

## SREE NARAYANA GURU COLLEGE OF ENGINEERING AND TECHNOLOGY, PAYYANUR DEPARTMENT OF SCIENCE AND HUMANITIES COURSE OUTCOME

SEMESTER	SUBJECT CODE	SUBJECT NAME	со	
S1 & S2 SEMESTER				
	PHT 100	ENGINEERING PHYSICS A	CO 1	Compute the quantitative aspects of waves and oscillations in engineering systems.
		(FOR CIRCOTT BRANCHES)	CO 2	Apply the interaction of light with matter through interference, diffraction and identify these ohenomena in different natural optical orocesses and optical instruments.
			CO 3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of
			CO 4	quantum mechanics to perceive the microscopic processes in electronic devices. Classify the properties of magnetic materials and apply vector calculus to static magnetic.
				fields and use Maxwell's equations to diverse engineering problems
			05	Anaryze the principles bening various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system
	PHT 110	ENGINEERING PHYSICS B (FOR NON-CIRCUIT BRANCHES)	CO 1	Compute the quantitative aspects of waves and oscillations in engineering systems.
			CO 2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
			CO 3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
			CO 4	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature and characterization of acoustic design and to provide a safe and healthy environment.
			CO 5	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications
	PHL 120	ENGINEERING PHYSICS LAB	CO 1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories
			CO 2	Understand the need for precise measurement practices for data recording
			CO 3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
			CO 4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics
			CO 5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
	CYT 100	ENGINEERING CHEMISTRY	CO 1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
			CO 2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
			CO 3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials.
			CO 4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.
			CO 5	Study various types of water treatment methods to develop skills for treating wastewater.
	CYL 120	ENGINEERING CHEMISTRY LAB	CO 1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
			CO 2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
			CO 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 comounds
			CO 4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
			CO 5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
			CO 6	Function as a member of a team, communicate effectively and exage is further learning. Also understand how chemistry addresses social, comonical and environmental problems and why it is an integral part of curriculum
	MAT 101	LINEAR ALGEBRA AND CALCULUS	CO 1	solve systems of linear equations, diagonalize matrices and characterise quadratic forms

			CO 2	compute the partial and total derivatives and maxima and minima of multivariable functions	
			CO 3	compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas	
			CO 4	perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent	
			CO 5	determine the Taylor and Fourier series expansion of functions and learn their applications.	
	MAT 102	VECTOR CALCULUS,	CO 1	Compute the derivatives and line integrals of vector functions and learn their applications	
		DIFFERENTIAL EQUATIONS AND TRANSFORMS	CO 2	Evaluate surface and volume integrals and learn their inter-relations and applications.	
			CO 3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients	
			CO 4	Compute Laplace transform and apply them to solve ODEs arising in engineering	
			CO 5	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering	
	HUN 101	LIFE SKILLS	CO 1	Define and Identify different life skills required in personal and professional life	
			CO 2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.	
			CO 3	Explain the basic mechanics of effective communication and demonstrate these through presentations.	
			CO 4	Take part in group discussions	
			CO 5	Use appropriate thinking and problem solving techniques to solve new problems	
			CO 6	Understand the basics of teamwork and leadership	
	HUN102	PROFESSIONAL COMMUNICATION	CO 1	Develop vocabulary and language skills relevant to engineering as a profession	
			CO 2	Analyze, interpret and effectively summarize a variety of textual content	
			CO 3	Create effective technical presentations	
			CO 4	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus	
			CO 5	Identify drawbacks in listening patterns and apply listening techniques for specific needs	
			CO 6	Create professional and technical documents that are clear and adhering to all the	
				necessary conventions	
S3 & S4 SEMESTER	MAT 201	PARTIAL DIFFERENTIAL	CO 1	Understand the concept and the solution of partial differential equation.	
		EQUATIONS AND COMPLEX ANALYSIS	CO 2	Analyse and solve one dimensional wave equation and heat equation.	
			CO 3	Understand complex functions, its continuity differentiability with the use of Cauchy-Riemann equations.	
			CO 4	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integralformula, understand the series expansion of analytic function	
			CO 5	Understand the series expansion of complex function about a singularity and Applyresidue theorem to compute several kinds of real integrals.	
	MAT 202	PROBABILITY, STATISTICS AND	CO 1	Understand the concept, properties and important models of discrete random variables	
		NOMENCAL METHOD3	CO 2	undyamity many a server involuti pretentites.	
				variables and using them, analyse suitable random phenomena.	
			CO 3	Perform statistical inferences concerning characteristics of a population based on attributes of samples drawn from the population	
			CO 4	Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques	
			CO 5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.	
	MAT 203	DISCRETE MATHEMATICAL STRUCTURES	CO 1	Check the validity of predicates in Propositional and Quantified Propositional Logic using truth tables, deductive reasoning and inference theory on Propositional Logic (Cognitive Knowledge Level: Apply)	
			CO 2	Solve counting problems by applying the elementary counting techniques - (Cognitive Knowledge Level: Apply) Rule of Sum, Rule of Product, Permutation, Combination, Binomial Theorem, Pigeonhole Principle and Principle of Inclusion and Exclusion	
			CO 3	Classify binary relations into various types and illustrate an application for each type of binary relation, in Computer Science	

1				(Cognitive Knowledge Level: Understand)
			CO 4	Illustrate an application for Partially Ordered Sets and Complete Lattices, in Computer Science (Cognitive Knowledge Level: Apply)
			CO 5	Explain Generating Functions and solve First Order and Second Order Linear Recurrence Relations with Constant Coefficients (Cognitive Knowledge Level: Apply)
			CO 6	Illustrate the abstract algebraic systems - Semigroups, Monoids, Groups, Homomorphism and isomorphism of Monoids and Groups (Cognitive Knowledge Level: Understand)
	MAT 204	PROBABLITY RANDOM PROCESS AND NUMERICAL METHODS	CO 1	Understand the concept, properties and important models of discrete random variables and, using them, analyse suitable random phenomena
			CO 2	Understand the concept, properties and important models of continuous random variables and, using them, analyse suitable random phenomena using them, analyse suitable random phenomena
			CO 3	Analyse random processes using autocorrelation, power spectrum and Po isson process model as appropriate
			CO 4	Compute roots of equations, evaluate definite integrals and per form interpolation on given numerical data using standard numerical techniques
			CO 5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations
	MAT 206	GRAPH THEORY	CO 1	Explain vertices and their properties, types of paths, classification of graphs and trees & their properties. (Cognitive Knowledge Level: Understand)
			CO 2	Demonstrate the fundamental theorems on Eulerian and Hamiltonian graphs. (Cognitive Knowledge Level: Understand)
			CO 3	Illustrate the working of Prim's and Kruskal's algorithms for finding minimum cost spanning tree and Dijkstra's and Floyd-Warshali algorithms for finding shortest paths. (Cognitive Knowledge Level: Apply)
			CO 4	Explain planar graphs, their properties and an application for planar graphs. (Cognitive Knowledge Level: Apply)
			CO 5	Illustrate how one can represent a graph in a computer. (Cognitive Knowledge Level: Apply)
			CO 6	Explain the Vertex Color problem in graphs and illustrate an example application for vertex coloring. (Cognitive Knowledge Level: Apply)
	MCN 202	CONSTITUTION OF INDIA	CO 1	Understand the core values that shapes the ethical behaviour of a professional
			CO 2	Adopt a good character and follow an ethical life.
			CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics
			CO 4	Solve moral and ethical problems through exploration and assessment by established experiments.
			CO 5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.
			CO 6	Show national and patriotic spirit as responsible citizens of the country
	HUT 200	PROFESSIONAL ETHICS	CO 1	Understand the core values that shape the ethical behaviour of a professional.
			CO 2	Adopt a good character and follow an ethical life.
			CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.
			CO 4	Solve moral and ethical problems through exploration and assessment by established experiments.
			CO 5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.
55 & 56 SEMESTER	HUT 300	INDUSTRIAL ECONOMICS & FOREIGN TRADE	CO 1	Explain the problem of scarcity of resources and consumer behaviour,
				and to evaluate the impact of government policies on the general economic welfare. (Cognitive knowledge level: Understand)
				Take appropriate unclosure regarding volume of output and to evaluate the social cost of production. (Loginitive knowledge level: Apply)
			04	Determine the functional requirement of a firm under various competitive conditions. (Cognitive knowledge rever, Analyse) Examine the overall performance of the economy, and the regulation of economic fluctuations and its innart.
				on various sections in the society. (Cognitive knowledge level: Analyse)
			CO 5	Determine the impact of changes in global economic policies on the business opportunities of a firm. (Cognitive knowledge level: Analyse)
	HUT 310	MANAGEMENT FOR ENGINEERS	CO 1	Explain the characteristics of management in the contemporary context (Cognitive Knowledge level: Understand).
			CO 2	Describe the functions of management (Cognitive Knowledge level: Understand).
			CO 3	Demonstrate ability in decision making process and productivity analysis (Cognitive Knowledge level: Understand).
			CO 4	Illustrate project management technique and develop a project schedule (Cognitive Knowledge level: Apply).
			CO 5	Summarize the functional areas of management (Cognitive Knowledge level: Understand).
			CO 6	Comprehend the concept of entrepreneurship and create business plans (Cognitive Knowledge level: Understand).
S1 & S2 SEMESTER (M TECH)	221TCE100	PROBABILITY AND STATISTICS	CO 1	To create an awareness of the concepts of statistics and probability distributions
			CO 2	To formulate and test hypotheses for civil engineering problems

			CO 3 CO 4	To apply statistical data analysis tools such as ANOVA and experimental designs To build regression models for civil engineering applications and to identify the principal components
			CO 5	To apply the concepts of data analysis for a time series
	10CE6101	ADVANCED NUMERICAL METHODS	CO 1	Students get awareness of different numerical solutions
			CO 2	Impart ability to apply mathematics
			CO 3	Impart ability to a find solutions to real time problems.
			CO 4	Get idea about solving ordinary differential equations of initial value type.
			CO 5	Get idea about solving ordinary differential equations of boundary value type.
			CO 6	Awareness of solving partial differential equation.