Narasu's Sarathy
Institute of Technology
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Salem Bengaluru Highway NH - 7, Poosaripatty, Kadayampatty Taluk, Salem - 636305.
Admin Office: 93449-72274, Admission Cell: 93449-72275,73977-56003,
admin@nsit.edu.in,www.nsit.edu.in

COURSE OUTCOMES (COs)

FOR ALL PROGRAMMES

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COURSE OUTCOMES (COs)

DEPARTMENT OF CIVIL ENGINEERING

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COURSE OUTCOMES (COs)

DEPARTMENT OF CIVIL ENGINEERING

2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

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DEPARTMENT OF CIVIL ENGINEERING

VISION

Impart knowledge and excellence in Civil engineering and technology with global perspectives and make the students ethically strong engineers to build our nation.

MISSION

- To provide civil engineers with high caliber, technical skills and ethical values to serve the society and nation.
- To promote innovation in the minds of budding engineers to face the challenges of future
- To make the department as center of excellence in the field of civil engineering and allied research.
- To provide knowledge based consultancy services to the community in all areas of civil engineering

PROGRAM SPECIFIC OUTCOMES (PSOs):

The B.E. Degree Programme in Civil Engineering is offered in the department with the following programme specific objectives:

1. The Graduates of this Programme with proficiency in mathematics and physical sciences will excel in the core areas of civil engineering such as structural, environmental and water resources engineering.
2. The graduates will plan, produce detailed drawings, write specification, and prepare cost estimates.
3. The graduates will interact with stakeholders effectively and execute quality construction work applying necessary tools

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PROGRAMME EDUCATIONAL OBJECTIVES:

I. To prepare students for successful careers in Civil Engineering field that meets the needs of Indian and multinational companies.
II. To develop the confidence and ability among students to synthesize data and technical concepts and thereby apply it in real world problems.
III. To develop students to use modern techniques, skill and mathematical engineering tools for solving problems in Civil Engineering.
IV. To provide students with a sound foundation in mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyse engineering problems and to prepare them for graduate studies.
V. To promote students to work collaboratively on multi-disciplinary projects and make them engage in life-long learning process throughout their professional life.

PROGRAMME OUTCOMES:

On successful completion of the programme,

a. Graduates will demonstrate knowledge of mathematics, science and engineering.
b. Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
c. Graduate will demonstrate an ability to design and conduct experiments, analyze and interpret data.
d. Graduates will demonstrate an ability to design a system, component or process as per needs and specifications.
e. Graduates will demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks.
f. Graduate will demonstrate skills to use modern engineering tools, software and equipment to analyze problems.
g. Graduates will demonstrate knowledge of professional and ethical responsibilities.
h. Graduate will be able to communicate effectively in both verbal and written form.

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i. Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.

j. Graduate will develop confidence for self-education and ability for life-long learning.

PO 1: Engineering knowledge Apply knowledge of mathematics, science and engineering fundamentals and Production and Industrial Engineering specialization to the solution of complex Production and Industrial Engineering problems.

PO 2: Problem Analysis Identify, formulate, research literature and analyze complex Production and Industrial Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3: Design/ Development of Solutions Design solutions for complex Engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO 4: Conduct investigations of complex Engineering Problems Use research-based knowledge and research methods including analysis, interpretation of data and synthesis of information to provide valid conclusions.

PO 5: Modern Tool Usage Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The Engineer and Society Apply contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO 7: Environment and Sustainability Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9: Individual and Team Work Function effectively as an individual, and as a member or

leader in diverse teams and in multi-disciplinary settings.

PO 10: Communication Communicate effectively on complex Engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO 11: Project Management and Finance Demonstrate knowledge and understanding of Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life Long Learning Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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DEPARTMENT OF CIVIL ENGINEERING	
REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	HS8151 - Communicative English
CO'S	**COURSE OUTCOMES**
CO1	Students will acquire wide knowledge in all the four skills such as listening, speaking, reading and writing
CO2	Students will be able to write effectively for a variety of professional and social settings.
CO3	Students will be able to share ideas and concepts in proper pronunciation, structure, appropriate use and style of the English Language as well as the application areas of English communication
CO4	Students will be able to prepare, organize, and deliver an engaging oral presentation.
CO5	Students will become active readers who can articulate their own interpretations with an awareness and curiosity for other perspectives.
SUBJECT CODE & NAME:	MA8151 -Engineering Mathematics - I
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To apply both the limit definition and rules of differentiation to differentiate functions.
CO2	To apply Differentiation in Maxima and Minima problems
CO3	To Evaluate integrals both by using Riemann's and the fundamental theorem of calculus
CO4	To compute multiple integrals, area, volume, integrals in polar coordinates in addition to change of order and change of variables
CO5	To evaluate the integrals using techniques of integration, such as substitution, partial fractions and integration by parts

2.6 Student Performance and Learning Outcomes

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SUBJECT CODE & NAME:	PH8151 - Engineering Physics
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Understand the elastic behavior and thermal properties of materials.
CO2	Understand the properties and applications of wave and fiber optics
CO3	Understand thermal properties of the material.
CO4	Understand Quantum mechanical behavior of the material
CO5	Understand the crystal structure and growing methods of crystal
SUBJECT CODE & NAME:	CY8151 - Engineering Chemistry
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To Know and develop innovative methods to produce soft water for boiler feed by various treatment process.
CO2	Explain role of adsorption phenomena and various catalytic types and its key properties
CO3	Students able to know about significance and properties of alloy making and its application on phase diagram.
CO4	To explain about analysis and manufacture of various types of fuel.
CO5	To Know about the importance and application of energy sources and energy storage devices.
SUBJECT CODE & NAME:	GE8151 - Problem Solving and Python Programming
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs.
CO3	Structure simple Python programs for solving problems.
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries
CO6	Read and write data from/to files in Python Programs.
SUBJECT CODE & NAME:	GE8152 - Engineering Graphics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform Freehand Sketching Of Basic Geometrical Constructions And Multiple Views Of Objects and conic sections.
CO2	Develop Orthographic Projections Of Lines And Plane Surfaces
CO3	Draw projections of solids
CO4	Draw projections of development of surfaces

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CO5	Visualize and to project isometric and perspective sections of simple solids
SUBJECT CODE & NAME:	GE8161- Problem Solving and Python Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops.
CO3	Develop Python programs step-wise by defining functions and calling them.
CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python.
SUBJECT CODE & NAME:	BS8161-Physics and Chemistry Laboratory
CO'S	**COURSE OUTCOMES**
CO1	Student will have knowledge to Analyze the particle size & acceptance ankle using laser.
CO2	Student will be able to Apply the principle of ultrasonic interferometer
CO3	Student will be able to understand the principles of spectrometer grating
CO4	Students can Analyze the thermal conductivity of a bad conductor
CO5	Student will be able to Apply the elastic behavior of material
REGULATION & SEMESTER:	**2017 - II**
SUBJECT CODE & NAME:	HS8251 - Technical English
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Read various types of texts adapting different reading strategies
CO2	Write letters and reports effectively in formal and informal situations.
CO3	Speak confidently and communicate with others effectively in order to improve their interview skills.
CO4	Use the language perfectly without grammatical errors and by using a wide range of vocabulary.
CO5	Use the technical information properly according to business situations.
SUBJECT CODE & NAME:	MA8251- Engineering Mathematics - II
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To understand the concept of Eigen values and Eigen vectors,

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	diagonalization of Matrix, symmetric matrices, positive definite matrices and similar matrices
CO2	To evaluate Gradient, Divergence and Curl of a Vector point functions and related identities.
CO3	To evaluate a Line, Surface and Volume integrals by using Gauss, Stokes and Green's Theorems and their verification.
CO4	To understand the concept of Analytic functions, conformal mapping and Complex integration
CO5	To understand the concept of Laplace Transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients
SUBJECT CODE & NAME:	PH8201 – Physics for civil engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the phase diagrams.
CO2	Understand the properties, preparation and applications of ferrous alloys
CO3	Understand the mechanical properties materials .
CO4	Understand properties and applications of the magnetic, dielectric and super conducting materials
CO5	Understand the properties,prepartion methods and applications of new materials
SUBJECT CODE & NAME:	BE8251 Basic Electrical, Electronics and Instrumentation Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand electric circuits and working principle of electrical machines
CO2	understanding the concept of various electronic devices
CO3	choose appropriate instruments for electrical measurements for a specific application
SUBJECT CODE & NAME:	GE8291 Environmental Science and Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To Know about the Scope and important of Environmental Science and values of Biodiversity.
CO2	Students will capable to identify Problems related to various Environmental Pollutions and its Control & Prevention.
CO3	Students will understand the Natural resources and sensible use of resources for sustainable lifestyles

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CO4	To acquire the knowledge about social problems related to energy and the environmental production.
CO5	To know about the importance of population explosion & family welfare programmer and application of information technology in environment.
SUBJECT CODE & NAME:	GE8292 Engineering Mechanics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Illustrate the statics of particles in equilibrium
CO2	Analyze the rigid body in equilibrium
CO3	Evaluate the properties of surfaces and solids
CO4	Calculate dynamic forces exerted in rigid body
CO5	Determine the friction and its effects, rigid body dynamics
SUBJECT CODE & NAME:	GE8261 Engineering Practices Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipment to join the structures.
CO3	Carry out the basic machining operations
CO4	Make the sheet metal models
CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO6	Carry out basic home electrical works and appliances
CO7	Measure the electrical quantities
CO8	Elaborate on the components, gates, soldering practices.
SUBJECT CODE & NAME:	CE8211 Computer aided building drawing
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to determine the speed characteristic of different building drawings
CO2	Ability to design drawing involving section and elevations
CO3	Ability to use procedure follow in design.

2.6 Student Performance and Learning Outcomes

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REGULATION & SEMESTER:	2017 - III
SUBJECT CODE & NAME:	MA8353 Transforms and Partial Differential Equations
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Understand how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
CO5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
SUBJECT CODE & NAME:	CE8301 Strength of Materials-I
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Apply basic equation of torsion in design of circular shafts and helical springs.
CO2	Determine shear force and bending moment in beam.
CO3	understanding the force of stress, strain and deformation of solids.
CO4	Derive
CO5	Calculate the pin jointed and space trusses.
SUBJECT CODE & NAME:	CE8302 Fluid Mechanics
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Apply Mathematical knowledge to predict the properties and characteristics of a fluid.
CO2	Analyse and calculate major and minor losses associated with pipe flow in piping networks.
CO3	Mathematically predict the nature of physical quantities
CO4	Critically analyse the performance of pumps
CO5	Critically analyse the performance of turbines

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SUBJECT CODE & NAME:	CE8351 Surveying
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the uses of different surveying instruments and mapping
CO2	Compare the different measuring horizontal and vertical instrument.
CO3	Concept of astronomical surveying and methods to determine time, longitudinal, latitude and azimuth
CO4	Work on various methods of levelling
CO5	Methods and principle of modern surveying.
SUBJECT CODE & NAME:	CE8391 Construction materials
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the typical and potential applications of lime, cement and aggregate.
CO2	Compare the properties of most common and advanced building materials.
CO3	Able to explain the different types of placing and making of concrete elements.
CO4	Application of timber and other materials.
CO5	Methods and importance of modern material for construction.
SUBJECT CODE & NAME:	CE8392 Engineering Geology
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the methods of study on geological agencies.
CO2	Compare the properties of geological of rock structures.
CO3	Able to explain the different types of rock, their distribution and uses
CO4	Application of geological of rock structures.
SUBJECT CODE & NAME:	CE8311 Construction materials laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	The required knowledge in the area of testing of construction materials and components of construction elements.
SUBJECT CODE & NAME:	CE8361 Surveying laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	The required knowledge in the basic survey instruments, various engineering project and location of site etc.

2.6 Student Performance and Learning Outcomes

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SUBJECT CODE & NAME:	HS8381 Interpersonal Skills / Listening & Speaking
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

REGULATION & SEMESTER:	2017 - IV
COURSE CODE & NAME:	MA8491 Numerical Methods
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand how to solve the given standard numerical methods
CO2	Solve differential equations using numerical methods analysis which plays a vital role in engineering applications.
CO3	Apply the numerical techniques of differentiation and integration for engineering problem.
CO4	Solve the partial and ordinary differential equations with initial and boundary condition by using certain techniques with engineering application.
COURSE CODE & NAME:	CE8401 Construction techniques and practices
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Follow the different construction techniques and structural system
CO2	The required knowledge in the construction of various types of super structures.
COURSE CODE & NAME:	CE8402 Strength of Materials-II
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Apply the strain energy principle
CO2	Determine the analysis of types of beams.
CO3	understanding the principal stress on structures.
CO4	Derive the various types of theory of failures
CO5	Calculate the unsymmetrical sections.

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COURSE CODE & NAME:	CE8403 Applied hydraulics engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply Mathematical knowledge to predict the properties and characteristics of an open channels.
CO2	Analyze and calculate the various flows in steady state conditions
CO3	Mathematically predict the nature of flow in different cross section.
CO4	Critically analyses the performance of pumps
CO5	Critically analyses the performance of turbines
COURSE CODE & NAME:	CE8404 Concrete technology
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain different requirements of cement, aggregate and water for making concrete.
CO2	The concept and procedure of mix design as per IS methods.
CO3	Application and maintains of special concrete
CO4	Distinguish various methods of fresh and hardened state concrete and effects.
COURSE CODE & NAME:	CE8491 Soil mechanics
COS	**COURSE OUTCOMES**
	Student will be,
CO1	Able to understand the basics of soil mechanic and properties
CO2	Able to analyze characteristics of different types IS sieves
CO3	Able to explain the different types of soil solids
CO4	Ability to use the measurement equipment's of soil.
CO5	Apply the concept of testing of soil properties.
COURSE CODE & NAME:	CE8481 Strength of materials laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	The required knowledge in the testing of materials and components of structural elements.
COURSE CODE & NAME:	CE8461 Hydraulic Engineering Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to use the measurement flow in pipes and determine friction losses
CO2	Ability to do performance develop characteristics of pump and turbine

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COURSE CODE & NAME:	HS8461 ADVANCED READING AND WRITINGY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write different types of essays.
CO2	Write winning job applications.
CO3	Read and evaluate texts critically.
CO4	Display critical thinking in various professional contexts
REGULATION & SEMESTER:	**2017 - V**
COURSE CODE & NAME:	CE8501 Design of Reinforced cement concrete elements
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the various design methodology for the design RC elements
CO2	Design the various types of slabs and staircase by limit state method
CO3	To analysis and design of footing, column design for axial, uniaxial and biaxial eccentric loading
COURSE CODE & NAME:	CE8502 Structural analysis-I
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the concept of matrix stiffness methods and analysis of continuous beam, pin joined trusses and rigid plane frame
CO2	Analysis the continuous beams and rigid frame by slope deflection methods and by using strain energy methods
CO3	Solve problems for beams and sway, non-sway structures
COURSE CODE & NAME:	EN8491 Water supply Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the water quality criteria and standard, their relation to public health
CO2	Describe the constructional and operational features of water supply system
CO3	Explain the structure of drinking water supply system, including water transport, treatment and distribution
CO4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.

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COURSE CODE & NAME:	CE8591 Foundation Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the site investigation, methods and sampling
CO2	Get knowledge on bearing capacity and testing methods
CO3	Design shallow foundation
CO4	Determine the load carrying capacity, settlement of pile foundation
CO5	Determine the earth pressure on retaining wall and analysis for stability
COURSE CODE & NAME:	CE8071 Disaster Management
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the different types of disaster, causes and their impact on environment and society.
CO2	Assess vulnerability and various methods of risk reduction measures as well as mitigation
CO3	Draw the hazard and vulnerability profile of India, scenarios in the Indian context, disaster damage assessment and management
COURSE CODE & NAME:	OAI551 Environmental and Agriculture
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	The of environment in the current practices of agriculture and concern of sustainability, especially in the context of climate change and emerging global issues
CO2	Ecological context of agriculture and its concern will be understand
COURSE CODE & NAME:	CE8511 Soil mechanics Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Able to conduct test to determine both the index and engineering properties of soils and to characterize the soil based on their properties
COURSE CODE & NAME:	CE8512 Water and waste water analysis laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Quantity the pollutant concentration in water and wastewater
CO2	Suggest the types of treatment required and amount of dosage required for the treatment
CO3	Examine the conditions for the growth of micro- organism

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COURSE CODE & NAME:	CE8513 Survey camp
COS	**COURSE OUTCOMES**
CO1	The required knowledge in the basic survey instruments, various engineering project and location of site etc.
REGULATION & SEMESTER:	**2017- VI**
COURSE CODE & NAME:	CE8601 Design of steel structural elements
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the concepts of various design philosophies of axial loaded column and column base connection
CO2	Design common bolted and welded connection for steel structure in tension members and design of laterally restrained and unrestrained steel beams.
COURSE CODE & NAME:	CE8602 Structural analysis-II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand Muller Breslau principle and draw the influence lines for statically indeterminate beams.
CO2	Analysis the three hinged ,two hinged and fixed arches.
CO3	Analysis the suspension bridge with stiffing girders.
CO4	Concept of plastic analysis and the method of analyzing beams and rigid frames.
COURSE CODE & NAME:	CE8603 Irrigation Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the methods and management of irrigation and methods of irrigation including canal irrigation
CO2	Get knowledge and skills on crop water requirement
CO3	Use of water management on irrigation system.
COURSE CODE & NAME:	CE8604 Highway Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Get knowledge on planning and alignment of highway
CO2	Geometric design of highway and design flexible and rigid pavement
CO3	Explain the procedure for highway construction materials, properties,

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	testing methods.
CO4	Understand the concept of pavement management system, evaluation of distress and maintenance of pavement.
COURSE CODE & NAME:	EN8592 Wastewater Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the water quality criteria and standard, their relation to public health
CO2	Describe the constructional and operational features of water supply system for disposal of sewage.
CO3	Explain the structure of drinking water supply system, including water transport, treatment and distribution
CO4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.
CO5	
COURSE CODE & NAME:	CE8005 Air pollution and control Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding of the nature and characteristics of air pollutants, noise pollution.
CO2	Basic concept of air quality management
CO3	Ability to select control equipment
CO4	Ability to ensure, control and preventive measures.
COURSE CODE & NAME:	CE8611 Highway Engineering Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	The required knowledge in the various pavement materials through relevant test.
COURSE CODE & NAME:	CE8612 Irrigation and Environmental Engineering Drawing
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Able to design and draw various units of Municipal water treatment plants and sewage treatment plants.
COURSE CODE & NAME:	HS8581 Professional communication
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Make effective presentation and group discussions

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CO2	Develop adequate soft skills required for the workplace
REGULATION & SEMESTER:	**2017 - VII**
COURSE CODE & NAME:	CE8701 Estimation, costing and valuation Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Estimate the quantities for building
CO2	Rate analysis for all building work, canal, Road and cost estimate
CO3	Understand types of specification, principles for report preparation, tender notices types.
CO4	Evaluate valuation for building and land.
COURSE CODE & NAME:	CE8702 Railway,Airport,Docks and Harbour Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the methods of route and design elements in Railway planning and construction.
CO2	Understand of planning techniques
CO3	Understanding of the various features in harbour engineering
CO4	Understanding of controlling system
COURSE CODE & NAME:	CE8703 Structural design and drawing
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and draw reinforced concrete cantilever and counterfort retaining wall
CO2	Design and draw flat slab as per code provision
CO3	Design and draw steel bridge and steel water tanks
CO4	Design and detail the various steel trusses and gantry girders.
COURSE CODE & NAME:	CE8012 Construction planning and scheduling
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand basic concept of construction planning
CO2	Schedule the construction activities
CO3	Forecast and control the cost in a construction
CO4	Understand the quality control and safety during construction
CO5	Organize information in centralized database management system
COURSE CODE & NAME:	OML751 Testing of Materials
COS	**COURSE OUTCOMES**

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	Student will be able to,
CO1	Identify suitable testing techniques to inspect industrial component
CO2	Ability to use the different techniques and know its application and limitations.
COURSE CODE & NAME:	CE8711 Creative and Innovation project
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology
COURSE CODE & NAME:	CE8712 Industrial training
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	the intricacies of implementation textbook knowledge into practice
CO2	The concept of developments and implementation of new techniques.

REGULATION & SEMESTER:	**2017 - VIII**
COURSE CODE & NAME:	GE8076 Professional Ethics in Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Discuss the ethical issues related to engineering and realize the responsibilities and rights in the society
COURSE CODE & NAME:	CE8020 Maintenance, Repair and Rehabilitation of structures
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	The importance of maintenance and assessment method of distressed structures
CO2	The techniques for repair rand protection methods
CO3	Repair, rehabilitation and retrofitting of structures and demolition methods.
COURSE CODE & NAME:	CE8811 Project Work
COS	**COURSE OUTCOMES**
CO1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology

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COURSE OUTCOMES (COs)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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COURSE OUTCOMES (COs)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION

- To prosper as a competent professional for serving industry and Nation's socio-economic progress.

MISSION

- To foster computing skills with an emphasis on professional competency, interpersonal development and ethics.
- To enrich the aptitude of the students for facing the recent challenges of industry and society.
- To inculcate the students for pursuing careers in industry, academic and research.

PROGRAM SPECIFIC OUTCOMES (PSOs):

1. To analyze, design and develop computing solutions by applying foundational concepts of Computer Science and Engineering.
2. To apply software engineering principles and practices for developing quality software for scientific and business applications.
3. To adapt to emerging Information and Communication Technologies (ICT) to innovate ideas and solutions to existing/novel problems.

PROGRAMME EDUCATIONAL OBJECTIVES:

1. To enable graduates to pursue higher education and research, or have a successful career in industries associated with Computer Science and Engineering, or as entrepreneurs.

2. To ensure that graduates will have the ability and attitude to adapt to emerging technological changes

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PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to

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comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING	
REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	HS8151 - Communicative English
CO'S	**COURSE OUTCOMES**
CO1	Students will acquire wide knowledge in all the four skills such as listening, speaking, reading and writing
CO2	Students will be able to write effectively for a variety of professional and social settings.
CO3	Students will be able to share ideas and concepts in proper pronunciation, structure, appropriate use and style of the English Language as well as the application areas of English communication
CO4	Students will be able to prepare, organize, and deliver an engaging oral presentation.
CO5	Students will become active readers who can articulate their own interpretations with an awareness and curiosity for other perspectives.
SUBJECT CODE & NAME:	MA8151 -Engineering Mathematics - I
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To apply both the limit definition and rules of differentiation to differentiate functions.
CO2	To apply Differentiation in Maxima and Minima problems
CO3	To Evaluate integrals both by using Riemann's and the fundamental theorem of calculus
CO4	To compute multiple integrals, area, volume, integrals in polar coordinates in addition to change of order and change of

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	variables
CO5	To evaluate the integrals using techniques of integration, such as substitution, partial fractions and integration by parts
SUBJECT CODE & NAME:	PH8151 - Engineering Physics
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Understand the elastic behavior and thermal properties of materials.
CO2	Understand the properties and applications of wave and fiber optics
CO3	Understand thermal properties of the material.
CO4	Understand Quantum mechanical behavior of the material
CO5	Understand the crystal structure and growing methods of crystal
SUBJECT CODE & NAME:	CY8151 - Engineering Chemistry
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To Know and develop innovative methods to produce soft water for boiler feed by various treatment process.
CO2	Explain role of adsorption phenomena and various catalytic types and its key properties
CO3	Students able to know about significance and properties of alloy making and its application on phase diagram.
CO4	To explain about analysis and manufacture of various types of fuel.
CO5	To Know about the importance and application of energy sources and energy storage devices.
SUBJECT CODE & NAME:	GE8151 - Problem Solving and Python Programming
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs.
CO3	Structure simple Python programs for solving problems.
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries
CO6	Read and write data from/to files in Python Programs.
SUBJECT CODE & NAME:	GE8152 - Engineering Graphics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform Freehand Sketching Of Basic Geometrical Constructions And Multiple Views Of Objects and conic sections.

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CO2	Develop Orthographic Projections Of Lines And Plane Surfaces
CO3	Draw projections of solids
CO4	Draw projections of development of surfaces
CO5	Visualize and to project isometric and perspective sections of simple solids
SUBJECT CODE & NAME:	GE8161- Problem Solving and Python Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops.
CO3	Develop Python programs step-wise by defining functions and calling them.
CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python.
SUBJECT CODE & NAME:	BS8161-Physics and Chemistry Laboratory
CO'S	**COURSE OUTCOMES**
CO1	Student will have knowledge to Analyze the particle size & acceptance ankle using laser.
CO2	Student will be able to Apply the principle of ultrasonic interferometer
CO3	Student will be able to understand the principles of spectrometer grating
CO4	Students can Analyze the thermal conductivity of a bad conductor
CO5	Student will be able to Apply the elastic behavior of material
REGULATION & SEMESTER:	**2017 - II**
SUBJECT CODE & NAME:	HS8251 - Technical English
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Read technical texts and write area- specific texts effortlessly.
CO2	Listen and comprehend lectures and talks in their area of specialization successfully.
CO3	Speak appropriately and effectively in varied formal and informal contexts.
CO4	Write reports and winning job applications.

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SUBJECT CODE & NAME:	MA8251- Engineering Mathematics - II
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To understand the concept of Eigen values and Eigen vectors, diagonalization of Matrix, symmetric matrices, positive definite matrices and similar matrices
CO2	To evaluate Gradient, Divergence and Curl of a Vector point functions and related identities.
CO3	To evaluate a Line, Surface and Volume integrals by using Gauss, Stokes and Green's Theorems and their verification.
CO4	To understand the concept of Analytic functions, conformal mapping and Complex integration
CO5	To understand the concept of Laplace Transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients
SUBJECT CODE & NAME:	PH8252 - PHYSICS FOR INFORMATION SCIENCE
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the phase diagrams.
CO2	Understand the properties, preparation and applications of ferrous alloys
CO3	Understand the mechanical properties materials.
CO4	Understand properties and applications of the magnetic, dielectric and super conducting materials
CO5	Understand the properties, preparation methods and applications of new materials
SUBJECT CODE & NAME:	BE8255 Basic Electrical, Electronics and Measurement Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Discuss the essentials of electric circuits and analysis.
CO2	Discuss the basic operation of electric machines and transformers
CO3	Introduction of renewable sources and common domestic loads.
CO4	Introduction to measurement and metering for electric circuits.
SUBJECT CODE & NAME:	GE8291 ENVIRONMENTAL SCIENCE AND ENGINEERING
CO'S	**COURSE OUTCOMES**

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	Student will be able to,
CO1	Public awareness of environmental is at infant stage.
CO2	Ignorance and incomplete knowledge has lead to misconceptions
CO3	Development and improvement in std. of living has lead to serious environmental disasters
SUBJECT CODE & NAME:	CS8251 Programming in C
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop simple applications in C using basic constructs
CO2	Design and implement applications using arrays and strings
CO3	Develop and implement applications in C using functions and pointers.
CO4	Develop applications in C using structures.
CO5	Design applications using sequential and random access file processing.
SUBJECT CODE & NAME:	GE8261 Engineering Practices Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipment's to join the structures. Carry out the basic machining operations
CO3	Make the sheet metal models
CO4	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO5	Carry out basic home electrical works and appliances
CO6	Measure the electrical quantities
CO7	Elaborate on the components, gates, soldering practices.
SUBJECT CODE & NAME:	**CS8261 C Programming Laboratory**
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop C programs for simple applications making use of basic constructs, arrays and strings.
CO2	Develop C programs involving functions, recursion, pointers, and structures.
CO3	Design applications using sequential and random access file processing.

2.6 Student Performance and Learning Outcomes

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REGULATION & SEMESTER:	2017 - III
SUBJECT CODE & NAME:	MA8351 Discrete Mathematics
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Apply knowledge of the concepts needed to test the logic of a program.
CO2	Understanding in identifying structures on many levels.
CO3	Aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
CO4	Aware of the counting principles.
CO5	Exposed to concepts and properties of algebraic structures such as groups, rings and fields.
SUBJECT CODE & NAME:	CS8351 Digital Principles and System Design
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Simplify Boolean functions using KMap
CO2	Design and Analyze Combinational and Sequential Circuits
CO3	Implement designs using Programmable Logic Devices
CO4	Write HDL code for combinational and Sequential Circuits
SUBJECT CODE & NAME:	CS8391 Data Structures
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Implement abstract data types for linear data structures.
CO2	Apply the different linear and non-linear data structures to problem solutions.
CO3	Critically analyze the various sorting algorithms.
SUBJECT CODE & NAME:	CS8392 Object Oriented Programming
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Develop Java programs using OOP principles
CO2	Develop Java programs with the concepts inheritance and interfaces
CO3	Build Java applications using exceptions and I/O streams
CO4	Develop Java applications with threads and generics classes
CO5	Develop interactive Java programs using swings
SUBJECT CODE &	EC8395 - COMMUNICATION ENGINEERING

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NAME:	
CO'S	**COURSE OUTCOMES**
CO1	Ability to comprehend and appreciate the significance and role of this course in the present contemporary world
CO2	Apply analog and digital communication techniques.
CO3	Use data and pulse communication techniques.
CO4	Develop Java applications with threads and generics classes Analyse Source and Error control coding.
SUBJECT CODE & NAME:	CS8381 Data Structures Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write functions to implement linear and non-linear data structure operations
CO2	Suggest appropriate linear / non-linear data structure operations for solving a given problem
CO3	Appropriately use the linear / non-linear data structure operations for a given problem
CO4	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval
SUBJECT CODE & NAME:	CS8383 Object Oriented Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
CO2	Develop and implement Java programs with array list, exception handling and multithreading.
CO3	Design applications using file processing, generic programming and event handling.
SUBJECT CODE & NAME:	CS8382 Digital Systems Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Implement simplified combinational circuits using basic logic gates
CO2	Implement combinational circuits using MSI devices
CO3	Implement sequential circuits like registers and counters
CO4	Simulate combinational and sequential circuits using HDL
SUBJECT CODE &	HS8381 Interpersonal Skills/Listening & Speaking

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NAME:	
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

REGULATION & SEMESTER:	**2017 - IV**
COURSE CODE & NAME:	MA8402 - PROBABILITY AND QUEUING THEORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
CO2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
CO3	Apply the concept of random processes in engineering disciplines
CO4	Acquire skills in analyzing queueing models
CO5	Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner
COURSE CODE & NAME:	CS8491 Computer Architecture
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the basics structure of computers, operations and instructions.
CO2	Design arithmetic and logic unit.
CO3	Understand pipelined execution and design control unit.
CO4	Understand parallel processing architectures.
CO5	Understand the various memory systems and I/O communication.
COURSE CODE & NAME:	CS8492 Database Management Systems
COS	**COURSE OUTCOMES**
	Student will be able to,

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CO1	Classify the modern and futuristic database applications based on size and complexity
CO2	Map ER model to Relational model to perform database design effectively
CO3	Write queries using normalization criteria and optimize queries
CO4	Compare and contrast various indexing strategies in different database systems
CO5	Appraise how advanced databases differ from traditional databases.
COURSE CODE & NAME:	CS8451 Design and Analysis of Algorithms
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design algorithms for various computing problems.
CO2	Analyze the time and space complexity of algorithms.
CO3	Critically analyze the different algorithm design techniques for a given problem.
CO4	Modify existing algorithms to improve efficiency.
COURSE CODE & NAME:	CS8493 Operating Systems
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze various scheduling algorithms.
CO2	Understand deadlock, prevention and avoidance algorithms.
CO3	Compare and contrast various memory management schemes.
CO4	Understand the functionality of file systems.
CO5	Perform administrative tasks on Linux Servers.
CO6	Compare iOS and Android Operating Systems.
COURSE CODE & NAME:	CS8494 - SOFTWARE ENGINEERING
COS	**COURSE OUTCOMES**
	Student will be,
CO1	Identify the key activities in managing a software project
CO2	Compare different process models
CO3	Concepts of requirements engineering and Analysis Modeling
CO4	Apply systematic procedure for software design and deployment
CO5	Compare and contrast the various testing and maintenance
CO6	Manage project schedule, estimate project cost and effort required.

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COURSE CODE & NAME:	CS8481 Database Management Systems Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Use typical data definitions and manipulation commands.
CO2	Design applications to test Nested and Join Queries
CO3	Implement simple applications that use Views
CO4	Implement applications that require a Front-end Tool
CO5	Critically analyze the use of Tables, Views, Functions and Procedures

COURSE CODE & NAME:	CS8461 Operating Systems Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Compare the performance of various CPU Scheduling Algorithms
CO2	Implement Deadlock avoidance and Detection Algorithms
CO3	Implement Semaphores
CO4	Create processes and implement IPC
CO5	Analyze the performance of the various Page Replacement Algorithms
CO6	Implement File Organization and File Allocation Strategies
COURSE CODE & NAME:	HS8461 Advanced Reading and Writing
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write different types of essays.
CO2	Write winning job applications.
CO3	Read and evaluate texts critically.
CO4	Display critical thinking in various professional contexts.
REGULATION & SEMESTER:	**2017 - V**
COURSE CODE & NAME:	MA8551 Algebra and Number Theory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.
CO2	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
CO3	Demonstrate accurate and efficient use of advanced algebraic techniques.
CO4	Demonstrate their mastery by solving non - trivial problems related to

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	the concepts, and by proving simple theorems about the, statements proven by the text.
CO5	Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.
COURSE CODE & NAME:	CS8591 Computer Networks
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the basic layers and its functions in computer networks.
CO2	Evaluate the performance of a network.
CO3	Understand the basics of how data flows from one node to another.
CO4	Analyze and design routing algorithms.
CO5	Design protocols for various functions in the network.
CO6	Understand the working of various application layer protocols
COURSE CODE & NAME:	EC8691 Microprocessors and Microcontrollers
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand and execute programs based on 8086 microprocessor.
CO2	Design Memory Interfacing circuits.
CO3	Design and interface I/O circuits.
CO4	Design and implement 8051 microcontroller based systems.
COURSE CODE & NAME:	CS8501 - THEORY OF COMPUTATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Construct automata, regular expression for any pattern.
CO2	Write Context free grammar for any construct.
CO3	Design Turing machines for any language
CO4	Propose computation solutions using Turing machines
CO5	Derive whether a problem is decidable or not.
COURSE CODE & NAME:	CS8592 - OBJECT ORIENTED ANALYSIS AND DESIGN
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Express software design with UML diagrams.
CO2	Design software applications using OO concepts

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CO3	Identify various scenarios based on software requirements
CO4	Transform UML based software design into pattern based design using design patterns
CO5	Understand the various testing methodologies for OO software
COURSE CODE & NAME:	OTL553 – TELECOMMUNICATION NETWORK MANAGEMENT
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and analyze of fault management.
CO2	Analyze the common management information protocol specifications.
CO3	Design and analyze of management information model.
CO4	Design the simple network management protocol.
CO5	Design the various types of network management tools.
COURSE CODE & NAME:	EC8681 Microprocessors and Microcontrollers Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
CO2	Interface different I/Os with processor
CO3	Generate waveforms using Microprocessors
CO4	Execute Programs in 8051
CO5	Explain the difference between simulator and Emulator
COURSE CODE & NAME:	CS8581 Networks Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Implement various protocols using TCP and UDP.
CO2	Compare the performance of different transport layer protocols.
CO3	Use simulation tools to analyze the performance of various network protocols.
CO4	Analyze various routing algorithms.
CO5	Implement error correction codes.
COURSE CODE & NAME:	CS8582 - OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY

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	Student will be able to,
CO1	Perform OO analysis and design for a given problem specification.
CO2	Identify and map basic software requirements in UML mapping
CO3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
CO4	Test the compliance of the software with the SRS.
REGULATION & SEMESTER:	**2017 - VI**
COURSE CODE & NAME:	CS8651 - INTERNET PROGRAMMING
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Construct a basic website using HTML and Cascading Style Sheets
CO2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms
CO3	Develop server side programs using Servlets and JSP.
CO4	Construct simple web pages in PHP and to represent data in XML format.
CO5	Use AJAX and web services to develop interactive web applications
COURSE CODE & NAME:	CS8691 - ARTIFICIAL INTELLIGENCE
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Use appropriate search algorithms for any AI problem
CO2	Represent a problem using first order and predicate logic
CO3	Provide the apt agent strategy to solve a given problem
CO4	Design software agents to solve a problem
CO5	Design applications for NLP that use Artificial Intelligence.
COURSE CODE & NAME:	CS8601 - MOBILE COMPUTING
COS	**COURSE OUTCOMES**
	Student will be able to,

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CO1	Explain the basics of mobile telecommunication systems
CO2	Illustrate the generations of telecommunication systems in wireless networks
CO3	Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network
CO4	Explain the functionality of Transport and Application layers
CO5	Develop a mobile application using android/blackberry/ios/Windows SDK
COURSE CODE & NAME:	CS8602 - COMPILER DESIGN
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the different phases of compiler
CO2	Design a lexical analyzer for a sample language.
CO3	Apply different parsing algorithms to develop the parsers for a given grammar
CO4	Understand syntax-directed translation and run-time environment
CO5	Learn to implement code optimization techniques and a simple code generator
CO6	Design and implement a scanner and a parser using LEX and YACC tools
COURSE CODE & NAME:	CS8603 - DISTRIBUTED SYSTEMS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Elucidate the foundations and issues of distributed systems
CO2	Understand the various synchronization issues and global state for distributed systems.
CO3	Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
CO4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems.

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CO5	Describe the features of peer-to-peer and distributed shared memory systems
COURSE CODE & NAME:	IT8076 Software Testing
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design test cases suitable for a software development for different domains.
CO2	Identify suitable tests to be carried out.
CO3	Prepare test planning based on the document.
CO4	Document test plans and test cases designed.
CO5	Use automatic testing tools.
CO6	Develop and validate a test plan.
COURSE CODE & NAME:	CS8662 Mobile Application Development Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop mobile applications using GUI and Layouts.
CO2	Develop mobile applications using Event Listener.
CO3	Develop mobile applications using Databases.
CO4	Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi- threading and GPS.
CO5	Analyze and discover own mobile app for simple needs.
COURSE CODE & NAME:	CS8661 - INTERNET PROGRAMMING LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Construct Web pages using HTML/XML and style sheets.
CO2	Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.
CO3	Develop dynamic web pages using server side scripting
CO4	Use PHP programming to develop web applications
CO5	Construct web applications using AJAX and web services.
COURSE CODE & NAME:	IT8611 Mini Project
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	On Completion of the project work students will be in a position to

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	take up any challenging practical problems and find solution by formulating proper methodology.
COURSE CODE & NAME:	HS8581 - PROFESSIONAL COMMUNICATION
COS	**COURSE OUTCOMES**
CO1	Make effective presentations
CO2	Participate confidently in Group Discussions
CO3	Attend job interviews and be successful in them
CO4	Develop adequate Soft Skills required for the workplace
REGULATION & SEMESTER:	**2017 - VII**
COURSE CODE & NAME:	MG8591 Principles of Management
COS	
	Student will be able to,
CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
COURSE CODE & NAME:	CS8792 Cryptography and Network Security
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
CO2	Apply the different cryptographic operations of symmetric cryptographic algorithms
CO3	Apply the different cryptographic operations of public key cryptography
CO4	Apply the various Authentication schemes to simulate different applications.
CO5	Understand various Security practices and System security standards

COURSE CODE & NAME:	CS8791 Cloud Computing
COS	**COURSE OUTCOMES**
	Student will be able to,

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CO1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
CO2	Learn the key and enabling technologies that help in the development of cloud.
CO3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
CO4	Explain the core issues of cloud computing such as resource management and security.
CO5	Be able to install and use current cloud technologies.
CO6	Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.
COURSE CODE & NAME:	OME753 – SYSTEMS ENGINEERING
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	The Student must be able to apply systems engineering principles to make decision for optimization.
CO2	Hence an understanding of the systems engineering discipline and be able to use the core principles and processes for designing effective system.

COURSE CODE & NAME:	IT8075 – SOFTWARE PROJECT MANAGEMENT
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand Project Management principles while developing software.
CO2	Gain extensive knowledge about the basic project management concepts, framework and the process models.
CO3	Obtain adequate knowledge about software process models and software effort estimation techniques.
CO4	Estimate the risks involved in various project activities
CO5	Define the checkpoints, project reporting structure, project progress and tracking mechanisms using project management principles.
CO6	Learn staff selection process and the issues related to people management

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COURSE CODE & NAME:	CS8073 – C # AND .NET PROGRAMMING
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write various applications using C# Language in the .NET Framework.
CO2	Develop distributed applications using .NET Framework.
CO3	Create mobile applications using .NET compact Framework.

COURSE CODE & NAME:	IT8711 FOSS and Cloud Computing Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Configure various virtualization tools such as Virtual Box, VMware workstation.
CO2	Design and deploy a web application in a PaaS environment.
CO3	Learn how to simulate a cloud environment to implement new schedulers.
CO4	Install and use a generic cloud environment that can be used as a private cloud.
CO5	Manipulate large data sets in a parallel environment.
COURSE CODE & NAME:	IT8761Security Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop code for classical Encryption Techniques to solve the problems.
CO2	Build cryptosystems by applying symmetric and public key encryption algorithms.
CO3	Construct code for authentication algorithms.
CO4	Develop a signature scheme using Digital signature standard.
CO5	Demonstrate the network security system using open source tools
REGULATION & SEMESTER:	**2017-VIII**
COURSE CODE & NAME:	CS8085 – SOCIAL NETWORK ANALYSIS
COS	**COURSE OUTCOMES**
CO1	Develop semantic web related applications.

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CO2	Represent knowledge using ontology.
CO3	Predict human behaviour in social web and related communities.
CO4	Visualize social networks.
COURSE CODE & NAME:	CS8080 – INFORMATION RETRIEVAL TECHNIQUES
COS	**COURSE OUTCOMES**
CO1	Use an open source search engine framework and explore its capabilities
CO2	Apply appropriate method of classification or clustering.
CO3	Design and implement innovative features in a search engine.
CO4	Design and implement a recommender system.
COURSE CODE & NAME:	CS8811 - PROJECT WORK
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

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COURSE OUTCOMES (COs)

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COURSE OUTCOMES (COs)

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2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VISION

To impart quality education by providing adequate training to students, both in theory and Practice, in Emerging Engineering and Communication fields, utilizing effectively the services of Qualified and experienced faculty and state-of-art facilities

MISSION

- Providing an intellectually inspiring environment for learning, innovation, creativity and professional training, incorporating ethical and moral values.
- Providing a strong foundation in the basic subjects of electronics and communication engineering.
- Providing an efficient teaching-learning process with a focus on application-oriented problem solving skills.
- Ensuring availability of best facility, infrastructure, and environment to students, researchers and faculty members and creating an ambience conducive for excellence in technical education and research.

PROGRAM SPECIFIC OUTCOMES (PSOs):

1.Apply basic knowledge related to electronic circuits, embedded & communication systems and signal processing to solve engineering/societal problems.

2.Design, verify and validate electronic functional elements for a variety of applications, with skills to interpret and communicate results.

3.Use engineering & management concepts to analyze specifications and prototype electronic experiments/projects either independently or in teams.

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PROGRAMME EDUCATIONAL OBJECTIVES:

PEO-1: To provide a foundation in fundamental engineering principles together with in-depth knowledge and solid foundation in mathematical, scientific and engineering fundamentals required to succeed in technical profession.

PEO-2: To train with a broad-based scientific and engineering knowledge so as to comprehend, analyze, design, and create innovative products and solutions for the real life problems.

PEO-3: To inculcate professional and ethical attitude with a strong character and to uphold the spiritual and cultural values, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context.

PEO-4: To provide an academic environment aware of advanced technological growth leading to life-long learning needed for a successful professional career, excellence and leadership.

PROGRAMME OUTCOMES:

PO 1: Engineering knowledge Apply knowledge of mathematics, science and engineering fundamentals and Production and Industrial Engineering specialization to the solution of complex Production and Industrial Engineering problems.

PO 2: Problem Analysis Identify, formulate, research literature and analyze complex Production and Industrial Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3: Design/ Development of Solutions Design solutions for complex Engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO 4: Conduct investigations of complex Engineering problems Use research-based knowledge and research methods including analysis, interpretation of data and synthesis of information to provide valid conclusions.

PO 5: Modern Tool Usage Create, select, and apply appropriate techniques, resources, and

modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The Engineer and Society Apply contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO 7: Environment and Sustainability Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9: Individual and Team Work Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10: Communication Communicate effectively on complex Engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO 11: Project Management and Finance Demonstrate knowledge and understanding of Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life Long learning Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	HS8151 - Communicative English
CO'S	**COURSE OUTCOMES**
CO1	Read articles of a general kind in magazines and newspapers.
CO2	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
CO3	Comprehend conversations and short talks delivered in English
CO4	Write short essays of a general kind and personal letters and emails in English

SUBJECT CODE & NAME:	MA8151 -Engineering Mathematics - I
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Use both the limit definition and rules of differentiation to differentiate functions.
CO2	Apply differentiation to solve maxima and minima problems
CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem ofCalculus.
CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables
CO5	Evaluate integrals using techniques of integration, such as substitution, partial fractionsand integration by parts
CO6	Determine convergence/divergence of improper integrals and evaluate convergentimproper integrals.
CO7	Apply various techniques in solving differential equations

SUBJECT CODE & NAME:	PH8151 - Engineering Physics
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	The students will gain knowledge on the basics of properties of

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	matter and itsapplications,
CO2	The students will acquire knowledge on the concepts of waves and optical devices andtheir applications in fibre optics,
CO3	The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,
CO4	The students will get knowledge on advanced physics concepts of quantum theory andits applications in tunneling microscopes, and
CO5	the students will understand the basics of crystals, their structures and different crystalgrowth techniques.

SUBJECT CODE & NAME:	CY8151 - Engineering Chemistry
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	The knowledge gained on engineering materials, fuels, energy sources and
CO2	water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
SUBJECT CODE & NAME:	GE8151 - Problem Solving and Python Programming
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs
CO3	Structure simple Python programs for solving problems
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries.
CO6	Read and write data from/to files in Python Programs.
SUBJECT CODE & NAME:	GE8152 - Engineering Graphics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Familiarize with the fundamentals and standards of Engineering graphics
CO2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
CO3	Project orthographic projections of lines and plane surfaces.
CO4	Draw projections and solids and development of surfaces

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CO5	Visualize and to project isometric and perspective sections of simple solids

SUBJECT CODE & NAME:	GE8161- Problem Solving and Python Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops.
CO3	Develop Python programs step-wise by defining functions and calling them.
CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python.
SUBJECT CODE & NAME:	BS8161-Physics and Chemistry Laboratory
CO'S	**COURSE OUTCOMES**
CO1	Student will have knowledge to Analyze the particle size & acceptance ankle using laser.
CO2	Student will be able to Apply the principle of ultrasonic interferometer
CO3	Student will be able to understand the principles of spectrometer grating
CO4	Students can Analyze the thermal conductivity of a bad conductor
CO5	Student will be able to Apply the elastic behavior of material
REGULATION & SEMESTER:	**2017 - II**
SUBJECT CODE & NAME:	HS8251 - Technical English
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Read technical texts and write area- specific texts effortlessly.
CO2	Listen and comprehend lectures and talks in their area of specialization successfully.
CO3	Write reports and winning job applications
CO4	Speak appropriately and effectively in varied formal and informal contexts.
SUBJECT CODE & NAME:	MA8251- Engineering Mathematics - II
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Eigenvalues and eigenvectors, diagonalization of a matrix,

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	Symmetric matrices, Positive definite matrices and similar matrices.
CO2	Gradient, divergence and curl of a vector point function and related identities.
CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification
CO4	Analytic functions, conformal mapping and complex integration.
CO5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients
SUBJECT CODE & NAME:	PH8253 - PHYSICS FOR ELECTRONICS ENGINEERING
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Gain knowledge on classical and quantum electron theories, and energy band structures
CO2	Acquire knowledge on basics of semiconductor physics and its applications in various devices,
CO3	Get knowledge on magnetic and dielectric properties of materials,
CO4	Have the necessary understanding on the functioning of optical materials for optoelectronics,
CO5	Understand the basics of quantum structures and their applications in spintronics and carbon electronics.
SUBJECT CODE & NAME:	BE8254 - BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the concept of three phase power circuits and measurement.
CO2	Comprehend the concepts in electrical generators, motors and transformers
CO3	Choose appropriate measuring instruments for given application
SUBJECT CODE & NAME:	EC8251 - CIRCUIT ANALYSIS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop the capacity to analyze electrical circuits, apply the circuit theorems in real time
CO2	Design and understand and evaluate the AC and DC circuits.

SUBJECT CODE	EC8252 - ELECTRONIC DEVICES

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& NAME:	
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the V-I characteristic of diode, UJT and SCR
CO2	Describe the equivalence circuits of transistors
CO3	Operate the basic electronic devices such as PN junction diode, Bipolar and Field effect Transistors, Power control devices, LED, LCD and other Opto-electronic devices

SUBJECT CODE & NAME:	EC8261 - CIRCUITS AND DEVICES LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze the characteristics of basic electronic devices
CO2	Design RL and RC circuits
CO3	Verify thevinin & Norton theorem KVL & KCL, and Super Position Theorems
SUBJECT CODE & NAME:	GE8261 ENGINEERING PRACTICES LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipment's to join the structures
CO3	Measure the electrical quantities
CO4	Carry out the basic machining operations
CO5	Make the models using sheet metal works
CO6	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO7	Carry out basic home electrical works and appliances
CO8	Elaborate on the components, gates, soldering practices
REGULATION & SEMESTER:	**2017 - III**
SUBJECT CODE & NAME:	MA8352 - LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate accurate and efficient use of advanced algebraic techniques.
CO2	Demonstrate their mastery by solving non - trivial problems related

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	to the concepts and byproving simple theorems about the statements proven by the text.
CO3	Able to solve various types of partial differential equations. Able to solve engineering problems using Fourier series.
CO4	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts
SUBJECT CODE & NAME:	EC8393 - FUNDAMENTALS OF DATA STRUCTURES IN C
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Implement linear and non-linear data structure operations using C
CO2	Suggest appropriate linear / non-linear data structure for any given data set.
CO3	Apply hashing concepts for a given problem
CO4	Modify or suggest new data structure for an application
CO5	Appropriately choose the sorting algorithm for an application.
SUBJECT CODE & NAME:	EC8351 - ELECTRONIC CIRCUITS I
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze the performance of small signal BJT and FET amplifiers - single stage and multistage amplifiers
CO2	Acquire knowledge of Working principles, characteristics and applications of BJT and FET
CO3	Frequency response characteristics of BJT and FET amplifiers

SUBJECT CODE & NAME:	EC8352 - SIGNALS AND SYSTEMS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To be able to determine if a given system is linear/causal/stable
CO2	Capable of determining the frequency components present in a deterministic signal
CO3	Capable of characterizing LTI systems in the time domain and frequency domain
CO4	To be able to compute the output of an LTI system in the time and frequency domains
SUBJECT CODE & NAME:	EC8392 - DIGITAL ELECTRONICS

2.6 Student Performance and Learning Outcomes

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CO'S	COURSE OUTCOMES
CO1	Use digital electronics in the present contemporary world
CO2	Design various combinational digital circuits using logic gates
CO3	Do the analysis and design procedures for synchronous and asynchronous sequentialcircuits
CO4	Use the semiconductor memories and related technology
CO5	Use electronic circuits involved in the design of logic gates
SUBJECT CODE & NAME:	EC8391 - CONTROL SYSTEMS ENGINEERING
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Identify the various control system components and their representations.
CO2	Analyze the various time domain parameters.
CO3	Analysis the various frequency response plots and its system.
CO4	Apply the concepts of various system stability criterions.
CO5	Design various transfer functions of digital control system using state variable models.
SUBJECT CODE & NAME:	EC8381 - FUNDAMENTALS OF DATA STRUCTURES IN C LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write basic and advanced programs in C
CO2	Implement functions and recursive functions in C
CO3	Implement data structures using C
CO4	Choose appropriate sorting algorithm for an application and implement it in a modularizedway
SUBJECT CODE & NAME:	EC8361 - ANALOG AND DIGITAL CIRCUITS LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and Test rectifiers, filters and regulated power supplies.
CO2	Design and Test BJT/JFET amplifiers.
CO3	Differentiate cascode and cascade amplifiers.
CO4	Analyze the limitation in bandwidth of single stage and multi stage amplifier
CO5	Measure CMRR in differential amplifier
CO6	Simulate and analyze amplifier circuits using PSpice.
CO7	Design and Test the digital logic circuits

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SUBJECT CODE & NAME:	HS8381 Interpersonal Skills / Listening & Speaking
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

REGULATION & SEMESTER:	2017 - IV
COURSE CODE & NAME:	MA8451 - PROBABILITY AND RANDOM PROCESSES
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the fundamental knowledge of the concepts of probability and have knowledgeof standard distributions which can describe real life phenomenon.
CO2	Understand the basic concepts of one and two dimensional random variables and apply inengineering applications.
CO3	Apply the concept random processes in engineering disciplines.
CO4	Understand and apply the concept of correlation and spectral densities.
CO5	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems.
COURSE CODE & NAME:	EC8452 - ELECTRONIC CIRCUITS II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze different types of amplifier, oscillator and multivibrator circuits
CO2	Design BJT amplifier and oscillator circuits
CO3	Analyze transistorized amplifier and oscillator circuits
CO4	Design and analyze feedback amplifiers
CO5	Design LC and RC oscillators, tuned amplifiers, wave shaping circuits,multivibrators, power amplifier and DC convertors.

COURSE CODE	EC8491 - COMMUNICATION THEORY

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COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design AM communication systems
CO2	Design Angle modulated communication systems
CO3	Apply the concepts of Random Process to the design of Communication systems
CO4	Analyze the noise performance of AM and FM systems
CO5	Gain knowledge in sampling and quantization
COURSE CODE & NAME:	EC8451 - ELECTROMAGNETIC FIELDS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Display an understanding of fundamental electromagnetic laws and concepts
CO2	Write Maxwell's equations in integral, differential and phasor forms and explain their physicalmeaning
CO3	Explain electromagnetic wave propagation in lossy and in lossless media
CO4	Solve simple problems requiring estimation of electric and magnetic field quantities based onthese concepts and laws
COURSE CODE & NAME:	EC8453 - LINEAR INTEGRATED CIRCUITS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design linear and non linear applications of OP – AMPS
CO2	Design applications using analog multiplier and PLL
CO3	Design ADC and DAC using OP – AMPS
CO4	Generate waveforms using OP – AMP Circuits
CO5	Analyses special function ICs
COURSE CODE & NAME:	GE8291 - ENVIRONMENTAL SCIENCE AND ENGINEERING
COS	**COURSE OUTCOMES**
	Student will be,
CO1	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledgeon the following after completing the course.
CO2	Public awareness of environmental is at infant stage.
CO3	Ignorance and incomplete knowledge has lead to misconceptions
CO4	Development and improvement in std. of living has lead to serious

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	environmental disasters

COURSE CODE & NAME:	EC8461 - CIRCUITS DESIGN AND SIMULATION LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze various types of feedback amplifiers
CO2	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators
CO3	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shapingcircuits and multivibrators using SPICE Tool.
COURSE CODE & NAME:	EC8462 - LINEAR INTEGRATED CIRCUITS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design amplifiers, oscillators, D-A converters using operational amplifiers.
CO2	Design filters using op-amp and performs an experiment on frequency response.
CO3	Analyze the working of PLL and describe its application as a frequency multiplier.
CO4	Design DC power supply using ICs.
CO5	Analyse the performance of filters, multivibrators, A/D converter and analogy multiplier using SPICE
REGULATION & SEMESTER:	**2017 - V**
COURSE CODE & NAME:	EC8501 - DIGITAL COMMUNICATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design PCM systems
CO2	Design and implement base band transmission schemes
CO3	Design and implement band pass signaling schemes
CO4	Analyze the spectral characteristics of band pass signaling schemes and their noiseperformance
CO5	Design error control coding schemes
COURSE CODE & NAME:	EC8553 - DISCRETE-TIME SIGNAL PROCESSING
COS	**COURSE OUTCOMES**
	Student will be able to,

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CO1	Apply DFT for the analysis of digital signals and systems
CO2	Design IIR and FIR filters
CO3	Characterize the effects of finite precision representation on digital filters
CO4	Design MultiMate filters
CO5	Apply adaptive filters appropriately in communication systems

COURSE CODE & NAME:	EC8552 - COMPUTER ARCHITECTURE AND ORGANIZATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Describe data representation, instruction formats and the operation of a digital computer
CO2	Illustrate the fixed point and floating-point arithmetic for ALU operation
CO3	Discuss about implementation schemes of control unit and pipeline performance
CO4	Explain the concept of various memories, interfacing and organization of multiple processors
CO5	Discuss parallel processing technique and unconventional architectures

COURSE CODE & NAME:	EC8551 - COMMUNICATION NETWORKS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Identify the components required to build different types of networks
CO2	Choose the required functionality at each layer for given application
CO3	Identify solution for each functionality at each layer
CO4	Trace the flow of information from one node to another node in the network

COURSE CODE & NAME:	EC8073 - MEDICAL ELECTRONICS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Know the human body electro- physiological parameters and recording of bio-potentials
CO2	Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc.
CO3	Interpret the various assist devices used in the hospitals viz.

	pacemakers, defibrillators, dialyzers and ventilators
CO4	Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods
CO5	Know about recent trends in medical instrumentation
COURSE CODE & NAME:	ORO551 Renewable Energy Sources
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the physics of solar radiation.
CO2	Ability to classify the solar energy collectors and methodologies of storing solar energy.
CO3	Knowledge in applying solar energy in a useful way.
CO4	Knowledge in wind energy and biomass with its economic aspects.
CO5	Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies.
COURSE CODE & NAME:	EC8562 - DIGITAL SIGNAL PROCESSING LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Carryout basic signal processing operations
CO2	Demonstrate their abilities towards MATLAB based implementation of various DSPsystems
CO3	Analyze the architecture of a DSP Processor
CO4	Design and Implement the FIR and IIR Filters in DSP Processor for performingfiltering operation over real-time signals
CO5	Design a DSP system for various applications of DSP
COURSE CODE & NAME:	EC8561 - COMMUNICATION SYSTEMS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Simulate & validate the various functional modules of a communication system
CO2	Demonstrate their knowledge in base band signaling schemes throughimplementation of digital modulation schemes
CO3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
	Simulate end-to-end communication Link
OURSE CODE &	EC8563 - COMMUNICATION NETWORKS LABORATORY

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COS	**COURSE OUTCOMES**
CO1	Communicate between two desktop computers
CO2	Implement the different protocols
CO3	Program using sockets.
CO4	Implement and compare the various routing algorithms
CO5	Use the simulation tool.
REGULATION & SEMESTER:	**2017- VI**
COURSE CODE & NAME:	EC8691 - MICROPROCESSORS AND MICROCONTROLLERS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand and execute programs based on 8086 microprocessor.
CO2	Design Memory Interfacing circuits.
CO3	Design and interface I/O circuits.
CO4	Design and implement 8051 microcontroller based systems.
COURSE CODE & NAME:	EC8095 - VLSI DESIGN
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Realize the concepts of digital building blocks using MOS transistor.
CO2	Design combinational MOS circuits and power strategies.
CO3	Design and construct Sequential Circuits and Timing systems.
CO4	Design arithmetic building blocks and memory subsystems.
CO5	Apply and implement FPGA design flow and testing.
COURSE CODE & NAME:	EC8652 - WIRELESS COMMUNICATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Characterize a wireless channel and evolve the system design specifications
CO2	Design a cellular system based on resource availability and traffic demands
CO3	Identify suitable signaling and multipath mitigation techniques for the wirelesschannel and system under consideration.
COURSE CODE & NAME:	MG8591 - PRINCIPLES OF MANAGEMENT
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Upon completion of the course, students will be able to have clear

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	understanding
CO2	Managerial functions like planning, organizing, staffing, leading & controlling and have samebasic knowledge on international aspect of management
COURSE CODE & NAME:	EC8651 - TRANSMISSION LINES AND RF SYSTEMS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the characteristics of transmission lines and its losses
CO2	Write about the standing wave ratio and input impedance in high frequencytransmission lines
CO3	Analyze impedance matching by stubs using smith charts
CO4	Analyze the characteristics of TE and TM waves
CO5	Design a RF transceiver system for wireless communication
COURSE CODE & NAME:	EC8004 - WIRELESS NETWORKS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Conversant with the latest 3G/4G networks and its architecture
CO2	Design and implement wireless network environment for any application using latest wireless protocols and standards
CO3	Ability to select the suitable network depending on the availability and requirement
CO4	Implement different type of applications for smart phones and mobile devices with latest network strategies
COURSE CODE & NAME:	EC8681 - MICROPROCESSORS AND MICROCONTROLLERS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write ALP Programmers for fixed and Floating Point and Arithmetic operations.
CO2	Interface different I/Os with processor
CO3	Generate waveforms using Microprocessors
CO4	Execute Programs in 8051
CO5	Explain the difference between simulator and Emulator
COURSE CODE & NAME:	EC8661 - VLSI DESIGN LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write HDL code for basic as well as advanced digital integrated circuit

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CO2	Import the logic modules into FPGA Boards
CO3	Synthesize Place and Route the digital IPs
CO4	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDAtools
REGULATION & SEMESTER:	**2017 - VII**
COURSE CODE & NAME:	EC8701 - ANTENNAS AND MICROWAVE ENGINEERING
COS	
	Student will be able to,
CO1	Apply the basic principles and evaluate antenna parameters and link power budgets
CO2	Design and assess the performance of various antennas
CO3	Design a microwave system given the application specifications
COURSE CODE & NAME:	EC8751 - OPTICAL COMMUNICATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Realize basic elements in optical fibers, different modes and configurations.
CO2	Analyze the transmission characteristics associated with dispersion and polarizationtechniques.
CO3	Design optical sources and detectors with their use in optical communication system.
CO4	Construct fiber optic receiver systems, measurements and coupling techniques.
CO5	Design optical communication systems and its networks.
COURSE CODE & NAME:	EC8791 - EMBEDDED AND REAL TIME SYSTEMS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Describe the architecture and programming of ARM processor
CO2	Outline the concepts of embedded systems
CO3	Explain the basic concepts of real time operating system design
CO4	Model real-time applications using embedded-system concepts
COURSE CODE & NAME:	EC8702 - AD HOC AND WIRELESS SENSOR NETWORKS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Know the basics of Ad hoc networks and Wireless Sensor Networks
CO2	Apply this knowledge to identify the suitable routing algorithm based

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	on the network and user requirement
CO3	Apply the knowledge to identify appropriate physical and MAC layer protocols
CO4	Understand the transport layer and security issues possible in Ad hoc and sensornetworks.
COURSE CODE & NAME:	EC8071 - COGNITIVE RADIO
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Gain knowledge on the design principles on software defined radio and cognitive radio
CO2	Develop the ability to design and implement algorithms for cognitive radio spectrum sensing and dynamic spectrum access
CO3	Build experiments and projects with real time wireless applications
CO4	Apply the knowledge of advanced features of cognitive radio for real world applications
COURSE CODE & NAME:	OCS752 - Introduction To C Programming
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop simple applications using basic constructs
CO2	Develop applications using arrays and strings
CO3	Develop applications using functions and structures
COURSE CODE & NAME:	EC8711 - EMBEDDED LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write programs in ARM for a specific Application
CO2	Interface memory, A/D and D/A convertors with ARM system
CO3	Analyze the performance of interrupt
CO4	Write program for interfacing keyboard, display, motor and sensor.
CO5	Formulate a mini project using embedded system

COURSE CODE & NAME:	EC8761 - ADVANCED COMMUNICATION LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze the performance of simple optical link by measurement of losses and Analyzingthe mode characteristics of fiber

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CO2	Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
CO3	Estimate the Wireless Channel Characteristics and Analyze the performance of WirelessCommunication System
CO4	Understand the intricacies in Microwave System design

REGULATION & SEMESTER:	**2017 - VIII**
COURSE CODE & NAME:	EC8094 - SATELLITE COMMUNICATION
COS	
	Student will be able to,
CO1	Analyze the satellite orbits
CO2	Analyze the earth segment and space segment
CO3	Analyze the satellite Link design
CO4	Design various satellite applications
COURSE CODE & NAME:	GE8076 - PROFESSIONAL ETHICS IN ENGINEERING
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Upon completion of the course, the student should be able to apply ethics in society,
CO2	discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
COURSE CODE & NAME:	EC8811 Project Work
COS	**COURSE OUTCOMES**
CO1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology

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COURSE OUTCOMES (COs)

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COURSE OUTCOMES (COs)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

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Course Code	**HS8151**
Name of the Course	**COMMUNICATIVE ENGLISH**
Year/Semester	I/I
Total Contact Hours	60
Course Outcome	CO1: Read articles of a general kind in magazines and newspapers. CO2: Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. CO3: Comprehend conversations and short talks delivered in English. CO4: Write short essays of a general kind and personal letters andemails in English. CO5: Writing long essays.

Course Code	**MA 8151**
Name of the Course	**ENGINEERING MATHEMATICS – I**
Year/Semester	I/I
Total Contact Hours	60
Course Outcome	CO1:Use both the limit definition and rules of differentiation todifferentiate functions CO2:Apply differentiation to solve maxima and minima problems CO3:Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus, Evaluate integrals using techniques of integration, such as substitution, partial fractions andintegration by parts, Determine convergence/divergence of improper integrals and evaluate convergent improper integrals CO4:Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order andchange of variables CO5:Apply various techniques in solving differential equations

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Course Code	**PH 8151**
Name of the Course	**ENGINEERING PHYSICS**
Year/Semester	I/I
Total Contact Hours	45
Course Outcome	CO1: The students will gain knowledge on the basics of properties of matter and its applications CO2: The students will acquire knowledge on the concepts of waves and optical devices and their applications in fiber optics CO3: The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers CO4: The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes CO5: The students will understand the basics of crystals, their structures and different crystal growth techniques.

Course Code	**CY 8151**
Name of the Course	**ENGINEERING CHEMISTRY**
Year/Semester	I/I
Total Contact Hours	45
Course Outcome	CO1: Summarize the water related problems in boilers and their treatment techniques. CO2: Discuss the types of adsorption, catalysis and the mechanism of enzyme catalysis CO3: Associate phase rule in the alloying and the behavior of one component and two component systems using phase diagram CO4: Explain various types of fuels, their manufacturing processes and calculation of calorific theoretically CO5: Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells

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Course Code	**GE8151**
Name of the Course	**PROBLEM SOLVING AND PYTHON PROGRAMMING**
Year/Semester	I/I
Total Contact Hours	45
Course Outcome	CO1: Develop algorithmic solutions to simple computational problems CO2: Read, write, execute by hand simple Python programs CO3: Structure simple Python programs for solving problems CO4: Decompose a Python program into functions. CO5: Represent compound data using Python lists, tuples, dictionaries

Course Code	**GE8152**
Name of the Course	**ENGINEERING GRAPHICS**
Year/Semester	I/I
Total Contact Hours	90
Course Outcome	CO1: Familiarize with the fundamentals and standards of engineeringgraphics CO2: Perform freehand sketching of basic geometrical constructions and multiple views of objects. CO3: Project orthographic projections of lines and plane surfaces. CO4: Draw projections and solids and development of surfaces. CO5: Visualize and to project isometric and perspective sections of simple solids.

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Course Code	**GE8161**
Name of the Course	**PROBLEM SOLVING AND PYTHON PROGRAMMINGLABORATORY**
Year/Semester	I/I
Total Contact Hours	60
Course Outcome	CO1: Write, test, and debug simple Python programs. CO2: Implement Python programs with conditionals and loops. CO3: Implement Python programs with conditionals and loops. CO4: Use Python lists, tuples, dictionaries for representing compounddata. CO5: Read and write data from/to files in Python. CO6: Develop elliptical orbits in Pygmy

Course Code	**BS8161**
Name of the Course	**PHYSICS AND CHEMISTRY LABORATORY**
Year/Semester	I/I
Total Contact Hours	60
Course Outcome	CO1: Carry out experiments using Air wedge set up to find the thickness of a thin wire and to determine the Young's modulus of the material using non uniform bending CO2:Calculate the wavelength of laser light and predict the particle size and to determine the rigidity modulus of the wire using torsional pendulum CO3: Demonstrate the Lees Disc experiment to determine the thermal Conductivity of a bad conductor. CO4: Calculate the amount of chloride content present in given watersample and to find the strength of given iron solution using potentiometer. CO5: Carryout an experiment using pH meter to calculate strength ofgiven acid. CO6: Compare the strength of acids A & B using conductometer and to estimate two acids in a mixture of acids.

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Course Code	**HS8251**
Name of the Course	**TECHNICAL ENGLISH**
Year/Semester	I/II
Total Contact Hours	60
Course Outcome	CO1: Read technical texts and write area- specific texts effortlessly. CO2: Listen and comprehend lectures and talks in their area specialisation successfully. CO3: Speak appropriately and effectively in varied formal and informal contexts. CO4: Write reports and winning job applications.

Course Code	**MA8251**
Name of the Course	**ENGINEERING MATHEMATICS-II**
Year/Semester	I/II
Total Contact Hours	60
Course Outcome	CO1: Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positivedefinite matrices and similar matrices. CO2: Gradient, divergence and curl of a vector point function and related identities. CO3: Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theoremsand their verification. CO4: Analytic functions, conformal mapping and complex integration. CO5: Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.

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Course Code	**PH8253**
Name of the Course	**PHYSICS FOR ELECTRONICS ENGINEERING**
Year/Semester	I/II
Total Contact Hours	45
Course Outcome	CO1:gain knowledge on classical and quantum electron theories, and energy band structures, CO2:acquire knowledge on basics of semiconductor physics and its applications in various devices, CO3:get knowledge on magnetic and dielectric properties of materials, CO4:have the necessary understanding on the functioning of optical materials for optoelectronics, CO5: understand the basics of quantum structures and their applications in spintronics and carbonelectronics.

Course Code	**BE8252**
Name of the Course	**BASIC CIVIL AND MECHANICAL ENGINEERING**
Year/Semester	I/II
Total Contact Hours	60
Course Outcome	CO1: appreciate the Civil and Mechanical Engineering components of Projects. CO2: explain the usage of construction material and proper selection of construction materials. CO3:measure distances and area by surveying CO4: identify the components used in power plant cycle. CO5: demonstrate working principles of petrol and diesel engine. CO6: elaborate the components of refrigeration and Air conditioning cycle.

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Course Code	**EE8251**
Name of the Course	**CIRCUIT THEORY**
Year/Semester	I/II
Total Contact Hours	60
Course Outcome	CO1:Ability to analyses electrical circuits CO2:Ability to apply circuit theorems CO3:Ability to analyze transients

Course Code	**GE8291**
Name of the Course	**ENVIRONMENTAL SCIENCE AND ENGINEERING**
Year/Semester	I/II
Total Contact Hours	45
Course Outcome	CO1: Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course. CO2: Public awareness of environmental is at infant stage. CO3:Ignorance and incomplete knowledge has lead to misconceptions CO4:Development and improvement in std. of living has lead to serious environmental disasters

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Course Code	**GE8261**
Name of the Course	**ENGINEERING PRACTICES LABORATORY**
Year/Semester	I/II
Total Contact Hours	60
Course Outcome	CO1: Fabricate carpentry components and pipe connections including plumbing works. CO2: use welding equipment's to join the structures. CO3:Carry out the basic machining operations CO4:Make the models using sheet metal works CO5:Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary andfittings CO6:Carry out basic home electrical works and appliances CO7:Measure the electrical quantities CO8: Elaborate on the components, gates, soldering practices.

Course Code	**EE8261**
Name of the Course	**ELECTRIC CIRCUITS LABORATORY**
Year/Semester	I/II
Total Contact Hours	60
Course Outcome	CO1: Understand and apply circuit theorems and concepts in engineering applications. CO2: Simulate electric circuits.

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Course Code	**MA8353**
Name of the Course	**TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS**
Year/Semester	II/III
Total Contact Hours	60
Course Outcome	CO1: To understand the basic properties of Standard Partial Differential Equations. Apply the Fundamental concept of Partial Differential Equations. CO2: To develop Fourier Series for different types of functions. CO3:Find the solutions of the heat equation, wave equation and the Laplace equation subject to boundary conditions CO4: To solve the Problems using Fourier Transforms and its inverse Transforms**.** CO5:Have a knowledge in Z- transform and inverse transform of simple functions, Properties, various related theorems and application to differential equations with constant coefficients. CO6:After successfully completing the course, the student will have a good understanding of the topics and their applications

Course Code	**EE8351**
Name of the Course	**DIGITAL LOGIC CIRCUITS**
Year/Semester	II/III
Total Contact Hours	60
Course Outcome	CO1: Develop a digital logic and apply it to solve real life problems. CO2: Analyze, design and implement combinational logic circuits. CO3: Classify different semiconductor memories. CO4: Analyze, design and implement sequential logic circuits. CO5: Analyze digital system design using PLD. CO6: Simulate and implement combinational and sequential circuits using VHDL systems.

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Course Code	**EE8391**
Name of the Course	**ELECTROMAGNETIC THEORY**
Year/Semester	II/III
Total Contact Hours	60
Course Outcome	CO1: Ability to Illustrate the Sources and effects of electromagnetic fields and discuss about various Coordinate Systems, laws and theorems related to electromagnetic fields. CO2: Able to analyze, find the Electric field produced in free space, dielectrics and apply boundary conditions to find Capacitance, Energy density. C03:Able to analyze the magnetic field intensity (H) and apply Biot–Savant's Law, Ampere's Circuit Law to find H due to straight conductors, circular loop, infinite sheet Of current. C04: Able to illustrate the concept of magnetic flux density (B) – B in free space, conductor and study the characteristics of magnetic materials. CO5:Capable to analyze the magnetic Circuits ,apply Faraday's law solve problems related to Displacement current CO6: To describe and derive the Maxwell's equations and apply it in solving Electromagnetic wave generating equations.

Course Code	**EE8301**
Name of the Course	**ELECTRICAL MACHINES – I**
Year/Semester	II/III
Total Contact Hours	60
Course Outcome	CO1: Obtain the knowledge about the fundamental of Magnetic circuits and Magnetic Materials. CO2:Secure the idea about the various construction details and erection of Transformer CO3:Assured the working principles of electrical machines and classify the various generator and its mathematical models CO4:Establish the working principles of electrical machines and classify the various motor and its speed control techniques CO5:Expertise in testing methods to obtain the performance of DC Machines. CO6:Analyze the real time recent applications of DC Machines and Transformers.

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Course Code	**EC8353**
Name of the Course	**ELECTRON DEVICES AND CIRCUITS**
Year/Semester	II/III
Total Contact Hours	45
Course Outcome	CO1: Understand the construction and modeling of semiconductor diodes and rectifiers. CO2: Discuss the methods of transistors and its characteristics. CO3: Interpret the midband analysis of amplifier circuits with gain and impedance values. CO4: Analyze the frequency response of differential amplifier and tuned circuits. CO5: Examine the methods of feedback and generation of oscillator conditions. CO6: Understand characteristics of electron devices towards its applications.

Course Code	**ME8792**
Name of the Course	**POWER PLANT ENGINEERING**
Year/Semester	II/III
Total Contact Hours	45
Course Outcome	CO1: Draw the layout of modern coal power plant and list the various componentsused in thermal power plant. CO2: Identify the components of diesel and gas turbine power plants and construct the integrated gasifier based combined cycle systems. CO3: Describe the layout of subsystems of various nuclear power plants and express safety measures for nuclear power plants. CO4: Distinguish different hydroelectric power plants and construct various renewable energy power plants such as wind, tidal, PV, solar, thermal, geo thermal, biogas and fuel cell. CO5: Calculate the per unit cost of electrical energy based on Power tariff, load factor, demand factor, diversity factor and plant safety factor. CO6: Draw the layout of modern coal power plant and list the various components used in thermal power plant.

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Course Code	**EC8311**
Name of the Course	**ELECTRONICS LABORATORY**
Year/Semester	II/III
Total Contact Hours	60
Course Outcome	CO1: Analyze various types of diodes and its v-i characteristics. CO2: Construct the various types of transistors and draw its v-i characteristics. CO3: Demonstrate the various types of amplifiers. CO4: Categorize about filter circuits and multivibrators. CO5: Design and analyze the feedback amplifiers and oscillator circuits. CO6: Ability to perform different types of electronic circuits and its characteristics.

Course Code	**EE8311**
Name of the Course	**ELECTRICAL MACHINES LABORATORY – I**
Year/Semester	II/III
Total Contact Hours	60
Course Outcome	CO1:Analyze the characteristics of DC shunt generator DC compound generator and calculate critical resistance and critical speed CO2:Examine load characteristics of DC shunt, series and compound motor and identify its maximum efficiency operating point CO3:Predict the efficiency of DC shunt machine in different methods CO4:Explain the load characteristics of single phase and three phase transformer separate the different losses and to find the efficiency CO5:Predetermine the equivalent circuit parameters of single phase transformer in two different methods and compare the results CO5: Explore the DC starters.

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Course Code	**MA8491**
Name of the Course	**NUMERICAL METHODS**
Year/Semester	II/IV
Total Contact Hours	60
Course Outcome	CO1: Able to solve the system of equations by using different methods and find Eigen values and Eigen vectors of a given matrix by power method. CO2: To make effective use of the interpolation formulas to find the missing data using the given data. CO3:Apply the techniques of solving any algebraic, transcendental equations CO4: Distinguish among the criteria of selection and procedures of various Numerical integration as well as Numerical differentiation rules. CO5: Apply various numerical methods in solving an initial value problem involving an ordinary differential equation. CO6: Estimate the best fit polynomial for the given tabulated data using the methods of Newton's interpolation and Lagrange's interpolation.

Course Code	**EE8401**
Name of the Course	**ELECTRICAL MACHINES – II**
Year/Semester	II/IV
Total Contact Hours	60
Course Outcome	CO1: Draw the constructional details and explain the performance of salient and non –salient type synchronous generators. CO2: Draw and explain the Principle of operation and performance of synchronous motor. CO3: Draw and describe the construction, principle of operation and performance of induction machines. CO4: Describe the starting and speed control of three-phase induction motors. CO5: Explain the construction, principle of operation and performance of single phase induction motors and special machines. CO6: Ability to model and analyze electrical apparatus and their application to power system.

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Course Code	**EE8402**
Name of the Course	**TRANSMISSION AND DISTRIBUTION**
Year/Semester	II/IV
Total Contact Hours	45
Course Outcome	CO1: Identify the basic elements of the electric power system, generation, transmission, distribution and describe the role played by each element. CO2: Compute the losses, efficiency and parameters of the Transmission line. CO3: Analyze the Performance of Transmission Lines. CO4: Solve the voltage distribution in insulator strings, cables and methods to improve the same. CO5: Design overhead lines both Mechanical and electrical aspects using Sag calculation. CO6: Ability to understand and analyze power system operation, stability, control and protection.

Course Code	**EE8403**
Name of the Course	**MEASUREMENTS AND INSTRUMENTATION**
Year/Semester	II/IV
Total Contact Hours	45
Course Outcome	CO1: To introduce the basic functional elements of instrumentation. CO2: To introduce the fundamentals of electrical and electronic instruments. CO3: To construct suitable bridges for measurement of particular parameters. CO4: To introduce various storage and display devices. CO5: To introduce various transducers and the data acquisition systems.

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Course Code	**EE8451**
Name of the Course	**LINEAR INTEGRATED CIRCUITS AND APPLICATIONS**
Year/Semester	II/IV
Total Contact Hours	45
Course Outcome	CO1:Ability to acquire knowledge in IC fabrication procedure CO2:Ability to analyze the characteristics of Op-Amp CO3: To understand the importance of Signal analysis using Op-amp based circuits. CO4: Functional blocks and the applications of special ICs like Timers, PLL circuits,regulator Circuits. CO5:To understand and acquire knowledge on the Applications of Op-amp CO6: Ability to understand and analyze, linear integrated circuits their Fabrication andApplication.

Course Code	**IC8451**
Name of the Course	**CONTROL SYSTEMS**
Year/Semester	II/IV
Total Contact Hours	75
Course Outcome	CO1: Develop electrical models/ mechanical models to design a physical system for a specific operation. CO2: Understand, define different time domain specification parameters and thus can apply that knowledge to conclude dynamic performance of a system. CO3:Use the basic knowledge in obtaining the open loop and closed–loop frequency responses of systems CO4: Able to explain the stability analysis and types of compensators. CO5:To describe the state variable representation of physical systems and the effect of state feedback CO6:Able to explain and use all the control techniques and to determine stability of all systems

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Course Code	**EE8411**
Name of the Course	**ELECTRICAL MACHINES LABORATORY - II**
Year/Semester	II/IV
Total Contact Hours	60
Course Outcome	CO1: Determine the voltage regulation of three phase alternator in different methods and compare the results. CO2: Determine the voltage regulation of salient pole synchronous machine and find negative &zero sequence components. CO3: Explain the V and inverted V characteristics of three phase synchronous machine at different load condition. CO4: Determine and pre determine performance characteristics of three phase induction Motor. CO5: Determine and pre determine performance characteristics of single phase induction Motor. CO6: Ability to model and analyze electrical apparatus and their application to power system.

Course Code	**EE8461**
Name of the Course	**LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY**
Year/Semester	II/IV
Total Contact Hours	60
Course Outcome	CO1:Apply Boolean functions to implement adder, subtractor circuits and convert Excess 3 to BCD, Binary to Gray code and vice versa. CO2:Test Parity generator and checker and Design encoder decoder circuits CO3:Demonstrate 4 bit synchronous, asynchronous counter and Shift registers CO4: Illustrate multiplexer circuit and apply 555 timer in Monostable and Astable operation. CO5: Apply OP-AMP to construct Adder, comparator, differentiator, Integrator and Describe VCO, PLL characteristics. CO6: Ability to understand and analyse, linear and digital electronic circuits.

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Course Code	**EE8412**
Name of the Course	**TECHNICAL SEMINAR**
Year/Semester	II/IV
Total Contact Hours	30
Course Outcome	CO1: Present seminar in the field of Electrical and Electronics Engineering subjects studied. CO2: Solve objective type questions in the field of Electrical and Electronics Engineering. CO3: Communicate effectively, the subjects learned in the form of seminar presentation. CO4: Communicate effectively, the modern trends in the field of Electrical and Electronics Engineering. CO5: Answer effectively during technical interviews.

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Course Code	**EE8501**
Name of the Course	**POWER SYSTEM ANALYSIS**
Year/Semester	III/V
Total Contact Hours	45
Course Outcome	CO1: Discuss Various components of Power System, their characteristics and Modeling. CO2:Draw equivalent single line reactance and impedance diagrams and per unit representation of a power system CO3: Explain significance of load flow problem and apply numerical techniques to obtain Load flow solution. CO4:Interpret the effect of symmetrical fault conditions and select suitable rating for various protective devices in a. power system CO5: Apply symmetrical components and solve unsymmetrical faults.in a power system. CO6: Discuss stability classifications and calculate stability limits using equal area criterion and numerical methods.

Course Code	**EE8551**
Name of the Course	**MICROPROCESSORS AND MICROCONTROLLERS**
Year/Semester	III/V
Total Contact Hours	45
Course Outcome	CO1: Describe the basic Architecture of 8085 Microprocessor and working of all blocks of the processor, IO and memory interfacings with necessary timing diagrams. CO2: Classify the instructions with the help of Addressing modes of 8085 with necessary programs. CO3: Explain the basic Architecture of 8051 Microcontroller with working of various blocks of the controller like Interrupts, Timer, IO ports etc. with necessary timing diagram andcompare the programming concepts with 8085. CO4:Analyze the architecture of various Interfacing Devices like 8255 PPI, 8259 PIC, 8251USART, 8279, 8253 CO5: Analyze the architecture of various Interfacing Devices like ADC and DAC and Programming of all the Interfacing IC's. CO6:Apply the knowledge of programming concepts of 8051 Microcontroller for various applications like keyboard display interface, servo motor etc.,

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Course Code	**EE8552**
Name of the Course	**POWER ELECTRONICS**
Year/Semester	III/V
Total Contact Hours	45
Course Outcome	CO1: Explain the significance of switching devices and its application to power Converters and demonstrate the triggering circuit and snubber circuits. CO2: Compare the operation of two, three Pulse Converters and draw output Waveforms with and without source and load inductance. CO3: Classify the operation of Choppers and outline the application of SMPS. CO4: Analyze the operation of single phase and three phase Inverters with and without. CO5: Illustrate the operation of cycloconverter and its application. CO6: Illustrate the operation of AC voltage controller and its application.

Course Code	**EE8591**
Name of the Course	**DIGITAL SIGNAL PROCESSING**
Year/Semester	III/V
Total Contact Hours	60
Course Outcome	CO1: Classify the different types of signals and systems and Explain the sampling process of continuous time signal. CO2: Apply z-transform and inverse Z transform and analyze discrete time systems. CO3:Apply Radix-2 Decimation in Time (DIT) and Decimation in Frequency (DIF) FFT Algorithm to Compute Discrete Fourier Transform CO4:Explain different types of Infinite Impulse Response (IIR) filters and Finite Impulse Response (FIR) filters CO5: An understanding of sampling conversion technique in signal processing and its applications. CO6: Explain various architectures of Digital signal processors.

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Course Code	**CS8392**
Name of the Course	**OBJECTED ORIENTED PROGRAMMING**
Year/Semester	III/V
Total Contact Hours	45
Course Outcome	CO1:Gain the basic knowledge on object oriented concepts CO2: Ability to implement features of object oriented programming to solve real world problems. CO3: Analyze the suitable test to validate the programs with exception handling mechanism. CO4: Analyze and apply to evaluate the concept of overloading. CO5: Develop the concept of java in creating classes, objects using arrays and control statements. CO6:Create packages, handle exceptions and develop multi-threaded programs

Course Code	**OAN551**
Name of the Course	**SENSORS AND TRASDUCERS**
Year/Semester	III/V
Total Contact Hours	45
Course Outcome	CO1. Expertise in various calibration techniques and signal types for sensors. CO2. Apply the various sensors in the Automotive and Mechatronics applications CO3. Study the basic principles of various smart sensors. CO4. Implement the DAQ systems with different sensors for real time

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Course Code	**EE8511**
Name of the Course	**CONTROL AND INSTRUMENTATION LABORATORY**
Year/Semester	III/V
Total Contact Hours	60
Course Outcome	CO1:Determine the characteristics of P, PI and PID controllers experimentally and analyze the stability of the control system by (i) Bode plot (ii) Root Locus Plot and (iii) Nyquist plot using MATLAB CO2:Compute the transfer function of a Field controlled DC motor experimentally and Design the Lag, Lead and Lag-Lead Compensators for the given specifications and hook up it using RC networks CO3:Draw the transient response of Position Control system experimentally, Determine the Characteristics of Synchro-Transmitter- Receiver and Use the MATLAB forthe Simulation of Control Systems CO4:Calculate the unknown Capacitance, Inductance and Resistance using AC and DC Bridges experimentally and Analyze the Dynamics of Sensors/Transducers (a)Temperature (b) Pressure (c) Displacement (d) Optical (e) Strain and (f) Flow CO5:Measure the Power and Energy experimentally CO6:Analyze the Signal Conditioning units (a) Instrumentation Amplifier (b) ADC and DACs and Use the MATLAB for Process Simulation

Course Code	**HS8581**
Name of the Course	**PROFESSIONAL COMMUNICATION**
Year/Semester	III/V
Total Contact Hours	30
Course Outcome	CO1: Apply appropriate communication skills across settings, purposes and audiences. CO2: Demonstrate knowledge of communication theory and applications. CO3: Practice critical thinking to develop innovative and well-founded perspectives related to the students emphasis. Build and maintain healthy and effective relationships. CO4: Use technology to communicate effectively in various settings and contexts. CO5: Demonstrate appropriate and professional ethical behavior.

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Course Code	**CS8383**
Name of the Course	**OBJECT ORIENTED PROGRAMMING LABORATORY**
Year/Semester	III/V
Total Contact Hours	60
Course Outcome	CO1: Design C++ programs using functions, classes with objects, member functions and constructors. CO2: Develop operator and function overloading and run time polymorphism using C++. CO3: Develop file handling techniques in C++ for sequential and random access also use Java code for strings. CO4: Construct packages and interfaces in Java. CO5: Create threads in Java and handle predefined and user defined exceptions. CO6:Ability to model and analyze electrical apparatus and their application to power system .

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Course Code	**EE8601**
Name of the Course	**SOLID STATE DRIVES**
Year/Semester	III/VI
Total Contact Hours	45
Course Outcome	CO1: Classify the various types of drives and load torque characteristics and Apply the multiquadrant dynamics in hoist load system. CO2: Analyze the operation of steady state analysis of single phase and three phase fullycontrolled converter and Chopper fed separately excited dc motor drives and discuss the various control strategies of converter. CO3: Explain the operation and characteristics of various methods of solid state speed control of induction motor. CO4: Describe the operation of various modes of V/f control of synchronous motor drives and different types of permanent magnet synchronous motor drives. CO5: Design a current and speed controller and develop the transfer function for DC motor, load and converter, closed loop control with current and speed feedback. CO6:Ability to understand and apply basic science, circuit theory, and Electro-magnetic field theory control theory and apply them to electrical engineering problems

Course Code	**EE8602**
Name of the Course	**PROTECTION AND SWITCH GEAR**
Year/Semester	III/VI
Total Contact Hours	45
Course Outcome	CO1: Summarize the causes and effects of faults in power system and explain the necessity of protection in power system. CO2:Describe the operation of various relays and summarize the various protective schemes CO3: List out the various faults that can occur on alternator, transformer, bus bar and transmission line and select the suitable protection schemes. CO4: Synthesize the static relays using comparators and explain numerical relays. CO5: Derive the expression for RRRV, critical resistance value CO6: Express the various types of circuit breakers and its application.

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Course Code	**EE8691**
Name of the Course	**EMBEDDED SYSTEMS**
Year/Semester	III/VI
Total Contact Hours	45
Course Outcome	CO1: Analyze the basic build process of embedded systems, structural units in embedded processor and selection of processor and memory devices depending upon theapplications. CO2: Classify the types of I/O device ports and buses and different interfaces for data transfer. CO3:Model the Embedded Product Development Life Cycle (EDLC) by using different techniques like state machine model, sequential program model and concurrent model CO4:Analyze the basic concept of Real Time Operating Systems and plan to scheduling of different task and compare the features of different types of Real Time Operating Systems CO5:Apply the knowledge of programming concepts of Embedded Systems for variousapplications like Washing Machine automotive and Smart Card System applications

Course Code	**EE8002**
Name of the Course	**DESIGN OF ELECTRICAL APPARATUS**
Year/Semester	III/VI
Total Contact Hours	45
Course Outcome	CO1:Ability to understand basics of design considerations for rotating and static electricalmachines CO2: Ability to design of field system for its application. CO3: Ability to design sing and three phase transformer. CO4: Ability to design armature and field of DC machines. CO5: Ability to design stator and rotor of induction motor. CO6: Ability to design and analyze synchronous machines.

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Course Code	**EE8005**
Name of the Course	**SPECIAL ELECTRICAL MACHINES**
Year/Semester	III/VI
Total Contact Hours	45
Course Outcome	CO1: Ability to analyze and design controllers for special Electrical Machines. CO2: Ability to acquire the knowledge on construction and operation of stepper motor. CO3: Ability to acquire the knowledge on construction and operation of stepper switchedreluctance motors. CO4: Ability to construction, principle of operation, switched reluctance motors. CO5: Ability to acquire the knowledge on construction and operation of permanent magnetbrushless D.C. motors. CO6:Ability to acquire the knowledge on construction and operation of permanent magnetsynchronous motors CO7: Ability to select a special Machine for a particular application.

Course Code	**EE8661**
Name of the Course	**POWER ELECTRONICS AND DRIVES LABORATORY**
Year/Semester	III/VI
Total Contact Hours	60
Course Outcome	CO1:Draw the VI characteristics of SCR and generate the Gate Pulse using R, RC and UJT CO2:Plot the characteristics of MOSFET and IGBT CO3:Simulate a single phase AC to DC half and fully controlled converter CO4: Draw the output response of step up and step down MOSFET based chopper and Simulate a single phase IGBT based PWM inverter. CO5:Plot the output response of AC voltage controller and Simulate the Power Electronic Circuits CO6: Ability to understand and analyze, linear and digital electronic circuits.

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Course Code	**EE8681**
Name of the Course	**MICROPROCESSORS AND MICROCONTROLLERS LABORATORY**
Year/Semester	III/VI
Total Contact Hours	60
Course Outcome	CO1: Demonstrate and apply working of programs in microprocessor 8085 and 8051 microcontroller. CO2:Explain various assembly language programs CO3:Develop the basic knowledge of microprocessor and microcontroller interfacing and their application CO4:Design the system using capabilities of stack program counter and status register and show how these are used to execute a machine code program CO5:Justify the programming proficiency using various addressing modes and data transfer instruction of target microprocessor CO6:Develop mini-projects using 8085 processor

Course Code	**EE8611**
Name of the Course	**MINI PROJECT**
Year/Semester	III/VI
Total Contact Hours	60
Course Outcome	CO1: Able to develop their own innovative prototype of ideas. CO2: Able to frame and use right principles. CO3: Able to implement proper methodology. CO4: Able to take up their final year project work. CO5: Able to prepare mini project reports and examination. CO6: Able to find solution for real time applications.

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Course Code	**EE8701**
Name of the Course	**HIGH VOLTAGE ENGINEERING**
Year/Semester	IV/VII
Total Contact Hours	45
Course Outcome	CO1: Identify the causes of over voltage and its effects in power system. CO2:Classify the breakdown Mechanisms in Solid, Liquid, gases and Composite dielectrics CO3:Design different type of Generating circuit for high voltage D.C and high voltage A.C CO4:Measure A.C and D.C high voltage and current using appropriate method CO5:Test the transformer ,insulator , circuit breakers, surge diverters and cables also discuss the insulation coordination CO6: Ability to understand and analyze power system operation, stability, control and protection.

Course Code	**EE8702**
Name of the Course	**POWER SYSTEM OPERATION AND CONTROL**
Year/Semester	IV/VII
Total Contact Hours	45
Course Outcome	CO1: Explain the concept of transients and Compute the solution of transient current equation for RL and RLC system. CO2: Illustrate the importance of switching transients; Explain the concept of resistance switching, load switching and capacitance switching. CO3: Explain the concept of lightning mechanism, Describe the interaction between lightning and power system CO4: Apply the concept of reflection and refraction, Draw the Bewley Lattice diagram for different systems. CO5: Analyze the concept of short line (or) Kilometric fault and justify the EMTP for transient computation. CO6: Ability to understand and analyze power system operation, stability, control and protection.

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Course Code	**EE8703**
Name of the Course	**RENEWABLE ENERGY SYSTEMS**
Year/Semester	IV/VII
Total Contact Hours	45
Course Outcome	CO1:Examine the various types of renewable energy sources CO2:Acquiring the knowledge about the performance of IG, PMSG, SCIG and DFIG CO3:Ability to fabricate different power converters namely AC to DC , DC to DC and AC to AC converters for renewable energy sources CO4:Analyze various operating modes of wind electrical generators and solar energy system CO5:Strengthen the knowledge about maximum power point tracking algorithms CO6:Gain the knowledge about various grid integrated systems

Course Code	**OML751**
Name of the Course	**TESTING OF MATERIALS**
Year/Semester	IV/VII
Total Contact Hours	45
Course Outcome	CO1. Identify suitable testing technique to inspect industrial component CO2. Ability to use the different technique and know its applications and limitations

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Course Code	**GE8071**
Name of the Course	**DISASTER MANAGEMENT**
Year/Semester	IV/VII
Total Contact Hours	45
Course Outcome	CO1:Differentiate the types of disasters, causes and their impact on environment and society CO2: Assess vulnerability and various methods of risk reduction measures as well as mitigation. CO3: Draw the hazard and vulnerability profile of India, Scenarious in the Indian context, Disasterdamage assessment and management.

Course Code	**EE8010**
Name of the Course	**POWER SYSTEMS TRANSIENTS**
Year/Semester	IV/VII
Total Contact Hours	45
Course Outcome	CO1: Ability to understand and analyze switching and lightning transients. CO2: Ability to acquire knowledge on generation of switching transients and their control. CO3: Ability to analyze the mechanism of lighting strokes. CO4: Ability to understand the importance of propagation, reflection and refraction oftravelling waves. CO5: Ability to find the voltage transients caused by faults. CO6: Ability to understand the concept of circuit breaker action, load rejection onintegrated power system.

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Course Code	**EE8711**
Name of the Course	**POWER SYSTEM SIMULATION LABORATORY**
Year/Semester	IV/VII
Total Contact Hours	60
Course Outcome	CO1:Determine the bus impedance and admittance matrices using C and MATLAB CO2:Apply numerical methods for solving load flow problems and verify using C and MATLAB CO3: Analyze various faults occurring in power system and simulate the faults using PSCAD. CO4: Analyze small signal stability of Single Machine Infinite Bus (SMIB) system and draw the swing curve using AUPOWER Lab and MATLAB. CO5: Generate the coding for economic dispatch problems and load frequency dynamics problems using MATLAB.

Course Code	**EE871**
Name of the Course	**RENEWABLE ENERGY SYSTEMS LABORATORY**
Year/Semester	IV/VII
Total Contact Hours	60
Course Outcome	CO1:Ability to understand and analyze Renewable energy systems CO2: Ability to train the students in Renewable Energy Sources and technologies. CO3: Ability to provide adequate inputs on a variety of issues in harnessing Renewable Energy. CO4: Ability to simulate the various Renewable energy sources. CO5: Ability to recognize current and possible future role of Renewable energy sources. CO6: Ability to understand basics of Intelligent Controllers.

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Course Code	**GE8076**
Name of the Course	**PROFESSIONAL ETHICS IN ENGINEERING**
Year/Semester	**IV/VIII**
Total Contact Hours	45
Course Outcome	CO1: Upon completion of the course, the student should be ability to apply ethics in society, discuss theethical issues related to engineering and realize the responsibilities and rights in the society.

Course Code	**EE8018**
Name of the Course	**MICROCONTROLLER BASED SYSTEM DESIGN**
Year/Semester	**IV/VIII**
Total Contact Hours	45
Course Outcome	CO1: Ability to understand and apply computing platform and software for engineeringproblems. CO2: Ability to understand the concepts of Architecture of PIC microcontroller CO3: Ability to acquire knowledge on Interrupts and timers. CO4: Ability to understand the importance of Peripheral devices for data communication. CO5:Ability to understand the basics of sensor interfacing CO6:Ability to acquire knowledge in Architecture of ARM processors

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Course Code	**EE8811**
Name of the Course	**PROJECT WORK**
Year/Semester	**IV/VIII**
Total Contact Hours	300
Course Outcome	CO1:Apply the fundamentals of mathematics, science and engineering knowledge to identify , formulate , design and investigate complex engineering problems of electrical and electronics engineering and allied applications . CO2: Apply appropriate techniques and modern engineering hardware and software tools in electrical and electronics engineering and allied applications. CO3:Apply reasoning informed by the contextual knowledge to assess societal , health, safety, legal and cultural issues with societal and environmental context, applying ethical principles in the field of electrical and electronics engineering and allied applications. CO4: Function effectively as an individual and as a member or leader in diverse teams in multidisciplinary settings and make effective presentation, and communicate effectively. CO5: Demonstrate the understanding of the engineering and management principles inmultidisciplinary environments to engage in lifelong learning in the broadest context of technological change.

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COURSE OUTCOMES (COs)

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COURSE OUTCOMES (COs)

DEPARTMENT OF MECHANICAL ENGINEERING

2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

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DEPARTMENT OF MECHANICAL ENGINEERING

VISION

- To be a universal knowledge center in mechanical engineering education, entrepreneurship and industry outreach services.
- To develop competent Mechanical Engineers who use their talent to take up challenges of the industry.

MISSION

- To provide quality education to students in Mechanical Engineering, with sufficient scope to meet emerging challenges of the society.
- To prepare students for successful engineering career by inculcating leadership qualities to encourage entrepreneurship, professional and ethical responsibilities for betterment of society.
- To make the department a "Centre of Excellence" in the field of Mechanical Engineering with highly developed educational infrastructure and active association with the relevant industries.

PROGRAM SPECIFIC OUTCOMES (PSOs):

1. Ability to use various techniques in computer aided design, manufacturing and robotics to obtain the solution for complex problems in automation.
2. Ability to demonstrate the impact of Lean Manufacturing principles, the tools and need for quality in manufacturing.
3. Ability to innovate knowledge in thermal and sustainable energy applications with creativity and skills.

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PROGRAMME EDUCATIONAL OBJECTIVES:

Bachelor of Mechanical Engineering curriculum is designed to impart Knowledge, Skill and Attitude on the graduates to

1. Have a successful career in Mechanical Engineering and allied industries.
2. Have expertise in the areas of Design, Thermal, Materials and Manufacturing.
3. Contribute towards technological development through academic research and industrial practices.
4. Practice their profession with good communication, leadership, ethics and social responsibility.
5. Graduates will adapt to evolving technologies through life-long learning.

PROGRAMME OUTCOMES:

1. An ability to apply knowledge of mathematics and engineering sciences to develop mathematical models for industrial problems.
2. An ability to identify, formulates, and solve complex engineering problems. With high degree of competence.
3. An ability to design and conduct experiments, as well as to analyze and interpret data obtained through those experiments.
4. An ability to design mechanical systems, component, or a process to meet desired needs within the realistic constraints such as environmental, social, political and economic sustainability.
5. An ability to use modern tools, software and equipment to analyze multidisciplinary problems.
6. An ability to demonstrate on professional and ethical responsibilities.
7. An ability to communicate, write reports and express research findings in a scientific community.
8. An ability to adapt quickly to the global changes and contemporary practices.

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9. An ability to engage in life-long learning.

PO 1: Engineering knowledge Apply knowledge of mathematics, science and engineering fundamentals and Production and Industrial Engineering specialization to the solution of complex Production and Industrial Engineering problems.

PO 2: Problem Analysis Identify, formulate, research literature and analyze complex Production and Industrial Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3: Design/ Development of Solutions Design solutions for complex Engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO 4: Conduct investigations of complex Engineering problems Use research-based knowledge and research methods including analysis, interpretation of data and synthesis of information to provide valid conclusions.

PO 5: Modern Tool Usage Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The Engineer and Society Apply contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO 7: Environment and Sustainability understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9: Individual and Team Work Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10: Communication Communicate effectively on complex Engineering activities with the engineering community and with society at large, such as being able to comprehend and write

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effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO 11: Project Management and Finance Demonstrate knowledge and understanding of Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life Long learning recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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DEPARTMENT OF MECHANICAL ENGINEERING	
REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	HS8151 - Communicative English
CO'S	**COURSE OUTCOMES**
CO1	Students will acquire wide knowledge in all the four skills such as listening, speaking, reading and writing
CO2	Students will be able to write effectively for a variety of professional and social settings.
CO3	Students will be able to share ideas and concepts in proper pronunciation, structure, appropriate use and style of the English Language as well as the application areas of English communication
CO4	Students will be able to prepare, organize, and deliver an engaging oral presentation.
CO5	Students will become active readers who can articulate their own interpretations with an awareness and curiosity for other perspectives.
SUBJECT CODE & NAME:	MA8151 -Engineering Mathematics - I
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To apply both the limit definition and rules of differentiation to differentiate functions.
CO2	To apply Differentiation in Maxima and Minima problems
CO3	To Evaluate integrals both by using Riemann's and the fundamental theorem of calculus
CO4	To compute multiple integrals, area, volume, integrals in polar coordinates in addition to change of order and change of variables
CO5	To evaluate the integrals using techniques of integration, such as substitution, partial fractions and integration by parts

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SUBJECT CODE & NAME:	PH8151 - Engineering Physics
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Understand the elastic behavior and thermal properties of materials.
CO2	Understand the properties and applications of wave and fiber optics
CO3	Understand thermal properties of the material.
CO4	Understand Quantum mechanical behavior of the material
CO5	Understand the crystal structure and growing methods of crystal
SUBJECT CODE & NAME:	CY8151 - Engineering Chemistry
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To Know and develop innovative methods to produce soft water for boiler feed by various treatment process.
CO2	Explain role of adsorption phenomena and various catalytic types and its key properties
CO3	Students able to know about significance and properties of alloy making and its application on phase diagram.
CO4	To explain about analysis and manufacture of various types of fuel.
CO5	To Know about the importance and application of energy sources and energy storage devices.
SUBJECT CODE & NAME:	GE8151 - Problem Solving and Python Programming
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs.
CO3	Structure simple Python programs for solving problems.
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries
CO6	Read and write data from/to files in Python Programs.

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SUBJECT CODE & NAME:	GE8152 - Engineering Graphics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform Freehand Sketching Of Basic Geometrical Constructions And Multiple Views Of Objects and conic sections.
CO2	Develop Orthographic Projections Of Lines And Plane Surfaces
CO3	Draw projections of solids
CO4	Draw projections of development of surfaces
CO5	Visualize and to project isometric and perspective sections of simple solids
SUBJECT CODE & NAME:	GE8161- Problem Solving and Python Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops.
CO3	Develop Python programs step-wise by defining functions and calling them.
CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python.
SUBJECT CODE & NAME:	BS8161-Physics and Chemistry Laboratory
CO'S	**COURSE OUTCOMES**
CO1	Student will have knowledge to Analyze the particle size & acceptance ankle using laser.
CO2	Student will be able to Apply the principle of ultrasonic interferometer
CO3	Student will be able to understand the principles of spectrometer grating
CO4	Students can Analyze the thermal conductivity of a bad conductor
CO5	Student will be able to Apply the elastic behavior of material

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Criteria 2 2.6 Student Performance and Learning Outcomes

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REGULATION & SEMESTER:	2017 - II
SUBJECT CODE & NAME:	HS8251 - Technical English
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Read various types of texts adapting different reading strategies
CO2	Write letters and reports effectively in formal and informal situations.
CO3	Speak confidently and communicate with others effectively in order to improve their interview skills.
CO4	Use the language perfectly without grammatical errors and by using a wide range of vocabulary.
CO5	Use the technical information properly according to business situations.
SUBJECT CODE & NAME:	MA8251- Engineering Mathematics - II
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	To understand the concept of Eigen values and Eigen vectors, diagonalization of Matrix, symmetric matrices, positive definite matrices and similar matrices
CO2	To evaluate Gradient, Divergence and Curl of a Vector point functions and related identities.
CO3	To evaluate a Line, Surface and Volume integrals by using Gauss, Stokes and Green's Theorems and their verification.
CO4	To understand the concept of Analytic functions, conformal mapping and Complex integration
CO5	To understand the concept of Laplace Transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients

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SUBJECT CODE & NAME:	PH8251 - Materials Science
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the phase diagrams.
CO2	Understand the properties, preparation and applications of ferrous alloys
CO3	Understand the mechanical properties material.
CO4	Understand properties and applications of the magnetic, dielectric and super conducting materials
CO5	Understand the properties, preparation methods and applications of new materials
SUBJECT CODE & NAME:	BE8253 Basic Electrical, Electronics and Instrumentation Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand electric circuits and working principle of electrical machines
CO2	understanding the concept of various electronic devices
CO3	choose appropriate instruments for electrical measurements for a specific application
SUBJECT CODE & NAME:	GE8291 Environmental Science and Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To Know about the Scope and important of Environmental Science and values of Biodiversity.
CO2	Students will capable to identify Problems related to various Environmental Pollutions and its Control & Prevention.
CO3	Students will understand the Natural resources and sensible use of resources for sustainable lifestyles
CO4	To acquire the knowledge about social problems related to energy and the environmental production.
CO5	To know about the importance of population explosion & family welfare programmer and application of information technology in environment.

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SUBJECT CODE & NAME:	GE8292 Engineering Mechanics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Illustrate the statics of particles in equilibrium
CO2	Analyze the rigid body in equilibrium
CO3	Evaluate the properties of surfaces and solids
CO4	Calculate dynamic forces exerted in rigid body
CO5	Determine the friction and its effects, rigid body dynamics
SUBJECT CODE & NAME:	GE8261 Engineering Practices Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipments to join the structures.
CO3	Carry out the basic machining operations
CO4	Make the sheet metal models
CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO6	Carry out basic home electrical works and appliances
CO7	Measure the electrical quantities
CO8	Elaborate on the components, gates, soldering practices.
SUBJECT CODE & NAME:	BE8261 Basic Electrical, Electronics and Instrumentation Engineering Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to determine the speed characteristic of different electrical machines
CO2	Ability to design simple circuits involving diodes and transistors
CO3	Ability to use operational amplifiers

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REGULATION & SEMESTER:	2017 - III
SUBJECT CODE & NAME:	MA8353 Transforms and Partial Differential Equations
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Understand how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
CO5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
SUBJECT CODE & NAME:	ME8391 Engineering Thermodynamics
CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Apply the first law of thermodynamics for simple open and closed systems.
CO2	Know second law of thermodynamics and apply to open and closed systems
CO3	Study Ranking cycle to steam power plant and compare few cycle improvement methods
CO4	Derive simple thermodynamic relations of ideal and real gases
CO5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes

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SUBJECT CODE & NAME:	CE8394 Fluid Mechanics and Machinery
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply Mathematical knowledge to predict the properties and characteristics of a fluid.
CO2	Analyze and calculate major and minor losses associated with pipe flow in piping networks.
CO3	Mathematically predict the nature of physical quantities
CO4	Critically analyze the performance of pumps
CO5	Critically analyze the performance of turbines
SUBJECT CODE & NAME:	ME8351 Manufacturing Technology - I
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain different metal casting processes, associated defects, merits and demerits
CO2	Compare different metal joining processes.
CO3	Summarize various hot working and cold working methods of metals.
CO4	Work on various sheet metal making processes.
CO5	Distinguish various methods of manufacturing plastic components.
SUBJECT CODE & NAME:	EE8353 Electrical Drives and Controls
CO'S	**COURSE OUTCOMES**
CO1	Able to understand the basics of electric drives and to discuss the thermal considerations.
CO2	Able to analyze characteristics of different types of drive motors.
CO3	Able to explain the different types of starters.
CO4	Able to elucidate the speed control of DC drives.
CO5	Able to elucidate the speed control of AC drives.

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SUBJECT CODE & NAME:	ME8361 Manufacturing Technology Laboratory - I
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate the safety precautions exercised in the mechanical workshop.
CO2	Make the work piece as per given shape and size using Lathe.
CO3	Join two metals using arc welding or gas welding
CO4	Use sheet metal fabrication tools and make simple tray and funnel.
CO5	Use different molding tools, patterns and prepare sand molds.
SUBJECT CODE & NAME:	ME8381 Computer Aided Machine Drawing
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Follow the drawing standards, Fits and Tolerances
CO2	Re-create part drawings, sectional views and assembly drawings as per standards
SUBJECT CODE & NAME:	EE8361 Electrical Engineering Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to perform speed characteristic of different electrical machine
SUBJECT CODE & NAME:	HS8381 Interpersonal Skills / Listening & Speaking
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

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REGULATION & SEMESTER:	2017 - III
COURSE CODE & NAME:	MA8353 Transforms and Partial Differential Equations
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
CO5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
COURSE CODE & NAME:	ME8381 COMPUTER AIDED MACHINE DRAWING
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Follow the drawing standards, Fits and Tolerances
CO2	Re-create part drawings, sectional views and assembly drawings as per standards

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COURSE CODE & NAME:	ME8391 Engineering Thermodynamics
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply the first law of thermodynamics for simple open and closed systems.
CO2	Know second law of thermodynamics and apply to open and closed systems
CO3	Study Ranking cycle to steam power plant and compare few cycle improvement methods
CO4	Derive simple thermodynamic relations of ideal and real gases
CO5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes
COURSE CODE & NAME:	CE8394 Fluid Mechanics and Machinery
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply Mathematical knowledge to predict the properties and characteristics of a fluid.
CO2	Analyze and calculate major and minor losses associated with pipe flow in piping networks.
CO3	Mathematically predict the nature of physical quantities
CO4	Critically analyses the performance of pumps
CO5	Critically analyses the performance of turbines
COURSE CODE & NAME:	ME8351 Manufacturing Technology - I
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain different metal casting processes, associated defects, merits and demerits
CO2	Compare different metal joining processes.
CO3	Summarize various hot working and cold working methods of metals.
CO4	Work on various sheet metal making processes.
CO5	Distinguish various methods of manufacturing plastic components.

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COURSE CODE & NAME:	EE8353 Electrical Drives and Controls
COS	**COURSE OUTCOMES**
	Student will be,
CO1	Able to understand the basics of electric drives and to discuss the thermal considerations.
CO2	Able to analyze characteristics of different types of drive motors.
CO3	Able to explain the different types of starters.
CO4	Able to elucidate the speed control of DC drives.
CO5	Able to elucidate the speed control of AC drives.
COURSE CODE & NAME:	ME8361 Manufacturing Technology Laboratory - I
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate and fabricate different types of components using the machine tools
COURSE CODE & NAME:	CE6461 Fluid Mechanics and Machinery Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Ability to use the measurement equipments for flow measurement
CO2	Ability to do performance trust on different fluid machinery
COURSE CODE & NAME:	EE8361 Electrical Engineering Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform speed characteristics of different electrical machines

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REGULATION & SEMESTER:	2017 - IV
COURSE CODE & NAME:	MA8452 Statistics and Numerical Methods
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
CO2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
CO3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
CO4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
CO5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
COURSE CODE & NAME:	ME8492 Kinematics of Machinery
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Discuss the basics of mechanism
CO2	Calculate velocity and acceleration in simple mechanisms
CO3	Develop CAM profiles
CO4	Solve problems on gears and gear trains
CO5	Examine friction in machine elements
COURSE CODE & NAME:	HS8461 ADVANCED READING AND WRITINGY
COS	COURSE OUTCOMES
CO1	Write different types of essays.
CO2	Write winning job applications.
CO3	Read and evaluate texts critically.
CO4	Display critical thinking in various professional contexts

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COURSE CODE & NAME:	ME8451 Manufacturing Technology– II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the mechanism of material removal processes
CO2	Describe the constructional and operational features of centre lathe and other special purpose lathes.
CO3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.
CO4	Summarize numerical control of machine tools and write a part program
CO5	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes.
COURSE CODE & NAME:	CE83951 STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
CO2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
CO3	Apply basic equation of simple torsion in designing of shafts and helical spring
CO4	Calculate the slope and deflection in beams using different methods.
CO5	Analyze and design thin and thick shells for the applied internal and external pressures
COURSE CODE & NAME:	CE8381 STRENGTH OF MATERIALS AND FLUID MECHANICS AND MACHINERY LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.
CO2	Use the measurement equipment's for flow measurement.
CO3	Perform test on different fluid machinery

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COURSE CODE & NAME:	ME8491 Engineering Metallurgy
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
CO2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
CO3	Clarify the effect of alloying elements on ferrous and non-ferrous metals
CO4	Summarize the properties and applications of non metallic materials.
CO5	Explain the testing of mechanical properties.
COURSE CODE & NAME:	ME8493 Thermal Engineering-I
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply thermodynamic concepts to different air standard cycles and solve problems.
CO2	Solve problems in single stage and multistage air compressors
CO3	Explain the functioning and features of IC engines, components and auxiliaries.
CO4	Calculate performance parameters of IC Engines.
CO5	Explain the flow in Gas turbines and solve problems
COURSE CODE & NAME:	ME8462 Manufacturing Technology Laboratory–II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Use different machine tools to manufacturing gears
CO2	Use different machine tools for finishing operations
CO3	Manufacture tools using cutter grinder
CO4	Develop CNC part programming

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Criteria 2 2.6 Student Performance and Learning Outcomes

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REGULATION & SEMESTER:	2017- V
COURSE CODE & NAME:	ME8595 Thermal Engineering-II
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Solve problems in Steam Nozzle
CO2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters
CO3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.
CO4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers
CO5	Solve problems using refrigerant table / charts and psychometric charts
COURSE CODE & NAME:	ORO551 RENEWABLE SOURCES OF ENERGY
COS	COURSE OUTCOMES
CO1	Discuss the importance and Economics of renewable Energy
CO2	Discuss the method of power generation from Solar Energy
CO3	Discuss the method of power generation from Wind Energy
CO4	Explain the method of power generation from Bio Energy
CO5	Explain the Tidal energy, Wave Energy, OTEC, Hydro energy, Geothermal Energy, Fuel Cells and Hybrid Systems.

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COURSE CODE & NAME:	ME8593 DESIGN OF MACHINE ELEMENTS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the influence of steady and variable stresses in machine component design
CO2	Apply the concepts of design to shafts, keys and couplings.
CO3	Apply the concepts of design to temporary and permanent joints.
CO4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.
CO5	Apply the concepts of design to bearings.
COURSE CODE & NAME:	ME8501 Metrology and Measurements
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Describe the basic concepts of measurements to apply on various metrological instruments
CO2	Explain the principles of linear and angular measurement tools used in industrial applications
CO3	Explain the procedure for conducting computer aided inspection
CO4	Demonstrate the techniques of form measurement used for industrial components
CO5	Discuss various measuring techniques of mechanical properties in industrial applications
COURSE CODE & NAME:	ME8594 Dynamics of Machines
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Find static and dynamic forces of mechanisms
CO2	Calculate the balancing masses and their locations of reciprocating and rotating masses
CO3	Determine the frequency of free vibration
CO4	Compute the frequency of forced vibration and damping coefficient
CO5	Calculate the governor variables and estimate the gyroscopic effect on automobiles, ships and airplanes

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COURSE CODE & NAME:	ME8511 KINEMATICS AND DYNAMICS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of lab equipment's
CO2	Determine mass moment of inertia of mechanical element, governor effort and range sensitivity, natural frequency and damping coefficient, torsional frequency, critical speeds of shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio.
COURSE CODE & NAME:	ME8512 Thermal Engineering Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials
CO2	Conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient
CO3	Conduct tests on radioactive heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity
CO4	Conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor
CO5	Conduct tests to evaluate the performance of refrigeration and air conditioning test rigs
COURSE CODE & NAME:	ME8513 Metrology and Measurements Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, thread parameters, temperature using thermocouple, force, displacement, torque and vibration
CO2	Calibrate the venire, micrometer and slip gauges and setting up the comparator for the inspection

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Criteria 2 2.6 Student Performance and Learning Outcomes

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REGULATION & SEMESTER:	2017 - VI
COURSE CODE & NAME:	ME8651 Design of Transmission Systems
COS	
	Student will be able to,
CO1	Apply the design concepts to belts, chains and rope drives
CO2	Apply the design concepts Design spur, helical gears
CO3	Apply the design concepts Design worm and bevel gears
CO4	Apply the design concepts Design gear boxes
CO5	Apply the concepts of design to cams, clutches and brakes
COURSE CODE & NAME:	MG6851 Principles of Management
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand managerial functions and organization
CO2	Understand of planning techniques
CO3	Understanding of organizing an organization
CO4	Demonstrate the concepts of directing
CO5	Understanding of controlling
COURSE CODE & NAME:	ME8691 COMPUTER AIDED DESIGN AND MANUFACTURING
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics
CO2	Explain the fundamentals of parametric curves, surfaces and Solids
CO3	Summarize the different types of Standard systems used in CAD
CO4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machine
CO5	Summarize the different types of techniques used in Cellular Manufacturing and FMS

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COURSE CODE & NAME:	ME8692 Finite Element Analysis
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Summarize the basics of finite element formulation
CO2	Apply finite element formulations to solve one dimensional Problems
CO3	Apply finite element formulations to solve two dimensional scalar Problems
CO4	Apply finite element method to solve two dimensional Vector problems
CO5	Apply finite element method to solve problems on iso parametric element and dynamic Problems
COURSE CODE & NAME:	ME8693 HEAT AND MASS TRANSFER
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems
CO2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems
CO3	Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems
CO4	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems
CO5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications

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COURSE CODE & NAME:	ME8694 HYDRAULICS AND PNEUMATICS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the Fluid power and operation of different types of pumps.
CO2	Summarize the features and functions of Hydraulic motors, actuators and Flow control valves
CO3	Explain the different types of Hydraulic circuits and systems
CO4	Explain the working of different pneumatic circuits and system
CO5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.
COURSE CODE & NAME:	ME8681 C.A.D. / C.A.M. Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Draw 3D and Assembly drawing using CAD software
CO2	Demonstrate manual part programming with G and M codes using CAM software
COURSE CODE & NAME:	ME8682 Design and Fabrication Project
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and Fabricate the machine elements or the mechanical product
CO2	Demonstrate the working model of the machine element or the mechanical product
COURSE CODE & NAME:	HS8581 Professional Communication Skills - Laboratory Based
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Make effective presentations
CO2	Participate confidently in Group Discussions.
CO3	Attend job interviews and be successful in them.
CO4	Develop adequate Soft Skills required for the workplace

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REGULATION & SEMESTER:	2017 - VII
COURSE CODE & NAME:	ME8792 Power Plant Engineering
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Explain the layout, construction and working of the components inside a thermal power plant.
CO2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants
CO3	Explain the layout, construction and working of the components inside nuclear power plants.
CO4	Explain the layout, construction and working of the components inside Renewable energy power plants
CO5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy
COURSE CODE & NAME:	ME8793 PROCESS PLANNING AND COST ESTIMATION
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Select the process, equipment and tools for various industrial products.
CO2	Prepare process planning activity chart.
CO3	Explain the concept of cost estimation
CO4	Compute the job order cost for different type of shop floor.
CO5	Calculate the machining time for various machining operations.
COURSE CODE & NAME:	ME8712 Technical Seminar
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand and comprehend any given problem related to mechanical engineering field.

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COURSE CODE & NAME:	ME8791 Mechatronics
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology.
CO2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller.
CO3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing
CO4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering
CO5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies
COURSE CODE & NAME:	ME8073 Unconventional Machining Process
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the need for unconventional machining processes and its classification
CO2	Compare various thermal energy and electrical energy based unconventional machining processes.
CO3	Summarize various chemical and electro-chemical energy based unconventional machining processes
CO4	Explain various nano abrasives based unconventional machining processes
CO5	Distinguish various recent trends based unconventional machining processes.

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COURSE CODE & NAME:	ME8099 Robotics
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the concepts of industrial robots, classification, specifications and coordinate systems. Also summarize the need and application of robots in different sectors.
CO2	Illustrate the different types of robot drive systems as well as robot end effectors
CO3	Apply the different sensors and image processing techniques in robotics to improve the ability of robots
CO4	Develop robotic programs for different tasks and familiarize with the kinematics motions of robot.
CO5	Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots
COURSE CODE & NAME:	ME8711 Simulation and Analysis Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB
CO2	Analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems
CO3	Calculate the natural frequency and mode shape analysis of 2D components and beams
COURSE CODE & NAME:	ME8781 Mechatronics Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems
CO2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers

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REGULATION & SEMESTER:	2017 - VIII
COURSE CODE & NAME:	MG8591 Principles of Management
COS	COURSE OUTCOMES
	Student will be able to,
CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
COURSE CODE & NAME:	MG8091 ENTREPRENEURSHIP DEVELOPMENT
COS	COURSE OUTCOMES
	Student will be able to,
CO	Upon completion of the course, students will be able to gain knowledge and skills needed to run a business successfully
COURSE CODE & NAME:	ME8811 Project Work
COS	COURSE OUTCOMES
CO1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology

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COURSE OUTCOMES (COs)

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COURSE OUTCOMES (COs)

DEPARTMENT OF INFORMATION TECHNOLOGY

2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

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DEPARTMENT OF INFORMATION TECHNOLOGY

VISION

- To prosper as a competent professional for serving industry and Nation's socio-economic progress.
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MISSION

- To foster computing skills with an emphasis on professional competency, interpersonal development and ethics.
- To enrich the aptitude of the students for facing the recent challenges of industry and society.
- To inculcate the students for pursuing careers in industry, academic and research.

PROGRAM SPECIFIC OUTCOMES (PSOs):

1. Ability to use various techniques in computer aided design, manufacturing and robotics to obtain the solution for complex problems in automation.
2. Ability to demonstrate the impact of Lean Manufacturing principles, the tools and need for quality in manufacturing.
3. Ability to innovate knowledge in thermal and sustainable energy applications with creativity and skills

PROGRAMME EDUCATIONAL OBJECTIVES:

1. To ensure graduates will be proficient in utilizing the fundamental knowledge of basic sciences, mathematics and Information Technology for the applications relevant to various streams of Engineering and Technology.

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2. To enrich graduates with the core competencies necessary for applying knowledge of computers and telecommunications equipment to store, retrieve, transmit, manipulate and analyze data in the context of business enterprise.
3. To enable graduates to think logically, pursue lifelong learning and will have the capacity to understand technical issues related to computing systems and to design optimal solutions.
4. To enable graduates to develop hardware and software systems by understanding the importance of social, business and environmental needs in the human context.
5. To enable graduates to gain employment in organizations and establish themselves as professionals by applying their technical skills to solve real world problems and meet the diversified needs of industry, academia and research.

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OBJECTIVES (PSOs):

1. To create, select, and apply appropriate techniques, resources, modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

2. To manage complex IT projects with consideration of the human, financial, ethical and environmental factors and an understanding of risk management processes, and operational and policy implications.

2.6 Student Performance and Learning Outcomes

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DEPARTMENT OF INFORMATION TECHNOLOGY	
REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	HS8151 - Communicative English
CO'S	**COURSE OUTCOMES**
CO1	Students will acquire wide knowledge in all the four skills such as listening, speaking, reading and writing
CO2	Students will be able to write effectively for a variety of professional and social settings.
CO3	Students will be able to share ideas and concepts in proper pronunciation, structure, appropriate use and style of the English Language as well as the application areas of English communication
CO4	Students will be able to prepare, organize, and deliver an engaging oral presentation.
CO5	Students will become active readers who can articulate their own interpretations with an awareness and curiosity for other perspectives.
SUBJECT CODE & NAME:	MA8151 -Engineering Mathematics - I
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To apply both the limit definition and rules of differentiation to differentiate functions.
CO2	To apply Differentiation in Maxima and Minima problems
CO3	To Evaluate integrals both by using Riemann's and the fundamental theorem of calculus
CO4	To compute multiple integrals, area, volume, integrals in polar coordinates in addition to change of order and change of variables
CO5	To evaluate the integrals using techniques of integration, such as substitution, partial fractions and integration by parts
SUBJECT CODE & NAME:	PH8151 - Engineering Physics
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Understand the elastic behavior and thermal properties of materials.
CO2	Understand the properties and applications of wave and fiber optics
CO3	Understand thermal properties of the material.
CO4	Understand Quantum mechanical behavior of the material
CO5	Understand the crystal structure and growing methods of crystal
SUBJECT CODE &	CY8151 - Engineering Chemistry

2.6 Student Performance and Learning Outcomes

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NAME:	
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To Know and develop innovative methods to produce soft water for boiler feed by various treatment process.
CO2	Explain role of adsorption phenomena and various catalytic types and its key properties
CO3	Students able to know about significance and properties of alloy making and its application on phase diagram.
CO4	To explain about analysis and manufacture of various types of fuel.
CO5	To Know about the importance and application of energy sources and energy storage devices.
SUBJECT CODE & NAME:	GE8151 - Problem Solving and Python Programming
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs.
CO3	Structure simple Python programs for solving problems.
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries
CO6	Read and write data from/to files in Python Programs.
SUBJECT CODE & NAME:	GE8152 - Engineering Graphics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform Freehand Sketching Of Basic Geometrical Constructions And Multiple Views Of Objects and conic sections.
CO2	Develop Orthographic Projections Of Lines And Plane Surfaces
CO3	Draw projections of solids
CO4	Draw projections of development of surfaces
CO5	Visualize and to project isometric and perspective sections of simple solids
SUBJECT CODE & NAME:	GE8161- Problem Solving and Python Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops.
CO3	Develop Python programs step-wise by defining functions and calling them.

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CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python.
SUBJECT CODE & NAME:	BS8161-Physics and Chemistry Laboratory
CO'S	**COURSE OUTCOMES**
CO1	Student will have knowledge to Analyze the particle size & acceptance ankle using laser.
CO2	Student will be able to Apply the principle of ultrasonic interferometer
CO3	Student will be able to understand the principles of spectrometer grating
CO4	Students can Analyze the thermal conductivity of a bad conductor
CO5	Student will be able to Apply the elastic behavior of material
REGULATION & SEMESTER:	**2017 - II**
SUBJECT CODE & NAME:	HS8251 - Technical English
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Read various types of texts adapting different reading strategies
CO2	Write letters and reports effectively in formal and informal situations.
CO3	Speak confidently and communicate with others effectively in order to improve their interview skills.
CO4	Use the language perfectly without grammatical errors and by using a wide range of vocabulary.
CO5	Use the technical information properly according to business situations.
SUBJECT CODE & NAME:	MA8251- Engineering Mathematics - II
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To understand the concept of Eigen values and Eigen vectors, diagonalization of Matrix, symmetric matrices, positive definite matrices and similar matrices
CO2	To evaluate Gradient, Divergence and Curl of a Vector point functions and related identities.
CO3	To evaluate a Line, Surface and Volume integrals by using Gauss, Stokes and Green's Theorems and their verification.
CO4	To understand the concept of Analytic functions, conformal mapping and Complex integration
CO5	To understand the concept of Laplace Transform and inverse transform of simple functions, properties, various related theorems

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	and application to differential equations with constant coefficients
SUBJECT CODE & NAME:	PH8252 - Physics for Information Science
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the phase diagrams.
CO2	Understand the properties, preparation and applications of ferrous alloys
CO3	Understand the mechanical properties materials .
CO4	Understand properties and applications of the magnetic, dielectric and super conducting materials
CO5	Understand the properties,prepartion methods and applications of new materials
SUBJECT CODE & NAME:	BE8255 Basic Electrical, Electronics and Measurement Engineering
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand electric circuits and working principle of electrical machines
CO2	understanding the concept of various electronic devices
CO3	choose appropriate instruments for electrical measurements for a specific application
SUBJECT CODE & NAME:	IT8201Information Technology Essentials
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and deploy web-sites
CO2	Design and deploy simple web-applications
CO3	Create simple database applications
CO4	Develop information system
CO5	Describe the basics of networking and mobile communications
SUBJECT CODE & NAME:	CS8251 Programming in C
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop simple applications in C using basic constructs
CO2	Design and implement applications using arrays and strings
CO3	Develop and implement applications in C using functions and pointers.
CO4	Develop applications in C using structures.
CO5	Design applications using sequential and random access file processing.
SUBJECT CODE &	GE8261 Engineering Practices Laboratory

2.6 Student Performance and Learning Outcomes

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NAME:	
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipment's to join the structures.
CO3	Carry out the basic machining operations
CO4	Make the sheet metal models
CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO6	Carry out basic home electrical works and appliances
CO7	Measure the electrical quantities
CO8	Elaborate on the components, gates, soldering practices.
SUBJECT CODE & NAME:	CS8261 C Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop C programs for simple applications making use of basic constructs, arrays and strings.
CO2	Develop C programs involving functions, recursion, pointers, and structures.
CO3	Design applications using sequential and random access file processing.
SUBJECT CODE & NAME:	IT8211 Information Technology Essentials Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design interactive websites using basic HTML tags, different styles, links and with all
CO2	Basic control elements.
CO3	Create client side and server side programs using scripts using PHP.
CO4	Design dynamic web sites and handle multimedia components
CO5	Create applications with PHP connected to database.
CO6	Create Personal Information System
CO7	Implement the technologies behind computer networks and mobile communication.
REGULATION & SEMESTER:	**2017 - III**
SUBJECT CODE & NAME:	MA8351 Discrete Mathematics

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CO'S	COURSE OUTCOMES
	Student will be able to,
CO1	Apply knowledge of the concepts needed to test the logic of a program.
CO2	Understanding in identifying structures on many levels.
CO3	Aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
CO4	Aware of the counting principles.
CO5	Exposed to concepts and properties of algebraic structures such as groups, rings and fields.
SUBJECT CODE & NAME:	CS8351 Digital Principles and System Design
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Simplify Boolean functions using KMap
CO2	Design and Analyze Combinational and Sequential Circuits
CO3	Implement designs using Programmable Logic Devices
CO4	Write HDL code for combinational and Sequential Circuits
SUBJECT CODE & NAME:	CS8391 Data Structures
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Implement abstract data types for linear data structures.
CO2	Apply the different linear and non-linear data structures to problem solutions.
CO3	Critically analyze the various sorting algorithms.
SUBJECT CODE & NAME:	CS8392 Object Oriented Programming
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop Java programs using OOP principles
CO2	Develop Java programs with the concepts inheritance and interfaces
CO3	Build Java applications using exceptions and I/O streams
CO4	Develop Java applications with threads and generics classes
CO5	Develop interactive Java programs using swings
SUBJECT CODE & NAME:	EC8394 Analog and Digital Communication
CO'S	**COURSE OUTCOMES**
CO1	Apply analog and digital communication techniques.
CO2	Use data and pulse communication techniques.
CO3	Analyze Source and Error control coding.

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CO4	Utilize multi-user radio communication.
SUBJECT CODE & NAME:	CS8381 Data Structures Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write functions to implement linear and non-linear data structure operations
CO2	Suggest appropriate linear / non-linear data structure operations for solving a given problem
CO3	Appropriately use the linear / non-linear data structure operations for a given problem
CO4	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval
SUBJECT CODE & NAME:	CS8383 Object Oriented Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
CO2	Develop and implement Java programs with array list, exception handling and multithreading.
CO3	Design applications using file processing, generic programming and event handling.
SUBJECT CODE & NAME:	CS8382 Digital Systems Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Implement simplified combinational circuits using basic logic gates
CO2	Implement combinational circuits using MSI devices
CO3	Implement sequential circuits like registers and counters
CO4	Simulate combinational and sequential circuits using HDL
SUBJECT CODE & NAME:	HS8381 Interpersonal Skills/Listening & Speaking
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

REGULATION &	**2017 - IV**

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SEMESTER:	
COURSE CODE & NAME:	MA8391 Probability and Statistics
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
CO2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
CO3	Apply the concept of testing of hypothesis for small and large samples in real life problems.
CO4	Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.
CO5	Have the notion of sampling distributions and statistical techniques used in engineering and management problems.
CO6	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
COURSE CODE & NAME:	CS8491 Computer Architecture
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the basics structure of computers, operations and instructions.
CO2	Design arithmetic and logic unit.
CO3	Understand pipelined execution and design control unit.
CO4	Understand parallel processing architectures.
CO5	Understand the various memory systems and I/O communication.
COURSE CODE & NAME:	CS8492 Database Management Systems
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Classify the modern and futuristic database applications based on size and complexity
CO2	Map ER model to Relational model to perform database design effectively
CO3	Write queries using normalization criteria and optimize queries
CO4	Compare and contrast various indexing strategies in different database systems
CO5	Appraise how advanced databases differ from traditional databases.
COURSE CODE &	CS8451 Design and Analysis of Algorithms

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NAME:	
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design algorithms for various computing problems.
CO2	Analyze the time and space complexity of algorithms.
CO3	Critically analyze the different algorithm design techniques for a given problem.
CO4	Modify existing algorithms to improve efficiency.
COURSE CODE & NAME:	CS8493 Operating Systems
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze various scheduling algorithms.
CO2	Understand deadlock, prevention and avoidance algorithms.
CO3	Compare and contrast various memory management schemes.
CO4	Understand the functionality of file systems.
CO5	Perform administrative tasks on Linux Servers.
CO6	Compare iOS and Android Operating Systems.
COURSE CODE & NAME:	GE8291 Environmental Science and Engineering
COS	**COURSE OUTCOMES**
	Student will be able to
CO1	Public awareness of environment at infant stage.
CO2	Ignorance and incomplete knowledge has led to misconceptions.
CO3	Development and improvement in standard of living has led to serious environmental disasters.
COURSE CODE & NAME:	CS8481 Database Management Systems Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Use typical data definitions and manipulation commands.
CO2	Design applications to test Nested and Join Queries
CO3	Implement simple applications that use Views
CO4	Implement applications that require a Front-end Tool
CO5	Critically analyze the use of Tables, Views, Functions and Procedures

COURSE CODE & NAME:	CS8461 Operating Systems Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Compare the performance of various CPU Scheduling Algorithms
CO2	Implement Deadlock avoidance and Detection Algorithms

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CO3	Implement Semaphores
CO4	Create processes and implement IPC
CO5	Analyze the performance of the various Page Replacement Algorithms
CO6	Implement File Organization and File Allocation Strategies
COURSE CODE & NAME:	HS8461 Advanced Reading and Writing
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write different types of essays.
CO2	Write winning job applications.
CO3	Read and evaluate texts critically.
CO4	Display critical thinking in various professional contexts.
REGULATION & SEMESTER:	**2017 - V**
COURSE CODE & NAME:	MA8551 Algebra and Number Theory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.
CO2	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
CO3	Demonstrate accurate and efficient use of advanced algebraic techniques.
CO4	Demonstrate their mastery by solving non - trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text.
CO5	Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.
COURSE CODE & NAME:	CS8591 Computer Networks
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the basic layers and its functions in computer networks.
CO2	Evaluate the performance of a network.
CO3	Understand the basics of how data flows from one node to another.
CO4	Analyze and design routing algorithms.
CO5	Design protocols for various functions in the network.
CO6	Understand the working of various application layer protocols
COURSE CODE & NAME:	EC8691 Microprocessors and Microcontrollers

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COS	COURSE OUTCOMES
	Student will be able to,
CO1	Understand and execute programs based on 8086 microprocessor.
CO2	Design Memory Interfacing circuits.
CO3	Design and interface I/O circuits.
CO4	Design and implement 8051 microcontroller based systems.
COURSE CODE & NAME:	IT8501Web Technology
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design simple web pages using markup languages like HTML and XHTML.
CO2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
CO3	Program server side web pages that have to process request from client side web pages.
CO4	Represent web data using XML and develop web pages using JSP.
CO5	Understand various web services and how these web services interact.
COURSE CODE & NAME:	CS8494 Software Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Identify the key activities in managing a software project.
CO2	Compare different process models.
CO3	Concepts of requirements engineering and Analysis Modeling.
CO4	Apply systematic procedure for software design and deployment.
CO5	Compare and contrast the various testing and maintenance.
CO6	Manage project schedule, estimate project cost and effort required.
COURSE CODE & NAME:	OTL553 Telecommunication Network Management
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and analyze of fault management.
CO2	Analyze the common management information protocol specifications.
CO3	Design and analyze of management information model.
CO4	Design the simple network management protocol.
CO5	Design the various types of network management tools.
COURSE CODE & NAME:	EC8681 Microprocessors and Microcontrollers Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,

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CO1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
CO2	Interface different I/Os with processor
CO3	Generate waveforms using Microprocessors
CO4	Execute Programs in 8051
CO5	Explain the difference between simulator and Emulator
COURSE CODE & NAME:	CS8581 Networks Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Implement various protocols using TCP and UDP.
CO2	Compare the performance of different transport layer protocols.
CO3	Use simulation tools to analyze the performance of various network protocols.
CO4	Analyze various routing algorithms.
CO5	Implement error correction codes.
COURSE CODE & NAME:	IT8511Web Technology Laboratory
	Student will be able to,
CO1	Design simple web pages using markup languages like HTML and XHTML.
CO2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
CO3	Program server side web pages that have to process request from client side web pages.
CO4	Represent web data using XML and develop web pages using JSP.
CO5	Understand various web services and how these web services interact.
REGULATION & SEMESTER:	**2017 - VI**
COURSE CODE & NAME:	IT8601 Computational Intelligence
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Provide a basic exposition to the goals and methods of Computational Intelligence.
CO2	Study of the design of intelligent computational techniques.
CO3	Apply the Intelligent techniques for problem solving
CO4	Improve problem solving skills using the acquired knowledge in the areas of, reasoning, natural language understanding, computer vision, automatic programming and machine learning.
CO5	Provide a basic exposition to the goals and methods of Intelligence.
COURSE CODE &	CS8592 Object Oriented Analysis and Design

2.6 Student Performance and Learning Outcomes

NAME:	
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Express software design with UML diagrams
CO2	Design software applications using OO concepts.
CO3	Identify various scenarios based on software requirements
CO4	Transform UML based software design into pattern based design using design patterns
CO5	Understand the various testing methodologies for OO software
COURSE CODE & NAME:	IT8602 Mobile Communication
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the basics of mobile telecommunication system
CO2	Illustrate the generations of telecommunication systems in wireless network
CO3	Understand the architecture of Wireless LAN technologies
CO4	Determine the functionality of network layer and Identify a routing protocol for a given Ad hoc networks
CO5	Explain the functionality of Transport and Application layer
COURSE CODE & NAME:	CS8091 Big Data Analytics
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Work with big data tools and its analysis techniques
CO2	Analyze data by utilizing clustering and classification algorithms
CO3	Learn and apply different mining algorithms and recommendation systems for large volumes of data
CO4	Perform analytics on data streams
CO5	Learn No SQL databases and management.
COURSE CODE & NAME:	CS8092 Computer Graphics and Multimedia
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design two dimensional graphics.
CO2	Apply two dimensional transformations.
CO3	Design three dimensional graphics.
CO4	Apply three dimensional transformations.
CO5	Apply Illumination and color models.
CO6	Apply clipping techniques to graphics.
CO7	Understood Different types of Multimedia File Format
CO8	Design Basic 3d Scenes using Blender

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COURSE CODE & NAME:	IT8076 Software Testing
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design test cases suitable for a software development for different domains.
CO2	Identify suitable tests to be carried out.
CO3	Prepare test planning based on the document.
CO4	Document test plans and test cases designed.
CO5	Use automatic testing tools.
CO6	Develop and validate a test plan.
COURSE CODE & NAME:	CS8662 Mobile Application Development Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop mobile applications using GUI and Layouts.
CO2	Develop mobile applications using Event Listener.
CO3	Develop mobile applications using Databases.
CO4	Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi- threading and GPS.
CO5	Analyze and discover own mobile app for simple needs.
COURSE CODE & NAME:	CS8582 Object Oriented Analysis and Design Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform OO analysis and design for a given problem specification.
CO2	Identify and map basic software requirements in UML mapping.
CO3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
CO4	Test the compliance of the software with the SRS.
COURSE CODE & NAME:	IT8611 Mini Project
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.
REGULATION & SEMESTER:	**2017 - VII**
COURSE CODE & NAME:	MG8591 Principles of Management
COS	

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	Student will be able to,
CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
COURSE CODE & NAME:	CS8792 Cryptography and Network Security
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
CO2	Apply the different cryptographic operations of symmetric cryptographic algorithms
CO3	Apply the different cryptographic operations of public key cryptography
CO4	Apply the various Authentication schemes to simulate different applications.
CO5	Understand various Security practices and System security standards

COURSE CODE & NAME:	CS8791 Cloud Computing
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
CO2	Learn the key and enabling technologies that help in the development of cloud.
CO3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
CO4	Explain the core issues of cloud computing such as resource management and security.
CO5	Be able to install and use current cloud technologies.
CO6	Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.
COURSE CODE & NAME:	OME753 Systems Engineering
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	The Student must be able to apply systems engineering principles ot make decision for optimization.

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CO2	Hence an understanding of the systems engineering discipline and be able to use the core principles and processes for designing effective system.
COURSE CODE & NAME:	CS8081 INTERNET OF THINGS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the concept of IoT.
CO2	Analyze various protocols for IoT.
CO3	Design a PoC of an IoT system using Rasperry Pi/Arduino
CO4	Apply data analytics and use cloud offerings related to IoT.
CO5	Analyze applications of IoT in real time scenario
COURSE CODE & NAME:	CS8073 C# and .NET Programming
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write various applications using C# Language in the .NET Framework.
CO2	Develop distributed applications using .NET Framework.
CO3	Create mobile applications using .NET compact Framework.
COURSE CODE & NAME:	IT8711 FOSS and Cloud Computing Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Configure various virtualization tools such as Virtual Box, VMware workstation.
CO2	Design and deploy a web application in a PaaS environment.
CO3	Learn how to simulate a cloud environment to implement new schedulers.
CO4	Install and use a generic cloud environment that can be used as a private cloud.
CO5	Manipulate large data sets in a parallel environment.
COURSE CODE & NAME:	IT8761Security Laboratory
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop code for classical Encryption Techniques to solve the problems.
CO2	Build cryptosystems by applying symmetric and public key encryption algorithms.
CO3	Construct code for authentication algorithms.
CO4	Develop a signature scheme using Digital signature standard.

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CO5	Demonstrate the network security system using open source tools
REGULATION & SEMESTER:	**2017-VIII**
COURSE CODE & NAME:	GE8076 Professional Ethics In Engineering
COS	
	Student will be able to,
CO1	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
COURSE CODE & NAME:	CS8080 Information Retrieval Techniques
COS	
	Student will be able to,
CO1	Use an open source search engine framework and explore its capabilities
CO2	Apply appropriate method of classification or clustering.
CO3	Design and implement innovative features in a search engine.
CO4	Design and implement a recommender system.
COURSE CODE & NAME:	IT8811Project Work
COS	
	Student will be able to,
CO1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

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COURSE OUTCOMES (COs)

M.E(COMPUTER SCIENCE & ENGINEERING)

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COURSE OUTCOMES (COs)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (PG)

2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION

- To prosper as a competent professional for serving industry and Nation's socio-economic progress.

MISSION

- To foster computing skills with an emphasis on professional competency, interpersonal development and ethics.
- To enrich the aptitude of the students for facing the recent challenges of industry and society.
- To inculcate the students for pursuing careers in industry, academic and research.

PROGRAM SPECIFIC OUTCOMES (PSOs):

1. To analyze, design and develop computing solutions by applying foundational concepts of Computer Science and Engineering.
2. To apply software engineering principles and practices for developing quality software for scientific and business applications.
3. To adapt to emerging Information and Communication Technologies (ICT) to innovate ideas and solutions to existing/novel problems.

PROGRAMME EDUCATIONAL OBJECTIVES:

1. To enable graduates to pursue research, or have a successful career in academia or industries associated with Computer Science and Engineering, or as entrepreneurs.

2. To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build solutions or systems of varying complexity.

3. To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented

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methodologies to solve the problems identified.

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING	
REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	MA5160 - APPLIED PROBABILITY AND STATISTICS
CO'S	**COURSE OUTCOMES**
CO1	Basic probability axioms and rules and the moments of discrete and continuous random variables.
CO2	Consistency, efficiency and unbiasedness of estimators, method of maximum likelihood estimation and Central Limit Theorem
CO3	Use statistical tests in testing hypotheses on data.
CO4	Perform exploratory analysis of multivariate data, such as multivariate normal density, calculating descriptive statistics, testing for multivariate normality.
SUBJECT CODE & NAME:	CP5151 - ADVANCED DATA STRUCTURES AND ALGORITHMS
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Design data structures and algorithms to solve computing problems

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CO2	Design algorithms using graph structure and various string matching algorithms to solve real-life problems
CO3	Apply suitable design strategy for problem solving
SUBJECT CODE & NAME:	CP5152 - ADVANCED COMPUTER ARCHITECTURE
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Identify the limitations of ILP.
CO2	Discuss the issues related to multiprocessing and suggest solutions
CO3	Point out the salient features of different multicore architectures and how they exploit parallelism
CO4	Discuss the various techniques used for optimising the cache performance
CO5	Design hierarchal memory system
CO6	Point out how data level parallelism is exploited in architectures
SUBJECT CODE & NAME:	CP5153 - OPERATING SYSTEM INTERNALS
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	To explain the functionality of a large software system by reading its source.
CO2	To revise any algorithm present in a system
CO3	To design a new algorithm to replace an existing one
CO4	To appropriately modify and use the data structures of the linux kernel for a different software system.
SUBJECT CODE & NAME:	CP5154 - ADVANCED SOFTWARE ENGINEERING
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Understand the advantages of various Software Development Lifecycle Models
CO2	Gain knowledge on project management approaches as well as cost and schedule estimation strategies
CO3	Perform formal analysis on specifications
CO4	Use UML diagrams for analysis and design
CO5	Architect and design using architectural styles and design patterns
CO6	Understand software testing approaches
CO7	Understand the advantages of DevOps practices
SUBJECT CODE & NAME:	CP5191 - MACHINE LEARNING TECHNIQUES
CO'S	**COURSE OUTCOMES**

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	Student will be able to,
CO1	Distinguish between, supervised, unsupervised and semi-supervised learning
CO2	Apply the appropriate machine learning strategy for any given problem
CO3	Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem
CO4	Design systems that uses the appropriate graph models of machine learning
CO5	Modify existing machine learning algorithms to improve classification efficiency
SUBJECT CODE & NAME:	CP5161 - DATA STRUCTURES LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and implement basic and advanced data structures extensively.
CO2	Design algorithms using graph structures
CO3	Design and develop efficient algorithms with minimum complexity using design techniques.
REGULATION & SEMESTER:	**2017 - II**
SUBJECT CODE & NAME:	CP5201 - NETWORK DESIGN AND TECHNOLOGIES
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Identify the components required for designing a network
CO2	Design a network at a high-level using different networking technologies
CO3	Analyze the various protocols of wireless and cellular networks
CO4	Discuss the features of 4G and 5G networks
CO5	Experiment with software defined networks
SUBJECT CODE & NAME:	CP5291 - SECURITY PRACTICES
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the core fundamentals of system security
CO2	Apply the security concepts related to networks in wired and wireless scenario

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CO3	Implement and Manage the security essentials in IT Sector
CO4	Able to explain the concepts of Cyber Security and encryption Concepts
CO5	Able to attain a thorough knowledge in the area of Privacy and Storage security and related Issues.
SUBJECT CODE & NAME:	CP5292 - INTERNET OF THINGS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze various protocols for IoT
CO2	Develop web services to access/control IoT devices.
CO3	Design a portable IoT using Rasperry Pi
CO4	Deploy an IoT application and connect to the cloud.
CO5	Analyze applications of IoT in real time scenario
SUBJECT CODE & NAME:	CP5293 - BIG DATA ANALYTICS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand how to leverage the insights from big data analytics
CO2	Analyze data by utilizing various statistical and data mining approaches
CO3	Perform analytics on real-time streaming data
CO4	Understand the various NoSql alternative database models
SUBJECT CODE & NAME:	CP5092 - CLOUD COMPUTING TECHNOLOGIES
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Employ the concepts of storage virtualization, network virtualization and its management
CO2	Apply the concept of virtualization in the cloud computing
CO3	Identify the architecture, infrastructure and delivery models of cloud computing
CO4	Develop services using Cloud computing
CO5	Apply the security models in the cloud environment
SUBJECT CODE & NAME:	CP5094 - INFORMATION RETRIEVAL TECHNIQUES
CO'S	**COURSE OUTCOMES**

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	Student will be able to,
CO1	Build an Information Retrieval system using the available tools.
CO2	Identify and design the various components of an Information Retrieval system.
CO3	Apply machine learning techniques to text classification and clustering which is used for efficient Information Retrieval.
CO4	Design an efficient search engine and analyze the Web content structure
SUBJECT CODE & NAME:	CP5261 - DATA ANALYTICS LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Process big data using Hadoop framework
CO2	Build and apply linear and logistic regression models
CO3	Perform data analysis with machine learning methods
CO4	Perform graphical data analysis
SUBJECT CODE & NAME:	CP5281 - TERM PAPER WRITING AND SEMINAR
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Selecting a subject, narrowing the subject into a topic
CO2	Stating an objective.
CO3	Collecting the relevant bibliography (atleast 15 journal papers)
CO4	Preparing a working outline.
CO5	Studying the papers and understanding the authors contributions and critically analysing each paper.
CO6	Preparing a working outline
CO7	Linking the papers and preparing a draft of the paper.
CO8	Preparing conclusions based on the reading of all the papers
CO9	Writing the Final Paper and giving final Presentation
REGULATION & SEMESTER:	**2017 - III**
SUBJECT CODE & NAME:	CP5074 - SOCIAL NETWORK ANALYSIS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Work on the internals components of the social network
CO2	Model and visualize the social network
CO3	Mine the behaviour of the users in the social network
CO4	Predict the possible next outcome of the social network
CO5	Apply social network in real time applications
SUBJECT CODE &	CP5097 - MOBILE APPLICATION DEVELOPMENT

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NAME:	
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Describe the requirements for mobile applications.
CO2	Explain the challenges in mobile application design and development.
CO3	Develop design for mobile applications for specific requirements.
CO4	Implement the design using Android SDK.
CO5	Implement the design using Objective C and iOS.
CO6	Deploy mobile applications in Android and iPhone marketplace for distribution.
SUBJECT CODE & NAME:	CP5005 - SOFTWARE QUALITY ASSURANCE AND TESTING
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Perform functional and non-functional tests in the life cycle of the software product.
CO2	Understand system testing and test execution process.
CO3	Identify defect prevention techniques and software quality assurance metrics.
CO4	Apply techniques of quality assurance for typical applications.
SUBJECT CODE & NAME:	CP5311 - Project Work Phase – I
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find problem statement.

REGULATION & SEMESTER:	**2017 - IV**
COURSE CODE & NAME:	CP5411 - Project Work Phase – II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

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COURSE OUTCOMES (COs)

M.E(COMPUTER SCIENCE & ENGINEERING)

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COURSE OUTCOMES (COs)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the

Programmes offered by the institution.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VISION

To impart quality education by providing adequate training to students, both in theory and Practice, in Emerging Engineering and Communication fields, utilizing effectively the services of Qualified and experienced faculty and state-of-art facilities

MISSION

- Providing an intellectually inspiring environment for learning, innovation, creativity and professional training, incorporating ethical and moral values.
- Providing a strong foundation in the basic subjects of electronics and communication engineering.
- Providing an efficient teaching-learning process with a focus on application-oriented problem solving skills.
- Ensuring availability of best facility, infrastructure, and environment to students, researchers and faculty members and creating an ambience conducive for excellence in technical education and research.

PROGRAM SPECIFIC OUTCOMES (PSOs):

1.Apply basic knowledge related to electronic circuits, embedded & communication systems and signal processing to solve engineering/societal problems.

2.Design, verify and validate electronic functional elements for a variety of applications, with skills to interpret and communicate results.

3.Use engineering & management concepts to analyze specifications and prototype electronic experiments/projects either independently or in teams.

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PROGRAMME EDUCATIONAL OBJECTIVES:

PEO-1: To provide a foundation in fundamental engineering principles together with in-depth knowledge and solid foundation in mathematical, scientific and engineering fundamentals required to succeed in technical profession.

PEO-2: To train with a broad-based scientific and engineering knowledge so as to comprehend, analyze, design, and create innovative products and solutions for the real life problems.

PEO-3: To inculcate professional and ethical attitude with a strong character and to uphold the spiritual and cultural values, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context.

PEO-4: To provide an academic environment aware of advanced technological growth leading to life-long learning needed for a successful professional career, excellence and leadership.

PROGRAMME OUTCOMES:

PO 1: Engineering knowledge Apply knowledge of mathematics, science and engineering fundamentals and Production and Industrial Engineering specialization to the solution of complex Production and Industrial Engineering problems.

PO 2: Problem Analysis Identify, formulate, research literature and analyze complex Production and Industrial Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3: Design/ Development of Solutions Design solutions for complex Engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO 4: Conduct investigations of complex Engineering problems Use research-based knowledge and research methods including analysis, interpretation of data and synthesis of information to provide valid conclusions.

PO 5: Modern Tool Usage Create, select, and apply appropriate techniques, resources, and

modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The Engineer and Society Apply contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO 7: Environment and Sustainability Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9: Individual and Team Work Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10: Communication Communicate effectively on complex Engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO 11: Project Management and Finance Demonstrate knowledge and understanding of Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life Long learning Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING	
REGULATION & SEMESTER:	**2017 - I**
SUBJECT CODE & NAME:	HS8151 - Communicative English
CO'S	**COURSE OUTCOMES**
CO1	Read articles of a general kind in magazines and newspapers.
CO2	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
CO3	Comprehend conversations and short talks delivered in English
CO4	Write short essays of a general kind and personal letters and emails in English

SUBJECT CODE & NAME:	MA8151 -Engineering Mathematics - I
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Use both the limit definition and rules of differentiation to differentiate functions.
CO2	Apply differentiation to solve maxima and minima problems
CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem ofCalculus.
CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables
CO5	Evaluate integrals using techniques of integration, such as substitution, partial fractionsand integration by parts
CO6	Determine convergence/divergence of improper integrals and evaluate convergentimproper integrals.
CO7	Apply various techniques in solving differential equations

SUBJECT CODE & NAME:	PH8151 - Engineering Physics
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	The students will gain knowledge on the basics of properties of

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	matter and itsapplications,
CO2	The students will acquire knowledge on the concepts of waves and optical devices andtheir applications in fibre optics,
CO3	The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,
CO4	The students will get knowledge on advanced physics concepts of quantum theory andits applications in tunneling microscopes, and
CO5	the students will understand the basics of crystals, their structures and different crystalgrowth techniques.

SUBJECT CODE & NAME:	CY8151 - Engineering Chemistry
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	The knowledge gained on engineering materials, fuels, energy sources and
CO2	water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
SUBJECT CODE & NAME:	GE8151 - Problem Solving and Python Programming
CO'S	**COURSE OUTCOMES**
	Student will be able,
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs
CO3	Structure simple Python programs for solving problems
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries.
CO6	Read and write data from/to files in Python Programs.
SUBJECT CODE & NAME:	GE8152 - Engineering Graphics
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Familiarize with the fundamentals and standards of Engineering graphics
CO2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
CO3	Project orthographic projections of lines and plane surfaces.
CO4	Draw projections and solids and development of surfaces

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CO5	Visualize and to project isometric and perspective sections of simple solids

SUBJECT CODE & NAME:	GE8161- Problem Solving and Python Programming Laboratory
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops.
CO3	Develop Python programs step-wise by defining functions and calling them.
CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python.
SUBJECT CODE & NAME:	BS8161-Physics and Chemistry Laboratory
CO'S	**COURSE OUTCOMES**
CO1	Student will have knowledge to Analyze the particle size & acceptance ankle using laser.
CO2	Student will be able to Apply the principle of ultrasonic interferometer
CO3	Student will be able to understand the principles of spectrometer grating
CO4	Students can Analyze the thermal conductivity of a bad conductor
CO5	Student will be able to Apply the elastic behavior of material
REGULATION & SEMESTER:	**2017 - II**
SUBJECT CODE & NAME:	HS8251 - Technical English
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Read technical texts and write area- specific texts effortlessly.
CO2	Listen and comprehend lectures and talks in their area of specialization successfully.
CO3	Write reports and winning job applications
CO4	Speak appropriately and effectively in varied formal and informal contexts.
SUBJECT CODE & NAME:	MA8251- Engineering Mathematics - II
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Eigenvalues and eigenvectors, diagonalization of a matrix,

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	Symmetric matrices, Positive definite matrices and similar matrices.
CO2	Gradient, divergence and curl of a vector point function and related identities.
CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification
CO4	Analytic functions, conformal mapping and complex integration.
CO5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients
SUBJECT CODE & NAME:	PH8253 - PHYSICS FOR ELECTRONICS ENGINEERING
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Gain knowledge on classical and quantum electron theories, and energy band structures
CO2	Acquire knowledge on basics of semiconductor physics and its applications in various devices,
CO3	Get knowledge on magnetic and dielectric properties of materials,
CO4	Have the necessary understanding on the functioning of optical materials for optoelectronics,
CO5	Understand the basics of quantum structures and their applications in spintronics and carbon electronics.
SUBJECT CODE & NAME:	BE8254 - BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the concept of three phase power circuits and measurement.
CO2	Comprehend the concepts in electrical generators, motors and transformers
CO3	Choose appropriate measuring instruments for given application
SUBJECT CODE & NAME:	EC8251 - CIRCUIT ANALYSIS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop the capacity to analyze electrical circuits, apply the circuit theorems in real time
CO2	Design and understand and evaluate the AC and DC circuits.

SUBJECT CODE	EC8252 - ELECTRONIC DEVICES

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& NAME:	
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the V-I characteristic of diode, UJT and SCR
CO2	Describe the equivalence circuits of transistors
CO3	Operate the basic electronic devices such as PN junction diode, Bipolar and Field effect Transistors, Power control devices, LED, LCD and other Opto-electronic devices

SUBJECT CODE & NAME:	EC8261 - CIRCUITS AND DEVICES LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze the characteristics of basic electronic devices
CO2	Design RL and RC circuits
CO3	Verify thevinin & Norton theorem KVL & KCL, and Super Position Theorems
SUBJECT CODE & NAME:	GE8261 ENGINEERING PRACTICES LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipment's to join the structures
CO3	Measure the electrical quantities
CO4	Carry out the basic machining operations
CO5	Make the models using sheet metal works
CO6	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO7	Carry out basic home electrical works and appliances
CO8	Elaborate on the components, gates, soldering practices
REGULATION & SEMESTER:	**2017 - III**
SUBJECT CODE & NAME:	MA8352 - LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Demonstrate accurate and efficient use of advanced algebraic techniques.
CO2	Demonstrate their mastery by solving non - trivial problems related

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	to the concepts and byproving simple theorems about the statements proven by the text.
CO3	Able to solve various types of partial differential equations. Able to solve engineering problems using Fourier series.
CO4	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts
SUBJECT CODE & NAME:	EC8393 - FUNDAMENTALS OF DATA STRUCTURES IN C
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Implement linear and non-linear data structure operations using C
CO2	Suggest appropriate linear / non-linear data structure for any given data set.
CO3	Apply hashing concepts for a given problem
CO4	Modify or suggest new data structure for an application
CO5	Appropriately choose the sorting algorithm for an application.
SUBJECT CODE & NAME:	EC8351 - ELECTRONIC CIRCUITS I
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze the performance of small signal BJT and FET amplifiers - single stage and multistage amplifiers
CO2	Acquire knowledge of Working principles, characteristics and applications of BJT and FET
CO3	Frequency response characteristics of BJT and FET amplifiers

SUBJECT CODE & NAME:	EC8352 - SIGNALS AND SYSTEMS
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	To be able to determine if a given system is linear/causal/stable
CO2	Capable of determining the frequency components present in a deterministic signal
CO3	Capable of characterizing LTI systems in the time domain and frequency domain
CO4	To be able to compute the output of an LTI system in the time and frequency domains
SUBJECT CODE & NAME:	EC8392 - DIGITAL ELECTRONICS

2.6 Student Performance and Learning Outcomes

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CO'S	COURSE OUTCOMES
CO1	Use digital electronics in the present contemporary world
CO2	Design various combinational digital circuits using logic gates
CO3	Do the analysis and design procedures for synchronous and asynchronous sequentialcircuits
CO4	Use the semiconductor memories and related technology
CO5	Use electronic circuits involved in the design of logic gates
SUBJECT CODE & NAME:	EC8391 - CONTROL SYSTEMS ENGINEERING
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Identify the various control system components and their representations.
CO2	Analyze the various time domain parameters.
CO3	Analysis the various frequency response plots and its system.
CO4	Apply the concepts of various system stability criterions.
CO5	Design various transfer functions of digital control system using state variable models.
SUBJECT CODE & NAME:	EC8381 - FUNDAMENTALS OF DATA STRUCTURES IN C LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write basic and advanced programs in C
CO2	Implement functions and recursive functions in C
CO3	Implement data structures using C
CO4	Choose appropriate sorting algorithm for an application and implement it in a modularizedway
SUBJECT CODE & NAME:	EC8361 - ANALOG AND DIGITAL CIRCUITS LABORATORY
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design and Test rectifiers, filters and regulated power supplies.
CO2	Design and Test BJT/JFET amplifiers.
CO3	Differentiate cascode and cascade amplifiers.
CO4	Analyze the limitation in bandwidth of single stage and multi stage amplifier
CO5	Measure CMRR in differential amplifier
CO6	Simulate and analyze amplifier circuits using PSpice.
CO7	Design and Test the digital logic circuits

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SUBJECT CODE & NAME:	HS8381 Interpersonal Skills / Listening & Speaking
CO'S	**COURSE OUTCOMES**
	Student will be able to,
CO1	Listen and respond appropriately.
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal

REGULATION & SEMESTER:	2017 - IV
COURSE CODE & NAME:	MA8451 - PROBABILITY AND RANDOM PROCESSES
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand the fundamental knowledge of the concepts of probability and have knowledgeof standard distributions which can describe real life phenomenon.
CO2	Understand the basic concepts of one and two dimensional random variables and apply inengineering applications.
CO3	Apply the concept random processes in engineering disciplines.
CO4	Understand and apply the concept of correlation and spectral densities.
CO5	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems.
COURSE CODE & NAME:	EC8452 - ELECTRONIC CIRCUITS II
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze different types of amplifier, oscillator and multivibrator circuits
CO2	Design BJT amplifier and oscillator circuits
CO3	Analyze transistorized amplifier and oscillator circuits
CO4	Design and analyze feedback amplifiers
CO5	Design LC and RC oscillators, tuned amplifiers, wave shaping circuits,multivibrators, power amplifier and DC convertors.

COURSE CODE	EC8491 - COMMUNICATION THEORY

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& NAME:	
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design AM communication systems
CO2	Design Angle modulated communication systems
CO3	Apply the concepts of Random Process to the design of Communication systems
CO4	Analyze the noise performance of AM and FM systems
CO5	Gain knowledge in sampling and quantization
COURSE CODE & NAME:	EC8451 - ELECTROMAGNETIC FIELDS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Display an understanding of fundamental electromagnetic laws and concepts
CO2	Write Maxwell's equations in integral, differential and phasor forms and explain their physicalmeaning
CO3	Explain electromagnetic wave propagation in lossy and in lossless media
CO4	Solve simple problems requiring estimation of electric and magnetic field quantities based onthese concepts and laws
COURSE CODE & NAME:	EC8453 - LINEAR INTEGRATED CIRCUITS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design linear and non linear applications of OP – AMPS
CO2	Design applications using analog multiplier and PLL
CO3	Design ADC and DAC using OP – AMPS
CO4	Generate waveforms using OP – AMP Circuits
CO5	Analyses special function ICs
COURSE CODE & NAME:	GE8291 - ENVIRONMENTAL SCIENCE AND ENGINEERING
COS	**COURSE OUTCOMES**
	Student will be,
CO1	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledgeon the following after completing the course.
CO2	Public awareness of environmental is at infant stage.
CO3	Ignorance and incomplete knowledge has lead to misconceptions
CO4	Development and improvement in std. of living has lead to serious

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	environmental disasters

COURSE CODE & NAME:	EC8461 - CIRCUITS DESIGN AND SIMULATION LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze various types of feedback amplifiers
CO2	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators
CO3	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shapingcircuits and multivibrators using SPICE Tool.
COURSE CODE & NAME:	EC8462 - LINEAR INTEGRATED CIRCUITS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design amplifiers, oscillators, D-A converters using operational amplifiers.
CO2	Design filters using op-amp and performs an experiment on frequency response.
CO3	Analyze the working of PLL and describe its application as a frequency multiplier.
CO4	Design DC power supply using ICs.
CO5	Analyse the performance of filters, multivibrators, A/D converter and analogy multiplier using SPICE
REGULATION & SEMESTER:	**2017 - V**
COURSE CODE & NAME:	EC8501 - DIGITAL COMMUNICATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Design PCM systems
CO2	Design and implement base band transmission schemes
CO3	Design and implement band pass signaling schemes
CO4	Analyze the spectral characteristics of band pass signaling schemes and their noiseperformance
CO5	Design error control coding schemes
COURSE CODE & NAME:	EC8553 - DISCRETE-TIME SIGNAL PROCESSING
COS	**COURSE OUTCOMES**
	Student will be able to,

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CO1	Apply DFT for the analysis of digital signals and systems
CO2	Design IIR and FIR filters
CO3	Characterize the effects of finite precision representation on digital filters
CO4	Design MultiMate filters
CO5	Apply adaptive filters appropriately in communication systems

COURSE CODE & NAME:	EC8552 - COMPUTER ARCHITECTURE AND ORGANIZATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Describe data representation, instruction formats and the operation of a digital computer
CO2	Illustrate the fixed point and floating-point arithmetic for ALU operation
CO3	Discuss about implementation schemes of control unit and pipeline performance
CO4	Explain the concept of various memories, interfacing and organization of multiple processors
CO5	Discuss parallel processing technique and unconventional architectures

COURSE CODE & NAME:	EC8551 - COMMUNICATION NETWORKS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Identify the components required to build different types of networks
CO2	Choose the required functionality at each layer for given application
CO3	Identify solution for each functionality at each layer
CO4	Trace the flow of information from one node to another node in the network

COURSE CODE & NAME:	EC8073 - MEDICAL ELECTRONICS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Know the human body electro- physiological parameters and recording of bio-potentials
CO2	Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc.
CO3	Interpret the various assist devices used in the hospitals viz.

	pacemakers, defibrillators, dialyzers and ventilators
CO4	Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods
CO5	Know about recent trends in medical instrumentation
COURSE CODE & NAME:	ORO551 Renewable Energy Sources
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understanding the physics of solar radiation.
CO2	Ability to classify the solar energy collectors and methodologies of storing solar energy.
CO3	Knowledge in applying solar energy in a useful way.
CO4	Knowledge in wind energy and biomass with its economic aspects.
CO5	Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies.
COURSE CODE & NAME:	EC8562 - DIGITAL SIGNAL PROCESSING LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Carryout basic signal processing operations
CO2	Demonstrate their abilities towards MATLAB based implementation of various DSPsystems
CO3	Analyze the architecture of a DSP Processor
CO4	Design and Implement the FIR and IIR Filters in DSP Processor for performingfiltering operation over real-time signals
CO5	Design a DSP system for various applications of DSP
COURSE CODE & NAME:	EC8561 - COMMUNICATION SYSTEMS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Simulate & validate the various functional modules of a communication system
CO2	Demonstrate their knowledge in base band signaling schemes throughimplementation of digital modulation schemes
CO3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
	Simulate end-to-end communication Link
OURSE CODE &	EC8563 - COMMUNICATION NETWORKS LABORATORY

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NAME:	
COS	**COURSE OUTCOMES**
CO1	Communicate between two desktop computers
CO2	Implement the different protocols
CO3	Program using sockets.
CO4	Implement and compare the various routing algorithms
CO5	Use the simulation tool.
REGULATION & SEMESTER:	**2017- VI**
COURSE CODE & NAME:	EC8691 - MICROPROCESSORS AND MICROCONTROLLERS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Understand and execute programs based on 8086 microprocessor.
CO2	Design Memory Interfacing circuits.
CO3	Design and interface I/O circuits.
CO4	Design and implement 8051 microcontroller based systems.
COURSE CODE & NAME:	EC8095 - VLSI DESIGN
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Realize the concepts of digital building blocks using MOS transistor.
CO2	Design combinational MOS circuits and power strategies.
CO3	Design and construct Sequential Circuits and Timing systems.
CO4	Design arithmetic building blocks and memory subsystems.
CO5	Apply and implement FPGA design flow and testing.
COURSE CODE & NAME:	EC8652 - WIRELESS COMMUNICATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Characterize a wireless channel and evolve the system design specifications
CO2	Design a cellular system based on resource availability and traffic demands
CO3	Identify suitable signaling and multipath mitigation techniques for the wirelesschannel and system under consideration.
COURSE CODE & NAME:	MG8591 - PRINCIPLES OF MANAGEMENT
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Upon completion of the course, students will be able to have clear

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	understanding
CO2	Managerial functions like planning, organizing, staffing, leading & controlling and have samebasic knowledge on international aspect of management
COURSE CODE & NAME:	EC8651 - TRANSMISSION LINES AND RF SYSTEMS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Explain the characteristics of transmission lines and its losses
CO2	Write about the standing wave ratio and input impedance in high frequencytransmission lines
CO3	Analyze impedance matching by stubs using smith charts
CO4	Analyze the characteristics of TE and TM waves
CO5	Design a RF transceiver system for wireless communication
COURSE CODE & NAME:	EC8004 - WIRELESS NETWORKS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Conversant with the latest 3G/4G networks and its architecture
CO2	Design and implement wireless network environment for any application using latest wireless protocols and standards
CO3	Ability to select the suitable network depending on the availability and requirement
CO4	Implement different type of applications for smart phones and mobile devices with latest network strategies
COURSE CODE & NAME:	EC8681 - MICROPROCESSORS AND MICROCONTROLLERS LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write ALP Programmers for fixed and Floating Point and Arithmetic operations.
CO2	Interface different I/Os with processor
CO3	Generate waveforms using Microprocessors
CO4	Execute Programs in 8051
CO5	Explain the difference between simulator and Emulator
COURSE CODE & NAME:	EC8661 - VLSI DESIGN LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write HDL code for basic as well as advanced digital integrated circuit

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CO2	Import the logic modules into FPGA Boards
CO3	Synthesize Place and Route the digital IPs
CO4	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDAtools
REGULATION & SEMESTER:	**2017 - VII**
COURSE CODE & NAME:	EC8701 - ANTENNAS AND MICROWAVE ENGINEERING
COS	
	Student will be able to,
CO1	Apply the basic principles and evaluate antenna parameters and link power budgets
CO2	Design and assess the performance of various antennas
CO3	Design a microwave system given the application specifications
COURSE CODE & NAME:	EC8751 - OPTICAL COMMUNICATION
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Realize basic elements in optical fibers, different modes and configurations.
CO2	Analyze the transmission characteristics associated with dispersion and polarizationtechniques.
CO3	Design optical sources and detectors with their use in optical communication system.
CO4	Construct fiber optic receiver systems, measurements and coupling techniques.
CO5	Design optical communication systems and its networks.
COURSE CODE & NAME:	EC8791 - EMBEDDED AND REAL TIME SYSTEMS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Describe the architecture and programming of ARM processor
CO2	Outline the concepts of embedded systems
CO3	Explain the basic concepts of real time operating system design
CO4	Model real-time applications using embedded-system concepts
COURSE CODE & NAME:	EC8702 - AD HOC AND WIRELESS SENSOR NETWORKS
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Know the basics of Ad hoc networks and Wireless Sensor Networks
CO2	Apply this knowledge to identify the suitable routing algorithm based

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	on the network and user requirement
CO3	Apply the knowledge to identify appropriate physical and MAC layer protocols
CO4	Understand the transport layer and security issues possible in Ad hoc and sensornetworks.
COURSE CODE & NAME:	EC8071 - COGNITIVE RADIO
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Gain knowledge on the design principles on software defined radio and cognitive radio
CO2	Develop the ability to design and implement algorithms for cognitive radio spectrum sensing and dynamic spectrum access
CO3	Build experiments and projects with real time wireless applications
CO4	Apply the knowledge of advanced features of cognitive radio for real world applications
COURSE CODE & NAME:	OCS752 - Introduction To C Programming
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Develop simple applications using basic constructs
CO2	Develop applications using arrays and strings
CO3	Develop applications using functions and structures
COURSE CODE & NAME:	EC8711 - EMBEDDED LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Write programs in ARM for a specific Application
CO2	Interface memory, A/D and D/A convertors with ARM system
CO3	Analyze the performance of interrupt
CO4	Write program for interfacing keyboard, display, motor and sensor.
CO5	Formulate a mini project using embedded system

COURSE CODE & NAME:	EC8761 - ADVANCED COMMUNICATION LABORATORY
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Analyze the performance of simple optical link by measurement of losses and Analyzingthe mode characteristics of fiber

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CO2	Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
CO3	Estimate the Wireless Channel Characteristics and Analyze the performance of WirelessCommunication System
CO4	Understand the intricacies in Microwave System design

REGULATION & SEMESTER:	**2017 - VIII**
COURSE CODE & NAME:	EC8094 - SATELLITE COMMUNICATION
COS	
	Student will be able to,
CO1	Analyze the satellite orbits
CO2	Analyze the earth segment and space segment
CO3	Analyze the satellite Link design
CO4	Design various satellite applications
COURSE CODE & NAME:	GE8076 - PROFESSIONAL ETHICS IN ENGINEERING
COS	**COURSE OUTCOMES**
	Student will be able to,
CO1	Upon completion of the course, the student should be able to apply ethics in society,
CO2	discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
COURSE CODE & NAME:	EC8811 Project Work
COS	**COURSE OUTCOMES**
CO1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology