

2016-2017
ELECTRICAL & ELECTRONICS ENGINEERING

ACADEMIC YEAR 2016-2017

Odd Semester

S7 EEE (2013 Batch)- 2013 Scheme

Sl no	Course code	Subject name	Staff handled
1	13.701	Embedded System	Arathy Babu
2	13.702	Digital Signal Processing	Abijith
3	13.703	Power Semiconductor Drives	Neethi R
4	13.704	Communication System	Sneha Narayanan
5	13.705	Industrial Engg.& Management	Bimal P.
6	13.706	High Voltage Engg.	Bhavya P.
7	13.707	Electrical Machines Lab II	Bhavya
8	13.708	Power System Lab	Rahul

**COURSE OBJECTIVE AND COURSE OUTCOME FOR
13.701 EMBEDDED SYSTEM**

Sl no	Course Objective	Course Outcome
		On completion of course the student will be able to
1	To impart basic concept about embedded system and identify the unique characteristic of real time system	Discuss various types of embedded system, and the issues involved in its component design

2	To impart knowledge about 8051 microcontroller	Interpret the 8051 microcontrollers and programming methods for 8051
3	To create programming knowledge of timers and counters in assembly and embedded C	Explained the various steps in programming 8051 timers counters and explained about serial communication
4	To understand about the various peripherals that can be interfaced with 8051	Explicate how various peripherals are interfaced with 8051

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
13.702: DIGITAL SIGNAL PROCESSING**

SI No.	Course Objectives	Course Outcomes
1	To introduce the discrete time signals and their mathematical manipulations	Student understand continuous-time signals and discrete-time signals
2		Student understand linear time-invariant systems theory and applications
3		Student can perform mathematical and graphical convolution of signals and systems
4	To represent the periodic and aperiodic signals in the frequency domain and to introduce the concept of frequency domain sampling, computation of DFT and FFT	Student understand continuous-time and discrete-time Fourier series/transforms
5	Knowledge of frequency-domain representation and analysis concepts using Fourier Analysis tools, Z-transform	Student can sketch the magnitude and phase of signals in transform domains
6		Analyze system properties based on impulse response and Fourier analysis.
7	To provide an understanding of Digital Signal Processing principles, algorithms and applications.	Learn the basic elements of digital signal processing frequency domain

		sampling, properties of DFT
8	To study computationally efficient method of DFT-FFT.	To learn butterfly diagram, DIT FFT and DIF FFT.
9	To study the design techniques for digital filters	Discuss various methods to design IIR and FIR filters like window method, frequency sampling method , impulse invariance, bilinear transformation.
10	To give an understanding of essential DSP structures and applications .	Learn the Direct Form, Cascade Form, parallel and Lattice Structure for FIR and IIR filters.

COURSE OBJECTIVES AND COURSE OUTCOME FOR

13.703 POWER SEMICONDUCTOR DRIVES

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To provide fundamental knowledge in dynamics and control of Electric Drives.	The ability to select a drive for a particular application.
2	To justify the selection of drives for various applications.	Understanding about the various control techniques employed for controlling drives with ac and dc motors.
3	To familiarize the various semiconductor controlled drives employing various motors.	The ability to articulate power electronics applications in control of speed, torque and other components.
4	To understand the basic and advanced speed control techniques using power electronic converters	The students will be able to analyze any type of 1 Φ & 3 Φ rectifiers fed to DC motors
5		The students will be able to analyze any type of 1 Φ & 3 Φ chopper fed

		DC motors
6		The ability to control the speed of an AC-AC & DC-AC converter fed to motor.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
17.304 COMMUNICATION SYSTEMS**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To impart knowledge about different modulation and demodulation schemes for analog communications.	Explain the block diagram of analog communication systems.
2	To create awareness on the principles of digital communication.	Describe the various analog modulation techniques, their generation and detection, and illustrate the various functional blocks in analog communication.
3	To introduce the concepts of Television, Radar.	Explain the principle of different technologies of digital communication.
4	To familiarize with cellular and satellite communication systems.	Illustrate the Television receiver and transmitter systems.
5		Describe the various digital communication techniques used for Television and radar.
6		Explain the concepts of Cellular and Satellite Communication.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.705 INDUSTRIAL ENGINEERING AND MANAGEMENT**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Contribute to the success of companies through effective problem solving	An ability to apply knowledge of mathematics, science, and engineering
2	Design, develop, implement, and improve integrated systems that include people, materials, information, equipment, and environments	An ability design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
3	Effectively manage business operations and project management teams	An ability to function on a multidisciplinary team
4	Continue to develop holistically, including the personal and professional skills necessary to adapt to our changing societal, technological, and global environments	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

5		An understanding of professional and ethical responsibility;
6		An ability to communicate effectively;

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
13.706 HIGH VOLTAGE ENGINEERING**

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
		On completion of course the student will be able to:
1	To Introduce the concepts of High voltage Generation and its application in Electrical Engineering .	Interpret the principles involved in generation of High dc and High Ac voltage and impulse voltage
2	To understand various types of testing techniques used in power equipments	Be aware of the causes of over voltages in power system and its significance in insulation design of H V and EHV systems
3	To introduce the types of over voltage occurring in a power system network and how the system insulation is coordinated for protection against overvoltage	Be Familiar with the test procedures to be carried out on high voltage equipments.
4	To introduce the insulation design aspects of a EHV cable	Classify EHV cable and design insulation parameters of cable for different test voltage.

COURSE OBJECTIVES AND COURSE OUTCOME FOR

13. 707 ELECTRICAL MACHINES – II LAB

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To prepare the students to have a basic knowledge of induction motors.	Ability to conduct experiments on Ac Machines to find the characteristics.
2	To prepare the students to have a basic knowledge of alternators.	Ability to conduct No Load and Full load tests on synchronous and Induction Machines
3	The ability to conduct testing and experimental procedures on different types of electrical machines.	Have knowledge of various parts of a electrical machine.
4	To expose the students to the operation synchronous and induction machines and give them experimental skills.	Understand the starting and connecting procedures of synchronous generators, and to obtain the 'V' curves of synchronous motors.
5		Skill to recognize different electrical machine
6		Ability to analyze possible causes of discrepancy in comparison to theory

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.708 POWER SYSTEM LAB**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To prepare the students to have a basic knowledge of high voltage experiments.	Ability to conduct experiments high voltage equipments.
2	To prepare the students to have a basic knowledge testing of solid, liquid and gas materials.	Ability to conduct testing of solids liquid and gases.
3	The ability to conduct testing and experimental procedures on different types of electrical relays.	Have knowledge of various parts and testing of relays.
4	To expose the students to power flow analysis in Matlab and e-TAP.	Understand the power flow using different methods in software.

S5 EEE (2013 Batch) - 2013 Scheme

Sl no	Course code	Subject name	Staff handled
1	13.501	Engineering Mathematics	Arun A.
2	13.502	Synchronous Machines	Subeekrishna
3	13.503	Switchgear & Protection	Nivea S
4	13.504	Control System	Praveen
5	13.505	Electronic Instrumentation	Mrudul Raj
6	13.506	New & Renewable Energy sources	Smith P S
7	13.507	Power Electronics Lab	Praveen/ Mrudul raj
8	13.508	Measurements Lab	Karthika/ Aryamol

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.501: ENGINEERING MATHEMATICS IV COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To provide a basic understanding of random variables and probability distributions.	After successful completion of this course, the students will be familiar with the large scale applications of linear programming techniques which require only a few minutes on the computer.
2	Mathematical programming techniques are introduced as a part of this course.	Also they will be familiar with the concepts of probability distributions which are essential in transportation engineering.

3	These techniques are concerned with the allotment of available resources so as to minimize cost or maximize profit subject to prescribed restrictions.	
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**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.502 SYNCHRONOUS MACHINES**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Identify alternator types, and appreciate their performance.	The ability to formulate and then analyze the working of any electrical machine under loaded and unloaded conditions
2	Determine the voltage regulation and analyze their performance.	The skill to analyze the response of any electrical machine.
3	Describe the principle of operation of synchronous motors and different applications.	The students will be able to explain how synchronous machines work
4	To give exposure to the students about the concepts of alternating current machines including the Constructional details, principle of operation and performance analysis.	The students will have a basic knowledge on synchronous machines with an understanding of fundamental concepts.
5		The ability to troubleshoot the operation of an electrical machine.
6		The understanding of areas of application of synchronous machines

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.503 SWITCHGEAR AND PROTECTION**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To understand the principle and operation of fuse and circuit breakers.	Identify and interpret the type of risks faced by power systems
2	To create awareness on the selection and application of relays.	Choose the appropriate switchgear for protection of any element in power systems
3	To describe the classification of relays.	Explain the classification of relays.
4	To familiarize the protection of alternators, transformers and transmission lines.	Decide the required scheme for protection of alternators, transformers and transmission lines.
5	To understand grounding and protection of overvoltages.	Decide the protection schemes to be adopted in various cases.
6		Decide the grounding practice for the protection of power system.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.504 CONTROL SYSTEMS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
		On completion of course the student will be able to:
1	To provide a strong foundation on the analytical and design techniques on classical control theory	Model any physical systems and analyse a given system to assess its performance.
2	modelling of dynamic systems	Design a suitable compensator to meet the required performance specifications
3	To provide a strong concept on the compensator design	analyse the stability aspects of linear time invariant systems.
4	understand the fundamentals of (feedback) control systems.	Apply root-locus technique to analyze and design control systems.
5	To analyse first and second-order systems	Determine the time and frequency-domain responses of first and second-order systems to step and sinusoidal (and to some extent, ramp) inputs.
6		Communicate design results in written reports.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.505 ELECTIVE II BIOMEDICAL ENGINEERING**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Interpret technical aspects of medicine	To introduce students to the measurements involved in some medical equipments.
2	Solve Engineering Problems related to medical field	Ability to understand diagnosis and therapy related equipments
3	Understand medical diagnosis and therapy	Understanding the problem and ability to identify the necessity of an equipment to a specific problem
4	To familiarize students with various medical equipments and their technical aspects	Application of systematic engineering synthesis and design processes..
5		Review the cardiac, respiratory and muscular physiological systems.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.506 NEW & RENEWABLE ENERGY SOURCES**

		Course Outcomes

Sl. No.	Course Objectives	On completion of course the students will be able to:
1	To understand and analyze the present and future energy demand of world and nation	know the energy demand of world, nation and available resources to fulfill the demand
2	Techniques to exploit the available renewable energy resources such as, solar, bio-fuels, wind power, tidal and geothermal effectively.	Know about the exploration of nonconventional energy resources and their effective tapping technologies
3	To impart knowledge about different types of energy sources.	Know the Effective utilization of available renewable energy resources
4	To create awareness on the principles of conversion of heat	Acquire the knowledge of modern energy conversion technologies
5		Explain the principle of different technologies for generating power from renewable energy sources
6		Explain the concepts of solar,wind,ocean and geothermal energy

COURSE OBJECTIVES AND COURSE OUTCOME FOR

13.507 POWER ELECTRONICS LAB

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To simulate and design various gate firing circuits	Ability to design and conduct simulation and experiments
2	To familiarize the students by introducing P-Sim and MultiSim and	Ability to use the techniques, skills and modern engineering tools

	help them to simulate and analyses different Converters.	necessary for engineering practice
3	To enable the student to study and simulate various Chopper Circuits using Matlab	Ability to identify, formulate and solve engineering problems with simulation
4	Calculate the power transfer capability of transmission lines	Ability to simulate characteristics of SCR, MOSFET, IGBT
5		Ability to simulate Gate firing circuits.
6		Ability to simulate Rectifier, Chopper, Inverter and AC Voltage Controller

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.508 ELECTRICAL MEASUREMENTS AND INSTRUMENTATION LAB**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To prepare the students to have a basic knowledge of basic integrator differentiator and summer circuits.	Ability to conduct experiments on op-amp circuits.
2	To prepare the students to have a basic transducers.	Ability to conduct experiments using transducer kits such as LVDT, thermistor, thermocouple etc.
3	The ability to conduct using bridge circuits.	Have knowledge of range extension of ammeter and voltmeter using Kelvin's double bridge and wheaston's bridge..

4	To expose the students to the operation potentiometers.	Understand the measurement and calibration of vernier dial potentiometer and slide wire potentiometer.
5	Study of energy meters.	Calibration of single phase and 3 phase energy meters

S3 EEE (2015 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	MA201	Linear Algebra and Complex Analysis	Rakhi Ravindran
2	EE 201	Circuits and Networks	Sneha Narayanan
3	EE203	Analog Electronics & Circuits	Ponnambili
4	EE 205	DC Machines and Transformers	Karthika V S
5	EE 207	Computer Programming	Divya V
6	HS 200	Business Economics	P J Rajan
7	EE 231	Electronic Circuits Lab	Ponnambili
8	EE 233	Programming Lab	Shreyas

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
MA201: LINEAR ALGEBRA & COMPLEX ANALYSIS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Identify complex-differentiable functions	Determine whether a given function is differentiable, analytic and if so find its derivative. To find harmonic conjugate

2	Use conformal mapping	Upon completion Conformal Mapping students will master concepts and theories of conformal mappings of simply connected and multiply connected domains.
3	Compute complex line integrals	Find parametrizations of curves, and compute complex line integrals directly. Use antiderivatives to compute line integrals. Use Cauchy's integral theorem and formula to compute line integral. Express complex-differentiable functions as power series.
4	Use the residue theorem.	Identify the isolated singularities of a function and determine whether they are removable, poles, or essential. Use the residue theorem to compute complex line integrals and real integrals.
5	Learn to solve systems of linear equations and application problems requiring them. Learn about and work with vector spaces and subspaces.	Demonstrate ability to manipulate matrices and to do matrix algebra. Demonstrate ability to solve systems of linear equations. Demonstrate ability to work within vector spaces and to distil vector space properties.
6	Learn to find and use eigenvalues and eigenvectors of a matrix.	Find the characteristic equation, eigenvalues and corresponding eigenvectors of a given matrix.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE201: CIRCUITS AND NETWORKS**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Design and analysis of RLC circuits using phasor techniques	Analyze circuit systems using direct application of Kirchoff Current and Voltage Laws along

		with Ohm Law.
2	Apply mesh-current analysis techniques to analyze circuit behavior	Interpret analytical circuit results to properly assign power, current, and voltage values to circuit graphical representations.
3	Apply mesh-current analysis techniques to analyze circuit behavior.	Apply node-voltage analysis techniques to analyze circuit behavior.
4	Apply node-voltage analysis techniques to analyze circuit behavior.	Compute initial conditions for current and voltage in first order R-L and R-C capacitor and inductor circuits
5		Compute initial conditions for current and voltage in second order RLC circuits
6		Compute time response of current and voltage in first order R-L and R-C capacitor and inductor circuits.

COURSE OBJECTIVE AND COURSE OUTCOME FOR

EE203: ANALOG ELECTRONICS

SI NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	To impart depth knowledge in electronic semiconductor devices and	Able to bias transistor , attain bias stability and design clipping and clamping

	circuits giving importance to the various aspects of design and analysis.	circuits. Able to analyze amplifier circuits. Able to analyze the frequency response of amplifiers.
2	Depth knowledge about the structure, working, biasing of JFET and MOSFET.	Able to design and compare different oscillators and waveform generators
3	Understand their capabilities and limitations and make decisions regarding their best utilization in a specific situation. Study large signal amplifiers and feedback amplifiers	Acquire reasonable proficiency in the analysis and design of power amplifiers and feedback amplifiers
4	To provide knowledge about different types amplifier & oscillator circuits and their design. To provide a sound understanding of the fundamentals of operational amplifier circuits.	Able to analyze differential amplifiers and study the applications of opamp.
5	To provide a thorough understanding of the operational amplifier circuits and their functions.	Able to design opamp circuits like inverting and noninverting amplifier circuits- Summing and difference amplifiers, Differentiator and Integrator circuits. Logarithmic amplifier- Half Wave Precision rectifier - Instrumentation amplifier etc.
6	Study Wave form generation, Astable and Monostable multivibrators using 555, Oscillator circuits using Op-amps	Able to design Wave form generators, Astable and Monostable multivibrators using 555, Oscillator circuits using Op-amps.

COURSE OBJECTIVES AND COURSE OUTCOME FOR

EE205: DC MACHINES AND TRANSFORMERS

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To impart knowledge on Constructional details, principle of operation, Performance, starters and speed control of DC Machines	Formulate and then analyze the working of any electrical machine using mathematical model under loaded and unloaded conditions.
2	To impart knowledge on constructional details, principle of operation of single phase Transformers.	Troubleshoot the operation of an electrical machine.
3	To impart knowledge on constructional details, principle of operation of three phase Transformers.	Identify and solve DC machine and Transformer related problem
4	To familiarize with winding diagrams	Perform the analysis of any electromechanical system.
5		Conduct testing and experimental procedures on different types of electrical machines.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

HS200: BUSINESS ECONOMICS COURSE

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To familiarize the prospective engineers with elementary Principles of Economics and Business Economics.	Make investment decisions based on capital budgeting methods in alignment with micro economic theories.
2	To acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability;	Make investment decisions based on capital budgeting methods in alignment with macro economic theories.
3	To apply business analysis to the “firm” under different market conditions.	Analyse the profitability of the firm, economy of operation.
4	To apply economic models to examine current economic scenario and evaluate policy options for addressing economic issues.	Determination of price under various market situations with good grasp on the effect of trade cycles in business.
5		Gain knowledge of elementary accounting concepts used for preparing balance sheet and interpretation of balance sheet.
6		

COURSE OBJECTIVE AND COURSE OUTCOME FOR

EE231: ELECTRONIC CIRCUITS LAB

SI NO:	COURSE OBJECTIVE	COURSE OUTCOMES
1	Design and construct simple electronic circuits to accomplish a specific function	Able to design rectifiers, clipping, clamping, amplifiers, etc...
2	Understand their capabilities and limitations and make decisions regarding their best utilization in a specific situation.	Able to design and compare different oscillators and waveform generators
3	Students should have to acquire reasonable proficiency in the analysis and design of basic electronic circuits.	Able to analyze the frequency response of amplifiers and able to design voltage regulators
4	Introduction to SPICE and simulation of experiments	Able to design the circuit and generate circuit layout using SPICE

S1 EEE (2016 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	MA101	Calculus	Ms.Sumi
2	CY 100	Chemistry	Ms. Renju
3	BE 110	Graphics	Mr. Sasi
4	BE 101	Introduction to Electrical Engineering	Ms karthika V S
5	BE 103	Introduction to Sustainable Engineering	Mr Sujith S Pillai
6	ME 100	Basics of Mechanical Engineering	Mr Pratheesh G
7	CY 110	Engineering Chemistry Lab	Mr Vishnu
8	ME 110	Mechanical Engineering Workshop	Mr. Dipu

9	EE110	Electrical Engineering Workshop	Ms Aswathi
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**COURSE OBJECTIVES AND COURSE OUTCOME FOR
MA 101: CALCULUS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To give the definition of an infinite series and explain what is meant by the sequence of partial sums. Relate the convergence or divergence of the series to the sequence of partial sums.	Evaluate the limit of a sequence of numbers (infinite series) and determine whether the series converges.
2	Compute partial derivatives of functions of several variables. Apply the theorem on mixed partial derivatives.	Understand the meaning of partial derivatives and calculate partial derivatives.
3	Use concepts of calculus to the model real-world problems	Compute dot product, cross product, length of vectors. Compute partial derivatives, derivatives of vector-valued functions, gradient functions.
4	Evaluate volumes of bounded solids and areas of bounded regions by using the ideas of double and triple integrals.	To change a double integral to polar coordinate. Compute (relatively simple) triple integrals
5	Apply the concept of line integral to work and circulation. Know the definition and properties of conservative vector fields and their relationship to gradient fields.	Determine if a vector field is conservative and find a potential function if conservative. Evaluate line integrals in the plane and in space, including line integrals of vector fields.
6		

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
CY 100: ENGINEERING CHEMISTRY COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To acquire knowledge about desalination of brackish water and treatment of municipal water.	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
2	To gain the knowledge of conducting polymers, bio-degradable polymers and fibre reinforced plastics.	Substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution. Design economically and new methods of synthesis nano materials.
	To learn significance of green chemistry and green synthesis.	Have the knowledge of converting solar energy into most needy electrical.
4	To understand mechanism of corrosion and preventive methods.	Apply their knowledge for protection of different metals from corrosion. To prevent the monuments from getting corroded.
5	To have an idea and knowledge about the Chemistry of Fuels.	Recent trends in electrochemical energy storage devices.
6	To study different types of spectroscopy.	Learn how to use different spectroscopy techniques for analysis purpose of simple molecules.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
ME 102: ENGINEERING GRAPHICS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Increase ability to communicate with people.	To hand letter will improve.
2	Learn to sketch and take field dimensions.	To perform basic sketching techniques will improve.
3	Learn to take data and transform it into graphic drawings.	To draw orthographic projections and sections.
4	Learn basic Auto Cad skills.	To use architectural and engineering scales will increase.
5	Learn basic engineering drawing formats	To produce engineered drawings will improve
6	Prepare the student for future Engineering positions	To convert sketches to engineered drawings will increase.

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
BE 101 INTRODUCTION TO ELECTRICAL ENGINEERING COURSE**

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:

1	To impart a basic knowledge in Electrical Engineering with an understanding of fundamental concepts.	Gain preliminary knowledge in basic concepts of Electrical Engineering.
2	To impart the basic knowledge about the Electric and Magnetic circuits.	Discuss the working of various dc and ac machines
3	To inculcate the understanding about the AC fundamentals.	To predict the behavior of any electrical and magnetic circuits.
4	To understand the working of various Electrical Machines.	To identify the type of electrical machine used for that particular application.
5		To wire any circuit depending upon the requirement.
6		Understand working principle of various analogue electrical measuring instruments.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
BE 103: INTRODUCTION TO SUSTAINABLE ENGINEERING COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will

		be able to:
1	To have an increased awareness among students on issues in areas of sustainability.	Able to appreciate and explain the different types of environmental pollution problems and their sustainable solutions
2	To have an insight into global environmental issues.	To be aware of problem related to global environmental issues
3	To establish a clear understanding of the role and impact of various aspects of engineering and engineering decisions on environmental, societal, and economic problems.	Able to apply the concepts of sustainability in their respective area of specialization
4	To understand the role of engineering in achieving sustainable world	To understand the need of waste disposal and management

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
ME 100: BASIC MECHANICAL ENGINEERING COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To expose the students to the thrust areas in Mechanical Engineering and their relevance by covering the fundamental concepts	The student will be able to understand the inter dependence of the thrust areas in Mechanical Engineering and their significance leading to the development of products, processes and systems.
2	This subject covers wide areas of Mechanical Engineering and is intended for exposing the students to the various theoretical and practical aspects of thermal engineering, fluid	The student can able to understand the inter dependence of the thrust areas in Mechanical Engineering and their significance leading to the development of products and systems.

	mechanics and machines, manufacturing and power transmission.	
3		The students can able to understand working of automobiles.
4		Able to understand about various mechanical processes.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
CY 110 : ENGINEERING CHEMISTRY LAB COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To make students familiarize with the practical aspects of volumetric analysis of water samples ad determine the parameters like alkalinity, chlorides and hardness.	To equip the students to apply the knowledge of Chemistry and take up Chemistry related topics as parts of their project works during higher semester of the course.
2	To improve the knowledge of different types of titrations used in volumetric analysis	To impart sound knowledge in the different fields of theoretical chemistry so as to apply it to the problems in engineering field. (b) To develop analytical capabilities of students so that they can characterize, transform and use materials in engineering and apply knowledge gained in solving related engineering problems
3	To make students develop in terms of practical skills required for analytical projects.	To develop abilities and skills that are relevant to the study and practice of Chemistry.
4	To study flash and fire point	To familiarize the students with different application oriented topics like new

		generation engineering material different instrumental methods etc.
5		To enable the students to acquire the knowledge in the concepts of chemistry for engineering applications.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
ME 110: MECHANICAL WORKSHOP COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduction to basic manufacturing process like welding, moulding, fitting, assembling, smithy, carpentry works etc.	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections- smithy, carpentry, assembling, welding etc.
2	Familiarization of basic manufacturing hand tools and equipment like files, hacksaw, spanner chisel hammers, etc.	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
	Familiarization of various measuring devises like vernier height gauge, vernier caliper, micrometer, steel rule etc.	Able to choose different measuring devises according to the work.
4	Demonstration and study of various machine tools like lathe, drilling machine, milling machine etc.	Ability to name and summarise the operations of various machine tools like lathe, milling, drilling and shaping machines.

5	Familiarizing the disassembling and assembling of machine parts.	Knowledge achieved to disassemble and assemble the machine like IC engines.
6		Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE 110 ELECTRICAL ENGINEERING WORKSHOP COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Study and practice on electric circuits	Draw and practice simple house wiring and testing methods
2	To develop skills leading to achievement to connect basic electrical instruments and devices	Develop practical workshop skills in the students.
3	To develop knowledge of electrical wiring and electronic circuits.	Grasp the applications of workshop equipment, wiring accessories etc
4	Various technical facilities used by electricians, wiring regulations, types of cables and electric accessories including switches, lamps, sockets etc.	Physical realization of the range of discrete and integrated semiconductor devices
5		Knowledge of protective devices in electric circuits like fuse, ELCB, MCB etc.

ACADEMIC YEAR 2016-2017

Odd Semester

S8 EEE (2013 Batch)- 2013 Scheme

Sl no	Course code	Subject name	Staff handled
1	13.801	Electrical System Design	Bimal P.
2	13.802	Electrical Machine Design	Atul Thomas
3	13.803	Electrical Drawing	Mrudul
4	13.804	Electrical Power Utilization & Safety	Rahul P Raj
5	13.805	Power Electronics & Application	Vaisakh J B
6	13.806	Hvdc & Facts	Bhavya P.
7	13.807	Project	Atul Thomas

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.803 ELECTRICAL SYSTEM DESIGN COURSE

SI NO	COURSE OBJECTIVES	SUBJECT LEARNING OUTCOMES OR COURSE OUTCOMES
		ON COMPLETION OF THE COURSE STUDENTS WILL BE THE ABLE TO:
1	To impart knowledge about design of electrical installation	Design electrical layout of LT installation
2	To impart knowledge about layout of electrical installation	Design electrical layout of HT installation
3	To impart knowledge about electrical design of auditorium and theatres	Design control circuit of motors
4	To impart knowledge about electrical design of large scale industries	Design backup system for industries

5		Design earthing systems
6		Design ac theatres

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
13.802 ELECTRICAL MACHINE DESIGN COURSE**

SI NO	COURSE OBJECTIVES	SUBJECT LEARNING OUTCOMES OR COURSE OUTCOMES
		ON COMPLETION OF THE COURSE STUDENTS WILL BE THE ABLE TO:
1	To gain the knowledge about calculation of total MMF in the machine	Design dc machines
2	To find the dimensions of various parts of the machine	Design transformer with reduced loses
3	To examine various loses in the machines	Calculate the losses and efficiency of machines
4	To understand the usage of auxiliary winding	Design of alternators
5		Design of induction machines
6		Design of compensating windings

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
13.803 ELECTRICAL DRAWING COURSE**

Sl No	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	The interpretation and understanding of standard electrical symbols	Describe the various types of electrical drawings
2	The characteristics of single line diagrams	Appreciate the importance of single line diagrams
3	The importance of ladder diagrams	Analyse the various electrical ladder drawings
4	Using diagrams for circuit tracing	Explain the operation of the electrical equipment using wiring and schematic diagrams
5		Recognize the symbols in electrical drawings
6		To draw the inner parts of electrical machines

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.804 ELECTRIC POWERUTILIZATION AND ELECTRICAL SAFETY**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Identify fundamental aspects and considerations for electrical energy systems	Acquire in–depth knowledge and integrate with existing knowledge to solve Power system problems in wider and global perspective
2	Develop applications for energy efficiency, integration of renewables, and distributed generation	Be able to modify or propose a new process design to increase energy efficiency and reduce

		environmental impacts.
3	Analyze and evaluate existing and future challenges in the field of electrical power and energy engineerin	Be able to apply their knowledge of power generation and management to new applications in electrical power utility/industry.
4	Design and analyze power systems or energy conversion devices	Be able to perform, analyze, and apply the results of experiments to Electrical power application improvements
5		Be able to identify problems in electrical power systems, analyze the problems, and solve them using all of the required and available resources
6		Be engaged in continuously learning the new practices, principles, and techniques of the electrical power industry

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.805 POWER ELECTRONICS APPLICATION IN POWER SYSTEM**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To get an overview of different types of power semiconductor devices and their switching characteristics	Choose appropriate power semiconductor device in converter circuits and develop their triggering circuits
2	To study the operation and characteristics of various types of power electronic converters.	Analyze various types of power electronic converters and apply different switching techniques

3	To study advanced converters and switching techniques implemented in recent technology	Select appropriate power converter for specific applications
4	To prepare the students to analyze and design different chopper circuits	Interpret and use datasheets of power semiconductor devices for design
5		Ability to express communication methods.
6		Design of power electronic converters in power control applications

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.806 HVDC AND FACTS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
		On completion of course the student will be able to:
1	To apply Power Electronics in Power transmission systems.	Apply the Engineering knowledge for analyzing the voltage control issue in an ac transmission line.
2	To impart knowledge about operation and analysis of different FACTS devices	Develop solutions to above problems using FACTS devices adaptable for the situation
3	To impart knowledge about importance of HVDC transmission	Analyze and estimate an HVDC project
4	analysis of HVDC converters,	Understand basics of HVDC system, converters control schemes harmonics filters reactive power control and power flow analysis in HVDC systems
5	It also deals with basic FACTS concepts, static shunt and series compensation and combined compensation techniques.	Understand basic concepts of FACTS, necessity of FACTS controllers and their operation, shunt and series compensation through various static compensators
6		apply the above conceptual things to real-world electrical and electronics problems and applications.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

08.707 PROJECT& viva - voce

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To introduce the students to various emerging fields in electronics and communication.	Exhibit the strength and grip on the fundamentals of the subjects studied in the previous semesters.
2	To provide an opportunity to exercise the creative and innovative qualities in group project environment,	An ability to utilise technical resources
3	To excite the imagination of aspiring engineers, innovators and technopreneurs.	An ability to write technical documents and give oral presentation related to work completed.
4	To have hands-on experience in the students related field so that they can relate and reinforce what has taught in the classroom.	Perform requirement analysis and identify design methodologies.

S6 EEE (2013 Batch)- 2013 Scheme

Sl no	Course code	Subject name	Staff handled
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1	13.601	Advanced Control System	Bhavya P
2	13.602	Industrial Machine and Special Machine	Neethi R Nair
3	13.603	Microprocessor	Rahul V
4	13.604	Numerical Techniques & Computer Programming	Divya V
5	13.605	Power System Analysis & Stability	Aryamol S
6	13.606	Biomedical Instrumentation	Mrudul Raj
7	13.607	Microprocessor lab	Kavya
8	13.608	Software lab	Divya V
9	13.609	Systems & Control lab	Bhavya P

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.601 ADVANCEDCONTROL SYSTEMS

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
		On completion of course the student will be able to:
1	To provide a strong concept on advanced control system analysis and design techniques	analyse both linear and nonlinear system using state space methods.
2	To analyse the behaviour of discrete time systems.	analyse the stability of discrete system
3	To analyse the behaviour of nonlinear control systems.	analyse the stability of nonlinear system.
4		Communicate design results in written reports

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

		On completion of course the student will be able to:
1	To get an overview of some of the special machines for control and industrial applications	The students will gain knowledge in the construction and principle of operation of certain special electrical machines having various applications.
2	To review the fundamental concepts of permanent magnets and the operation of permanent magnet brushless DC motors.	Use different types of special machines efficiently for various applications.
3	To introduce the concepts of permanent magnet brushless synchronous motors and synchronous reluctance motors.	Maintain different types of linear induction machines for different applications
4	To develop the control methods and operating principles of switched reluctance motors.	Maintain different types synchronous machines for different applications
5	To introduce the concepts of stepper motors and its applications.	Maintain various types of Small specialised electric machines.
6	To understand the basic concepts of other special machines	

13.602 INDUSTRIAL MACHINE & SPECIAL MACHINES

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.603 MICROPROCESSORS

SI NO	Course Outcomes	Subject Learning Outcomes or Course Outcomes
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		On completion of course the students will be able to :
1	To provide a strong foundation about the principles, programming and various applications of different microprocessors and microcontrollers	Apply the fundamentals of assembly level programming of 8085 and 8086 microprocessors
2		Work with standard microprocessor real time interfaces
3		Develop skill for writing C programs for 8051 microcontroller
4		Design microprocessors/microcontrollers-based systems.

COURSE OBJECTIVES AND COURSE OUTCOMES

13.604 NUMERICAL TECHNIQUES & COMPUTER PROGRAMMING

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Introduction to C programming. Introduction to loop and decision making statements.	Able to write simple C programs.
2	Basic concepts of pointers, functions and files.	Develop C programs using files, pointers and functions.
3	Programming examples in C for the solution of linear equations.	Develop programs to solve engineering problems using numerical methods.
4	Programming examples in C for the solution of numerical integration.	Develop programs to find roots using simpson method, RK method, NR method etc.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.605 POWER SYSTEM ANALYSIS AND STABILITY**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Calculate the power transfer capability of transmission lines.	Demonstrate an understanding of the nature of the modern power system, including the behaviour of the constituent components and sub-systems
2	Analyse various voltage control techniques applicable to distribution feeders.	Describe the construction, operation and equivalent circuit of three-phase transformers
3	Model the networks in terms of symmetrical components and sequence networks.	Apply load flow analysis to an electrical power network and interpret the results of the analysis
4	Calculate the fault currents and voltages when faults occur in power system.	Analyse a network under both balanced and unbalanced fault conditions and interpret the results
5		Design a protection system for an item of electrical plant
		Demonstrate an awareness of the methods used for voltage

6		regulation in electrical power networks
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**COURSE OBJECTIVES AND COURSE OUTCOME FOR
13.606 ELECTIVE II BIOMEDICAL ENGINEERING**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Interpret technical aspects of medicine	To introduce students to the measurements involved in some medical equipments.
2	Solve Engineering Problems related to medical field	Ability to understand diagnosis and therapy related equipments
3	Understand medical diagnosis and therapy	Understanding the problem and ability to identify the necessity of an equipment to a specific problem
4	To familiarize students with various medical equipments and their technical aspects	Application of systematic engineering synthesis and design processes..
5		Review the cardiac, respiratory and muscular physiological systems.

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.607 MICROPROCESSOR LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To get practical knowledge about 8085 Microprocessor	Develop and execute programs to perform data transfer, arithmetic & logical operations. and code conversions using 8085 microprocessors and basic arithmetic operations using 8085.
2	To develop and execute programs for microprocessor based applications in electrical and electronics engineering.	Generate square wave using 8085 microprocessor and to interface using PPI 8255
3	To understand basic operating concepts of microprocessors	Make use of 8085 microprocessor for speed and position control of dc motor and stepper motor
4	To understand low level programming like generation of square wave, triangular wave etc	
5	To give awareness about the concept of 8086 Microprocessor	
6	To understand the basic arithmetic operations in 8 bit and 16 bit microprocessor that can be run on 8086 microprocessors	

COURSE OBJECTIVES AND COURSE OUTCOMES

13.608 SOFTWARE LAB

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To impart the basic concepts C programming	Able to develop simple applications like calculator, interest calculations etc. using C
2	Understand the C programming using array, structure	Able to develop programs for alphabetical sorting of names, sorting of students details based on certain criteria
3	Practise usage of functions in programming	Familiarized with modularised programming
4	To provide the knowledge of pointers, programming using command line arguments, files	Able to store and retrieve data records permanently
5	Find accurate solutions for numerical problems using computer programming.	Able to develop solutions for Newton Raphson method, Gauss elimination, Gauss Jordan elimination, RK method

COURSE OBJECTIVES AND COURSE OUTCOMES FOR

13.609 SYSTEMS AND CONTROL LAB

S4 EEE (2015 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
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Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
		On completion of course the student will be able to:
1	To develop mathematical models for electrical systems, analyse the systems and implement controllers and compensators for systems based on system performance.	Develop mathematical models for servomotors and other electrical systems
2	To experimentally determine the transfer function of a Servo-Motor	Performance analysis of different process control systems
3	To understand and practice the modeling, simulation, and implementation of a physical dynamical system by a linear time invariant ordinary differential equation	Performance analysis of different types of controllers
4	To highlight the electrical modeling of a second order system and analyse the under-damped, over-damped and critically damped cases	Use MATLAB and SIMULINK to design and analyze simple systems and compensators
5	To study the effects of poles and zeros location in the s-plane on the transient and steady state behavior	Demonstrate the ability to apply Laplace transform, transfer functions, modeling RLC circuit, block diagrams for simulation and control
6	To study the effects of Lead, Lag and Lag-Lead series compensator on a second order system transient and steady state system response.	Demonstrate the ability to design and determine control system's parameters and transfer functions by combining both theoretical and applied analysis that they have acquired in their control courses and in this lab.

1	MA202	Maths	Jisha T Omana
2	EE202	Synchronous & Induction Machines	Harsha Ravi
3	EE204	Digital Electronics	Sneha Narayanan
4	EE206	Material Science	Rahul P Raj
5	EE208	Measurements & Instrumentation	Karthika V S
6	HE210	Life Skills	Smitha
7	EE 232	Electrical Machines Lab I	Bimal P
8	EE 234	Circuits and Measurements lab	Karthika V S

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
MA202: PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL
METHODS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Providing students with a formal treatment of probability theory.	Develop problem-solving techniques needed to accurately calculate probabilities.
2	Equipping students with essential tools for statistical analyses at the graduate level.	Apply selected probability distributions to solve problems.
3	The goal is to provide the basic understanding of the derivation analysis and use of these numerical methods along with the rudimentary understanding of finite precision arithmetic.	Apply problem-solving techniques to solving real-world events.

4	Apply the appropriate numerical techniques for problems	Be aware of the use of numerical methods in modern scientific computing. Be familiar with finite precision computation. Be familiar with numerical solutions of nonlinear equations in a single variable.
5		Be familiar with numerical interpolation and approximation of functions. Be familiar with numerical integration and differentiation
6		Be familiar with numerical solution of ordinary differential equations. Be familiar with calculation and interpretation of errors in numerical methods.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE202: SYNCHRONOUS AND INDUCTION MACHINES**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Identify alternator types, and appreciate their performance.	The ability to formulate and then analyze the working of any electrical machine under loaded and unloaded conditions
2	Determine the voltage regulation and analyze their performance.	The skill to analyze the response of any electrical machine.
3	Describe the principle of operation of synchronous motors and different applications.	The students will be able to explain how synchronous and induction machines work

4	Describe the principle of operation of three phase induction motors and select appropriate motor types for different applications.	The students will have a basic knowledge on synchronous and induction machines with an understanding of fundamental concepts.
5		The ability to troubleshoot the operation of an electrical machine.
6		The understanding of areas of application of synchronous and induction machines

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE204 DIGITAL ELECTRONICS**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.	Acquired knowledge about basics of digital electronics
2	To understand and examine the structure of various number systems and its application in digital design	Acquired knowledge about solving problems related to number systems and Boolean algebra.
3	The ability to understand, analyze and design various combinational and sequential circuits.	Ability to identify, analyze and design combinational circuits.
4	Ability to identify basic requirements for a design application and propose a cost effective solution	Ability to design various synchronous and asynchronous sequential circuits.

5		Acquired knowledge about internal circuitry and logic behind any digital system
6		To study and analyze the rectifier and regulated circuits.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE206: MATERIAL SCIENCE**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	An ability to apply knowledge of mathematics, science and engineering to materials issues	Discuss and communicate the management evolution and how it will affect future managers
2	An ability to design and conduct experiments and critically analyze and interpret data	Observe and evaluate the influence of historical forces on the current practice of management.
3	An ability to work effectively in multidisciplinary teams, be conversant in languages of other fields, and provide leadership to such teams	Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.

4	An ability to design a process and/or material system to achieve specific requirements within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	Practice the process of management's four functions: planning
5		Evaluate leadership styles to anticipate the consequences of each leadership style.
6		Gather and analyze both qualitative and quantitative information to isolate issues and formulate best control methods.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE208: MEASUREMENTS AND INSTRUMENTATION**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To develop understanding of various electrical measuring instruments and instrumentation devices.	Explain working and application of DC bridges.
2	Use AC and DC bridges for relevant parameter measurement..	Differentiate between moving iron and moving coil type instruments

3	Use Signal Generator, frequency counter, CRO and digital IC tester for appropriate measurement	Measure energy and power using Watt meter and Energy Meter.
4	Maintain various types of test and measuring instruments.	Differentiae the following: active and passive, primary and secondary transducers.
5		Describe the working if different types of temperature transducers.

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
HS210: LIFE SKILLS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To develop communication competence in prospective engineers.	Communicate effectively.
2	To enable them to convey thoughts and ideas with clarity and focus. To develop report writing skills.	Make effective presentations.
	To equip them to face interview & Group Discussion.	Write different types of reports.
4	To inculcate critical thinking process.	Face interview & group discussion

5	To prepare them on problem solving skills.	Critically think on a particular problem.
6	To provide symbolic, verbal, and graphical interpretations of statements in a problem description.	Handle Engineering Ethics and Human Values.

COURSE OBJECTIVES AND COURSE OUTCOME FOR

EE232: ELECTRICAL MACHINES LAB -I

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To learn the characteristics of dc machines and to learn how it can be employed for various applications.	The ability describe the principle of operation of dc motor and select appropriate motor types for different applications
2	To get an overview of some of the dc machines and transformers and industrial applications	The skill to analyze the response of any electrical machine.
3	To give exposure to the students about the concepts of direct current machines and transformers	The students will be able to explain how dc machines and transformers
4	Describe the constructional details, principle of operation and performance Analysis of dc machines and transformers.	The skill to analyze the performance of different types of dc motors
5		The ability to troubleshoot the operation of an electrical machine.

6		Familiarize with the principle of operation and performance of three phase transformers
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**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE234: CIRCUITS AND MEASUREMENTS LAB**

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To prepare the students to have a basic knowledge of basic integrator differentiator and summer circuits.	Ability to conduct experiments on op-amp circuits.
2	To prepare the students to have a basic transducers.	Ability to conduct experiments using transducer kits such as LVDT, thermistor, thermocouple etc.
3	The ability to conduct using bridge circuits.	Have knowledge of range extension of ammeter and voltmeter using Kelvin's double bridge and wheaston's bridge..
4	To expose the students to the operation potentiometers.	Understand the measurement and calibration of vernier dial potentiometer and slide wire potentiometer.
5	Study of energy meters.	Calibration of single phase and 3 phase energy meters

S2 EEE (2016 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	MA 102	Differential Equations	Ms Sincy
2	PH 100	Engineering Physics	Dr Sasi

3	BE 100	Engineering Mechanics	Mr Aravind
4	CE 100	Basics of Civil Engineering	Ms Greeshma
5	EC 100	Basics of Electronics Engineering	Mr Viswajith
6	BE 102	Design and Engineering	Ms Manjusha
7	PH 110	Engineering Physics Lab	Mr Rajesh
8	CE 110	Civil Engineering Workshop	Ms Greeshma
9	EC 110	Electronics Engineering Workshop	Ms Gopika

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
MA 102 - DIFFERENTIAL EQUATIONS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To put it briefly, the point of this class is to take your existing knowledge of calculus and apply it towards the construction and solution of mathematical models in the form of differential equations.	Distinguish between linear, partial and ordinary differential equations. State the basic existence theorem for 1st order ODE's and use the theorem to determine a solution interval
2	Solve non-homogeneous linear equations with constant coefficients using the methods of undetermined coefficients and variation of parameters.	Recognize and solve a non homogeneous differential equation. Find particular solutions to initial value problems.
3	Introduce the Fourier series and its application to the solution of partial differential equation.	Find the Fourier series representation of a function of one variable.
4	To provide the student with the concept and the understanding of	Knowledge in the Technic, methodology of solving Partial Differential Equations. A

	basics in Partial Differential Equations.	basic understanding in the Transforms which are useful in solving engineering problems.
5	This course introduces ideas of wave equation and heat equation which are widely used in the 58 modeling and analysis of a wide range of physical phenomena and has got applications across all branches of engineering.	At the end of the course students will have acquired basic knowledge of differential equations and methods of solving them and their use in analyzing typical mechanical or electrical systems.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
PH100: ENGINEERING PHYSICS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Dynamics of mechanical and electrical oscillation using Fourier series and integrals; time and frequency representations for driven damped oscillators, resonance; one-dimensional waves in classical mechanics and electromagnetism; normal modes.	Solve for the solutions and describe the behavior of a damped and driven harmonic oscillator in both time and frequency domains. Damped and Forced Oscillations oscillating system problems.
2	The fundamental principles of photonics that complement the topics in the optics and laser courses and to help students develop problem-solving skills applicable to real-world photonics problems.	Define and explain the propagation of light in conducting and non-conducting media.
3	Introduce basic concepts and principles of acoustics.	Define and explain the physics governing laser behaviour and light matter interaction

		ting and non-conducting media.
4		Apply wave optics and diffraction theory to a range of problems
5		Explain and calculate the physical effects of acoustic reflections, absorption, scattering, diffusion, diffraction, and propagation losses.
6		Use advanced theoretical, numerical, and experimental techniques to model and analyze acoustical elements in musical instruments, the human voice, room acoustics, and audio.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
BE100: ENGINEERING MECHANICS COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To apply the principles of mechanics to practical engineering problems.	Understand the fundamental concepts of mechanics.
2	To identify appropriate structural system for studying a given problem and isolate it from its environment.	Students would be able to apply and demonstrate the concepts of resultant and equilibrium of force system.
3	To develop simple mathematical model for engineering problems and carry out static analysis.	Students would be able to determine the properties of planes and solids.
4	To develop simple mathematical model for engineering problems and carry out static analysis.	Understand the concepts of moment of inertia.

5		Students would be able to apply fundamental concepts of dynamics to practical problems.
6		Understand the basic elements of vibration.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
CE 100: BASICS OF CIVIL ENGINEERING COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To inculcate the essentials of civil engineering field to the students of all branches	The students will be able to illustrate the fundamental aspects of civil engineering
2	To provide the students an illustration of the significance of the civil engineering profession satisfying societal needs.	The students should able to plan a building
3		Students will be able to explain about surveying for making horizontal and vertical measurements.
4	.	They will able to illustrate the uses of various building materials and construction of different components of a building.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EC 100: BASICS OF ELECTRONICS ENGINEERING COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To get basic idea about types, specification and common values of passive components.	Student can identify the active and passive electronic components.
2	To familiarise the working and characteristics of diodes transistors, MOSFET and some measuring instruments.	Student can setup simple circuits using diodes, transistors and other electronic components.
3	To understand working of diodes in circuits and in rectifiers.	Student will get fundamental idea about basic communication and entertainment electronics.
4	To understand the concept of mobile networks.	Student will get fundamental idea about mobile operation.
5		Student will get fundamental idea about different electronic circuits.
6		

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
BE 103: DESIGN AND ENGINEERING COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To excite the student on creative design and its significance	To appreciate different elements involved in design and to apply them when they called for.
2	To make the student aware of the	Aware of product centred and user centred aspects that makes in the design

	processes involved in design	process.
3	To make the student understand the interesting interaction of various segments of humanities, sciences and engineering in the evolution of a design	To be aware of different stages in design process and results of incorporating other fields with engineering stream
4	To get an exposure as to how to engineer a design.	Understand different stages in manufacturing of a designed product

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
PH 103 : ENGINEERING PHYSICS LAB COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	Competency in an engineering or science profession via promotion to positions of increasing responsibility, publications, and/or conference presentations.	An ability to apply knowledge of mathematics, science, and engineering.
2	Adaptability to new developments in science and technology by successfully completing or pursuing graduate education in engineering or related fields, or participating in professional development and/or industrial training courses.	An ability to design and conduct experiments, as well as to analyze and interpret data.
3		An ability to identify, formulate, and solve engineering problems
4		Understanding of professional and ethical responsibility

5		The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
6		A recognition of the need for, and an ability to engage in life-long learning

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
CE110 CIVIL ENGINEERING WORKSHOP COURSE**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To inculcate the essentials of civil engineering field to the students of all branches.	The ability to practice civil engineering using up-to-date techniques, skills, and tools as a result of life-long learning ability to design and conduct experiments
2	To provide the students an illustration of the significance of the civil engineering profession satisfying societal needs.	An ability to design a system or component to satisfy stated or code requirements of Civil Engineering.
3	To develop awareness about the instruments used in civil engineering field work.	The students will be able to illustrate the fundamental aspects of civil engineering
4	.	The students should able to plan a building

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EC 110 ELECTRONICS ENGINEERING WORKSHOP COURS**

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
		On completion of course the students will be able to:
1	To gives the basic introduction of electronic hardware systems.	Students can identify the active and passive electronic components.
2	To provide hands on training with familiarization, testing, assembling.	Students get hands on assembling, dismantling and repairing systems.
3	To develop knowledge of electrical wiring and electronic circuits.	Drawing of electronic circuit diagrams using BIS/ IEEE symbols.
4	To use the various tools and instruments available in the Electronic Workshop.	Testing of electronic components (Resistor, Capacitor, Diode)
5		Assembling of electronic circuit / system on general purpose PCB.