

ACADEMIC YEAR 2018-2019

Odd Semester

S7 EEE (2015 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	EE 401	Electronic Communication	AryamolSudhakaran
2	EE 403	Distributed Generation & Smart Grids	Vinduja S
3	EE 405	Electrical System Design	Harsha Ravi
4	EE 407	Digital Signal Processing	Chinchu S
5	EE 409	Electrical Machine Design	Atul Thomas
6	EE 451	Power Quality	Rahul P Raj
7	EE 431	Power System Lab	Atul Thomas

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE 401 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
EE 403 DISTRIBUTED GENERATION & SMART GRIDS**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To develop a conceptual introduction to distributed generation systems, micro grids, smart grids and their control	The students will be able to explain various distributed generation systems
2	To equip students in working with project and to take up research work in connected areas	The students will be able to understand the microgrids and their control schemes
3	To give knowledge about the different cloud architecture	Understand various developments happening in the field of Smart Grids.
4	Make students understand the substation automation, feeder automation	Understand various developments happening in the field of substation automation

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE 405 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
EE 407 DIGITAL SIGNAL PROCESSING**

Sl 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 OUTCOMES FOR

EE 409 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
EE 451 POWER QUALITY**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To make aware of the power quality problems	Know the basics of power issues
2	To impart knowledge in the IEEE Standard	Standard and recommended practices of harmonics, different types of switching devices
3	To give basics knowledge of design of filters	Basics of different type active and passive filters
4	To familiarize different types of power quality measuring instruments	Power quality management in smart grid

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE 431 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 (2016 Batch) - KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	EE301	Power Generation, Transmission & Protection	Aryamol Sudhakaran
2	EE303	Linear Control Systems	Bhavya P
3	EE305	Power Electronics	Harsha Ravi
4	EE307	Signals and Systems	Viswajith
5	EE309	Microprocessor and Embedded Systems	Rahul V
6	EE367	New and renewable Energy Sources	Smith P S
7	EE331	Digital Circuits and Embedded Systems	Rahul V
8	EE333	Electrical Machines Lab II	Bhavya P/ Harsha Ravi

COURSE OBJECTIVES AND COURSE OUTCOME FOR

EE301 POWER GENERATION, TRANSMISSION AND PROTECTION

Sl. No.	Course Objectives	Course Outcomes
		On completion of course the students will be able to:
1	To understand different power generating stations and their working.	Discuss the various power generating methods.

2	To create awareness on the economical aspects of power generation.	Interpret the effect of economics on electric power generation.
3	To explain the modeling of transmission lines and their classification.	Discuss various components of transmission lines, their classification and modeling.
4	To expose to the mechanical and electrical characteristics of transmission lines.	Analyze the mechanical and electrical characteristics of transmission lines.
5	To understand high voltage dc transmission system and distribution systems.	Explain HVDC transmission and distribution system.
6		To select the appropriate distribution system for specific area.

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE303 LINEAR CONTROL SYSTEMS**

Sl No.	Course Objectives	Subject Learning Outcomes or course outcomes
		On completion of course the student will be able to:
1	To impart knowledge in open and closed loop system and modelling of mechanical and electrical systems.	Develop Mathematical models of mechanical and electromechanical system using F-V and F-I analogy.
2	To familiarize with different kinds of control system components and their response to various signals.	Ability to get an insight on various control system components.
3	To impart knowledge in stability of LTI systems using root locus method.	Analyze the stability of linear time invariant systems using root locus techniques.
4	To explain the concept of stability analysis using Routh array and Nyquist plots.	Analyze stability using Nyquist and Nichols plot.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
305 POWER ELECTRONICS**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To learn about various types of power electronic devices along with its working and applications.	To understand concepts of power electronics and various applications
2	To impart the knowledge in the design of switched mode regulators, ups and convertors with their working and applications	Ability to get an insight on various power electronics applications in all means of convertors
3	To develop understanding the concepts of transducers and digital instruments	To understand principle of operation of Transducers
4	To familiarize with different kinds of digital instruments and spectrum analyzers	To gain the ability to know how to work with digital instruments along with by knowing how they work.

**COURSE OBJECTIVE AND COURSE OUTCOME FOR
EE 309 MICROPROCESSOR & EMBEDDED SYSTEM**

Sl no	Course Objective	Course Outcome
		On completion of course the student will be able to
1	To learn the 8085 architecture and instruction set.	The ability to formulate programs based on instruction set.
2	To get an overview of timing and control of 8085.	The skill to analyze the response of 8085 microprocessor using timing and control circuit.
3	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
4	To impart knowledge about 8051 microcontroller	Interpret the 8051 microcontrollers and programming methods for 8051
5	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
6	To understand about the various peripherals that can be interfaced with 8051	Explicate how various peripherals are interfaced with 8051

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE367 NEW & RENEWABLE ENERGY SOURCES**

Sl. No.	Course Objectives	Course Outcomes
		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
EE 333 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

S3 EEE (2017 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	MA201	Linear Algebra and Complex Analysis	Lijimol
2	EE 201	Circuits and Networks	Arjun Mohanlal
3	EE203	Analog Electronics & Circuits	Ponnambili
4	EE 205	DC Machines and Transformers	Seethu Vijayan
5	EE 207	Computer Programming	Vivitha V
6	HS 200	Business Economics	P J Rajan
7	EE 231	Electronic Circuits Lab	Ponnambili
8	EE 233	Programming Lab	Vivitha

**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 OBJECTIVE	COURSE OUTCOME
1	To learn about various techniques available to solve various types of circuits and networks	Having an idea to simplify electrical circuits with the help of several theorems
2	To explain basic concepts in combinatorial graph theory and how they serve as models for many standard problems	Ability to apply graph theory in solving networks

3	To gain capability to syntheses a circuit using steady state and transient response and application of Laplace Transform	Ability to apply Laplace Transform to find transient response
4	To impart knowledge in network functions and having idea on two port networks.	Ability to synthesis networks

**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 circuits giving importance to the various aspects of design and analysis.	Able to bias transistor , attain bias stability and design clipping and clamping 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.	Able to analyze differential amplifiers and study the applications of opamp.

	To provide a sound understanding of the fundamentals of operational amplifier circuits.	
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 OBJECTIVE	COURSE OUTCOME
1	Identify DC Generator types and appreciate their performance.	Understand construction and operating principle of DC machines and transformers.
2	Describe the principle of operation of DC motor and select appropriate motor types for different applications.	Acquire knowledge on characteristics of DC machines and transformers for different operating conditions.
3	Analyze the performance of different types of DC motors.	Test and calculate performance parameters of DC machines and transformers.
4	Familiarize with the principle of operation and performance of three phase transformers.	Familiarize with the principle of operation and performance of three phase transformers.

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

**COURSE OBJECTIVES AND COURSE OUTCOMES
EE 233 PROGRAMMING 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

S1 EEE (2018 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	MA101	Calculus	Ambilimol
2	CY 100	Chemistry	Renju
3	BE 110	Mechanics	Archana
4	BE 101	Introduction to Electrical Engineering	Atul Thomas
5	BE 103	Introduction to Sustainable Engineering	Remya
6	ME 100	Basics of Civil Engineering	Greeshma
7	CY 110	Engineering Chemistry Lab	Renju
8	ME 110	Civil Engineering Workshop	Greeshma
9	EE110	Electrical Engineering Workshop	Amjith

**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, biodegradable 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 prevents 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
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 OUTCOMES FOR
BE 101 INTRODUCTION TO ELECTRICAL ENGINEERING COURSE**

SI 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 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
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	To equip the students to apply the knowledge of Chemistry and take up

	analysis of water samples and determine the parameters like alkalinity, chlorides and hardness.	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
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
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 2018-2019

Even Semester

S8 EEE (2015 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	EE 402	Special Electrical Machines	Dr. Manju J
2	EE 404	Industrial Instrumentation And Automation	Vinduja V
3	EE 474	Energy Management And Auditing	Aryamol Sudhakaran
4	CE 482	Non Departmental Elective: Environmental Impact Assessment	Arjun Mohanlal
5	EE 492	PROJECT & VIVA VOCE	Aryamol Sudhakaran, Arjun Mohanlal

SI No.	Course Objectives	Subject Learning Outcomes or course outcomes
		On completion of course the student will be able to:
1	To impart knowledge in Servomotors.	Gain knowledge in construction and principle of operation of .
2	To familiarize with different kinds of stepper motor and their applications in various fields.	Ability to get an insight on various types of stepper motors.
3	To impart knowledge in single phase special electrical machines and reluctance motors.	Compare the principle of operation of various types of single phase electrical machines.
4	To explain the role of brushes in conventional DC motors and about brushless DC motors	Analyze the function of brushes in various types of DC motors and their role in commutation.
5.	To familiarize with different kinds of linear induction motors and their applications in various fields	Ability to get an insight on various types of linear motors.

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE 404 INDUSTRIAL INSTRUMENTATION AND AUTOMATION**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To impart knowledge about Industrial instrumentation and automation	Select instruments and transducers for various physical variables.
2	To equip students in working with project and to take up research work in connected areas	Get an insight on data acquisition, processing and monitoring system
3	To give knowledge about the different types of transducers	Design various signal conditioning systems for transducers.
4	Make students understand the programming realization of PLC	Analyze dynamic responses of various systems.

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE 474 ENERGY MANAGEMENT AND AUDITING**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To enable the students to understand the concept of energy management and energy management opportunities.	Apply the Engineering knowledge for analyzing energy management utilization of power.

2	To understand the different methods used to control peak demand.	Develop solutions to control peak demand and energy saving opportunities.
3	To learn about energy saving opportunities with boilers, furnaces, HVAC, heat recovery systems etc...	Understand the energy saving and fuel economy measures in various systems.
4	To know energy auditing procedure. To understand the application of computers in energy management. To learn about types and schemes of co-generation.	Analyze and estimate audit. Identify optimal operation of co-generation.
5	To understand the different methods used for the economic analysis of energy projects.	Understand different methods used for economic analysis of energy projects.

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE 482 ENVIRONMENTAL IMPACT ASSESSMENT**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To enable students to understand the need to conserve the environment effectively	Obtain knowledge about methods to overcome environmental issues and to understand the key ideologies of EIA

2	To understand the concepts and steps involved in Environmental Impact Assessment	Analyze the best possible ways to implement methodologies for protecting the nature
3	To know various types of environmental pollution	Recognize opportunities for enabling rational use of energy without distressing the nature
4	To study the impact of various types of pollutants and their assessment techniques	Develop innovative energy efficiency solutions and demand management strategies

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE 492 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 (2016 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	EE302	Electromagnetic	Rahul V
2	EE304	Advance Control Theory	Aparna K G
3	EE306	Power System Analysis	Aryamol Sudhkaran
4	EE308	Electric Drives	Harsha Ravi
5	HS300	Principles of Management	Viswajith
6	EE372	Biomedical Instrumentation	Sony Sethukumar
7	EE332	Systems & Control Lab	Aparna/ Rahul P Raj
8	EE334	Power Electronics & Drives Lab	Arya/ Vaisakh
9	EE352	Comprehensive Exam	Atul

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE 302 ELECTROMAGNETICS**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To develop a conceptual basis of electrostatics, magnetostatics, electromagnetic waves	Analyze fields and potentials due to static charges
2	To understand various engineering applications of electromagnetics	Explain the physical meaning of the differential equations for electrostatic and magnetic fields
3	To understand principles of propagation of uniform plane waves.	Understand how materials are affected by electric and magnetic fields

4	To understand aware of electromagnetic interference and compatibility	Understand the relation between the fields under time varying situations

**COURSE OBJECTIVES AND COURSE OUTCOMES FOR
EE304 ADVANCED CONTROL SYSTEMS**

COURSE OUTCOME	COURSE OBJECTIVE
Design compensators using classical techniques	To provide a strong concept on the compensator design and on advanced control system analysis and design techniques
Analyse both linear and nonlinear system using state space methods	To analyse the behaviour of discrete time systems and nonlinear control systems
Analyse the stability of discrete system and nonlinear system	
Familiarize with principle of operation and application of controllers	

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE306 POWER SYSTEM ANALYSIS**

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

1	To understand the modelling of power system components. Model the networks in terms of symmetrical components and sequence networks.	Demonstrate an understanding of the nature of the modern power system, including the modelling and behaviour of the constituent components and sub-systems.
2	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.
3	To study the power transfer capability.	Apply load flow analysis to an electrical power network and interpret the results of the analysis
4	To understand voltage control, generation control and economic load dispatch.	Demonstrate an awareness of the methods used for voltage regulation in electrical power networks and power system stability.

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE 308 ELECTRIC 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 1Φ & 3Φ rectifiers fed to DC motors
5		The students will be able to analyze any type of 1Φ & 3Φ 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
HS 300 PRINCIPLES OF MANAGEMENT**

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	To develop ability to critically analyse and evaluate a variety of management practices in the contemporary context	manage people and organisations
2	To understand and apply a variety of management and organisational theories in practice	critically analyse and evaluate management theories and practices

3	To be able to mirror existing practices or to generate their own innovative management competencies, required for today's complex and global workplace	plan and make decisions for organisations
4	To be able to critically reflect on ethical theories and social responsibility ideologies to create sustainable organisations	do staffing and related HRD functions

**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE 372 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
EE332 SYSTEMS AND CONTROL LAB**

SI 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	Demonstrate the ability to design and determine control system's parameters and transfer functions by combining both theoretical and

	second order system transient and steady state system response.	applied analysis that they have acquired in their control courses and in this lab.
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**COURSE OBJECTIVES AND COURSE OUTCOME FOR
EE334 POWER ELECTRONICS & DRIVES 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 help them to simulate and analyses different Converters.	Ability to use the techniques, skills and modern engineering tools 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

S4 EEE (2017 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	MA202	Maths	Jisha T Omana
2	EE202	Synchronous & Induction Machines	Harsha Ravi
3	EE204	Digital Electronics	Anup Vasavan
4	EE206	Material Science	Rahul P Raj
5	EE208	Measurements & Instrumentation	Arathy Babu
6	HE210	Life Skills	Smitha
7	EE 232	Electrical Machines Lab I	RAhul P Raj
8	EE 234	Circuits and Measurements lab	Karthika V S/Arya

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

SL NO	COURSE OBJECTIVE	COURSE OUTCOME
1	Give exposure to the students about the concepts of alternating current machines including the constructional details, principle of operation and performance analysis.	Acquire knowledge on operating principle of synchronous motor and different applications.
2	Learn the characteristics of induction machines and to learn how it can be employed for various applications .	Acquire knowledge on operating principle of 3 phase induction motors and select appropriate types for different applications
3	Identify alternator types and appreciate their performance.	Test and calculate performance parameters of 3 phase induction motors
4	Determine the voltage regulation and analyze the performance of alternators.	Familiarize with the principle of operation and application of 1 phase induction motors.

**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 OBJECTIVE	COURSE OUTCOME
1	To develop understanding of various electrical measuring instruments and instrumentation devices	Compare different types of instruments-their working principles, advantages and disadvantages
2	To introduce a capability to monitor, analyze and control any physical system	Explain operating principle of various ammeters, voltmeters and ohm meters
3	To provide knowledge to design and create novel products and solutions for real life problems	Describe wattmeter, energy meters, different flux meters and permeability measurement techniques.
4	To understand how different types of meters works and their construction and to make a knowledge to use modern tools necessary for electrical projects.	Understand working principle of cathode ray oscillator, transducers of physical variables and describe operating principles

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

Sl. No.	Course Objectives	Subject Learning Outcomes or Course Outcomes
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		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

**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 (2018 Batch)- KTU Scheme

Sl no	Course code	Subject name	Staff handled
1	MA 102	Differential Equations	Sangeetha
2	PH 100	Engineering Physics	Dr Sasi
3	BE 102	Engineering Graphics	Sasi
4	CE 100	Basics of Mechanical Engineering	John P George
5	EC 100	Basics of Electronics Engineering	Prajeesh
6	BE 102	Design and Engineering	Kavya
7	PH 110	Engineering Physics Lab	Sreethi
8	CE 110	Civil Engineering Workshop	Murugan
9	EC 110	Electronics Engineering Workshop	Linta

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	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

	solution of mathematical models in the form of differential equations.	
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 basics in Partial Differential Equations.	Knowledge in the Technic, methodology of solving Partial Differential Equations. A 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 50 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	Solve for the solutions and describe the behavior of a damped and driven harmonic oscillator in both time and

	driven damped oscillators, resonance; one-dimensional waves in classical mechanics and electromagnetism; normal modes.	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
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
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 mechanics and	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.

	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
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 processes involved in design	Aware of product centred and user centred aspects that makes in the 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	An ability to apply knowledge of mathematics, science, and engineering.

	responsibility, publications, and/or conference presentations.	
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
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
EC 110 ELECTRONICS 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 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.