



Nawab Shah Alam Khan

COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF CIVIL ENGINEERING

Course Outcome

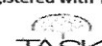
S.NO	YEAR	Course	Course Code	Course Outcomes	
				Upon completion of Course , student will be able to	
1	I-I	Mathematics-I	BS102MT	1	Distinguish between the concepts of sequence and series and determined limits of
				2	Implements knowledge of differential calculus like radius of curvature ,envelopes in their respective domain .
				3	Able to solve differential functions and evaluate multiple integral, change in variable is required to find volume and area of an object.
				4	Develop the skills required in solving problems related to vector field ,apply this knowledge in presenting a component of multi body mechanical system.
2	I-I	Chemistry	BS105CH	1	Apply the knowledge of electrochemistry, electrode potential in identifying feasibility of electrochemical reactions and working of batteries
				2	Understand and examine the parameters responsible for quality of water, and mechanism of corrosion of materials to analyze and design corrosion control methods.
				3	Prepare, classify and use polymers and other engineering materials including conducting and biodegradable polymers.
				4	Classify, analyse and Grade the fuels, relate green chemistry for healthy and sustainable lifestyle by designing and manufacturing engineering materials using principles of green chemistry.
3	I-I	Programming for Problem Solving	ES107CS	1	Build up skill on problem solving by constructing algorithms
				2	Identify Solutions to a problem and apply control structures, user defined functions and string for solving the problem.
				3	Understand the concept of recursions able to solve iteration problems.
				4	Apply skill of identifying appropriate programming constructs for pointers problem solving



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Course Outcome

S.NO	YEAR	Course	Course Code	Course Outcomes	
				Upon completion of Course , student will be able to	
1	I-I	Mathematics-I	BS102MT	1	Distinguish between the concepts of sequence and series and determined limits of
				2	Implements knowledge of differential calculus like radius of curvature ,envelopes in their respective domain .
				3	Able to solve differential functions and evaluate multiple integral, change in variable is required to find volume and area of an object.
				4	Develop the skills required in solving problems related to vector field ,apply this knowledge in presenting a component of multi body mechanical system.
2	I-I	Chemistry	BS105CH	1	Apply the knowledge of electrochemistry, electrode potential in identifying feasibility of electrochemical reactions and working of batteries
				2	Understand and examine the parameters responsible for quality of water, and mechanism of corrosion of materials to analyze and design corrosion control methods.
				3	Prepare, classify and use polymers and other engineering materials including conducting and biodegradable polymers.
				4	Classify, analyse and Grade the fuels, relate green chemistry for healthy and sustainable lifestyle by designing and manufacturing engineering materials using principles of green chemistry.
3	I-I	Programming for Problem Solving	ES107CS	1	Build up skill on problem solving by constructing algorithms
				2	Identify Solutions to a problem and apply control structures, user defined functions and string for solving the problem.
				3	Understand the concept of recursions able to solve iteration problems.
				4	Apply skill of identifying appropriate programming constructs for pointers problem solving

4	I-I	Environmental Science	MC112CE	1	Analyzing the functions of ecosystem in various relationship with its suffix, value services and holding capacity.
				2	Identify the consumptions of living & non living resources, use and over utilization of water which can result in drought, and effect on environment due to continuous extraction of minerals.
				3	Classify the genetic species and able to perform survey of habitat loss, poaching of wildlife, as well as man-wild life conflicts by giving ethical & optional values.
				4	Creating awareness for reducing pollution and its causing agents, also improving the steps for waste control management by government aspects.
5	I-I	Chemistry Lab	BS153CH	1	Determine hardness and alkalinity of water for safer health and environment
				2	Apply and interpret electro analytical principles in quantitative estimations
				3	Understand and analyse theoretical concepts of electrochemistry through experiments
				4	To synthesize drugs for public health and safety
6	I-I	Programming for Problem Solving Lab	ES155CS	1	Design and implement modular programs involving input output operation, decision making and looping constructs
				2	Implement Search and sort operations on arrays
				3	Apply the concept of pointers for implementing programs on dynamic memory management and string handling
				4	Design and implement programs to store data in structures and files
7	I-I	Workshop/ Manufacturing Process	ES157ME	1	Demonstrate and understanding and comply with workshop safety regulations .
				2	Identify and apply suitable tools for different trades of engineering processes like drilling ,material removing ,measuring ,chiseling
				3	Study and practice on machine tools and their operations.
				4	Undertake jobs connected with engineering work shop trades including fitting ,carpentry, sheet metal ,house wiring ,welding, smithy and apply basic electrical engineering
8	I-II	English	HS101EG	1	Use English Language effectively in spoken and written forms.
				2	Comprehend the given texts and respond appropriately.
				3	Communicate confidently in various context and different cultures.
				4	Acquire basic proficiency in English including Reading and Listening comprehension, Writing and Speaking skills.

9	I-II	Mathematics-II	BS103MT	1	Apply to solve qualitative problems based on vector analysis and matrix analysis such as linear independence and dependence of vectors ,ranks ,eigen values and eigen vectors.It is used for making Graphics and for creating and modifying images.
				2	Ability to solve first and higher order linear differential equation which is required in digital computer processing to formulate the numerical solutions of systems of ordinary differential equation.
				3	Identify properties of special functions like Beta Gamma function and Bessles equations these function is applicable for solving other important identities and theorems in mathematics.
				4	Solve problems of Laplace transform and used to simplify calculations in system modeling where large number of differential equations are used.
10	I-II	Physics	BS104PH	1	Explore understand and distinguish structural characteristics of the material and apply this knowledge to identify defects in crystal .
				2	Classify the material based on band theory of solids and also understand the di electric, semiconductor material.
				3	Explore understand and differentiate the electromagnetic material and super conductor material in the field of engineering and sciences
				4	Explore the knowledge of optical absorption on different lasers sources and understand communication in fiber optics
11	I-II	Engineering Mechanics	ES211CE	1	Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces
				2	Solve problem of bodies subjected to friction. Find the location of centroid and calculate moment of inertia of a given section
				3	Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
				4	Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration
12	I-II	English Lab	HS151EG	1	Listen, Understand and Interpret Formal and Informal spoken Language.
				2	Overcome from the difficulties with sounds of English.
				3	Learn to participate well in GD's , Debate and Presentations.
				4	Communicate with appropriate body Language, Expressions.
13	I-II	Physics Lab	BS152PH	1	After conducting experiments and taking measures independently will give desired results
				2	Write appropriate laboratory reports

				3	Compute and compare experimental results and draw relevant conclusions
				4	Estimate results from graphs .
14	I-II	Engineering Graphics & Design	ES156CE	1	Get information about the important tools for engineering drawing. This will give student basic knowledge of technical drawings, projections and means of
				2	Apply basic knowledge of projections of the objects including points, lines, planes by positioning object in the space of the different quadrants for the projections acting on an oblique plane..
				3	Explain Development of surfaces of lateral surfaces of vertical prism, cylinder pyramid, and cone truncated by surfaces of inclined to HP alone.
				4	practice different types of Isometric, or pictorial drawings, which represent an object in a three dimensional fashion by showing 3 surfaces of the object in one drawing.
15	II-I	Industrial Psychology	HS203MP	1	Understanding of key concepts, theoretical perspectives, and trends in industrial psychology.
				2	Evaluate the problems thorough and systematic competency model.
				3	Analyse the problems present in environment and design a job analysis method.
				4	Create a better work environment for better performance.
16	II-I	Engineering Geology	PC222CE	1	Explain the role and key elements of Environmental Impact Assessment. (Understanding)
				2	Demonstrate the impacts on environment from development Activities.(Understanding)
				3	Evaluations of soil quality to reduce the impact on environment, Impact prediction, Assessment of Impact significance.(Evaluating)
				4	To inspect the outgoing process of EIA by audit team and Audit & Environmental legislation objectives of Environmental Audit. (Analyzing)
17	II-I	Solid Mechanics	PC221CE	1	Calculate the stress and strain developed in any structural member due to applied external load and can Differentiate the type of beams, and the various loading and support condition upon them.
				2	Apply the formulae for beams under different loading condition. Draw shear force diagram and bending moment diagram for different type of beams.
				3	Derive the pure bending equation, and on its basis, Explain the existence of normal stresses and shear stresses in the different layers of the beam and Evaluate the section modulus for various beam cross-sections.
				4	Calculate the normal and tangential stresses on an inclined section of a bar under uniaxial, biaxial and Evaluate the principal stress and principal strain at a point of a stressed member and Draw the Mohr's circle of stresses.

18	II-I	Engineering Mechanics	ES211CE	1	Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.
				2	Solve problem of bodies subjected to friction. Find the location of centroid and calculate moment of inertia of a given section
				3	Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
				4	Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration
19	II-I	Surveying and Geomatics	PC223CE	1	Able to understand the principles of surveying and applications to civil engineering projects
				2	Able to Apply the concepts of tacheometry for Calculation of elevations and distances of accessible and inaccessible objects
				3	Computation of setting out data for horizontal and vertical curves by various methods
				4	Understand and learn the basic concepts related to photogrammetry, remote sensing and GIS
20	II-I	Overview of Civil Engineering*	MC204CE	1	Understand the relevance of civil engineering in the society & describe the uses of various construction materials
				2	Explain the new technology/concepts of architecture in planning
				3	Remember the basics of surveying, transportation and geotechnical systems
				4	Remember the basics of environmental, water resources and structural engineering systems
21	II-I	Energy Sciences and Engineering	ES213ME	1	Understand the basics of various sources of energy
				2	Analyse the present status of conventional energy sources.
				3	Understand the working principles of Renewable Energy systems
				4	Design and develop waste heat recovery systems.
22	II-I	Engineering Geology Lab	PC251CE	1	Identify the Physical Properties of Minerals.
				2	Understand the Study of Rocks Referred under theory .
				3	Analyze Observations and Identification of Rocks .
				4	Understand Interpretation and Drawing of Sections for Geological Maps .
23	II-I	Surveying Lab	PC252CE	1	Apply the principle of surveying for civil engineering applications.
				2	Calculation of areas Drawing plans and contour maps using different measuring equipment at field level.
				3	Calculation of area by using different types of tools & techniques.
				4	Different types of instruments used for measurement of land.

24	II-II	Effective Technical Communication in English	HS201EG	1	Handle Technical communication effectively.
				2	Use different types of professional correspondence.
				3	Use various techniques of Report Writing
				4	Acquire adequate skills of Manual Writing, Information Transfer and Presentation.
25	II-II	Fluid Mechanics	PC232CE	1	Understand the physical properties of fluid, concept of viscosity for kinematics and dynamics flow with effect of temperature, vapor pressure, surface tension, capillary rise and fall derivation of Pascal's law, Manometers (U-tube, differential, single column),
				2	Remembering the classification of fluid flow, stream- streak line concept properties of it, continuity equation for 3-D flow, uses of flow nets.
				3	Remember the concept of Convective and local accelerations, applications of Bernoulli's equation ,concept of vortex flow.
				4	Remember in Venturi meter, orifice meter and pitot tube, hot wire anemometer, discharge through notches and wiers, spillways, discharge through mouthpiece.
26	II-II	Mathematics – III (PDE, Probability & Statistics)	BS205MT	1	Understand and solve the probability problems in the finite sample space with discrete and continuous random variable.
				2	Apply the concept of probability and distribution to derive mean variance and MGF of random variables
				3	Evaluate Statistical parameters using distributions and understand the curve fittings for various polynomial.
				4	Basic concept of fundamental sampling theory. Identify the four steps of hypothesis testing, estimate and maximize error and application of central limit theorem and solve problems related to it.
27	II-II	Mechanics of Materials and Structures	PC231CE	1	Evaluate the various methods to determine the slope and deflections in beams
				2	Understand the behavior of columns and struts under axial loading for different end conditions
				3	Analyse the beams and frames using energy methods
				4	Analyse the three hinged and two hinged arches cables and suspension bridges
28	II-II	Finance and Accounting	HS202CM	1	Evaluate the financial performance of the business unit.
				2	To take decisions on selection of projects.
				3	Take decisions on procurement of finances.

		Accounting		4	Interpret the financial statement by using Fundamental accounting concepts and Ratio analysis
29	II-II	Elements of Mechanical Engineering	ES212ME	1	State and differentiate various classifications of IC engines and reciprocating air compressors with specific focus on similarities and differences between (i) 2 stroke and 4 stroke engines and (ii) CI and SI engines. Subsequently, the student would be able to compute the performance parameters of the engines and gas turbines.
				2	Compare various types of heat transfer, analyse the governing equations, understand the applications of heat exchangers and solve related problems
				3	Demonstrate the working principles of hydraulic turbines and pumps
				4	Classify different types of power transmission systems like gears, gear trains, belts, ropes etc. with emphasis on their kinematic mechanisms and solve related problems
30	II-II	Materials: Testing and Evaluation	PC233CE	1	Know the properties of basic materials using in civil engineering
				2	Remember the constituents required for making concrete.
				3	Analyse the characteristics and properties of concrete
				4	Apply the concepts of mix design for making concrete.
31	II-II	Solid Mechanics Lab	PC261CE	1	Compute the fundamentals of stress and strain concepts and Calculate stresses and deformations in beams subjected to different loadings.
				2	Estimate the effect of torsion in shafts and springs.
				3	Calculate the deflection in beams and effects of young's modulus of the material of the beam using different materials bars.
				4	Calculate the stresses and strains associated with thin and thick cylinder and compare the deformation in members subjected to axial, flexural and torsional loads.
32	II-II	Materials: Testing and Evaluation Lab	PC262CE	1	Determine the consistency of cement find out the initial and final setting time of cement. Determine the compressive strength of cement. Determine the fineness of cement
				2	Calculate the fineness modulus of aggregate. Determination of bulk density, Void ratio and Porosity
				3	Determine gravity of aggregate, determination of slump test
				4	Calculate the compressive strength of concrete 7days, 14 days, 28 days. Determine the flexural strength of concrete. Determine the water observation of bricks and compressive strength of bricks.

33	II-II	Indian Constitution	MC111PO	1	Know the background of the present constitution of India
				2	Understand the working of the union, state and local levels
				3	Gain consciousness on the fundamental rights and duties
				4	Be able to understand the functioning and distribution of financial resources between the centre and states.
34	III-I	Structural Analysis-II	CE501PC	1	Analyzing the two hinged arch and calculating the secondary stresses developed in it due to the temperature and elastic shortening, understanding the classification of two hinged arch, MDM in analyzing of the continuous beams (with and without settlement of support), portal frame with side sways.
				2	Analyzing the multi-storey frames for lateral loads by using Portal method, Cantilever method and Factored method and analyzing the frames for the gravity loads by Substitute frame method and drawing the SFD and BMD for the frames.
				3	Analyzing and solving the indeterminate beams, portal frames with settlements by using the Kani's method and understanding the concept of suspension cable subjected to point load and UDL.
				4	Understanding the concept of Stiffness and Flexibility matrix for three degrees of indeterminacy through system approach, Analyzing the continuous beam, pin-jointed determinate planes, single bay single-storey by using the Stiffness and Flexibility matrix and sketching the SFD and BMD for the same results. Understanding and drawing the diagrams for the indeterminate beams continuous beams theory against the different moment of inertia by using influence line
35	III-I	Geotechnical Engineering	CE502PC	1	Explain the importance of highway development of India and classification of roads
				2	Demonstrate the factors affecting highway alignment and its design.
				3	Analyze to perform a various traffic surveys and study of basics of traffic engineering and regulations
				4	Analyze the traffic signal intersections, road markings and their designs
36	III-I	Structural Engineering –I (RCC)	CE503PC	1	stress strain properties along with different design methodologies to Analyse and
				2	Analyze and design the beams for shear, torsion as well and need for development length & its design for different conditions.
				3	Describe one-way, two-way slabs, staircases, Analyze and design different types of slabs and staircases using IS Provision. Design for serviceability as per codal provision

				4	Describe short, long columns different types of footing, Analyze and Design short & Long columns for different load conditions, uniaxial, biaxial moments and footings using IS provision.
37	III-I	Transportation Engineering	CE504PC	1	Explain the importance of highway development of India and classification of roads and road patterns.
				2	Demonstrate the factors affecting highway alignment and its design.
				3	Analyze to perform a various traffic surveys and study of basics of traffic engineering and regulations
				4	Analyze the traffic signal intersections, road markings and their designs
38	III-I	Concrete Technology	CE511PE	1	Identify the functional role of Materials in concrete.
				2	Apply fundamental knowledge in the fresh and hardened properties of concrete.
				3	Gather knowledge to mix design methodology.
				4	Design ordinary and control concretes, replacement of ingredients and their specific applications.
39	III-I	Engineering Economics and Accountancy	SM505MS	1	To perform and evaluate present and future worth of the alternate projects
				2	To appraise projects by using traditional and DCF Methods.
				3	To carry out cost benefit analysis of projects
				4	To calculate BEP of different alternative projects
40	III-I	Highway Engineering and Concrete Technology Lab	CE506PC	1	Understand and learn the basics test standards of Concrete Technology laboratory and conduct tests on cement.
				2	Determine the different properties of aggregate as per IS Standards.
				3	Understand the concept of workability and perform tests on fresh concrete and hardened concrete by performing relevant tests.
				4	Identify the grade & properties of bitumen.
41	III-I	Geotechnical Engineering Lab	CE507PC	1	the students will be able to determine the physical, index and engineering properties of soil
				2	the students will be able to classify soils based on test results and interpret engineering behaviour based on test results
				3	the students will be able to evaluate compaction characteristics required for field application
				4	the students will be able to evaluate the permeability and shear strength of soils
		Advanced		1	Acquire vocabulary and use it contextually.

42	III-I	Advanced Communication Skills Lab	EN508HS	2	Listen and speak effectively.
				3	Develop proficiency in academic reading and writing.
				4	Communicate confidently in formal and informal contexts.
43	III-I	Intellectual Property Rights	*MC509	1	Understand the Purpose and function of trademarks, acquisition of trade mark rights
				2	Learn the Fundamental of copy right law, copy right registration
				3	Understand Foundation of patent law, determination of trade secrete.
				4	International overview on intellectual property, international trade mark law, copy right law, international patent law, and international development in trade secrets law.
44	III-II	Hydrology & Water Resources Engineering	CE601PC	1	Understand the basic concept of hydrological cycle and analyze hydro-metrological data based on different precipitation methods
				2	Define and illustrate flood hydrograph and evaluate various types of runoff with respect to effective rainfall.
				3	Classification of irrigation, based on irrigation standards and applying controlled method for improvement of soil-water-plant relationship
				4	Classify and solve a canal irrigation by using IS-Standard and design an unlined and lined irrigation canals based on theorem's
45	III-II	Environmental Engineering	CE602PC	1	Explain various sources of drinking water, standards of drinking water and estimate population and water demand.
				2	Apply layout of water treatment units, layouts of water distribution systems and design the filters and layout of water distribution system.
				3	Explain shapes and material of sewers, house drainage components, Examine characteristics of sewage, and design sewers, waste water treatment units.
				4	Explain biological treatment units, sludge disposal, waste water disposal, Air pollution and design the same.
46	III-II	Foundation Engineering	CE603PC	1	Analyze and explain soil, its exploration methods and prepare soil investigation
				2	Understand the stability of soil, its methods of slope and types of failure by Swedish & Bishop Taylor methods.
				3	Apply Rankine's theory Coulombs for active and passive measure of earth pressure, Stability of Gravity and Cantilever retaining wall against overturning sliding, bearing capacity etc...
				4	Analyze different types of foundation, Depending on carrying capacity, bearing capacity of soil with references to IS CODE as well.

47	III-II	Structural Engineering –II (Steel)	CE604PC	1	Classify the types of connections and specifications as per IS: 800-2007
				2	Apply the provisions of IS: 800-2007 to design tension and compression members
				3	Illustrate behaviour of beams, beam columns and built up sections and design strengths as per IS code
				4	Adapt IS code procedures to design of roof trusses and welded plate girder
48	III-II	Prestressed Concrete	CE611PE	1	Materials for pre-stressing.
				2	Analysis of sections for flexure and shear, Able to design prestressed concrete structures.
				3	Understand the concepts of transfer of prestress in pretensioned members.
				4	Analysis of composite beams and importance of deflections.
49	III-II	Fundamentals of Management for Engineers		1	students learn the basics of Entrepreneurship and entrepreneurial development
				2	Able to Present Business Plan & Procedure for setting up Enterprises
				3	Understand The process of Entrepreneurial Development.
				4	Able to implement the Fundamentals of Entrepreneurship.
50	III-II	Environmental Engineering Lab	CE605PC	1	Understand about the equipment used to conduct the test procedures
				2	Perform the experiments in the lab
				3	Examine and Estimate water, waste water, air and soil Quality
				4	Develop a report on the quality aspect of the environment
51	III-II	Computer Aided Design Lab	CE606PC	1	Applying commands of 2D and 3D in autocadd for different coordinate systems.
				2	Creating and planning buildings in civil engineering as per aspect and orientation.
				3	Evaluating drawing as per user requirement and preparation of technical report
				4	Analyze able to draft various structural components.
52	III-II	Environmental Science	*MC609	1	Analyzing the functions of ecosystem it various relationship with its suffix, value
				2	Identify the consumptions of living & non living resources, use and over utilization of water which can result in drought, and effect on environment due to continuous extraction of minerals.
				3	Classify the genetic species and able to perform survey of habitat loss, poaching of wildlife, as well as man-wild life conflicts by giving ethical & optional values.
				4	Creating awareness for reducing pollution and its causing agents, also improving the steps for waste control management by government aspects.

53	IV-I	Transportation Engineering	CE701PC	1	Understand various basic components of Railways
				2	Perform geometric design of railway track.
				3	Airport Runway design and other structural facilities at Airport.
				4	Suggest various facilities at ports and Harbours and Exploring the design of dock
54	IV-I	Estimation Quantity Surveying and Valuation	CE702PC	1	Identify and calculate the units for various quantities of item of work.
				2	Calculation of earth work quantity for roads and canals.
				3	Analyze the rates for various items of work and prepare abstract estimate.
				4	Prepare bar bending schedule for reinforcement works
55	IV-I	Construction Technology and Management.	CE722PE	1	Describe the management process and the social responsibilities and classification of construction projects
				2	Develop plan and Schedule of civil engineering project by using techniques like CPM, PERT.
				3	Analyze the different quality and safety issues involved in contracts and tenders.
				4	Describe the management information system and labour law
56	IV-I	Prestressed Concrete.	CE732PE	1	Materials for pre-stressing.
				2	Analysis of sections for flexure and shear, Able to design prestressed concrete structures.
				3	Understand the concepts of transfer of prestress in pretensioned members.
				4	Analysis of composite beams and importance of deflections.
57	IV-I	Traffic Engineering.	CE741PE	1	Understand various basic components of Railways
				2	Perform geometric design of railway track.
				3	Airport Runway design and other structural facilities at Airport.
				4	Suggest various facilities at ports and Harbours and Exploring the design of dock
58	IV-I	Transportation Engineering Lab	CE703PC	1	the students will be able to determine the physical, index and engineering properties of soil
				2	the students will be able to classify soils based on test results and interpret engineering behaviour based on test results
				3	the students will be able to evaluate compaction characteristics required for field application
				4	the students will be able to evaluate the permeability and shear strength of soils

59	IV-I	Environmental Engineering Lab	CE704PC	1	Understand about the equipment used to conduct the test procedures
				2	Perform the experiments in the lab
				3	Examine and Estimate water, waste water, air and soil Quality
				4	Develop a report on the quality aspect of the environment
60	IV-I	Industry Oriented Mini Project	CE705PC	1	Students should be able to identify and define problems in the area of Civil engineering
				2	Students should be able to enhance their field work and designing skills.
				3	Students must get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills
				4	Able to apply the engineering and management principles to achieve the goal of the project
61	IV-I	Seminar	CE706PC	1	Students should be able to identify and define problems in the area of Civil engineering
				2	Students should be able to enhance their field work and designing skills.
				3	Students must get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills
				4	Able to apply the engineering and management principles to achieve the goal of the project
62	IV-II	Disaster Management	PE831OE	1	Understanding Disasters, man-made Hazards and Vulnerabilities.
				2	Understanding disaster management mechanism.
				3	Understanding capacity building concepts and planning of disaster managements
				4	Applying Concepts of disaster management Safety Plan like Safety norms and survival kits etc.
63	IV-II	Waste Management.	CE851PE	1	Identify the quality requiring of boiler and cooling waters
				2	Analyse the functional elements of waste water management
				3	Design the treatment plants and effects of treatment methods
				4	To understand the advantages and limitations of disposal method
64	IV-II	Industrial Waste Water Treatment.	CE864PE	1	Identify the characteristics of industrial wastewater and design the different treatment units.
				2	Design the different treatment operation and describe pollution effects of disposal of industrial effluent
				3	Classify, Identify and design the biological treatment plant.
				4	Design the Activated sludge disposal, sludge treatment and disposal.

65	IV-II	Major Project	CE801PC	1	Students should be able to identify and define problems in the area of Civil engineering
				2	Students should be able to enhance their field work and designing skills.
				3	Students must get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills
				4	Able to apply the engineering and management principles to achieve the goal of the project



Head of Department



Principal

DEPARTMENT OF MECHANICAL ENGINEERING
Course Outcome

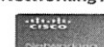
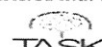
YEAR	Course	Course Code	Course Outcomes	
			Upon completion of Course , student will be able to	
I-I	Mathematics-I	BS102MT	1	Distinguish between the concept of sequence and series and determine limits of a sequence and convergence and approximate sum of series.
			2	Implement knowledge of differential calculus topics like radius of curvature ,Envelopes in their respective domain
			3	Able to solve the problems of differentiation of functions of two variables and Evaluate multiple integral Double integration in Cartesian integration, the change of variable in multiple integration which is required to find the volume and area of an object.
			4	Developed the skills required in solving problems related to vector field Apply this knowledge in presenting a component of multi body mechanical system.
I-I	Chemistry	BS105CH	1	Apply the knowledge of electrochemistry, electrode potential in identifying feasibility of electrochemical reactions and working of batteries
			2	Understand and examine the parameters responsible for quality of water, and mechanism of corrosion of materials to analyze and design corrosion control methods.
			3	Prepare, classify and use polymers and other engineering materials including conducting and biodegradable polymers.
			4	Classify, analyze and Grade the fuels, relate green chemistry for healthy and sustainable lifestyle by designing and manufacturing engineering materials using principles of green chemistry.
			1	Formulate algorithm/flowchart for given arithmetic and logical problem.



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COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF MECHANICAL ENGINEERING

Course Outcome

YEAR	Course	Course Code	Course Outcomes	
			Upon completion of Course , student will be able to	
I-I	Mathematics-I	BS102MT	1	Distinguish between the concept of sequence and series and determine limits of a sequence and convergence and approximate sum of series.
			2	Implement knowledge of differential calculus topics like radius of curvature ,Envelopes in their respective domain
			3	Able to solve the problems of differentiation of functions of two variables and Evaluate multiple integral Double integration in Cartesian integration, the change of variable in multiple integration which is required to find the volume and area of an object.
			4	Developed the skills required in solving problems related to vector field Apply this knowledge in presenting a component of multi body mechanical system.
I-I	Chemistry	BS105CH	1	Apply the knowledge of electrochemistry, electrode potential in identifying feasibility of electrochemical reactions and working of batteries
			2	Understand and examine the parameters responsible for quality of water, and mechanism of corrosion of materials to analyze and design corrosion control methods.
			3	Prepare, classify and use polymers and other engineering materials including conducting and biodegradable polymers.
			4	Classify, analyze and Grade the fuels, relate green chemistry for healthy and sustainable lifestyle by designing and manufacturing engineering materials using principles of green chemistry.
			1	Formulate algorithm/flowchart for given arithmetic and logical problem.

I-I	Programming for Problem Solving	ES107CS	2	Translate algorithm/flowchart into C program using correct syntax and execute it.
			3	Write programs using conditional, branching, iteration, and recursion.
			4	Develop an application using the concepts of array, pointer, structure, and file management to solve engineering and/or scientific problems.
I-I	Environmental Science	MC112CE	1	Adopt environmental ethics to attain sustainable development. Develop an attitude of concern for the environment.
			2	Develop an attitude of concern for the environment.
			3	Creating awareness of Green technologies for nation's security.
			4	Imparts awareness for environmental laws and regulations.
I-I	Chemistry Lab	BS153CH	1	Determine hardness and alkalinity of water for safer health and environment.
			2	Apply and interpret electro analytical principles in quantitative estimations.
			3	Understand and Analyze theoretical concepts of electrochemistry through experiments.
			4	To synthesize drugs for public health and safety.
I-I	Programming for Problem Solving Lab	ES155CS	1	Design and implement modular programs involving input output operations, decision making and looping constructs.
			2	Implement search and sort operations on arrays.
			3	Apply the concept of pointers for implementing programs on dynamic memory management and string handling.
			4	Design and implement programs to store data in structures and files
I-I	Workshop/ Manufacturing Process	ES157ME	1	Demonstrate & understanding of and comply with Workshop safety regulations.
			2	Identify and apply suitable tools for different trades of engineering processes including Drilling, material removing, measuring, chiseling
			3	Study & practice on machine tools and there operations.
			4	Undertake jobs connected with engineering workshop trades including Fitting, Carpentry, sheet metal, house wiring, welding, smithy and foundry and apply basic electrical engineering.
I-II	English	HS101EG	1	Use English Language effectively in spoken and written forms.
			2	Comprehend the given texts and respond appropriately.
			3	Communicate confidently in various context and different cultures.

			4	Acquire basic proficiency in English including Reading and Listening comprehension, Writing and Speaking skills.
I-II	Mathematics-II	BS103MT	1	Solve system of linear equations and eigen value problems
			2	Solve certain first order and higher order differential equations
			3	Solve basic problems of Beta Gamma and Legendre's Function.
			4	Apply Laplace Transforms; solve ordinary Differential Equations by using it.
I-II	Physics	BS104PH	1	Explore, understand and distinguish the structural characteristics of the material
			2	Classify the material based on band theory of solids and also understand the
			3	Explore, understand and differentiate the magnetic, electromagnetic material
			4	Explore the knowledge optical absorption in different laser sources and understand communication system in fiber optics.
I-II	Engineering Mechanics	ES211CE	1	To understand distributed force systems, centroid/ center of gravity and method of finding centroids of composite figures and bodies.
			2	To understand the moment of inertia and method of finding moment of inertia of areas and bodies.
			3	To understand types of frames and analyze for the forces in the members of the truss by method of joints and method of sections.
			4	To interpret the simple given dynamic problems and solve them for positions, velocities and accelerations, etc.,
I-II	English Lab	HS151EG	1	Able to understand the variation of English language through audio-visual and
			2	Neutralization of mother tongue.
			3	Speaking skills with clarity and confidence.
			4	Correct usage of English Grammar in writing.
I-II	Physics Lab	BS152PH	1	Conduct experiments, take measurements independently.
			2	Write appropriate laboratory reports.
			3	Compute and compare the experimental results and draw relevant conclusions.
			4	Use the graphical representation of data and estimate results from graphs
			1	Preparing working drawings to communicate the ideas and information.
			2	Read, understand and interpret engineering drawings.

I-II	Engineering Graphics & Design	ES156CE	3	Introduction to engineering design and its place in society Exposure to the visual aspects of engineering design. Exposure to engineering graphics standards.
			4	Exposure to computer-aided geometric design. Exposure to creating working drawings.
15	MECHANICS OF SOLIDS		1	Analyze the behavior of the solid bodies subjected to various types of loading.
			2	Apply knowledge of materials and structural elements to the analysis of simple structures; Undertake problem identification, formulation and solution using a range of analytical methods.
			3	Analyze and interpret laboratory data relating to behavior of structures and the materials they are made of, and undertake associated laboratory work individually and in teams
			4	Expectation and capacity to undertake lifelong learning.
16	MATERIAL SCIENCE AND METALLURGY		1	Understand the concept of engineering materials with its classification and
			2	Illustrate the concept of solid solutions as well as concept of phase diagram & Iron-Carbon system.
			3	Apply & analyze the process of Heat treatment of steels & its effects on final microstructures and their properties.
			4	Evaluate knowledge for selection of materials in real life applications.
17	PRODUCTION TECHNOLOGY		1	Understand and apply the process of design & prepare patterns, Gate, runner,
			2	Understand the classification of different type of welding as well as welding defects.
			3	Employ the appropriate metal forming techniques to produce components, Develop process maps for metal forming processes using plasticity principles. As well as the various sheet metal forming processes.
			4	Understand and apply to the working of Extrusion, Forming and Forging processes.
18	THERMODYNAMICS		1	At the end of the course, the students should be able to Understand and
			2	Understand and apply the laws of Thermodynamics to different types of systems under going various processes.
			3	To perform thermodynamic analysis.

			4	Understand and analyze the Thermodynamic cycles and evaluate performance parameters.
19	PRODUCTION TECHNOLOGY LAB		1	Understand the properties of moulding sands and pattern making.
			2	Fabricate joints using gas welding and arc welding as well as inspect the quality of welded joints.
			3	Perform press working operations.
			4	Compare and contrast injection moulding and blow moulding.
20	MACHINE DRAWING PRACTICE		1	Apply & Developing assembly drawings using part drawings of machine
			2	Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned. Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centers, curved and tapered features.
			3	Title boxes, their size, location and details - common abbreviations and their liberal usage.
			4	Types of Drawings – working drawings for machine parts.
21	MATERIAL SCIENCE AND MECHANICS OF SOLID LAB		1	Understand the basic concept of mechanical behavior and properties of materials
			2	Differentiate and Analyze the Structure of crystal models for simple cubic, body
			3	Analyze the microstructure of various Ferrous and non Ferrous alloys and also
			4	Apply knowledge of materials and structural elements to the analysis of simple structures in materials related industries individually or in team.
22	BASIC ELECTRICAL AND ELECTRONIC ENGINEERING		1	Study and analyze the rectifiers and regulator circuits. Analyze the performance of BJTs, FETs on the basis of their operation and working.
			2	Ability to analyze & design oscillator circuits.
			3	Ability to analyze different logic gates & multi-vibrator circuits.
			4	Ability to analyze different data acquisition systems
23	KINEMATICS OF MACHINERY		1	Understand the principles of kinematic pairs, chains and their classification, DOF, inversions, equivalent chains and planar mechanisms.
			2	Analyze the planar mechanisms for velocity and acceleration.
			3	Synthesize planar slider crank mechanisms for specified kinematic conditions
			4	Evaluate gear tooth geometry and select appropriate gears for the required applications.

24	THERMAL ENGINEERING-I R18		1	Understand the working principles of various types of IC engines and its supporting systems.
			2	Distinguish between normal and abnormal combustion and evaluate the performance of IC engines with different operating conditions.
			3	Recognize the types of compressors and evaluate their performance under different operating conditions.
			4	Apply the laws of thermodynamics to assess the performance of refrigeration and design an air-conditioning system.
25	FLUID MECHANICS AND HYDRAULIC MACHINE		1	Able to explain the effect of fluid properties on a flow system.
			2	Able to identify type of fluid flow patterns and describe continuity equation.
			3	To analyze a variety of practical fluid flow and measuring devices and utilize fluid Mechanics principles in design.
			4	To select and analyze an appropriate turbine with reference to given situation in power plants. To estimate performance parameters of a pump.
26	BASIC ELECTRICAL AND ELECTRONIC ENGINEERING LAB		1	To analyze and solve electrical circuits using network laws and theorems.
			2	To understand and analyze basic Electric and Magnetic circuits To study the working principles of Electrical Machines
			3	To introduce components of Low Voltage Electrical Installations
			4	To identify and characterize diodes and various types of transistors.
27	FLUID MECHANICS AND HYDRAULIC MACHINE LAB		1	Explain the effect of fluid properties on a flow system; identify types of fluid flow and continuity equation.
			2	Analyze variety of practical fluid flow and measuring devices
			3	Analyze an appropriate turbine with reference to given situation in power plants.
			4	Estimate performance parameters of given centrifugal and reciprocating pump.
28	INSTRUMENTATI ON AND CONTROL SYSTEM LAB		1	Students will be able to identify and understand errors in measurement.
			2	Students will be able to do calibration of pressure gauges, temperature, LVDT, capacitive transducer, rotameter.
			3	Students will be able to classify and calibrate measuring devices.
			4	Students will be able to analyze measured data using statistical analysis.
			1	The student acquires the knowledge about the principles of design, material selection, and component behavior subjected to loads.

29	DESIGN OF MACHINE MEMBERS-I		2	Understands the concepts of principal stresses, stress concentration in machine members and fatigue loading.
			3	Design & analysis of riveted, welded and bolted joints.
			4	Design & analysis of cotter joint, knuckle joint, shaft, keys & coupling.
30	THERMAL ENGINEERING-I R16		1	Understand the working principles of various types of IC engines and its supporting systems.
			2	Distinguish between normal and abnormal combustion and evaluate the performance of IC engines with different operating conditions.
			3	Recognize the types of compressors and evaluate their performance under different operating conditions.
			4	Apply the laws of thermodynamics to assess the performance of refrigeration and design an air-conditioning system.
31	METROLOGY & MACHINE TOOL		1	At the end of the course, the student would be able to Impart the fundamental aspects of the metal cutting principles and their application in studying the behavior of various machining processes.
			2	Understand working of lathe, shaper, planer, drilling, milling grinding machines etc.
			3	Estimate machining times for machining operations on machine tools
			4	Identify techniques to minimize the errors in measurement.
32	DISASTER MANAGEMENT		1	Understanding Disasters, man-made Hazards and Vulnerabilities
			2	Understanding disaster management mechanism
			3	Understanding capacity building concepts
			4	Understanding planning of disaster managements
33	THERMAL ENGINEERING LAB		1	Determine the valve timing diagram of SI/CI engine and simultaneously to understand the Constructive working principle of the internal combustion engine.
			2	Analyze the performance of air compressors stages and calculate the IP, BP, brake thermal efficiency.
			3	Evaluate the efficiency of C.I and S.I Engines, with respective Calculate & Compare their performance characteristics.
			4	Investigate each different type of Engine parts and it working basic principles. Also Investigate various parameters in boilers.

34	MACHINE TOOL LAB		1	Identify techniques to minimize the errors in measurement.
			2	Identify methods and devices for measurement of length, angle, and gear & thread parameters, surface roughness and geometric features of parts.
			3	Understand working of lathe, shaper, and planer, drilling, milling and grinding machines
			4	Comprehend speed and feed mechanisms of machine tools. Estimate machining times for machining operations on machine tools
35	THERMAL ENGINEERING-II		1	Remember the basic concepts of Rankine cycle & understand the concept of combustion.
			2	Apply the principles of boilers, nozzles & turbines for implementation in industry and interpret velocity diagrams.
			3	Examine types of condensers & assess the efficiency of gas turbines working on different cycles.
			4	Design and analyze the performance of Jet propulsion & Rocket engine.
36	DESIGN OF MACHINE MEMBERS-II		1	Knowledge about journal bearing design using different empirical relations.
			2	Estimation of life of rolling contact bearing and their selection based on different service conditions.
			3	Design of engine parts and springs.
			4	Design of belt drives, rope drives, gear drives.
37	HEAT TRANSFER		1	Understand the basic modes of heat transfer and compute distribution in steady and unsteady state heat transfer through conduction
			2	Apply general heat conduction equation in Cartesian and cylindrical co-ordinates to simple problems.
			3	Understand the Principle of Radiation, Evaluation of heat transfer by radiation between different Geometries and basic of Mass Transfer
			4	Design and analysis of Heat Exchanger
38	INTELLECTUAL PROPERTY RIGHTS		1	Understand Intellectual property and its types and importance.
			2	Understand purpose and function of trademarks, selection and evaluation and acquisition of trademarks.
			3	Understand the law of copyrights and patents, issues and registration of copyrights and patents.

			4	Understand the trade secret law, protection and litigation, new International developments of IP.
39	REFRIGERATION & AIR CONDITIOINING		1	At the end of the course, the student should be able to Differentiate between different types of refrigeration systems with respect to application as well as conventional and unconventional refrigeration systems.
			2	Thermodynamically analyze refrigeration and air conditioning systems.
			3	Evaluate performance parameters of refrigeration and air conditioning systems.
			4	Apply the principles of Psychometrics to design the air conditioning loads for the industrial applications.
40	HEAT TRANSFER LAB		1	To learn and understand the surface heat transfer coefficient for a horizontal plate losing heat by natural conversion
			2	To be able to understand comparison of horizontal and vertical felt plate heat transfer in free convection.
			3	To learn and understand the local surface heat transfer coefficient of a pipe losing heat by forced convection. To be able to understand heat exchanger as parallel flow and find temperature distribution in heat exchanges, oversell heat transfer coefficient and efficiencies.
			4	To learn and understand the superconductivity characteristics of heat pipe and plot graph temperature vs. time of three pipes. To learn and understand heat exchangers as contest flow and find temperature distribution, over all heat transfer coefficient and efficiencies
41	CADD AND MAT LAB		1	Understand and describe computer methods for solving a wide range of engineering problems.
			2	Use computer engineering software to solve and present problem solutions in a technical format.
			3	Utilize computer skills to enhance learning and performance in other engineering and science courses.
			4	To developed a new professional software for solving complex real life problem.
			1	Understand geometric transformation techniques in CAD and develop mathematical models to represent curves and surfaces.
			2	Model engineering components using solid modeling techniques.

42	CAD/CAM		3	Develop programs for CNC to manufacture industrial components.
			4	To understand the application of computers in various aspects of Manufacturing viz., Design, planning, Manufacturing cost, Layout & Material Handling system.
43	POWER PLANT ENGINEERING		1	Understand the concept of Rankine cycle and describe the basic principles of steam power plant and combustion process.
			2	Apply the principles of internal combustion engines, gas turbines, and direct energy conversion in power plants.
			3	Distinguish the working of hydroelectric power plant, hydro project plants and nuclear power station and recognize various non-conventional power sources.
			4	Design power plants considering power plant economics and environmental impact.
44	CNC TECHNOLOGY		1	Describe and Understand the different types of Numerical Control (NC) system and structure (their components) of the Computer Numerical Control (CNC).
			2	Learn different tooling method and prepare types of programming for Numerical Control (NC) system and Automatically Programmed Tool (APT) part programming.
			3	Learn Direct Numerical Control (DNC) system with proper use of Adaptive Control with optimization and constraints for turning and grinding.
			4	Learn types of micro controller and Programmable Logic Controller (PLCs) system sue in CNC machines.
45	ADDITIVE MANUFACTURING TECHNOLOGY		1	Remembering the fundamentals of manufacturing and understanding the concept of Rapid Prototyping system in practical applications.
			2	Applying the concepts of Powder based RTP System Tooling for implementation in manufacturing process.
			3	Evaluating the RTP system by using different software and Data formation.
			4	Creating and designing the RTP model for various Applications.
			1	Drawing of simple machine parts and assemblies from the part drawings using standard CAD packages
			2	Advanced aspects of using computer aided technologies used in design.

46	CAD/CAM LAB		3	Generate CNC Turning and Milling codes for different operations using standard CAM packages. Write manual part programming using ISO codes for turning and milling operations.
			4	Application of thermal analysis software.
47	INSTRUMENTATION AND CONTROL SYSTEM LAB		1	Students will be able to identify and understand errors in measurement.
			2	Students will be able to do calibration of pressure gauges, temperature, LVDT, capacitive transducer, rotameter.
			3	Students will be able to classify and calibrate measuring devices.
			4	Students will be able to analyze measured data using statistical analysis.
48	MINI PROJECT		1	Recognize a real-world problem and develop its requirements and develop a design solution for a set of requirements. Develop a design solution for a set of requirements
			2	Test and validate the conformance of the developed prototype against the original requirements of the problem.
			3	Express technical and behavioral ideas and thought in oral settings.
			4	Express technical ideas, strategies and methodologies in written form, Prepare and conduct oral presentations.
49	SEMINAR		1	Formulate a real-world problem and develop its requirements.
			2	Develop a design solution for a set of requirements
			3	Self study to enhance student's educational, intractive, empowering, and motivating skills.
			4	Develop a design solution for a set of requirements
50	PRODUCTION PLANNING AND CONTROL		1	Students will be able to understand different types of production system and ability to apply optimized one. Able to work according to forecasting of organization production system.
			2	Students will be able to analyze the knowledge of mathematics, science and engineering to evaluate MRP, JIT systems and solve problems related to inventory controls models like ABC, VED, EOQ.
			3	Students will be able to apply knowledge on the basis of process requirements like Line of Balancing, routing, scheduling etc.
			4	Assessing the effort of process variables and manufacture defect free products.

51	UNCONVENTIONAL MACHINING PROCESS		1	Understand the types, needs and application of unconventional machining process.
			2	Discuss the various mechanical energy based machining methods
			3	Explain electrical and thermal energy based machining processes for specific application
			4	Explain the principle and working of plasma based machining methods and its industrial applications
52	MAJOR PROJECT		1	Recognize a real-world problem and develop its requirements and develop a design solution for a set of requirements.
			2	Test and validate the conformance of the developed prototype against the original requirements of the problem.
			3	Express technical and behavioral ideas and thought in oral settings.
			4	Express technical ideas, strategies and methodologies in written form, Prepare and conduct oral presentations.



Head of Department



Principal

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course Outcome

BS102MT Engineering Mathematics-1

Course outcomes:

CO1	Distinguish between the concepts of sequence and series and determined limits of sequence and convergence .
CO2	Implements knowledge of differential calculus like radius of curvature ,envelopes in their respective domain .
CO3	Able to solve differential functions and evaluate multiple integral, change in variable is required to find volume and area of an object.
CO4	Develop the skills required in solving problems related to vector field ,apply this knowledge in presenting a component of multi body mechanical system.

BS105CH Chemistry

Course outcomes:

CO1	Apply the knowledge of electrochemistry, electrode potential in identifying feasibility of electrochemical reactions and working of batteries
CO2	Understand and examine the parameters responsible for quality of water, and mechanism of corrosion of materials to analyze and design corrosion control methods.
CO3	Prepare, classify and use polymers and other engineering materials including conducting and biodegradable polymers.
CO4	Classify, analyse and Grade the fuels, relate green chemistry for healthy and sustainable lifestyle by designing and manufacturing engineering materials using principles of green chemistry.

BS105CH EOITK

Course outcomes:

CO 1	Understand philosophy of Indian culture
CO 2	Learn the philosophy of ancient, medieval and modern India
CO 3	Acquire the information about the fine arts in India.
CO 4	Acquire the information about the fine arts in India.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course Outcome

BS102MT Engineering Mathematics-1

Course outcomes:

CO1	Distinguish between the concepts of sequence and series and determined limits of sequence and convergence .
CO2	Implements knowledge of differential calculus like radius of curvature ,envelopes in their respective domain .
CO3	Able to solve differential functions and evaluate multiple integral, change in variable is required to find volume and area of an object.
CO4	Develop the skills required in solving problems related to vector field ,apply this knowledge in presenting a component of multi body mechanical system.

BS105CH Chemistry

Course outcomes:

CO1	Apply the knowledge of electrochemistry, electrode potential in identifying feasibility of electrochemical reactions and working of batteries
CO2	Understand and examine the parameters responsible for quality of water, and mechanism of corrosion of materials to analyze and design corrosion control methods.
CO3	Prepare, classify and use polymers and other engineering materials including conducting and biodegradable polymers.
CO4	Classify, analyse and Grade the fuels, relate green chemistry for healthy and sustainable lifestyle by designing and manufacturing engineering materials using principles of green chemistry.

BS105CH EOITK

Course outcomes:

CO 1	Understand philosophy of Indian culture
CO 2	Learn the philosophy of ancient, medieval and modern India
CO 3	Acquire the information about the fine arts in India.
CO 4	Acquire the information about the fine arts in India.

ES107CS PROGRAMMING FOR PROBLEM SOLVING**Course outcomes:**

CO1	Build up skill on problem solving by constructing algorithms
CO2	Identify Solutions to a problem and apply control structures, user defined functions and string for solving the problem.
CO3	Understand the concept of recursions able to solve iteration problems.
CO4	Apply skill of identifying appropriate programming constructs for pointers problem solving

BS153CH CHEMISTRY LAB**Course outcomes:**

CO1	Determine hardness and alkalinity of water for safer health and environment
CO2	Apply and interpret electro analytical principles in quantitative estimations
CO3	Understand and analyse theoretical concepts of electrochemistry through experiments
CO4	To synthesize drugs for public health and safety

ES155CS Programming for problem Solving Lab**Course outcomes:**

CO1	Design and implement modular programs involving input output operation, decision making and looping constructs
CO2	Implement Search and sort operations on arrays
CO3	Apply the concept of pointers for implementing programs on dynamic memory management and string handling
CO4	Design and implement programs to store data in structures and files

ES157ME Workshop / Manufacturing Process**Course outcomes:**

CO1	Demonstrate and understanding and comply with workshop safety regulations .
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CO2	Identify and apply suitable tools for different trades of engineering processes like drilling ,material removing ,measuring ,chiseling
CO3	Study and practice on machine tools and their operations.
CO4	Undertake jobs connected with engineering work shop trades including fitting ,carpentry, sheet metal ,house wiring ,welding, smithy and apply basic electrical engineering

HS101EG ENGLISH

Course outcomes:

CO-ID	COURSE OUTCOME
CO1	Use English Language effectively in spoken and written forms.
CO2	Comprehend the given texts and respond appropriately.
CO3	Communicate confidently in various context and different cultures.
CO4	Acquire basic proficiency in English including Reading and Listening comprehension, Writing and Speaking skills.

BS103MT MATHEMATICS-II

Course outcomes:

CO1	Apply to solve qualitative problems based on vector analysis and matrix analysis such as linear independence and dependence of vectors ,ranks ,eigen values and eigen vectors.It is used for making Graphics and for creating and modifying images.
CO2	Ability to solve first and higher order linear differential equation which is required in digital computer processing to formulate the numerical solutions of systems of ordinary differential equation.
CO3	Identify properties of special functions like Beta Gamma function and Bessles equations these function is applicable for solving other important identities and theorems in mathematics.
CO4	Solve problems of Laplace transform and used to simplify calculations in system modeling where large number of differential equations are used.

BS104PH PHYSICS

Course outcomes:

CO1	Explore understand and distinguish structural characteristics of the material and apply this knowledge to identify defects in crystal .
CO2	Classify the material based on band theory of solids and also understand the di electric, semiconductor material.
CO3	Explore understand and differentiate the electromagnetic material and super conductor material in the field of engineering and sciences
CO4	Explore the knowledge of optical absorption on different lasers sources and understand communication in fiber optics

BS1h01 INDIAN CONSTITUTION

Course outcomes:

CO1	Know the background of the present constitution of India
CO2	Understand the working of the union, state and local levels
CO3	Gain consciousness on the fundamental rights and duties
CO4	Be able to understand the functioning and distribution of financial resources between the centre and states.

ES106EE BASIC ELECTRICAL ENGINEERING

Course outcomes:

CO1	apply and solve electrical circuits using different laws and theorems
CO2	comprehend and analyze basic electric and magnetic circuits
CO3	understand the contruction and operation of ac and dc machines
CO4	to introduce components of low voltage installation

HS151EG ENGLISH LAB

Course outcomes:

CO1	Listen, Understand and Interpret Formal and Informal spoken Language.
CO2	Overcome from the difficulties with sounds of English.
CO3	Learn to participate well in GD's , Debate and Presentations.
CO4	Communicate with appropriate body Language, Expressions.

ES154EE BASIC ELECTRICAL ENGINEERING LAB

Course outcomes:

CO1	To analyze and solve electrical circuits using network laws and theorems.
CO2	To understand and analyze basic Electric and Magnetic circuits
CO3	To study the working principles of Electrical Machines
CO4	To introduce components of Low Voltage Electrical Installations

ES156CE ENGINEERING GRAPHICS LAB

Course outcomes:

CO1	Get information about the important tools for engineering drawing. This will give student basic knowledge of technical drawings professions and means of communications to others.
CO2	Apply basic knowledge of projections of the objects including points, lines, planes by positioning object in the space of the different quadrants for the projections acting on an oblique plane..
CO3	Explain Development of surfaces of lateral surfaces of vertical prism, cylinder pyramid, and cone truncated by surfaces of inclined to HP alone.
CO4	practice different types of Isometric, or pictorial drawings, which represent an object in a three dimensional fashion by showing 3 surfaces of the object in one drawing.

ES156CE ENGINEERING PHYSICS LAB

Course outcomes:

CO1	After conducting experiments and taking measures independently will give desired results
CO2	Write appropriate laboratory reports
CO3	Compute and compare experimental results and draw relevant conclusions
CO4	Estimate results from graphs .

ES216EC DIGITAL ELECTRONICS

Course outcomes:

CO1	Able to design digital hardware and optimize implementation of logical functions
CO2	Students able to design combinational circuits, using PLDS
CO3	Analyze sequential circuits using flip flops , design registers and counters.
CO4	Apply state minimization techniques to design finite state machines.

PC221CS Data Structures and Algorithm

Course outcomes:

CO 1	Able to choose appropriate data structures to represent data items in real world problems
CO 2	Ability to analyse the time and space complexities of algorithms
CO 3	Ability to design programs using variety data structures such as stacks,queues,hash tables,binary trees,search trees ,heaps, graphs, and B trees
CO 4	Able to analyse and implement various kind of searching and sorting techniques.

HS204ME Operation Research

Course outcomes:

CO1	Developed linear programming problem models for shortest path, maximum profit, minimum cost and transportation problem
CO2	Conduct and inter post optimal and sensitivity analysis and explain the primal & dual relationship.
CO3	Teach to student about LPP, Transportation, sequencing and Replacement model.
CO4	SelSelect the best strategy on the basis of decision criteria under risk.

ES214EC Basic Electronics

Course outcomes:

CO1	Able to analyze the rectifiers and regulator circuits.
CO2	Anacquire knowledge on performance of BJTs, FETs on the basis of their operation and woworking
CO3	Able to analyse & design oscillator circuits.
CO4	learn different logic gates & multi-vibrator circuits.

PC222CS Discrete Mathematics

Course outcomes:

CO1	Student able to apply logic of mathematics to solve problem.
CO2	Student able to understand fundamental mathematical concepts of sets, relations and functions.
CO3	Student able to solve recurrence solution.
CO4	Student able to model real world problems using graph and trees.

PC223CS Programming Language

Course outcomes:

CO 1	Formulate simple algorithms for arithmetic and logical problems
CO 2	Remember the basics of computer fundamentals of computer history
CO 3	Translate the algorithms to programs in C language ,also test and execute the programs and correct syntax and logical errors
CO 4	Implement conditional branching, iteration and recursion.

PC252CS Data Structures and Algorithm Lab

Course outcomes:

CO1	Able to identify the appropriate data structures and algorithms for solving real world problems
CO2	Able to implement various kinds of searching and sorting techniques
CO3	Able to implement data structures such as stacks, queues, Search trees, and hash tables to solve various computing problems.
CO4	Able to implement data structures of hash tables to solve various computing problems

PC253CS Advanced Computer Skills Lab

Course outcomes:

CO1	To learn how to write programs in the MATLAB environment
CO2	Using MATLAB commands to handle Functions and Polynomials
CO3	Ability to solve any mathematical problem
CO4	To learn Mathematical Modeling in a different way.

ES251EC Basic Electronics Lab**Course outcomes:**

CO1	Learn to design diode circuits & understand the application of Zener diode. .
CO2	analyse characteristics of BJTs & FETs
CO3	understand the different oscillator circuits.
CO4	Able to design Analog-to-Digital converters & Digital-to-Analog converters.

PC232CS Computer Organization**Course outcomes:**

CO1	Able to understand the basic components and the design of CPU, ALU, and Control Unit.
CO2	Learn the basic elements and functions of 8086 microprocessors
CO3	Understand the instruction set of 8086 and use them to write assembly language programs.
CO4	Demonstrate fundamental understanding on the operation between the microprocessor and its interfacing devices.

HS202CM Finance and Accounting**Course outcomes:**

CO1	Evaluate the financial performance of the business unit.
CO2	To take decisions on selection of projects.
CO3	Take decisions on procurement of finances.
CO4	Interpret the financial statement by using Fundamental accounting concepts and Ratio analysis

ES215EC Signals&Systems**Course outcomes:**

CO1	Able to differentiate types of signals and systems in continuous and discrete time
CO2	Apply the properties of Fourier transform for continuous time signals
CO3	Relate Laplace transforms to solve differential equations and to determine the response of the Continuous Time Linear Time Invariant Systems to known inputs
CO4	Apply Z-transforms for discrete time signals to solve Difference equations

PC233CS Database Management System

Course outcomes:

CO1	Understand the mathematical foundations on which RDBMS are built
CO2	Model a set of requirements using the EER model, transform an ERR Model into a relational model and refine the relational model using theory of normalization.
CO3	Develop database application using SQL and EmbeddedSQL
CO4	Use the knowledge of organization and indexing to improve database application performance, and understand recovery mechanisms in RDBMS

PC231CS OOPS using Java

Course outcomes:

CO1	ABLE to solve real world problems using OOP techniques, understand the use of Abstract classes.
CO2	SOLVE problems using java collection framework and I/O classes
CO3	DEVELOP multithreaded applications with synchronization
CO4	DEVELOP applets for web applications. design GUI based applications

HS201EG Effective Technical Comm In English

Course outcomes:

CO1	Handle Technical communication effectively.
CO2	Use different types of professional correspondence.
CO3	Use various techniques of Report Writing
CO4	Acquire adequate skills of Manual Writing, Information Transfer and Presentation.

BS207MT Mathematics III

Course outcomes: At the end of the course, the student will be able to:

CO1	Understand and solve the probability problems in the finite sample space with discrete and continuous random variable.
CO2	Apply the concept of probability and distribution to derive mean variance and MGF of random variables
CO3	Evaluate Statistical parameters using distributions and understand the curve fittings for various polynomial.
CO4	Basic concept of fundamental sampling theory. Identify the four steps of hypothesis testing, estimate and maximize error and application of central limit theorem and solve problems related to it.

PC261CS Computer Organization Lab

Course outcomes:

CO1	Learn the principles of Assembly Language Programming, instruction set in developing microprocessor based applications.
CO2	Develop Applications such as: 8-bit Addition, Multiplication, Division, array operations, swapping, negative and positive numbers.
CO3	Analyse the interfaces like serial ports, digital-to-analog Converters and analog-to-digital converters
CO4	Analyse the function of traffic light controller.

PC263CS Database Management systems Lab

Course outcomes:

CO1	Design and implement a database schema for a given problem
CO2	To practice various DDL commands in SQL
CO3	Populate and query a database using SQL and PL/SQL
CO4	Develop multi-user database application using locks

PC262CS OOPS using JavaLab

Course outcomes:

CO1	Able to write programs for solving real world problems using java collection frame work
CO2	Able to write programs using abstract classes

CO3	Able to write multithreaded programs
CO4	Able to write GUI programs using switch controls in Java

CS501PC FLAT

Course outcomes:

CO1	Understand to employ finite state machines for modeling and solving computing problems.
CO2	Able to design context free grammars for formal languages.
CO3	Able to distinguish between decidability and undecidability.
CO4	Understand proficiency with mathematical tools and formal methods

CS502PC Software Engineering

Course outcomes:

CO1	Students will be able apply the basic concepts of software engineering
CO2	Students will be able to identify the significance of process models.
CO3	Students will be able to Analyze the principles of requirement Engineering
CO4	Students will be able to Create architectural design for a given project

CS503PC Computer Networks

Course outcomes:

CO1	Identify the issues and challenges in the architecture of a computer network.
CO2	Understand the ISO/OSI seven layers in a network.
CO3	Realize protocols at different layers of a network hierarchy.
CO4	Will get awareness about the structure and equipment of computer network structures.

CS504PC Web Technologies

Course outcomes:

CO1	Make the web pages dynamic and interactive through client side technologies.
CO2	Learn XML and how to parse and use of XML data with java
CO3	Able to understand the server side scripting with PHP.
CO4	Illustrate the server side scripting with java servlets and JSP

CS505PC Computer Graphics**Course outcomes:**

CO1	Students will be able to get relevant mathematics of computer graphics.
CO2	Able to design basic graphic applications with animations.
CO3	Able to design display graphic images
CO4	Design applications on using display graphic images

CS515PE PrinciplesofProgrammingLanguage**Course outcomes:**

CO1	learn the skills for expressing syntax and semantics in formal notation
CO2	Able to apply a suitable programming paradigm for a given computing application
CO3	able to compare the features of various programming languages
CO4	Learn different scripting languages

MC510 IPR**Course outcomes:**

CO1	Understand the Purpose and function of trademarks, acquisition of trade mark rights
CO2	Learn the Fundamental of copy right law, copy right registration
CO3	Understand Foundation of patent law, determination of trade secrete.
CO4	International overview on intellectual property, international trade mark law, copy right law, international patent law, and international development in trade secrets law.

CS506PC CN&WTLab**Course outcomes:**

CO1	Integrate frontend and backend web technologies in distributed systems.
CO2	Facilitate interface between frontend and backend of a web application.
CO3	Debug, test and deploy web applications in different web servers.
CO4	Migrate the web applications to the other platforms like .Net

EN508HS Advanced Communication Skills Lab

Course outcomes:

CO1	Acquire vocabulary and use it contextually.
CO2	Listen and speak effectively.
CO3	Develop proficiency in academic reading and writing.
CO4	Communicate confidently in formal and informal contexts.

CS505PC SoftwareEngineeringLab

Course outcomes:

CO1	Ability to translate end-user requirements into system and software requirements
CO2	Ability to generate a high-level design of the system from the software requirements
CO3	Will have experience and/or awareness of testing problems
CO4	will be able to develop a simple testing report

CS601PC Cyber Security

Course outcomes:

CO1	Understand overview of types of cyber-attacks and cyber-crimes
CO2	Able to deal with cyber-attacks, types of cybercrimes, cyber laws
CO3	Learn how to protect the entire Internet community from such attacks.
CO4	Learn different Privacy concepts, privacy in different domains

CS602PC Compiler Design

Course outcomes:

CO1	able to design a compiler given a set of language features.
CO2	knowledge of patterns, tokens & regular expressions for lexical analysis.
CO3	Design and implement LL and LR parsers
CO4	Able to Design algorithms for code optimization in order to improve the performance of a program in terms of space and time complexity.

CS603PC Design Analysis&Algorithms

Course outcomes:

CO1	To analyze performance of algorithms
CO2	To choose the appropriate data structure and algorithm design method for a specified application.
CO3	To understand how the choice of data structures and algorithm design methods impacts the performance of programs
CO4	To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound

CS60IPC MachineLearning

Course outcomes:

CO1	Understand the concepts of computational intelligence like machine learning
CO2	Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
CO3	Understand the Neural Networks and its usage in machine learning application.
CO4	Understand the pattern comparison techniques

CS615PE SoftwareTestingMethodologies

Course outcomes:

CO1	Able to understand the purpose of testing and types of testing
CO2	Learn skills in software test automation and management using latest tools.
CO3	Able to evaluate regular expressions and learn logic testing.
CO4	Understand graph matrices and its applications

CS604PC DPPM

Course outcomes:

CO1	the application of Disaster Concepts to Management
CO2	Analyzing Relationship between Development and Disasters.
CO3	Ability to understand Categories of Disasters and
CO4	realization of the responsibilities to society

CS605PC CompilerDesignLab**Course outcomes:**

CO1	Understand different phases of compilers
CO2	Ability to design, develop, and implement a compiler for any language.
CO3	Able to use lex and yacc tools for developing a scanner and a parser
CO4	Able to design and implement LL and LR parsers.

CS606PC MachineLearningLab**Course outcomes:**

CO1	understand complexity of Machine Learning algorithms and their limitations
CO2	understand modern notions in data analysis-oriented computing
CO3	be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
CO4	Be capable of performing experiments in Machine Learning using real-world data

CS606PC SoftwareTestingMethodologiesLab**Course outcomes:**

CO1	To provide knowledge of Software Testing Methods.
CO2	To develop skills in software test automation and management using latest tools
CO3	Design and develop the best test strategies in accordance to the development model.
CO4	Able to develop bug free programs

CS701PC**DataMining****Course outcomes:**

CO1	Able to Understand the need and importance of preprocessing techniques.
CO2	Able to Implement Similarity and dissimilarity techniques
CO3	Able to Analyze and evaluate performance of algorithms for Association Rules.
CO4	Able to Deploy Classification and Clustering algorithms

CS702PC Principles of Programming Language

Course outcomes:

CO1	Able to apply suitable programming paradigm for the application
CO2	Ability to compare the features of various programming languages.
CO3	Able to understand the concepts of ADT and OOP
CO4	Ability to program in different language paradigms and evaluate their relative benefits.

CS721PE Python Programming

Course outcomes:

CO1	Learn Syntax and Semantics and create Functions in Python
CO2	Understand Lists, Dictionaries and Regular expressions ,Handle Strings and Files in Python.
CO3	Implement Object Oriented Programming concepts in Python
CO4	Build Web Services and introduction to Network and Database Programming in Python.

CS734PE SPPM

Course outcomes:

CO1	Get knowledge of software economics, phases in the life cycle of software development
CO2	Analyze the major and minor milestones, artifacts and metrics from management and technical perspective
CO3	Design and develop software product using conventional and modern principles of software project management
CO4	Able for project organization, project control and process instrumentation

CS734PE Blockchain Technology

Course outcomes:

CO1	Get Knowledge in security and applied cryptography
CO2	Understand the concepts of block chain technology and Cryptocurrency
CO3	Able to deal with technical,business challenges
CO4	Learn about research advances related to one of the most popular technological areas today.

CS703PC DataMiningLab

Course outcomes:

CO1	Analyze the classification rules on various databases.
CO2	Deploy association rules for any kind of databases
CO3	Develop clustering rules for applications.
CO4	Able to apply mining techniques for realistic data.

CS751PC PythonProgrammingLab

Course outcomes:

CO1	able to understand the basic concepts scripting and the contributions of scripting language
CO2	Able to explore the object oriented concepts, and the built in objects of Python.
CO3	To understand the high-performance programs
CO4	Able to create practical and contemporary applications.

CE833OE ENTREPRENEURSHIP AND SMALL BUSINESS ENTERPRISES

Course outcomes:

CO1	students learn the basics of Entrepreneurship and entrepreneurial development
CO2	Able to Present Business Plan & Procedure for setting up Enterprises
CO3	Understand The process of Entrepreneurial Development.
CO4	Able to implement the Fundamentals of Entrepreneurship.

CS862PE Modern Software Engineering

Course outcomes:

CO1	Students learn Extreme Programming (XP) - Agile Development
CO2	Able to understand real time customer involvement Ubiquitous language, meetings, coding standards.
CO3	Learn about planning and release of software with bugs free
CO4	Learn Test driven development, Performance optimization, Exploratory testing

CS864PE Computer Forensics

Course outcomes:

CO1	Learn on digital evidences which are obtained from digital media.
CO2	Students will understand the usage of computers in forensic, and how to use various forensic tools for a wide variety of investigations.
CO3	opportunity to students to continue their zeal in research in computer forensics
CO4	understanding various file systems,


Head of Department

HEAD

Dept. of Computer
Science & Engineering

NAWAB SHAH ALAM KHAN COLLEGE

OF ENGINEERING & TECHNOLOGY

16-4-1/A, New Malakpet, Hyderabad-500024.



Principal

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
Course Outcome

S.NO	YEAR	Course	Course Code	Course Outcomes	
				Upon completion of Course , student will be able to	
1	II-I	Digital Electronics	ES216EC	1	Understand the number representation and design combinational circuits like adders, MUX etc.
				2	Design Combinational circuits using PLDS and write VHDL code for basic gates and combinational circuits.
				3	Analyze sequential circuits using flip-flops and design registers, counter .
				4	Represent a sequential circuit using Finite State machine and apply state minimization techniques to design a FSM
2	II-I	Electronic Devices	PC221EC	1	Interpret the characteristics and apply diode models to analyze various application of diodes.
				2	Analyze, Compare and design of BJT amplifiers with various biasing circuits.
				3	Distinguish the working principles of BJT and FET also between FET & MOSFET.
				4	Discriminate the BJT configurations to recognize appropriate transistor configuration for any given application and design the biasing circuits with good stability.
3	II-I	Network Theory	PC222EC	1	Able to learn how to calculate properties of networks and design of attenuator.
				2	Able to design of equalizers.
				3	Able to design different types of filters using passive elements.
				4	Able to synthesize the RL & RC networks in Foster and Cauer Forms
4	II-I	Electronic Devices Lab	PC251EC	1	Understand characteristics of diode
				2	Plot the characteristics of BJT in different configurations
				3	Record the parameters of BJT and FET amplifiers

				4	Understanding biasing techniques of BJT
5	II-I	Electronic Workshop	PC252EC	1	Use the basic electronic components and design circuits
				2	Verify various parameters of the circuits by applying theorems
				3	Understand the pin config of ICs
				4	Design and verify the combinational and logic circuits
6	II-II	Signals and Systems	ES215EC	1	Define and differentiate types of signals and systems in continuous and discrete time
				2	Apply the properties of Fourier transform for continuous time signals
				3	Apply Z-transforms for discrete time signals to solve Difference equations
				4	Obtain Linear Convolution and Correlation of discrete time signals with graphical representation
7	II-II	Analog Electronic Circuits	PC231EC	1	Identify the type of negative feedback, Analyze and design of negative feedback amplifiers.
				2	Design Audio Frequency and Radio Frequency oscillator
				3	Distinguish between the classes of Power Amplifier and their design considerations
				4	Compare the performance of single and double tuned amplifiers
8	II-II	Electromagnetic Theory and Transmission Lines	PC232EC	1	Understand the different coordinate system, vector calculus, Coulomb's law and Gauss law for finding electric fields due to different charges and to formulate the capacitance for different capacitors.
				2	Learn basic magnetostatics concepts and laws such as Biot-Savart's law and Ampere's law, their application in finding magnetic field intensity, inductance and magnetic boundary condition.
				3	Determine the Transmission Line parameters to characterize the distortions and estimate the characteristics for different lines.
				4	Study the Smith Chart profile and stub matching features and gain ability to practically use the same for solving practical problems
9	II-II	Pulse and Linear Integrated Circuits	PC233EC	1	Construct different linear networks and analyze their response to different input signals
				2	Understand, Analyze and design multi-vibrators and sweep circuits using transistors.
				3	Distinguish different types of rectifying circuits and amplifier circuits and their performance parameters.

				4	Analyze DC and AC characteristics for Single/Dual in put Balanced/Unbalanced output configurations using BJTs .
10	II-II	Computer Organization and Architecture	PC234EC	1	Illustrate the operation of a digital computer.
				2	Understand I/O interfacing of a computer.
				3	Interface microprocessor with memory devices..
				4	Understand latest trends in microprocessor.
11	II-II	Analog Electronic Circuits Lab	PC261EC	1	Caliculate gain and bandwidth of BJT, FET
				2	Study multivibratoe circuits
				3	Study Oscillator circuits
				4	Demonstrate filter circuits, power amplifiers and Op Amp circuits
12	II-II	Pulse and Linear Integrated Circuits Lab	PC262EC	1	Design and analyze linear and non linear wave shaping circuits
				2	Design and analyze clipping and clamping circuits
				3	Design and analyze multivibrator circuits
				4	Design and analyze Schmitt trigger circuits
13	III-I	MICROPROCE SSORS AND MICROCONTR OLLERS	EC501PC	1	Understands the internal architecture, organization and assembly language programming of 8086 processors.
				2	Understands the internal architecture, organization and assembly language programming of 8051/controllers
				3	Understands the interfacing techniques to 8086 and 8051 based systems.
				4	Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
14	III-I	DATA COMMUNICA TIONS AND NETWORKS	EC502PC	1	Know the Categories and functions of various Data communication Networks
				2	Design and analyze various error detection techniques.
				3	Demonstrate the mechanism of routing the data in network layer
				4	Know the Functioning of various Application layer Protocols.
15	III-I	CONTROL SYSTEMS	EC503PC	1	Understand the modeling of linear-time-invariant systems using transfer function and state- space representations.
				2	Understand the concept of stability and its assessment for linear-time invariant systems.
				3	Design simple feedback controllers.
				4	
		ELECTRONIC MEASUREMENT		1	Measure electrical parameters with different meters and understand the basic definition of measuring parameters.

16	III-I	MEASUREMENTS AND INSTRUMENTATION	EC513PE	2	Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.
				3	Operate an Oscilloscope to measure various signals.
				4	Measure various physical parameters by appropriately selecting the transducers.
17	III-I	MICROPROCESSORS AND MICROCONTROLLERS LAB	EC505PC	1	Design and implement programs on 8085 & 8086 microprocessor.
				2	Design interfacing circuits with 8085 & 8086
				3	Design and implement 8051 microcontroller based systems
				4	To Understand the concepts related to I/O and memory interfacing
18	III-I	DATA COMMUNICATIONS AND NETWORKS LAB	EC506PC	1	understand network communication using the layered concept, Open System Interconnect (OSI) and the Internet Model.
				2	understand various types of transmission media, network devices; and parameters of evaluation of performance for each media and device.
				3	understand the concept of flow control, error control and LAN protocols; to explain the design of, and algorithms used in, the physical, data link layers.
				4	understand the working principles of LAN and the concepts behind physical and logical addressing, subnetting and supernetting.
19	III-II	DIGITAL SIGNAL PROCESSING	EC602PC	1	Understand the LTI system characteristics and Multirate signal processing.
				2	Understand the inter-relationship between DFT and various transforms.
				3	Design a digital filter for a given specification.
				4	Understand the significance of various filter structures and effects of round off errors.
20	III-II	ANTENNAS AND PROPAGATION	EC601PC	1	Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of VHF, UHF and Microwave antennas and also antenna arrays.
				2	Specify the requirements for microwave measurements and arrange a setup to carry out the antenna far zone pattern and gain measurements in the laboratory.
				3	Classify the different wave propagation mechanisms, determine the characteristic features of different wave propagations, and estimate the parameters involved.
				4	
				1	Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors.

21	III-II	VLSI DESIGN	EC603PC	2	Draw the layout of any logic circuit which helps to understand and estimate parasitic effect of any logic circuit
				3	Design building blocks of data path systems, memories and simple logic circuits using PLA, PAL, FPGA and CPLD.
				4	Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system.
22	III-II	EMBEDDED SYSTEM DESIGN	EC613PE	1	To understand the selection procedure of Processors in the embedded domain.
				2	Design Procedure for Embedded Firmware.
				3	To visualize the role of Real time Operating Systems in Embedded Systems.
				4	To evaluate the Correlation between task synchronization and latency issues
23	III-II	DIGITAL SIGNAL PROCESSING LAB	EC604PC	1	To use computational tools to do basic operations for signal processing.
				2	Apply FFT algorithms for various signal processing operations
				3	To develop algorithms for designing and implementation of FIR and IIR filters with standard techniques
				4	To understand DSP processors
24	III-II	e-CAD LAB	EC605PC	1	An ability to design CMOS logic circuits.
				2	simulate circuits with in a CAD tool and compare to design specifications.
				3	To learn by using Xilinx Foundation tools and Hardware
				4	To analyze the results of logic and timing simulations and to use these simulation results to debug digital systems.
25	IV-I	MICROWAVE ENGINEERING	EC701PC	1	To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical microwave transmission line problems.
				2	To distinguish between the different types of waveguide and ferrite components, explain their functioning and select proper components for engineering applications.
				3	To realize the need for solid state microwave sources, understand the concepts of TEDs, RWH Theory and explain the salient features of Gunn Diodes and ATT Devices.
				4	To establish the properties of Scattering Matrix, formulate the S-Matrix for various microwave junctions, and understand the utility of S-parameters in microwave component design.

26	IV-I	COMPUTER NETWORKS	ET702PC	1	Students should understand and explore the basics of Computer Networks and Various Protocols.
				2	He/ She will be in a position to understand the World Wide Web concepts.
				3	Students will be in a position to administrate a network and flow of information.
				4	He/she can understand easily the concepts of network security, Mobile and ad hoc networks.
27	IV-I	EMBEDDED SYSTEM DESIGN	EC734PE	1	Expected to understand the selection procedure of Processors in the embedded domain.
				2	Design Procedure for Embedded Firmware.
				3	Expected to visualize the role of Real time Operating Systems in Embedded Systems.
				4	Expected to evaluate the Correlation between task synchronization and latency issues
28	IV-I	ELECTRONIC MEASUREMENTS AND INSTRUMENTATION	EC743PE	1	Identify the various electronic instruments based on their specifications for carrying out a particular task of measurement.
				2	Measure various physical parameters by appropriately selecting the transducers.
				3	Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.
				4	
29	IV-I	VLSI DESIGN	EC702PC	1	Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors, choose an appropriate inverter depending on specifications required for a circuit
				2	Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit.
				3	Design different types of logic gates using CMOS inverter and analyze their transfer characteristics
				4	Provide design concepts required to design building blocks of data path using gates.
30	IV-I	MICROWAVE ENGINEERING	EC704PC	1	Able to handle microwave equipment
				2	Able to understand microwave measurements
				3	Able to understand Wave guide and antenna measurements
				4	
				1	Understand the concepts of computational intelligence like machine learning

31	IV-II	MACHINE LEARNING	EC854PE	2	Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
				3	Understand the Neural Networks and its usage in machine learning application.
				4	
32	IV-II	GLOBAL POSITIONING SYSTEM	EC863PE	1	Plan, collect, and process geospatial data using GPS technologies.
				2	Determine accuracy and precision of GPS data.
				3	Calculate and analyze error sources for GPS data.
				4	Correct GPS data using differential correction, represent GPS with other geospatial data on a map.
33	II-I	ELECTRONIC DEVICES AND CIRCUITS	EC301PC	1	Know the characteristics of various components.
				2	Understand the utilization of components.
				3	Understand the biasing techniques
				4	Design and analyze small signal amplifier circuits.
34	II-I	NETWORK ANALYSIS AND TRANSMISSION LINES	EC302PC	1	Gain the knowledge on basic RLC circuits behavior.
				2	Analyze the Steady state and transient analysis of RLC Circuits.
				3	Know the characteristics of two port network parameters.
				4	Analyze the transmission line parameters and configurations.
35	II-I	DIGITAL SYSTEM DESIGN	EC303PC	1	Understand the numerical information in different forms and Boolean Algebra theorems
				2	Postulates of Boolean algebra and to minimize combinational functions
				3	Design and analyze combinational and sequential circuits
				4	Known about the logic families and realization of logic gates.
36	II-I	SIGNALS AND SYSTEMS	EC304PC	1	Differentiate various signal functions.
				2	Represent any arbitrary signal in time and frequency domain.
				3	Understand the characteristics of linear time invariant systems.
				4	Analyze the signals with different transform technique.
37	II-I	PROBABILITY THEORY AND STOCHASTIC PROCESSES	EC305ES	1	Understand the concepts of Random Process and its Characteristics.
				2	Understand the response of linear time Invariant system for a Random Processes.
				3	Determine the Spectral and temporal characteristics of Random Signals.
				4	Understand the concepts of Noise in Communication systems.
38	II-I	Basic	EC308PC	1	Verify the various operation on signals
				2	Implement the convolution and correlation on signals.

38	II-I	Simulation Lab	EC306PC	3	To understand and analyze the transforms on signals and systems
				4	To study and implement the noise removal on periodic signal.
39	II-I	ELECTRONIC DEVICES AND CIRCUITS LAB	EC306PC	1	Understand characteristics of diode
				2	Plot the characteristics of BJT in different configurations
				3	Record the parameters of BJT and FET amplifiers
				4	Understanding biasing techniques of BJT
40	II-II	ELECTROMAGNETIC FIELDS AND WAVES	EC402PC	1	Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magnetostatic Fields.
				2	Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
				3	Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
				4	To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems
41	II-II	ANALOG AND DIGITAL COMMUNICATIONS	EC403PC	1	Analyze and design of various continuous wave and angle modulation and demodulation techniques
				2	Understand the effect of noise present in continuous wave and angle modulation techniques.
				3	Attain the knowledge about AM, FM Transmitters and Receivers
				4	Analyze and design the various Pulse Modulation Techniques.
42	II-II	LINEAR IC APPLICATIONS	EC404PC	1	A thorough understanding of operational amplifiers with linear integrated circuits.
				2	Attain the knowledge of functional diagrams and applications of IC 555 and IC 565.
				3	Acquire the knowledge about the Data converters.
				4	
43	II-II	ELECTRONIC CIRCUIT ANALYSIS	EC405PC	1	Design the multistage amplifiers and understand the concepts of High Frequency Analysis of Transistors.
				2	Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations
				3	Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications.
				4	Design Multivibrators and sweep circuits for various applications.

44	III-I	Electromagnetic Theory And Transmission Lines	EC501PC	1	Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions, and use them for solving engineering problems.
				2	Analyze the Wave Equations for good conductors and good dielectrics, and evaluate the UPW Characteristics for several practical media of interest.
				3	Establish the proof and estimate the polarization features, reflection and transmission coefficients for UPW propagation, distinguish between Brewster and Critical Angles, and acquire knowledge of their applications.
				4	Determine the Transmission Line parameters for different lines, characterize the distortions and estimate the characteristics for different lines
45	III-I	Linear And Digital Ic Applications	EC502PC	1	A thorough understanding of operational amplifiers with linear integrated circuits.
				2	Understanding of the different families of digital integrated circuits and their characteristics.
				3	Also students will be able to design circuits using operational amplifiers for various applications.
				4	
46	III-I	Digital Communications	EC503PC	1	Analyze the error performance of Digital Modulation Techniques.
				2	Understand the redundancy present in Digital Communication by using various source coding techniques.
				3	Know about different error detecting and error correction codes like block codes, cyclic codes and convolution codes.
				4	
47	III-II	Digital Image Processing	EC612PE	1	Exploration of the limitations of the computational methods on digital images.
				2	Expected to implement the spatial and frequency domain image transforms on enhancement and restoration of images.
				3	Elaborate understanding on image enhancement techniques.
				4	
48	III-II	Antennas And Wave Propagation	EC601PC	1	Generate various types of Spread spectrum sequences and can simulate CDMA system (Both Transmitter & Receiver).
				2	Analyze the performance of Spread spectrum systems in Jamming environment and systems with Forward Error Correction.
				3	Can provide detection and cancellation schemes for Multiusers in CDMA cellular radio

				4	
49	III-II	Microprocessors And Microcontroller s	EC602PC	1	Understands the internal architecture and organization of 8086, 8051 and ARM processors/controllers.
				2	Understands the interfacing techniques to 8086 and 8051 and can develop assembly language programming to design microprocessor/ micro controller based systems.
				3	Understands the internal architecture and organization of 8085, 8051 and ARM processors/controllers.
				4	
50	III-II	Digital Signal Processing	SM603MS	1	Perform time, frequency, and Z -transform analysis on signals and systems.
				2	Understand the inter-relationship between DFT and various transforms.
				3	Understand the significance of various filter structures and effects of round off errors.
				4	Design a digital filter for a given specification.
51	II-I	ANALOG ELECTRONIC S	EC302ES	1	Design and analyze small signal amplifier circuits applying the biasing techniques learnt earlier.
				2	Cascade different amplifier configurations to obtain the required overall specifications like Gain, Bandwidth, Input and Output interfacing Impedances.
				3	Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications.
				4	Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations.
52	II-I	ELECTRICAL TECHNOLOG Y	EC303ES	1	To analyze the performance of dc generators and motors.
				2	To analyze the performance of transformers.
				3	To learn the in-depth knowledge on three phase induction motors.
				4	To analyze the performance of special motors and electrical instruments in real time applications.
53	II-I	SIGNALS AND STOCHASTIC PROCESS	EC304ES	1	Represent any arbitrary analog or Digital time domain signal in frequency domain.
				2	Understand the importance of sampling, sampling theorem and its effects.
				3	Understand the characteristics of linear time invariant systems.
				4	Determine the conditions for distortion less transmission through a system.
				1	Gains the knowledge on Basic network elements.

54	II-I	NETWORK ANALYSIS	EC305ES	2	Learns and analyze the RLC circuits' behavior in detail.
				3	Analyze the performance of periodic waveforms.
				4	Learns and gain the knowledge in characteristics of two port network parameters (Z, Y, ABCD, h & g). To analyze the filter design concepts in real world applications.
55	II-I	Basic Simulation Lab	EC307ES	1	Verify the various operation on signals
				2	Implement the convolution and correlation on signals.
				3	To understand and analyze the transforms on signals and systems
				4	To study and implement the noise removal on periodic signal.
56	II-I	ELECTRONIC DEVICES AND CIRCUITS LAB	EC306ES	1	Understand characteristics of diode
				2	Plot the characteristics of BJT in different configurations
				3	Record the parameters of BJT and FET amplifiers
				4	Understanding biasing techniques of BJT
57	II-II	SWITCHING THEORY AND LOGIC DESIGN	EC401ES	1	Be able to manipulate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray and BCD.
				2	Be able to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
				3	Be able to design and analyze small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.
				4	Be able to design and analyze small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits.
58	II-II	PULSE AND DIGITAL CIRCUITS	EC402ES	1	Understand the applications of diode as integrator, differentiator, clippers, clamper circuits.
				2	Realizing logic gates using diodes and transistors.
				3	Understanding of time and frequency domain aspects.
				4	Importance of clock pulse and its generating techniques.
59	II-II	CONTROL SYSTEMS	EE404ES	1	Improve the system performance by selecting a suitable controller and/or a compensator for a specific application
				2	Apply various time domain and frequency domain techniques to assess the system performance
				3	Apply various control strategies to different applications (example: Power systems, electrical drives etc...).

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				2	Apply various time domain and frequency domain techniques to assess the system performance
				3	Apply various control strategies to different applications (example: Power systems, electrical drives etc...).
				4	Test system Controllability and Observability using state space representation and applications of state space representation to various systems
60	II-II	ANALOG COMMUNICATIONS	EC405ES	1	Able to analyze and design various modulation and demodulation analog systems.
				2	Understand the characteristics of noise present in analog systems.
				3	Study of signal to Noise Ratio (SNR) performance, of various Analog communication systems.
				4	Analyze and design the various Pulse Modulation Systems.


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Nawab Shah Alam Khan

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DEPARTMENT OF INFORMATION TECHNOLOGY

Course Outcome

BS102MT Engineering Mathematics-1

Course outcomes:

CO1	Distinguish between the concepts of sequence and series and determined limits of sequence and convergence .
CO2	Implements knowledge of differential calculus like radius of curvature ,envelopes in their respective domain .
CO3	Able to solve differential functions and evaluate multiple integral, change in variable is required to find volume and area of an object.
CO4	Develop the skills required in solving problems related to vector field ,apply this knowledge in presenting a component of multi body mechanical system.

BS104PH PHYSICS

Course outcomes:

CO1	Explore understand and distinguish structural characteristics of the material and apply this knowledge to identify defects in crystal .
CO2	Classify the material based on band theory of solids and also understand the di electric, semiconductor material.
CO3	Explore understand and differentiate the electromagnetic material and super conductor material in the field of engineering and sciences
CO4	Explore the knowledge of optical absorption on different lasers sources and understand communication in fiber optics

ES106EE BASIC ELECTRICAL ENGINEERING

Course outcomes:

CO1	APPLY AND SOLVE ELECTRICAL CIRCUITS USING DIFFERENT LAWS AND THEOREMS
CO2	COMPREHEND AND ANALYZE BASIC ELECTRIC AND MAGNETIC CIRCUITS
CO3	UNDERSTAND THE CONTRUCTION AND OPERATION OF AC AND DC MACHINES
CO4	TO INTRODUCE COMPONENTS OF LOW VOLTAGE INSTALLATION



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CO2	COMPREHEND AND ANALYZE BASIC ELECTRIC AND MAGNETIC CIRCUITS
CO3	UNDERSTAND THE CONTRUCTION AND OPERATION OF AC AND DC MACHINES
CO4	TO INTRODUCE COMPONENTS OF LOW VOLTAGE INSTALLATION

Mapping of course outcomes with program outcomes

ES154EE BASIC ELECTRICAL ENGINEERING LAB

Course outcomes:

CO1	To analyze and solve electrical circuits using network laws and theorems.
CO2	To understand and analyze basic Electric and Magnetic circuits
CO3	To study the working principles of Electrical Machines
CO4	To introduce components of Low Voltage Electrical Installations

ES156CE ENGINEERING PHYSICS LAB

Course outcomes:

CO1	After conducting experiments and taking measures independently will give desired results
CO2	Write appropriate laboratory reports
CO3	Compute and compare experimental results and draw relevant conclusions
CO4	Estimate results from graphs .

ES156CE ENGINEERING GRAPHICS LAB

Course outcomes:

CO1	Get information about the important tools for engineering drawing. This will give student basic knowledge of technical drawings professions and means of communications to others.
CO2	Apply basic knowledge of projections of the objects including points, lines, planes by positioning object in the space of the different quadrants for the projections acting on an oblique plane..
CO3	Explain Development of surfaces of lateral surfaces of vertical prism, cylinder pyramid, and cone truncated by surfaces of inclined to HP alone.
CO4	practice different types of Isometric, or pictorial drawings, which represent an object in a three dimensional fashion by showing 3 surfaces of the object in one drawing.

BS105CH EOITK

Course outcomes:

CO 1	Understand philosophy of Indian culture
CO 2	Learn the philosophy of ancient, medieval and modern India
CO 3	Acquire the information about the fine arts in India.
CO 4	Acquire the information about the fine arts in India.

HS101EG ENGLISH

Course outcomes:

CO-ID	COURSE OUTCOME
CO1	Use English Language effectively in spoken and written forms.
CO2	Comprehend the given texts and respond appropriately.
CO3	Communicate confidently in various context and different cultures.
CO4	Acquire basic proficiency in English including Reading and Listening comprehension, Writing and Speaking skills.

BS103MT MATHEMATICS-II

Course outcomes:

CO1	Apply to solve qualitative problems based on vector analysis and matrix analysis such as linear independence and dependence of vectors ,ranks ,eigen values and eigen vectors.It is used for making Graphics and for creating and modifying images.
CO2	Ability to solve first and higher order linear differential equation which is required in digital computer processing to formulate the numerical solutions of systems of ordinary differential equation.
CO3	Identify properties of special functions like Beta Gamma function and Bessles equations these function is applicable for solving other important identities and theorems in mathematics.
CO4	Solve problems of Laplace transform and used to simplify calculations in system modeling where large number of differential equations are used.

BS105CH Chemistry**Course outcomes:**

CO1	Apply the knowledge of electrochemistry, electrode potential in identifying feasibility of electrochemical reactions and working of batteries
CO2	Understand and examine the parameters responsible for quality of water, and mechanism of corrosion of materials to analyze and design corrosion control methods.
CO3	Prepare, classify and use polymers and other engineering materials including conducting and biodegradable polymers.
CO4	Classify, analyse and Grade the fuels, relate green chemistry for healthy and sustainable lifestyle by designing and manufacturing engineering materials using principles of green chemistry.

ES107CS PROGRAMMING FOR PROBLEM SOLVING**Course outcomes:**

CO1	Build up skill on problem solving by constructing algorithms
CO2	Identify Solutions to a problem and apply control structures, user defined functions and string for solving the problem.
CO3	Understand the concept of recursions able to solve iteration problems.
CO4	Apply skill of identifying appropriate programming constructs for pointers problem solving

HS151EG ENGLISH LAB**Course outcomes:**

CO1	Listen, Understand and Interpret Formal and Informal spoken Language.
CO2	Overcome from the difficulties with sounds of English.
CO3	Learn to participate well in GD's ,Debate and Presentations.
CO4	Communicate with appropriate body Language, Expressions.

ES157ME Workshop / Manufacturing Process**Course outcomes:**

CO1	Demonstrate and understanding and comply with workshop safety regulations .
CO2	Identify and apply suitable tools for different trades of engineering processes like drilling ,material removing ,measuring ,chiseling
CO3	Study and practice on machine tools and their operations.
CO4	Undertake jobs connected with engineering work shop trades including fitting ,carpentry, sheet metal ,house wiring ,welding, smithy and apply basic electrical engineering

HS201EG Effective Technical Comm In English**Course outcomes:**

CO1	Handle Technical communication effectively.
CO2	Use different types of professional correspondence.
CO3	Use various techniques of Report Writing
CO4	Acquire adequate skills of Manual Writing, Information Transfer and Presentation.

HS202CM Finance and Accounting**Course outcomes:**

CO1	Evaluate the financial performance of the business unit.
CO2	To take decisions on selection of projects.
CO3	Take decisions on procurement of finances.
CO4	Interpret the financial statement by using Fundamental accounting concepts and Ratio analysis

BS207MT Mathematics III

Course outcomes: At the end of the course, the student will be able to:

CO1	Understand and solve the probability problems in the finite sample space with discrete and continuous random variable.
------------	--

CO2	Apply the concept of probability and distribution to derive mean variance and MGF of random variables
CO3	Evaluate Statistical parameters using distributions and understand the curve fittings for various polynomial.
CO4	Basic concept of fundamental sampling theory. Identify the four steps of hypothesis testing, estimate and maximize error and application of central limit theorem and solve problems related to it.

ES214EC Basic Electronics

Course outcomes:

CO1	Able to analyze the rectifiers and regulator circuits.
CO2	Anacquire knowledge on performance of BJTs, FETs on the basis of their operation and woworking
CO3	Able to analyse & design oscillator circuits.
CO4	learn different logic gates & multi-vibrator circuits.

ES216EC DIGITAL ELECTRONICS

Course outcomes:

CO1	Able to design digital hardware and optimize implementation of logical functions
CO2	Students able to design combinational circuits,using PLDS
CO3	Analyze sequential circuits using FLIP FLOPS ,design registers and counters.
CO4	Apply state minimization techniques to design finite state machines.

PC221CS Data Structures and Algorithm

Course outcomes:

CO 1	Able to choose appropriate data structures to represent data items in real world problems
CO 2	Ability to analyse the time and space complexities of algorithms
CO 3	Ability to design programs using variety data structures such as stacks,queues,hash tables,binary trees,search trees ,heaps, graphs, and B trees
CO 4	Able to analyse and implement various kind of searching and sorting techniques.

ES251EC Basic Electronics Lab

Course outcomes:

CO1	Learn to design diode circuits & understand the application of Zener diode. .
CO2	analyse characteristics of BJTs & FETs
CO3	understand the different oscillator circuits.
CO4	Able to design Analog-to-Digital converters & Digital-to-Analog converters.

PC252CS Data Structures and Algorithm Lab

Course outcomes:

CO1	Able to identify the appropriate data structures and algorithms for solving real world problems
CO2	Able to implement various kinds of searching and sorting techniques
CO3	Able to implement data structures such as stacks, queues, Search trees, and hash tables to solve various computing problems.
CO4	Able to implement data structures of hash tables to solve various computing problems

HS204ME Operation Research

Course outcomes:

CO1	Developed linear programming problem models for shortest path, maximum profit, minimum cost and transportation problem
CO2	Conduct and inter post optimal and sensitivity analysis and explain the primal & dual relationship.
CO3	Teach to student about LPP, Transportation, sequencing and Replacement model.
CO4	Select the best strategy on the basis of decision criteria under risk.

ES215EC Signals&Systems

Course outcomes:

CO1	Able to differentiate types of signals and systems in continuous and discrete time
CO2	Apply the properties of Fourier transform for continuous time signals
CO3	Relate Laplace transforms to solve differential equations and to determine the response of the Continuous Time Linear Time Invariant Systems to known inputs
CO4	Apply Z-transforms for discrete time signals to solve Difference equations

PC231CS Java Programming

Course outcomes:

CO1	ABLE to solve real world problems using OOP techniques, understand the use of Abstract classes.
CO2	SOLVE problems using java collection framework and I/O classes
CO3	DEVELOP multithreaded applications with synchronization
CO4	DEVELOP applets for web applications. design GUI based applications

PC233CS Database System

Course outcomes:

CO1	Understand the mathematical foundations on which RDBMS are built
CO2	Model a set of requirements using the EER model, transform an ERR Model into a relational model and refine the relational model using theory of normalization.
CO3	Develop database application using SQL and EmbeddedSQL
CO4	Use the knowledge of organization and indexing to improve database application performance, and understand recovery mechanisms in RDBMS

PC232CS Computer Organization

Course outcomes:

CO1	Able to understand the basic components and the design of CPU, ALU, and Control Unit.
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CO2	Learn the basic elements and functions of 8086 microprocessors
CO3	Understand the instruction set of 8086 and use them to write assembly language programs.
CO4	Demonstrate fundamental understanding on the operation between the microprocessor and its interfacing devices.

CS501PC FLAT

Course outcomes:

CO1	Understand to employ finite state machines for modeling and solving computing problems.
CO2	Able to design context free grammars for formal languages.
CO3	Able to distinguish between decidability and undecidability.
CO4	Understand proficiency with mathematical tools and formal methods

CS502PC Software Engineering

Course outcomes:

CO1	Students will be able apply the basic concepts of software engineering
CO2	Students will be able to identify the significance of process models.
CO3	Students will be able to Analyze the principles of requirement Engineering
CO4	Students will be able to Create architectural design for a given project

CS503PC Data Communication & Computer Networks

Course outcomes:

CO1	Identify the issues and challenges in the architecture of a computer network.
CO2	Understand the ISO/OSI seven layers in a network.
CO3	Realize protocols at different layers of a network hierarchy.
CO4	Will get awareness about the structure and equipment of computer network structures.

CS515PE Web Programming

Course outcomes:

CO1	learn the skills for expressing syntax and semantics in formal notation
CO2	Able to apply a suitable programming paradigm for a given computing application

CO3	able to compare the features of various programming languages
CO4	Learn different scripting languages

EN508HS Advanced Communication Skills Lab

Course outcomes:

CO1	Acquire vocabulary and use it contextually.
CO2	Listen and speak effectively.
CO3	Develop proficiency in academic reading and writing.
CO4	Communicate confidently in formal and informal contexts.

CS505PC Software Engineering Lab

Course outcomes:

CO1	Ability to translate end-user requirements into system and software requirements
CO2	Ability to generate a high-level design of the system from the software requirements
CO3	Will have experience and/or awareness of testing problems
CO4	will be able to develop a simple testing report

CS603PC Algorithms Design& Analysis

Course outcomes:

CO1	To analyze performance of algorithms
CO2	To choose the appropriate data structure and algorithm design method for a specified application.
CO3	To understand how the choice of data structures and algorithm design methods impacts the performance of programs
CO4	To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound

CS615PE Software Testing Methodologies

Course outcomes:

CO1	Able to understand the purpose of testing and types of testing
CO2	Learn skills in software test automation and management using latest tools.
CO3	Able to evaluate regular expressions and learn logic testing.
CO4	Understand graph matrices and its applications

CS606PC Software Testing Methodologies Lab

Course outcomes:

CO1	To provide knowledge of Software Testing Methods.
CO2	To develop skills in software test automation and management using latest tools
CO3	Design and develop the best test strategies in accordance to the development model.
CO4	Able to develop bug free programs

CS701PC

DataMining

Course outcomes:

CO1	Able to Understand the need and importance of preprocessing techniques.
CO2	Able to Implement Similarity and dissimilarity techniques
CO3	Able to Analyze and evaluate performance of algorithms for Association Rules.
CO4	Able to Deploy Classification and Clustering algorithms

CS721PE PythonProgramming

Course outcomes:

CO1	Learn Syntax and Semantics and create Functions in Python
CO2	Understand Lists, Dictionaries and Regular expressions ,Handle Strings and Files in Python.
CO3	Implement Object Oriented Programming concepts in Python
CO4	Build Web Services and introduction to Network and Database Programming in Python.

CS734PE SPPM

Course outcomes:

CO1	Get knowledge of software economics, phases in the life cycle of software development
CO2	Analyze the major and minor milestones, artifacts and metrics from management and technical perspective
CO3	Design and develop software product using conventional and modern principles of software project management
CO4	Able for project organization, project control and process instrumentation

CS751PC PythonProgrammingLab

Course outcomes:

CO1	able to understand the basic concepts scripting and the contributions of scripting language
CO2	Able to explore the object oriented concepts, and the built in objects of Python.
CO3	To understand the high-performance programs
CO4	Able to create practical and contemporary applications.

CS862PE Modern Software Engineering

Course outcomes:

CO1	Examine the important of agile development and basics of XP
CO2	Apply the collaborating methods of Agile software development
CO3	Analyze and use the Bug free development of the software and release
CO4	Illustrate the mechanisms of adopting and implementing the agile software


Head of Department
HEAD

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Principal

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

course outcome

ENGINEERING MECHANICS

Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.

- Solve problem of bodies subjected to friction.
- Find the location of centroid and calculate moment of inertia of a given section.
- Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
- Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.

ELECTRICAL CIRCUIT ANALYSIS

After completion of this course, the student able to

- Apply network theorems for the analysis of electrical circuits.
- Obtain the transient and steady-state response of electrical circuits.
- Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
- Analyze two port circuit behavior.

ANALOG ELECTRONICS

After completion of this course, the student able to

- Know the characteristics, utilization of various components.
- Understand the biasing techniques
- Design and analyze various rectifiers, small signal amplifier circuits.
- Design sinusoidal and non-sinusoidal oscillators.
- A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits.

ELECTRICAL MACHINES – I

After completion of this course, the student able to

- Identify different parts of a DC machine & understand its operation
- Carry out different testing methods to predetermine the efficiency of DC machines
- Understand different excitation and starting methods of DC machines
- Control the voltage and speed of a DC machines
- Analyze single phase and three phase transformers circuits.

ELECTROMAGNETIC FIELDS

After completion of this course, the student able to



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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- Understand different excitation and starting methods of DC machines
- Control the voltage and speed of a DC machines
- Analyze single phase and three phase transformers circuits.

ELECTROMAGNETIC FIELDS

After completion of this course, the student able to

- To understand the basic laws of electromagnetism.
- To obtain the electric and magnetic fields for simple configurations under static conditions.
- To analyze time varying electric and magnetic fields.
- To understand Maxwell's equation in different forms and different media.
- To understand the propagation of EM waves.

ELECTRICAL MACHINES LAB – I

After completion of this course, the student able to

- Start and control the Different DC Machines.
- Assess the performance of different machines using different testing methods
- Identify different conditions required to be satisfied for self - excitation of DC Generators.
- Separate iron losses of DC machines into different components

ANALOG ELECTRONICS LAB

After completion of this course, the student able to

- Know the characteristics, utilization of various components.
- Understand the biasing techniques
- Design and analyze various rectifiers, small signal amplifier circuits.
- Design sinusoidal and non-sinusoidal oscillators.
- A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits.

ELECTRICAL CIRCUITS LAB

After completion of this course, the student able to

- Analyze complex DC and AC linear circuits
- Apply concepts of electrical circuits across engineering
- Evaluate response in a given network by using theorems

LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES

After completion of this course, the student able to

- Use the Laplace transforms techniques for solving ODE's
- Find the root of a given equation.

- Estimate the value for the given data using interpolation
- Find the numerical solutions for a given ODE's
- Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
- Taylor's and Laurent's series expansions of complex function

ELECTRICAL MACHINES – II

After completion of this course, the student able to

- Understand the concepts of rotating magnetic fields.
- Understand the operation of ac machines.
- Analyze performance characteristics of ac machines.

DIGITAL ELECTRONICS

After completion of this course, the student able to

- Understand working of logic families and logic gates.
- Design and implement Combinational and Sequential logic circuits.
- Understand the process of Analog to Digital conversion and Digital to Analog conversion.
- Be able to use PLDs to implement the given logical problem.

CONTROL SYSTEMS

After completion of this course, the student able to

- Understand the modeling of linear-time-invariant systems using transfer function and statespace representations.
- Understand the concept of stability and its assessment for linear-time invariant systems.
- Design simple feedback controllers.

POWER SYSTEM – I

After completion of this course, the student able to

- Understand the concepts of power systems.
- Understand the operation of conventional generating stations and renewable sources of electrical power.
- Evaluate the power tariff methods.
- Determine the electrical circuit parameters of transmission lines
- Understand the layout of substation and underground cables and corona.

DIGITAL ELECTRONICS LAB

After completion of this course, the student able to

- Understand working of logic families and logic gates.
- Design and implement Combinational and Sequential logic circuits.
- Understand the process of Analog to Digital conversion and Digital to Analog conversion.

- Be able to use PLDs to implement the given logical problem.

ELECTRICAL MACHINES LAB – II

After completion of this course, the student able to

- Assess the performance of different machines using different testing methods
- To convert the Phase from three phase to two phase and vice versa
- Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods
- Control the active and reactive power flows in synchronous machines
- Start different machines and control the speed and power factor

CONTROL SYSTEMS LAB

After completion of this course, the student able to

- How to improve the system performance by selecting a suitable controller and/or a compensator for a specific application
- Apply various time domain and frequency domain techniques to assess the system performance
- Apply various control strategies to different applications (example: Power systems, electrical drives etc)
- Test system controllability and observability using state space representation and applications of state space representation to various systems

POWER ELECTRONICS

After completion of this course, the student able to

- Understand the differences between signal level and power level devices.
- Analyze controlled rectifier circuits.
- Analyze the operation of DC-DC choppers.
- Analyze the operation of voltage source inverters.

POWER SYSTEM – II

After completion of this course, the student able to

- Analyze transmission line performance.
- Apply load compensation techniques to control reactive power
- Understand the application of per unit quantities.
- Design over voltage protection and insulation coordination
- Determine the fault currents for symmetrical and unbalanced faults

MEASUREMENTS AND INSTRUMENTATION

After completion of this course, the student able to

- Understand different types of measuring instruments, their construction, operation and

characteristics

- Identify the instruments suitable for typical measurements
- Apply the knowledge about transducers and instrument transformers to use them effectively.
- Apply the knowledge of smart and digital metering for industrial applications

HIGH VOLTAGE ENGINEERING

After completion of this course, the student able to

- Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials.
- Knowledge of generation and measurement of D. C., A.C., & Impulse voltages.
- Knowledge of tests on H. V. equipment and on insulating materials, as per the standards.
- Knowledge of how over-voltages arise in a power system, and protection against these overvoltages.

BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

After completion of this course, the student able to

- The students will understand the various Forms of Business and the impact of economic variables on the Business
- The Students can study the firm's financial position by analysing the Financial Statements of a Company.
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POWER SYSTEM SIMULATION LAB

After completion of this course, the student able to

- Perform various transmission line calculations
- Understand Different circuits time constants
- Analyze the experimental data and draw the conclusions.

POWER ELECTRONICS LAB

After completion of this course, the student able to

- Understand the operating principles of various power electronic converters.
- Use power electronic simulation packages& hardware to develop the power converters.
- Analyze and choose the appropriate converters for various applications

MEASUREMENTS AND INSTRUMENTATION LAB

After completion of this lab the student is able to

- to choose instruments
- test any instrument
- find the accuracy of any instrument by performing experiment
- calibrate PMMC instrument using D.C potentiometer

POWER SEMICONDUCTOR DRIVES

After completion of this course the student is able to

- Identify the drawbacks of speed control of motor by conventional methods.
- Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristics

merits and demerits

- Understand Ac motor drive speed–torque characteristics using different control strategies its merits and demerits
- Describe Slip power recovery schemes

SIGNALS AND SYSTEMS

Upon completing this course, the student will be able to

- Differentiate various signal functions.
- Represent any arbitrary signal in time and frequency domain.
- Understand the characteristics of linear time invariant systems.
- Analyze the signals with different transform technique

MICROPROCESSORS & MICROCONTROLLERS

Upon completing this course, the student will be able to

1. Understands the internal architecture, organization and assembly language programming of 8086 processors.
2. Understands the internal architecture, organization and assembly language programming of 8051/controllers
3. Understands the interfacing techniques to 8086 and 8051 based systems.
4. Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.

POWER SYSTEM PROTECTION

At the end of the course the student will be able to:

- Compare and contrast electromagnetic, static and microprocessor-based relays
- Apply technology to protect power system components.
- Select relay settings of over current and distance relays.
- Analyze quenching mechanisms used in air, oil and vacuum circuit breakers

POWER SYSTEM OPERATION AND CONTROL

At the end of the course the student will be able to:

- Understand operation and control of power systems.
- Analyze various functions of Energy Management System (EMS) functions.
- Analyze whether the machine is in stable or unstable position.
- Understand power system deregulation and restructuring

POWER SYSTEM LAB

After completion of this lab, the student will be able to

- Perform various load flow techniques
- Understand Different protection methods
- Analyze the experimental data and draw the conclusions.

SIGNALS AND SYSTEMS LAB

At the end of this course, students will demonstrate the ability to

- Understand the concepts of continuous time and discrete time systems.
- Analyse systems in complex frequency domain.

- Understand sampling theorem and its implications.

ENVIRONMENTAL SCIENCE

Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

DIGITAL SIGNAL PROCESSING

Upon completing this course, the student will be able to

- Understand the LTI system characteristics and Multirate signal processing.
- Understand the inter-relationship between DFT and various transforms.
- Design a digital filter for a given specification.
- Understand the significance of various filter structures and effects of round off errors

HVDC TRANSMISSION

After completion of this course the student is able to

- Compare EHV AC and HVDC system and to describe various types of DC links
- Analyze Graetz circuit for rectifier and inverter mode of operation
- Describe various methods for the control of HVDC systems and to perform power flow analysis in AC/DC systems
- Describe various protection methods for HVDC systems and classify Harmonics and design different types of filters

FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS

· The students understand the significance of Management in their Profession. The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course. The students can explore the Management Practices in their domain area.

ELECTRICAL & ELECTRONICS DESIGN LAB

After completion of course, student will be able to

- Get practical knowledge related to electrical
- Fabricate basic electrical circuit elements/networks
- Trouble shoot the electrical circuits
- Design filter circuit for application
- Get hardware skills such as soldering, winding etc.
- Get debugging skills.

POWER QUALITY AND FACTS

After completion of this course, the student will be able to:

- Know the severity of power quality problems in distribution system
- Understand the concept of voltage sag transformation from up-stream (higher voltages) to down-stream (lower voltage)
- Concept of improving the power quality to sensitive load by various mitigating custom power devices
- Choose proper controller for the specific application based on system requirements

- Understand various systems thoroughly and their requirements
- Understand the control circuits of Shunt Controllers SVC & STATCOM for various functions viz. Transient stability Enhancement, voltage instability prevention and power oscillation damping
- Understand the Power and control circuits of Series Controllers GCSC, TSSC and TCSC

ELECTRICAL DISTRIBUTION SYSTEMS

After completion of this course, the student able to

- distinguish between transmission, and distribution line and design the feeders
- compute power loss and voltage drop of the feeders
- design protection of distribution systems
- understand the importance of voltage control and power factor improvement



Head of Department

HEAD
 Dept. of Electrical & Electronics Engg.
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 OF ENGINEERING & TECHNOLOGY
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Principal