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Tamaram, Makavarapalem, Narsipatnam(R.D), Visakhapatnam Dist-531113

DEPARTEMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOMES(R20)

1ST YEAR FIRST SEMESTER :

MATHEMATICS-I

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1101	utilize mean value theorems to real life problems (L3)
2	BS1101	solve the differential equations related to various engineering fields (L3)
3	BS1101	familiarize with functions of several variables which is useful in optimization (L3)
4	BS1101	pply double integration techniques in evaluating areas bounded by region (L3)
5	BS1101	students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems (L5)

MATHEMATICS - II

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1102	develop the use of matrix algebra techniques that is needed by engineers for practical applications (L6)
2	BS1102	solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel (L3)
3	BS1102	evaluate the approximate roots of polynomial and transcendental equations by different algorithms (L5)

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4	BS1102	apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (L3)
5	BS1102	apply numerical integral techniques to different Engineering problems (L3)
6	BS1102	apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3)

COMMUNICATIVE ENGLISH

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1108	Facilitate effective listening skills for better comprehension of academic lectures and English spoken by native speakers
2	BS1108	Focus on appropriate reading strategies for comprehension of various academic texts and authentic materials
3	BS1108	Help improve speaking skills through participation in activities such as role plays, discussions and structured talks/oral presentations
4	BS1108	Impart effective strategies for good writing and demonstrate the same in summarizing, writing well organized essays, record and report useful information
6	BS1108	Provide knowledge of grammatical structures and vocabulary and encourage their appropriate use in speech and writing

PROGRAMMING FOR PROBLEM SOLVING USING C

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1101	To write algorithms and to draw flowcharts for solving problems
2	ES1101	To convert flowcharts/algorithms to C Programs, compile and debug programs
3	ES1101	To use different operators, data types and write programs that use two-way/ multi-way selection
4	ES1101	To select the best loop construct for a given problem
5	ES1101	To design and implement programs to analyze the different pointer applications
6	ES1101	To decompose a problem into functions and to develop modular reusable code

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7	ES1101	To apply file I/O operations

ENGINEERING DRAWING :

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1103	

PROGRAMMING FOR PROBLEM SOLVING USING C LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1102	Gains Knowledge on various concepts of a C language
2	ES1102	Draw flowcharts and write algorithms.
3	ES1102	Design and development of C problem solving skills.
4	ES1102	Design and develop modular programming skills.
5	ES1102	Trace and debug a program

ENGLISH COMMUNICATION SKILLS LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	HSMC	

ELECTRICAL ENGINEERING WORKSHOP

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BSC	

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1ST YEAR 2ND SEMESTER :

MATHEMATICS-III

At the end of the course student should be able to

Sno	Course code	CO Statement
1	HS1201	interpret the physical meaning of different operators such as gradient, curl and divergence (L5)
2	HS1201	estimate the work done against a field, circulation and flux using vector calculus (L5)
3	HS1201	apply the Laplace transform for solving differential equations (L3)
4	HS1201	find or compute the Fourier series of periodic signals (L3)

APPLIED PHYSICS

At the end of the course student should be able

Sno	Course code	CO Statement
1	BS1204	Explain the need of coherent sources and the conditions for sustained interference (L2)
2	BS1204	Identify engineering applications of interference (L3)
3	BS1204	Analyze the differences between interference and diffraction with applications (L4)
4	BS1204	Illustrate the concept of polarization of light and its applications (L2)
5	BS1204	Classify ordinary polarized light and extraordinary polarized light (L2)

DATA STRUCTURES THROUGH C

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1206	data structures concepts with arrays, stacks, queues.
2	ES1206	linked lists for stacks, queues and for other applications.

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3	ES1206	traversal methods in the Trees.
4	ES1206	various algorithms available for the graphs.
5	ES1206	sorting and searching in the data ret retrieval applications.

ELECTRICAL CIRCUIT ANALYSIS –I

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1207	Various electrical networks in presence of active and passive elements.
2	ES1207	Electrical networks with network topology concepts.
3	ES1207	Any magnetic circuit with various dot conventions.
4	ES1207	Any R, L, C network with sinusoidal excitation.
5	ES1207	Any R, L, network with variation of any one of the parameters i.e., R, L, C and f.
6	ES1207	Electrical networks by using principles of network theorems.

BASIC CIVIL AND MECHANICAL ENGINEERING

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ESC	Apply Shear force diagram & Bending moment diagram principles for Cantilever and Simply supported beams. Apply concepts of Rosette analysis for strain measurements.
2	ESC	Analyse the characteristics of common building materials. Compare the working characteristics of Internal Combustion engines. Compare the differences between boiler mountings and accessories.

Applied Physics Lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BSC	

| 2 | BSC | |

Basic Civil and Mechanical Engineering Lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ESC	Solve to arrive at finding constant speed and variable speed on IC engines and interpret their performance. Estimate energy distribution by conducting heat balance test on IC engines Explain procedure for standardization of experiments.
2	ESC	Determine flow discharge measuring device used in pipes channels and tanks. Determine fluid and flow properties. Solve for drag coefficients. Test for the performance of pumps and turbines

Data Structures through C Lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ESC	Be able to design and analyze the time and space efficiency of the data structure. Be capable to identity the appropriate data structure for given problem.
2	ESC	Have practical knowledge on the applications of data structures.

CONSTITUTION OF INDIA

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At the end of the course student should be able to

Sno	Course code	CO Statement
1		Understand the concept of Indian constitution Apply the knowledge on directive principle of state policy Analyze the History, features of Indian constitution Evaluate Preamble Fundamental Rights and Duties .
2		Understand the structure of Indian government Differentiate between the state and central government Explain the role of President and Prime Minister Know the Structure of supreme court and High court
3		Understand the structure of state government Analyze the role Governor and Chief Minister Explain the role of state Secretariat Differentiate between structure and functions of state secretariat
4		Understand the local Administration Compare and contrast district administration role and importance Analyze the role of Myer and elected representatives of Municipalities Evaluate Zilla panchayat block level organization
5		Know the role of Election Commission apply knowledge Contrast and compare the role of Chief Election commissioner and Commissionerate Analyze role of state election commission Evaluate various commissions of viz SC/ST/OBC and women References: 1

II Year I semester

MATHEMATICS-IV (Complex Variables and Statistical Methods)

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BSC	apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic (L3)
2	BSC	find the differentiation and integration of complex functions used in engineering problems (L5)

3	BSC	make use of the Cauchy residue theorem to evaluate certain integrals (L3)
		apply discrete and continuous probability distributions (L3)
		● design the components of a classical hypothesis test (L6)
		infer the statistical inferential methods based on small and large sampling tests (L4)

ELECTRONIC DEVICES AND CIRCUITS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PCC-ME	Understand the basic concepts of semiconductor physics.
2	PCC-ME	Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation.
3	PCC-ME	Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons.
		Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations.
		Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations.
		Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET in different configurations.

ELECTRICAL CIRCUIT ANALYSIS – II

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1211	Understand the concepts of balanced and unbalanced three-phase

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		circuits.
2	BS1211	Know the transient behavior of electrical networks with DC excitations.
3	BS1211	Learn the transient behavior of electrical networks with AC excitations.
4	BS1211	Estimate various parameters of a two port network.
5	BS1211	x Understand the significance of filters in electrical networks

DC MACHINES AND TRANSFORMERS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1208	Assimilate the concepts of electromechanical energy conversion
2	ES1208	Mitigate the ill-effects of armature reaction and improve commutation in dc machines
3	ES1208	Understand the torque production mechanism and control the speed of dc motors
4	ES1208	Analyze the performance of single phase transformers.
5	ES1208	Predetermine regulation, losses and efficiency of single phase transformers
6	ES1208	Predetermine regulation, losses and efficiency of single phase transformers

ELECTRO MAGNETIC FIELDS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PR1201	Compute electric fields and potentials using Gauss law or solve Laplace's or Poisson's equations for various electric charge distributions
2	PR1201	Calculate the capacitance and energy stored in dielectrics.
3	PR1201	Calculate the magnetic field intensity due to current carrying conductor and understanding the application of Ampere's law, Maxwell's second and third law
4		Estimate self and mutual inductances and the energy stored in the magnetic field
5		Understand the concepts of displacement current and Poynting

ELECTRICAL CIRCUITS LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	Determine and predetermine the performance of DC machines and Transformers
2	PCC-ME	Control the speed of DC motor.
3	PCC-ME	Obtain three phase to two phase transformation.

DC MACHINES AND TRANSFORMERS LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC	Determine and predetermine the performance of DC machines and Transformers. Control the speed of DC motor.
2	PCC	Obtain three phase to two phase transformation.

ELECTRONIC DEVICES AND CIRCUITS LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	Analyze the characteristics of diodes, transistors and other devices
2	PCC-ME	x Design and implement the rectifier circuits, SCR and UJT in the hardware circuits.
3	PCC-ME	Design the biasing and amplifiers of BJT and FET amplifiers
4	PCC-ME	x Measure electrical quantities using CRO in the experimentation

| 5 | PCC-ME | |

SKILL ORIENTED COURSE DESIGN OF ELECTRICAL CIRCUITS USING ENGINEERING SOFTWARE TOOLS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	write the MATLAB programs to simulate the electrical circuit problems
2	PCC-ME	simulate various circuits for electrical parameters
3	PCC-ME	simulate various wave form for determination of wave form parameters
4	PCC-ME	simulate RLC series and parallel resonance circuits for resonant parameters
5	PCC-ME	simulate magnetic circuits for determination of self and mutual inductances

PROFESSIONAL ETHICS & HUMAN VALUES

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field
2	PCC-ME	Identify the multiple ethical interests at stake in a real-world situation or practice
3	PCC-ME	Articulate what makes a particular course of action ethically defensible
4	PCC	Assess their own ethical values and the social context of problems
5	PCC	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects
6	PCC	Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work
7	PCC	Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research.

II Year - II Semester

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PYTHON PROGRAMMING

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ESC	Develop essential programming skills in computer programming concepts like data types, containers
2	ESC	Apply the basics of programming in the Python language Solve coding tasks related conditional execution, loops
3	ESC	Solve coding tasks related to the fundamental notions and techniques used in object- oriented programming

DIGITAL ELECTRONICS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PCC	Classify different number systems and apply to generate various codes. Use the concept of Boolean algebra in minimization of switching functions
2	PCC	Design different types of combinational logic circuits.
3	PCC	Apply knowledge of flip-flops in designing of Registers and counters
4	PCC	The operation and design methodology for synchronous sequential circuits and algorithmic state machines.

POWER SYSTEMS-I

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PCC	identify the different components of thermal power plants.
2	PCC	identify the different components of nuclear Power plants.
3	PCC	identify the different components of air and gas insulated substations.

4	PCC	identify single core and three core cables with different insulating materials

INDUCTION AND SYNCHRONOUS MACHINES

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PCC	Explain the operation and performance of three phase induction motor. Analyze the torque-speed relation, performance of induction motor and induction generator.
2	PCC	Implement the starting of single phase induction motors.
3	PCC	Develop winding design and predetermine the regulation of synchronous generators.
4	PCC	Explain hunting phenomenon, implement methods of staring and correction of power factor with synchronous motor.

MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	HSMC	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product. The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least. The Learner can able to evaluate various investment project proposals with the help of capital. cost combination of inputs
2	HSMC	The pupil is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
3	HSMC	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis
4	HSMC	The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.

PYTHON PROGRAMMING LAB

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At the end of the course student should be able to

S.No	Course code	CO Statement
1	ESC	Write, Test and Debug Python Programs Use Conditionals and Loops for Python Programs
2	ESC	Use functions and represent Compound data using Lists, Tuples and Dictionaries Use various applications using python

INDUCTION AND SYNCHRONOUS MACHINES LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC	Assess the performance of single phase and three phase induction motors. Control the speed of three phase induction motor.
2	PCC	Predetermine the regulation of three–phase alternator by various methods
3	PCC	Find the Xd/Xq ratio of alternator and asses the performance of three–phase synchronous motor. Determine the performance of single phase AC series motor.

DIGITAL ELECTRONICS LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC	Learn the basics of gates, filp-flops and counters. Construct basic combinational circuits and verify their functionalities
2	PCC	Apply the design procedures to design basic sequential circuits To understand the basic digital circuits and to verify their operation

3	PCC	Apply Boolean laws to simplify the digital circuits.

SKILL ORIENTED COURSE IOT APPLICATIONS OF ELECTRICAL ENGINEERING

At the end of the course student should be able to

S.No	Course code	CO Statement
1	SC	Apply various technologies of Internet of Things to real time applications.
2	SC	Apply various communication technologies used in the Internet of Things.
3	SC	Cconnect the devices using web and internet in the IoT environment. implement IoT to study Smart Home, Smart city, etc.

HOD   **PRINCIPAL**