems of linear equations, diagonalize matrices and characterise quadratic forms
			2	Compute the partial and total derivatives and maxima and minima of multivariable functions
			3	Compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
			4	Perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
			5	Determine the Taylor and Fourier series expansion of functions and learn their applications
S3	HUN102	PROFESSIONAL COMMUNICATION	1	Develop vocabulary and language skills relevant to engineering as a profession
			2	Analyze, interpret and effectively summarize a variety of textual content
			3	Create effective technical presentations
			4	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus
			5	Identify drawbacks in listening patterns and apply listening techniques for specific needs
			6	Create professional and technical documents that are clear and adhering to all the necessary conventions
S3	MAT 203	DISCRETE MATHEMATICAL STRUCTURES	1	Check the validity of predicates in Propositional and Quantified Propositional Logic using truth tables, deductive reasoning and inference theory on Propositional Logic

			<p>Solve counting problems by applying the elementary counting techniques - Rule of Sum, Rule of Product, Permutation, Combination, Binomial Theorem, Pigeonhole</p> <p>Principle and Principle of Inclusion and Exclusion</p>
			<p>2</p>
			<p>Classify binary relations into various types and illustrate an application for each type. Illustrate an application for Partially Ordered Sets and Complete Lattices, in</p> <p>Computer Science</p>
			<p>3</p>
			<p>of binary relation, in Computer Science</p>
			<p>Explain Generating Functions and solve First Order and Second Order Linear Recurrence Relations with Constant Coefficients</p>
			<p>4</p>
			<p>Illustrate the abstract algebraic systems - Semigroups, Monoids, Groups, Homomorphism and Isomorphism of Monoids and Groups</p>
			<p>5</p>
S3	CST 201	DATA STRUCTURES	<p>Design an algorithm for a computational task and calculate the time/space complexities of that algorithm</p>
			<p>1</p>
			<p>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 algorithm to find the solution of the computational problem</p>
			<p>2</p>
			<p>Write an algorithm to find the solution of a computational problem by selecting an appropriate data structure (binary tree/graph) to represent a data item to be processed</p>
			<p>3</p>
			<p>Store a given dataset using an appropriate Hash Function to enable efficient access of data in the given set</p>
			<p>4</p>
			<p>Select appropriate sorting algorithms to be used in specific circumstances</p>
			<p>5</p>
			<p>Design and implement Data Structures for solving real world problems efficiently</p>
			<p>6</p>
S3	CST203	LOGIC SYSTEM DESIGN	<p>Illustrate decimal, binary, octal, hexadecimal and BCD number systems, perform conversions among them and do</p>
			<p>1</p>

			the operations - complementation, addition, subtraction, multiplication and division on binary numbers
			2 Simplify a given Boolean Function and design a combinational circuit to implement the simplified function using Digital Logic Gates
			3 Design combinational circuits - Adders, Code Convertors, Decoders, Magnitude Comparators, Parity Generator/Checker and design the Programmable Logic Devices - ROM and PLA.
			4 Design sequential circuits - Registers, Counters and Shift Registers
			5 Use algorithms to perform addition and subtraction on binary, BCD and floating point numbers
S3	CST205	OBJECT ORIENTED PROGRAMMING USING JAVA	1 Write Java programs using the object oriented concepts - classes, objects, constructors, data hiding, inheritance and polymorphism
			2 Utilise datatypes, operators, control statements, built in packages & interfaces, Input/Output Streams and Files in Java to develop programs
			3 Illustrate how robust programs can be written in Java using exception handling mechanism
			4 Write application programs in Java using multithreading and database connectivity
			5 Write Graphical User Interface based application programs by utilising event handling features and Swing in Java
S3	HUT 200	PROFESSIONAL ETHICS	1 Understand the core values that shape the ethical behaviour of a professional.
			2 Adopt a good character and follow an ethical life.
			3 Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.
			4 Solve moral and ethical problems through exploration and assessment by established experiments.
			5 Apply the knowledge of human values and social values to contemporary ethical values and global issues.
			6

S3	MCN201	SUSTAINABLE ENGINEERING	1	Understand the relevance and the concept of sustainability and the global initiatives in this direction
			2	Explain the different types of environmental pollution problems and their sustainable solutions
			3	Discuss the environmental regulations and standards
			4	Outline the concepts related to conventional and non-conventional energy
			5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles
S3	CSL201	DATA STRUCTURES LAB	1	Write a time/space efficient program using arrays/linked lists/trees/graphs to provide necessary functionalities meeting a given set of user requirements
			2	Write a time/space efficient program to sort a list of records based on a given key in the record
			3	Examine a given Data Structure to determine its space complexity and time complexities of operations on it
			4	Design and implement an efficient data structure to represent given data
			5	Write a time/space efficient program to convert an arithmetic expression from one notation to another
			6	Write a program using linked lists to simulate Memory Allocation and Garbage Collection
S3	CSL203	OBJECT ORIENTED PROGRAMMING LAB	1	Implement the object oriented concepts
			2	Implement programs in Java which uses datatypes, operators, control statements, built in packages and interfaces, Input/Output streams and Files
			3	Implement robust application programs in Java using exception handling
			4	Implement application programs in Java using multithreading and database connectivity
			5	Implement Graphical User Interface based application programs by utilizing event handling features and Swing in Java
			6	

S4	MAT206	GRAPH THEORY	1	Understand the basic concept in graph theory
			2	Formulate and prove fundamental theorems on Eulerian graphs and Hamiltonian graphs
			3	Apply theorems and algorithms on trees
			4	Understand planar graph and its properties and detect planarity of a given graph
			5	Demonstrate the knowledge of fundamental concepts in matrix representation of graphs and coloring problems.
S4	CST202	COMPUTER ORGANISATION AND ARCHITECTURE	1	Recognize and express the relevance of basic components, I/O organization and pipelining schemes in a digital computer (Cognitive knowledge: Understand
			2	Explain the types of memory systems and mapping functions used in memory systems (Cognitive Knowledge Level: Understand)
			3	Demonstrate the control signals required for the execution of a given instruction (Cognitive Knowledge Level: Apply) )
			4	Illustrate the design of Arithmetic Logic Unit and explain the usage of registers in it (Cognitive Knowledge Level: Apply)
			5	Explain the implementation aspects of arithmetic algorithms in a digital computer (Cognitive Knowledge Level:Apply)
			6	Develop the control logic for a given arithmetic problem (Cognitive Knowledge Level: Apply
S4	CST204	DATABASE MANAGEMENT SYSTEMS	1	Summarize and exemplify fundamental nature and characteristics of database systems
			2	Model real word scenarios given as informal descriptions, using Entity Relationship diagrams.
			3	Model and design solutions for efficiently representing and querying data using relational model
			4	Demonstrate the features of indexing and hashing in database application
			5	Discuss and compare the aspects of Concurrency Control and Recovery in Database systems

			6	Explain various types of nosql databases
S4	EST200	DESIGN AND ENGINEERING	1	Explain the different concepts and principles involved in design engineering.
			2	Apply design thinking while learning and practicing engineering
			3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.
S4	MCN202	CONSTITUTION OF INDIA	1	Explain the background of the present constitution of India and features.
			2	Utilize the fundamental rights and duties.
			3	Understand the working of the union executive, parliament and judiciary.
			4	Understand the working of the state executive, legislature and judiciary
			5	Utilize the special provisions and statutory institutions.
			6	Show national and patriotic spirit as responsible citizens of the country
S4	CSL202	DIGITAL LAB	1	Design and implement combinational logic circuits using Logic Gates
			2	Realise various types of flip flops using gates.
			3	Design and implement counters.
			4	Implement various type of shift registers
			5	Simulate functioning of digital circuits using programs written in a Hardware Description Language
			6	Function effectively as an individual and in a team to accomplish a given task of designing and implementing digital circuits
S4	CSL204	OPERATING SYSTEMS LAB	1	Iiustrate the use of system calls in operating systems
			2	Implement process creation and interprocess communicationand process synchronisation in operating systems
			3	Implement FCFS,SJF,RR and priority based CPU Scheduling algorithms
			4	Iiustrate the performance of FIFO,LRU and OPT page replacement algorithms
			5	Implement modules for deadlock detection and deadlock avoidance in operating systems

				6	Implement modules for storage management and disk scheduling in operating systems.
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