

EASWARI ENGINEERING COLLEGE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Regulation – 2017

III SEMESTER

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	: EE8391	Lecture	: 30
Subject Title	: Electromagnetic Theory	Tutorials	: 30
Year/Semester	: II-2018/3	Practical	: -
Faculty Name	: J.Lydia	TOTAL	: 60

COURSE OBJECTIVES:

1. To introduce the basic mathematical concepts related to electromagnetic vector fields
2. To impart knowledge on the concepts of electrostatics, electrical potential, energy density and their applications.
3. To impart knowledge on the concepts of magnetostatics, magnetic flux density, scalar and Vector potential and its applications.
4. To impart knowledge on the concepts of Faraday's law, induced emf and Maxwell's equations.
5. To impart knowledge on the concepts of Concepts of electromagnetic waves and Poynting vector.

COURSE OUTCOMES:

Upon completion of the course, the students will be able to..

EE 8391.1	To analyze the various coordinate systems and to analyze the application of Coulomb's and Gauss's law.
EE 8391.2	To discriminate the symmetrical and unsymmetrical nature of the problem and the ability to solve the problems based on boundary conditions in electric field.
EE 8391.3	To discriminate the symmetrical and unsymmetrical nature of the problem and the ability to solve the problems based on boundary conditions in magnetic field.
EE 8391.4	To apply the Maxwell's equation relating to the electric and magnetic fields and the applications in the machines.
EE 8391.5	To analyze the characteristics of radio waves, TVsignals, radar beams and light rays.
EE 8391.6	To apply basic science, circuit theory and Electro-magnetic field theory to electrical engineering problems.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE 8391 Electromagnetic Theory	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 8391.1	3	3	2	2	1	1	-	-	1	-	1	-
EE 8391.2	3	3	2	2	2	-	1	-	1	-	1	1
EE 8391.3	3	3	2	2	2	-	1	-	1	-	1	1
EE 8391.4	3	2	2	2	2	-	-	-	1	-	2	-
EE 8391.5	2	3	2	2	1	1	1	-	1	-	2	-
EE 8391.6	3	3	2	2	2	1	-	-	1	-	1	-
EE 8391	3	3	2	2	2	1	1	-	1	-	2	1

JUSTIFICATION OF THE MAPPING:

EE 8391.1	<p>By analyzing the various coordinate systems and the application of Coulomb's and Gauss's law, it attributes to strong Engineering knowledge (PO1), as the student will know how to explain the position displacement and separation vectors and gains knowledge about three dimensional analysis of various coordinate systems. This strongly helps in problem solving (PO2) of coordinate systems. In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately. Analyzing the various systems and laws helps in learning the commercial software (PO5) weakly. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and it promotes individual and team work (PO9) and helps in project management (PO11) weakly. It has strong usage of logical & technical skills to model, simulate and analyze electrical components and systems by applying the concept of co ordinate systems (PSO1).</p>
EE 8391.2	<p>By discriminating the symmetrical and unsymmetrical nature of the problem and by developing the ability to solve the problems based on boundary conditions in electric field, it attributes to strong Engineering knowledge (PO1), as the concept of field, potential and continuous charge distribution is dealt. This will help in problem solving (PO2) strongly like finding the field due to a line charge having various symmetries. In design and development of solution (PO3) and in investigation of complex problem (PO4) like finding the flux density of a cylinder it attributes moderately. By knowing the nature of the problem it helps in using the commercial software (PO5) moderately and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9), effective project management (PO11) and lifelong learning (PO12) weakly. Strong usage of logical & technical skills to model, simulate and analyze electrical components and systems (PSO1) is possible and the capacitance of parallel plate capacitor of various geometrics using boundary conditions is possible.</p>

EE 8391.3	By discriminating the symmetrical and unsymmetrical nature of the problem and by developing the ability to solve the problems based on boundary conditions in magnetic field, it attributes to strong Engineering knowledge (PO1) as the concept of mmf, magnetic flux density and ampere's circuital law is discussed. This will help in problem solving related to emf induced and magnetostatic field (PO2) strongly, design and development of solution (PO3) and in investigation of complex problem related to boundary conditions (PO4) moderately. By knowing the nature of the problem it helps in using the commercial software (PO5) moderately and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) and helps in effective project management (PO11) weakly. It aids lifelong learning (PO12) weakly. Strong usage of logical & technical skills to model, simulate and analyze electrical components and systems (PSO1) like analysis of the magneto static fields.
EE 8391.4	By applying the Maxwell's equation relating to the electric and magnetic fields and the applications in the machines attributes to strong Engineering knowledge (PO1) as the various laws are discussed. This will help in problem solving (PO2), design and development of solution explaining the behavior of electric and magnetic field (PO3) and in investigation of complex problem related to it (PO4) moderately. It helps in learning and using the commercial software (PO5) moderately and it promotes individual and team work (PO9) weakly. It helps in effective project management (PO11) moderately. Analysis of Maxwell's equation contributes for the development of smart power grid and integrating green energy on it to meet the increasing demand of the society (PSO3) weakly.
EE 8391.5	By analyzing the characteristics of radio waves, TV signals, radar beams and light rays, Engineering knowledge (PO1) is developed moderately. This will help in problem solving of skin depth, characteristic impedance and reflection and transmission coefficients (PO2) strongly. In design and development of solution (PO3) and in investigation of complex problems like how electromagnetic energy is propagated as wave (PO4) it attributes moderately. It helps in learning the commercial software (PO5) weakly. It promotes engineer society relation (PO6), helps in environment and sustainability (PO7) and it promotes individual and team work (PO9) weakly. It helps in effective project management (PO11) moderately. There is strong usage of logical & technical skills to model, simulate and analyze electrical components and systems and used to derive the characteristics of uniform plane waves (PSO1).
EE 8391.6	Applying basic science, circuit theory and Electro-magnetic field theory to electrical engineering problems attributes strong Engineering knowledge as to how conducting medium and dielectric medium behaves with electromagnetic field (PO1). This will help in problem solving like obtaining current density and power loss (PO2) strongly, design and development of solution (PO3) and in investigation of complex problem using various laws (PO4) moderately. It helps in learning the commercial software (PO5) moderately by analyzing the problems. It promotes engineer society relation (PO6) and individual and team work (PO9) weakly. It helps in project management (PO11) weakly due to the increase in innovations in research. Strong usage of logical & technical skills to model, simulate and analyze electrical components and systems to obtain circuit

	elements (PSO1).
EE 8391.2	By discriminating the symmetrical and unsymmetrical nature of the problem and by developing the ability to solve the problems based on boundary conditions in electric field, it attributes to strong Engineering knowledge (PO1), as the concept of field, potential and continuous charge distribution is dealt. This will help in problem solving (PO2) strongly like finding the field due to a line charge having various symmetries. In design and development of solution (PO3) and in investigation of complex problem (PO4) like finding the flux density of a cylinder it attributes moderately. By knowing the nature of the problem it helps in using the commercial software (PO5) moderately and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9), effective project management (PO11) and lifelong learning (PO12) weakly. Strong usage of logical & technical skills to model, simulate and analyze electrical components and systems (PSO1) is possible and the capacitance of parallel plate capacitor of various geometrics using boundary conditions is possible.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE 8391 Electromagnetic Theory	PSO1	PSO2	PSO3
EE 8391.1	3	-	-
EE 8391.2	3	-	-
EE 8391.3	3	-	-
EE 8391.4	-	-	1
EE 8391.5	3	-	-
EE 8391.6	3	-	-
EE 8391	3	-	1

Course/Branch	:	B.E/ EEE	Total no. of hours given in syllabus:60		
Subject Code	:	EE 8351	Lecture	:	45
Subject Title	:	Digital Logic Circuits	Tutorials	:	15
Year/Semester	:	II/III	Practical	:	-
Faculty Name	:	S.Vijayakumar	TOTAL	:	60

COURSE OBJECTIVES:

1. To study various number systems , simplify the logical expressions using Boolean functions
2. To study implementation of combinational circuits
3. To design various synchronous and asynchronous circuits.
4. To introduce asynchronous sequential circuits and PLDs
5. To introduce digital simulation for development of application oriented logic circuits.

COURSE OUTCOMES:

Upon completion of the course, the students will be able to..

CO1	to interpret different number systems and choose the family of logic devices based on the characteristics.
CO2	to solve the logic functions using different simplification technique and to design the combinational circuits using logic gates.
CO3	to design and analyze the different flipflops.
CO4	to design and analyze the synchronous sequential circuit.
CO5	To design and analyze the asynchronous sequential circuit and to understand the working of different types of memories and programmable logic devices.
CO6	to develop and simulate VHDL codes for logic circuits.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE 6301 Digital Logic Circuits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 6301.1	1	1	-	-	-	-	-	-	-	-	-	-
EE 6301.2	3	3	2	2	-	-	-	-	-	-	-	-
EE 6301.3	1	-	-	1	-	-	-	-	-	-	-	-
EE 6301.4	2	1	1	2	-	1	2	-	-	-	-	-
EE 6301.5	2	1	1	-	-	-	-	-	-	-	-	-
EE 6301.6	1	-	-	1	3	-	-	-	1	-	2	1
EE 6301	3	3	2	2	3	1	2	-	1	-	2	1

JUSTIFICATION OF THE MAPPING:

EE 6301.1	By understanding the operation, characteristics of digital logic families it features weakly to Engineering knowledge (PO1), by analysing the different number system, binary codes for the application of data transmission help in problem solving mapping moderately with (PO2).
EE 6301.2	By analysing different simplification techniques and designing of logic circuits it features strongly to Engineering knowledge (PO1).This will help in problem solving related designing of simplified logic circuit using universal gates and other logic gates (PO2) strongly. By understanding the concepts of the applications of different combinational logic circuits it features moderately with design and development of solution (PO3) and in investigation of complex problem (PO4).
EE 6301.3	By understanding the working of different flip flops it features weakly to Engineering knowledge (PO1). This will help to design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions in investigation of complex problem mapping weakly with (PO4).
EE 6301.4	By understanding the design procedure of synchronous sequential circuits it features moderately to Engineering knowledge (PO1), this will help to analyze complex engineering problems (PO2) with mapping moderately. By analyzing the designing of shift registers and counters helps to solve societal and environmental problems in design and development of solution (PO3) and mapping weakly and used to design of experiments in investigation of complex problem (PO4) moderately. By designing the different synchronous sequential circuit helps in the societal health and safety mapping weakly with (PO6) and also helps in societal and environmental sustainability mapping moderately (PO7).
EE 6301.5	By knowing the working of different programmable logic devices it features moderately to Engineering knowledge (PO1), by designing the asynchronous sequential circuits this will help weakly in problem solving(PO2) related to races and hazards. By knowing the working of memories and logic devices helps in design and development of solution mapping weakly with (PO3).
EE 6301.6	By understanding the operators and packages in VHDL it features weakly to Engineering knowledge (PO1), this will helps to design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions mapping weakly with (PO4). By knowing the nature of the problem it helps in using the commercial software (PO5) strongly. It promotes individual and team work weakly with (PO9) and helps in effective project management (PO11) moderately. It aids lifelong learning (PO12) weakly.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE 6301 Digital Logic Circuits	PSO1	PSO2	PSO3
EE 6301.1	1	-	-
EE 6301.2	1	1	-
EE 6301.3	-	1	-
EE 6301.4	3	1	-
EE 6301.5	-	1	-

EE 6301.6	3	1	-
EE 6301	3	1	-

JUSTIFICATION OF THE MAPPING:

EE 6301.1	By understanding the operation, characteristics of digital logic families, different number system, binary codes for the application of data transmission it features weakly with analyzing the electrical components (PSO1).
EE 6301.2	By knowing the different simplification techniques it features weakly with analyzing the electrical components (PSO1) and by designing a simplified combinational logic circuit helps in reliability and sustainability thus mapping weakly with (PSO2).
EE 6301.3	By understanding the working of different flipflops it features weakly with analyzing the electrical components (PSO1).
EE 6301.4	By designing the synchronous sequential circuits it features weakly with analyzing the electrical components (PSO1), by knowing the working of shift registers counters helps in reliability and sustainability thus mapping strongly with (PSO2).
EE 6301.5	By understanding the working programmable logic devices, memories and designing an asynchronous sequential circuits it features weakly with reliability and sustainability thus mapping moderately with (PSO2).
EE 6301.6	By developing the VHDL coding it features strongly with the usage of logical & technical skills to model, simulate and analyze electrical components (PSO1) and this will helps in reliability and sustainability thus mapping weakly with (PSO2) .

Course/Branch	:	B.E. (EEE)	Total no. of hours given in syllabus:	
Subject Code	:	EE8301	Lecture	: 30
Subject Title	:	Electrical Machines I	Tutorials	: 30
Year/Semester	:	2018-2019/III Semester	Practical	: Nil
Faculty Name	:	D.Chandrakala, Asst. Prof./EEE	TOTAL	: 60

COURSE OBJECTIVES:

To impart knowledge on the following Topics

1. Magnetic-circuit analysis and introduce magnetic materials
2. Constructional details, the principle of operation, prediction of performance, the methods of testing the transformers and three phase transformer connections.
3. Working principles of electrical machines using the concepts of electromechanical energy conversion principles and derive expressions for generated voltage and torque developed in all Electrical Machines.
4. Working principles of DC machines as Generator types, determination of their no-load/ load characteristics, starting and methods of speed control of motors.

5. Various losses taking place in D.C. Motor and to study the different testing methods to arrive at their performance.

COURSE OUTCOMES:

Upon completion of the course, the students will be able to,

EE8301.1	analyze the magnetic-circuits
EE8301.2	acquire the knowledge in constructional details of transformers.
EE8301.3	Gain knowledge of basic electromechanical energy conversion process understands the concepts of electromechanical energy conversion.
EE8301.4	acquire the knowledge in working principles of DC Generator.
EE8301.5	acquire the knowledge in working principles of DC Motor.
EE8301.6	acquire the knowledge in various losses taking place in D.C. Machines

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE8301 Electrical Machines I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8301.1	3	1	1	1	-	2	2	-	-	-	1	-
EE8301.2	3	1	1	1	-	2	2	-	-	-	1	-
EE8301.3	3	2	2	2	-	2	2	-	-	-	2	1
EE8301.4	3	2	2	2	-	2	2	-	-	-	2	1
EE8301.5	3	2	2	2	-	2	2	-	-	-	2	1
EE8301.6	3	2	2	2	-	2	2	-	-	-	2	1
EE8301	3	2	2	2	-	2	2	-	-	-	2	1

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES

EE8301 Electrical Machines I	PSO1	PSO2	PSO3
EE8301.1	1	1	1
EE8301.2	1	1	1
EE8301.3	1	1	1
EE8301.4	1	1	1
EE8301.5	1	1	1
EE8301.6	1	1	1
EE8301	1	1	1

JUSTIFICATION OF THE MAPPING:

EE8301.1	<p>The analysis of fundamentals of magnetic circuits will help the students to apply engineering knowledge to devices such as of transformers and rotating machines which strongly maps with (PO1). This will form the basics for problem analysis and to design magnetic system components and also to form new ideas with a weak relation to (PO2), (PO3) and (PO4). Transformers and rotating machineries form the basic electric components which influences the electrical development of the society</p> <p>.Inferring the fundamentals helps the students in designing advanced machinery and with due consideration given to their sustainability to environment with medium mapping to (PO6) and (PO7).The student will be able to apply the fundamentals to his own work and keep progressing in his research field lifelong. The student takes his first step in applying his engineering knowledge for the societal by knowing the fundamentals with low mapping to (PO11), (PSO1), (PSO2) and (PSO3).</p>
EE8301.2	<p>By assimilating the basic concepts of electromechanical energy conversion the students will be able to solve, a wide variety of practical engineering problems in a logical and effective manner which attributes strongly to (PO1). Electro mechanical energy conversion theory is the corner stone for the problem analysis of electromechanical motion devices with a low mapping to (PO2).The theory allows us to express the electromagnetic force or torque in terms of the device variables such as the currents and displacement of the mechanical systems .By interpreting these concepts the students will contribute to the development of new designs and also conduct investigations of complex problems attributing weakly to (PO3) and (PO4). The students can apply these concepts to the numerous types of electromechanical devices used in motion systems and also contribute to their sustainable development which attributes with a medium mapping to (PO6) and (PO7). Knowing the fundamentals he will be able to create his own ideas to fulfill the growing societal demand and improvise on it lifelong attributing weakly to (PO11), (PSO1), (PSO2) and (PSO3).</p>
EE8301.3	<p>Transformers are among the most common of electrical devices found in power plants, substations, electrical and electronic equipments. Inferring the effects of leakage inductance the students will contribute to an efficient load sharing concept of transformers when they are operated in parallel. By assimilating the different testing procedures available the students will be able to confirm the transformer performance and to get the best performance out of a transformer the students will analyze ways of achieving the lowest possible voltage regulation by intercepting the causes of loss occurrence. Mastering these concepts, helps the students to apply his engineering knowledge to formulate new ideas, design transformers that meet specified needs, analyze and interpret datas attributing strongly to (PO1) and</p>

	<p>moderately to (PO2), (PO3) and (PO4). Transformers play a major role in power systems which is the need for increasing the production rates of making a better society. With a thorough knowledge of transformers, the students will apply their knowledge to the sustainable development and a safe and a better society attributing moderately to (PO6) and (PO7). The students will also apply his engineering knowledge to his own work and meet the changing needs of the society lifelong attributing a medium mapping with (PO11) and low with (PO12). Transformers are a basic components of power systems. Understanding and analyzing their behaviour the students will able to model new designs and also contribute to the growing smart grid attributing weakly to (PSO1), (PSO2) and (PSO3).</p>
EE8301.4	<p>Throughout the world there is a need for generators in many different applications. In addition to the underlying need for a public supply of electricity, there are a number of situations in which independent supplies are needed. DC motors play a vital role in the development of industrial power transmission systems. By analyzing their operating characteristics and apprehending the various effects like armature reaction, commutation, etc, that influences the design of electrical machines the student will be able to be able to apply his engineering specialization to the solution of complex engineering problems attributing strongly to (PO1). The student will be able to formulate new ideas, thereby design efficient machinery by analysis and interpretation of datas attributing moderately with (PO2), (PO3) and (PO4). Operating temperature should be considered when using sensitive electronic equipment, when the environment is not at the standard 40°C, or when the environment may be sensitive to a motor's heat dissipation. Motors and generators are the major components of the power systems. Developing state of art machinery remains a challenge. Additive cooling mechanisms can be installed to counteract excessive heating of machinery or the surrounding environment. By understanding the entire concepts of machinery the student will be able to contribute to the societal needs and understand the impact of electrical engineering in environmental context. The student will be able to implement the acquired knowledge to his own work and contribute to the technological change attributing a medium mapping with (PO11) and low with (PO12). The student will also be able to apply his analytical skills, model new designs and contribute to the development of smart grid attributing weakly with (PSO1), (PSO2) and (PSO3).</p>
EE8301.5	<p>Speed control means intentional change of the drive speed to a value required for performing the specific work process. Speed control is a different concept from speed regulation where there is natural change in speed due change in load on the shaft. Speed control is either done manually by the operator or by means of some automatic control device. The impacts of load changes on terminal voltage are necessary to maintain a constant voltage level. By understanding these concepts and the various factors that affect their performance the student will be able to apply his engineering knowledge to formulate new ideas leading to new design concepts and provide valid conclusions based on the interpretation of datas attributing strongly to (PO1) and moderately to (PO2), (PO3) and (PO4). DC motors can provide a variable starting torque and it is also possible to obtain speed control over wide range. Many applications demand high speed control for better performance. A primary concern when deciding what type of generator is best for your environment needs knowledge of its electrical configuration. An electrical configuration typically includes the phase, voltage, kW, and hertz that are best for an application. Knowing the various control methods the student will be able to understand the societal need and apply his knowledge to fulfill it with due importance given to its impact on the environment and its sustainability attributing moderately to (PO6) and (PO7). He will be able to apply his problem solving skills, use his logical reasoning ability</p>

	towards the technological change and also contribute to the development of smart grid attributing a medium mapping with (PO11) and low with (PO12) and a weak mapping with (PSO1), (PSO2) and (PSO3).
EE8301.6	By analyzing the operating characteristic curves the student will be able to illustrate the performance of dc machinery and understand their usage in different applications. Having a knowledge of the performance of machines under different conditions the student will be able to apply his engineering knowledge for problem analysis, to develop solutions for different requirements and also come to valid conclusions resulting in the development of new techniques and different kinds of models which suits for different environmental conditions and also contribute for the sustainable growth of technology attributing strongly to (PO1) and moderately with (PO2), (PO3), (PO4), (PO6) and (PO7). Having understood the different the operating characteristics that an application needs the student will implement his engineering knowledge to his own work and improvise its development by engaging in lifelong learning attributing moderately with (PO11) and low with (PO12). By acquiring the knowledge about the behaviour of machines the students will be able to trouble shoots problems in the related electrical field and work towards its sustainability. Power systems form the backbone of smart grid. Motors and generators are the pillars of power systems. Having a thorough knowledge of them , the students will be able to contribute the development of smart grid attributing weakly with (PSO1), (PSO2) and (PSO3)

Course/Branch	:	B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	:	ME8792	Lecture	: 45
Subject Title	:	Power Plant Engineering	Tutorials	: -
Year/Semester	:	II/III	Practical	: -
Faculty Name	:	Ms.B.Ponkarthika	TOTAL	: 45

COURSE OBJECTIVES:

To understand the overview about the functioning of coal based Thermal Power plant.

1. To know the operation and working of diesel, Gas power plants and its components.
2. To understand the layout of nuclear power plant and working of different types of reactors.
3. To be familiar with the working and various methods of hydro electric power plants.
4. To know about the working of various renewable energy resources.
5. To understand the overview of Energy, economic and environmental issues of Power Plants.

COURSE OUTCOMES:

Upon completion of the course, the students will be able to...

CO1	To discuss different power generation methods and boilers and estimate load curves and load duration curves.
CO2	To explain the layout, construction and working of the components inside a thermal power plant.
CO3	To explain the layout, construction and working of the components inside nuclear and hydro electric power plants.
CO4	To explain the layout, construction and working of the components inside diesel and gas turbine power plants.
CO5	To explain the applications of renewable energy on power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

CO6	To inter-relate the concept of different types of power plants, functions and their flow lines and issues related to them which relate the analysis in power sectors.
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MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OUTCOMES

ME 8792 Power Plant Engineering	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
ME 8792.1	2	2	1	2	-	-	-	-	1	-	1	1
ME 8792.2	2	2	2	2	-	-	-	-	1	-	1	1
ME 8792.3	3	1	1	2	-	2	-	-	1	-	1	1
ME 8792.4	2	1	2	2	-	-	2	-	1	-	1	1
ME 8792.5	2	1	2	2	1	-	2	-	1	-	1	1
ME 8792.6	2	-	2	2	-	2	-	-	1	-	1	1
ME 8792	3	2	2	2	1	2	2	-	1	-	1	1

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES

ME 8792 Power Plant Engineering	PSO1	PSO2	PSO3
ME 8792.1	-	-	2
ME 8792.2	-	-	2
ME 8792.3	-	-	2
ME 8792.4	-	-	3
ME 8792.5	2	2	3
ME 8792.6	2	-	2
ME 8792	2	2	3

JUSTIFICATION OF THE MAPPING:

ME 8792.1	<p>By analyzing the basics of thermodynamics it helps in learning the working and various components of steam power plant, it attributes to moderately Engineering knowledge(PO1), as the students will know how to explain the various steam handling systems and types of fans and boilers used in steam power plant. This strongly helps in problem solving (PO2) of different thermodynamic cycles. In design and development of solution (PO3) it attributes weakly and in investigation of complex problem (PO4) it attributes moderately. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in industrial application, as it attributes to lifelong learning weakly (PO12). It has moderate usage of thermodynamic principles and power plants in green energy (PSO1).</p>
ME 8792.2	<p>By knowing the basics of thermodynamics it helps in learning the working and various components of gas and diesel power plant, it attributes to moderately Engineering knowledge (PO1), as the students able to know about the types of turbines, cycles and the methods to improve the performance of power plants .This moderately helps in problem solving (PO2) as it deals with the performance and efficiency of power plant. In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts to improve the performance of the plant, as it attributes to lifelong learning weakly (PO12). It attributes to moderate usage in green energy (PSO1).</p>
ME 8792.3	<p>By discriminating the fission principle with the knowledge in physics, as the students is able to understand the principle of nuclear power plant and various reactor types, it attributes to strong engineering knowledge (PO1). This weakly helps in problem solving (PO2). In design and development of solution (PO3) it attributes weakly and in investigation of complex problem (PO4) it attributes moderately as the students able to explain about different nuclear reactors. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in mainly in industries, as it attributes to lifelong learning weakly (PO12). It attributes to moderate usage of fission principles in green energy (PSO1).</p>
ME 8792.2	<p>By analyzing the various turbines used, it helps to gain knowledge about the principle and the working of hydro power plant, it attributes to moderately Engineering knowledge (Po1), as the students will know about dams and different hydel power plant. This weakly helps in problem solving (PO2).In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately as it deals with the pumps and turbines. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in real time, as it attributes to lifelong learning weakly (PO12). It attributes to strong usage of principles and working of hydro power plants in green energy (PSO1).</p>
ME 8792.5	<p>By gaining the knowledge about the non conventional power generation, the students able to get the knowledge about various renewable energy resources like solar, wind , geothermal etc it attributes to moderately Engineering knowledge (PO1). This weakly helps in problem solving</p>

	(PO2).In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately as it deals with various renewable energy sources. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in real time applications, as it attributes to lifelong learning weakly (PO12). It attributes to strong usage of non conventional power generation to maximum extent in green energy (PSO1).
ME 8792.6	By interrelating the concept of different types of power plants, students able to know the functions of power plants and issues related to them which relate the analysis in power sectors, it attributes to moderately Engineering knowledge (PO1).In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in real time applications and also in industrial sectors, as it attributes to lifelong learning weakly (PO12). It attributes to moderate usage in green energy (PSO1).

Course/Branch	:	B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	:	EC8353	Lecture	:	45
Subject Title	:	ELECTRONIC DEVICES AND CIRCUITS	Tutorials	:	-
Year/Semester	:	II/III	Practical	:	-
Faculty Name	:	P.Pushpakarthick , AP /EEE	TOTAL	:	45

COURSE OUTCOMES:

Upon completion of the course, the students will be able to...

CO1: to analyse the operation, Characteristics and applications of PN junction devices.
CO2: to distinguish the different transistor configuring and apply it in different fields.
CO3: to develop the small signal model for BJT and FET amplifiers.
CO4:To analyze the performance of multistage amplifiers based on their operation
CO5:To analyze the performance of differential amplifiers based on their operation
CO6:to analyze the operation of oscillators and feedback amplifiers

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EC 6202	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
EC8353.1	3	1	3	-	-	-	-	-	1	-	-	2	-	1	-
EC8353.2	2	3	1	-	-	-	-	-	1	-	-	2	-	1	-
EC8353.3	2	2	1	-	-	-	-	-	1	-	-	2	2	1	-
EC8353.4	2	2	-	1	-	-	-	-	1	-	-	1	2	1	-

EC8353.5	2	2	-	1	-	-	-	-	1	-	-	1	2	1	-
EC8353.6	2	2	-	1	-	-	-	-	1	-	-	1	2	1	-
EC8353	3	3	3	2	1	-	-	-	2	2	2	-	3	1	-

JUSTIFICATION AND MAPPING:

EC8353.1	By gaining the knowledge of PN diodes, it attributes to strong Engineering knowledge (PO1). Knowing the operation results in weak problem solving (PO2), Knowing the characteristics, help in designing(PO3) It promotes individual and team work (PO9) and lifelong learning (PO12) effectively.This contributes for the integration of electronics for controllability, sustainability and realibility of electrical systems .(PSO2)
EC8353 .2	By distinguishing transistor configuration, it attributes to medium Engineering knowledge (PO1). Knowing the operation results in strong problem solving (PO2), It promotes individual and team work (PO9) and lifelong learning (PO12) effectively.This contributes for the integration of electronics for controllability, sustainability and realibility of electrical systems .(PSO2)
EC8353.3	It attributes to medium Engineering knowledge (PO1). This promotes problem solving (PO2), design and development of solution (PO3). It promotes individual and team work (PO9) and lifelong learning (PO12) effectively. Strong Usage of logical & technical skills to model, simulate and analyze electrical components and systems. (PSO1).This contributes for the integration of electronics for controllability, sustainability and realibility of electrical systems. (PSO2).
EC8353.4	By analyzing the performance of multi-stage amplifiers, Engineering knowledge (PO1) is developed. This promotes problem solving (PO2), design and development of solution (PO3). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It promotes individual and team work (PO9) weakly and lifelong learning (PO12). Strong Usage of logical & technical skills to model, simulate and analyze electrical components and systems. (PSO1).This contributes for the integration of electronics for controllability, sustainability and realibility of electrical systems. (PSO2).
EC8353.5	By analyzing the performance of differential amplifiers, Engineering knowledge (PO1) is developed. This promotes problem solving (PO2), design and development of solution (PO3). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It promotes individual and team work (PO9) weakly and lifelong learning (PO12). Strong Usage of logical & technical skills to model, simulate and analyze electrical components and systems. (PSO1).This contributes for the integration of electronics for controllability, sustainability and realibility of electrical systems. (PSO2).
EC8353.6	By analyzing the operation of oscillators and feedback amplifiers, Engineering knowledge (PO1) is developed. This promotes problem solving (PO2), design and development of solution (PO3). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It

	promotes individual and team work (PO9) weakly and lifelong learning (PO12). Strong Usage of logical & technical skills to model, simulate and analyze electrical components and systems. (PSO1).
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IV SEMESTER

Course/Branch	: BE/EEE	Total no. of hours given in syllabus:	
Subject Code	: EE8401	Lecture	: 45
Subject Title	: Electrical Machines II	Tutorials	: 15
Year/Sem/Sec	: II/IV/A	Practical	: -
Faculty Name	: N. Priya	TOTAL	: 60

Course Objective:

- To impart knowledge on Construction and performance of salient and non – salient type synchronous generators.
- To impart knowledge on Principle of operation and performance of synchronous motor.
- To impart knowledge on Construction, principle of operation and performance of induction machines.
- To impart knowledge on Starting and speed control of three-phase induction motors.
- To impart knowledge on Construction, principle of operation and performance of single phase induction motors and special machines.

COURSE OUTCOME

- CO1:** Skilled to relate the knowledge on Construction and performance of salient and non – salient type synchronous generators.
- CO2:** Capable of narrating the knowledge on Principle of operation and performance of synchronous motor
- CO3:** Ability to apply the knowledge on Construction, principle of operation and performance of induction machines.
- CO4:** Ability to apply the knowledge on Starting and speed control of three-phase induction motors
- CO5:** Ability to apply the knowledge on Construction, principle of operation and performance of single phase induction motors and special machines
- CO6:** Ability to apply the knowledge of AC Electrical equipments and their applications in Power System

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE8401 Electrical Machines- II	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8401.1	3	2	2	2	-	-	-	-	-	-	-	-
EE8401.2	2	1	1	2	-	-	-	-	-	-	-	-
EE8401.3	3	2	2	2	-	-	-	-	-	-	-	-
EE8401.4	1	-	1	1	-	1	2	-	-	-	-	1
EE8401.5	1	-	1	1	-	-	-	-	-	-	-	-
EE8401.6	2	1	1	1	-	1	2	-	1	-	2	1
EE8401	3	2	2	2	-	1	2	-	1	-	2	1

JUSTIFICATION OF THE MAPPING:

EE8401.1	By understanding the constructional details, parallel operation of synchronous generator it features strongly to Engineering knowledge (PO1), by knowing various methods for calculating voltage regulation help in problem solving mapping moderately with (PO2), design and development of solution (PO3) moderately and in investigation of complex problem (PO4) moderately.
EE8401.2	By understanding the constructional details, power equations of the synchronous motor it features moderately to Engineering knowledge (PO1), by knowing Torque and power equation with phasor diagram help in problem solving mapping weakly with (PO2), design and development of solution (PO3) weakly and in investigation of complex problem (PO4) moderately.
EE8401.3	By knowing the constructional details, principle of Three phase Induction Motor it features strongly to Engineering knowledge (PO1), by knowing equivalent circuit, torque, power equation and circle diagram help in problem solving mapping moderately with (PO2), design and development of solution (PO3) moderately and in investigation of complex problem (PO4) moderately.
EE8401.4	By understanding the starting methods and speed control methods of Three phase Induction Motor it features weakly to Engineering knowledge (PO1), by knowing the various speed control techniques and braking of induction motor helps in design and development of solution (PO3) and mapping

	weakly and in investigation of complex problem (PO4) weakly. By understanding the starting of three phase induction motor helps in the societal health and safety mapping weakly with (PO6) and also helps in societal and environmental sustainability mapping moderately (PO7), it also helps in technological change their by mapping weakly with (PO12)
EE8401.5	By understanding the working principle and construction of single phase induction motor and various special machines it features weakly to Engineering knowledge (PO1), by knowing the magnetic levitation system helps in design and development of solution (PO3) and mapping weakly and in investigation of complex problem (PO4) weakly.
EE8401.6	By understanding the constructional details, power equations of AC generator and motor it features moderately to Engineering knowledge (PO1), by knowing Torque and power equation with phasor diagram help in problem solving mapping weakly with (PO2), design and development of solution (PO3) weakly and in investigation of complex problem (PO4) weakly. By understanding the starting of three phase induction motor helps in the societal health and safety mapping weakly with (PO6) and also helps in societal and environmental sustainability mapping moderately (PO7). By knowing about AC machines will help us to function effectively as an individual and as a leader in diversity their by mapping weakly with (PO9) and thus understanding the engineering principles their by mapping with (PO11) moderately and helps in lifelong learning for the power system planning by mapping with (PO12) weakly.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE8401 Electrical Machines-II	PSO1	PSO2	PSO3
EE8401.1	1	1	-
EE8401.2	1	1	-
EE8401.3	1	1	-
EE8401.4	1	3	-
EE8401.5	1	2	1
EE8401.6	1	1	1
EE8401	1	3	1

JUSTIFICATION OF THE MAPPING:

EE8401.1	By understanding the constructional details, parallel operation of synchronous generator it features weakly with analyzing the electrical components (PSO1), by knowing various methods for calculating voltage regulation helps in reliability and sustainability thus mapping weakly with (PSO2).
EE8401.2	By understanding the constructional details, power equations of the synchronous motor it features weakly with analyzing the electrical components (PSO1), by knowing Torque and power equation with phasor diagram helps in reliability and sustainability thus mapping weakly with (PSO2).
EE8401.3	By knowing the constructional details, principle of Three phase Induction Motor it features weakly with analyzing the electrical components (PSO1), by knowing equivalent circuit, torque, power equation and circle diagram helps in reliability and sustainability thus mapping weakly with (PSO2).
EE8401.4	By understanding the starting methods and speed control methods of Three phase Induction Motor it features weakly with analyzing the electrical components (PSO1), by knowing the various speed control techniques and braking of induction motor helps in reliability and sustainability thus mapping strongly with (PSO2).
EE8401.5	By understanding the working principle and construction of single phase induction motor and various special machines it features weakly with analyzing the electrical components (PSO1), by knowing the magnetic levitation helps in reliability and sustainability thus mapping moderately with (PSO2) and helps in satisfying the increase in power demand with weakly mapping (PSO3)
EE8401.6	By understanding the working principle and construction of various AC machines it features weakly with analyzing the electrical components (PSO1), by knowing the starting and speed control of AC machines helps in reliability and sustainability thus mapping weakly with (PSO2) and helps in satisfying the increase in power demand with weakly mapping (PSO3)

Course/Branch	: B.E. (EEE)	Total no. of hours given in syllabus:	
Subject Code	: EE 8402	Lecture	: 45
Subject Title	: Transmission And Distribution	Tutorials	: Nil
Year/Semester	: 2018-2019/IV Semester	Practical	: Nil
Faculty Name	: Ms.B.Ponkarthika, & Mrs.K.Shanthi , Asst. Prof./ EEE	TOTAL	: 45

COURSE OBJECTIVES:

1. To study the structure of electric power system and to develop expressions for the computation of transmission line parameters.
2. To obtain the equivalent circuits for the transmission lines based on distance and operating voltage for determining voltage regulation and efficiency.

3. To understand the mechanical design of transmission line and to analyze the voltage distribution in insulator strings to improve the efficiency.
4. To study the types, construction of cables and methods to improve the efficiency.
5. To understand the operation of the different distribution schemes and methods of voltage control.
6. To study about the types of substation, Methods of grounding, EHVAC, HVDC and FACTS.

Course Outcomes:

CO1: Students will be able to study the structure of electric power system and to compute the parameters of transmission line.

CO2: Students will be able to model the different types of transmission line and determine its efficiency and voltage regulation.

CO3: Students will be able to calculate the sag and tension of the transmission line for different weather conditions.

CO4: Students will be able to improve voltage distribution across the string insulator and enhance its efficiency.

CO5: Students will be able to study the types, construction of cables and enhance its efficiency.

CO6: Students will be able to become familiar about different power distribution schemes and the concepts of compensation devices.

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	-	2	1	-	-	-	-	-	1
CO2	2	3	2	1	2	1	2	-	-	-	-	1
CO3	2	3	3	1	-	2	1	-	-	-	-	1
CO4	2	2	2	1	-	2	2	-	-	-	-	1
CO5	2	2	2	1	-	2	2	-	-	-	-	1
CO6	2	2	3	2	1	1	2	-	-	-	-	1
CO	2	3	3	2	2	2	2	-	-	-	-	1

MAPPING OF COURSE OUTCOMES WITH PROGRAM SPECIFIC OUTCOMES:

CO	PSO1	PSO2	PSO3
CO1	3	2	-
CO2	1	-	2
CO3	2	-	2
CO4	2	-	2
CO5	2	-	2
CO6	1	2	2
CO	3	2	3

Justification of the mapping:

CO 1: Students could apply the knowledge of R,L,C of transmission line to solve complex engineering problems (PO1); Could analyse the problem (PO2); could develop solution for the complex engineering problem (PO3); Could use modern tools (PO5); Would able to engage in lifelong learning (PO12); Able to model and analyze transmission systems (PSO1); knowledge of electronics could be used to improve reliability (PSO2).

CO 2: Students could apply the knowledge of modelling of transmission line in solving complex engineering problems (PO1); Could analyse the problem (PO2); Able to develop the process to meet the specified needs (PO3); Could use modern tools to solve equivalent circuit (PO5); Engineering solution in societal context could be given (PO7); They will able to engage in lifelong learning. Technical skills could be used to analyze the performance of systems (PSO1). They could contribute to the development of smart grid (PSO3).

CO 3: Students could apply the knowledge of science and engineering fundamentals (PO1); they could analyze problems related to sag and tension (PO2); Could develop solutions with safety and environmental considerations (PO3); So societal and safety issues could be analyzed (PO6); Provide solutions in societal contexts (PO7); Would able to engage in lifelong learning (PO12); Technical skills could be used to analyze the performance of systems (PSO1). They could contribute to the development of smart grid (PSO3).

CO 4: Students could apply the knowledge about insulators to solve complex engineering problems (PO1); Problem analysis could be carried out (PO2); Process could be designed to meet the needs with safety consideration (PO3); Could apply knowledge to assess safety issues (PO6); Provide solutions in societal contexts(PO7); Could recognize the need for lifelong learning (PO12); Students are skilful to model, Simulate and analyze insulators (PSO1); They could also contribute for the development of smart power grid (PSO3).

CO 5: Students could apply the knowledge about insulators to solve complex engineering problems (PO1); Problem analysis could be carried out (PO2); Process could be designed to meet the needs with safety consideration (PO3); Could apply knowledge to assess safety issues (PO6); Provide solutions in societal contexts(PO7); Could recognize the need for lifelong learning (PO12); Students are skilful to model, Simulate and analyze

insulators (PSO1); They could also contribute for the development of smart power grid (PSO3).

CO 6: Students could apply the knowledge of compensating devices for engineering problems (PO1); They could analyze problems related to engineering sciences(PO2); Could design solutions to meet the specific needs (PO3); Could apply research based knowledge of compensation devices (PO4); Could demonstrate the needs for sustainable development (PO7); Could recognize the need for lifelong learning(PO12); Students could analyze compensation devices (PSO1); Could integrate electronics for the sustainability of system(PSO2); Could also contribute for the development of smart power grid (PSO3).

Course/Branch	:	B.E. (EEE)	Total no. of hours given in syllabus:	
Subject Code	:	EE 8403	Lecture	: 45
Subject Title	:	Measurements and Instrumentation	Tutorials	: -
Year/Semester	:	II/IV – A & B	Practical	: -
Faculty Name	:	Dr. D. Fathema Farzana, AP Mr.G.V.Chidambarathanu, AP	TOTAL	: 45

COURSE OBJECTIVES:

To impart knowledge on the following Topics

- Basic functional elements of instrumentation
- Fundamentals of electrical and electronic instruments
- Comparison between various measurement techniques
- Various storage and display devices
- Various transducers and the data acquisition systems

COURSE OUTCOMES:

Students will be able to

EE8403.1

Students will be able to analyze the characteristics of instruments, evaluate the errors for the measurement data and the importance of standards and calibration.

EE8403.2

Students will be able to distinguish the construction of various types of meters, working of instrument transformers and their characteristics.

EE8403.3

The student will be able to measure the unknown values of R, L and C by using the bridges and also to use the potentiometer for voltage measurement

EE8403.4

Students will be able to handle the various storage and display devices in the practical environment

EE8403.5

Students will be able to know the operation of various transducers, DAS

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8403												
EE 8403.1	2	1	2	1	-	1	2	-	-	-	1	-
EE 8403.2	2	2	2	2	-	-	2	-	1	-	1	-
EE 8403.3	3	2	2	2	1	-	1	-	1	-	2	-
EE 8403.4	2	2	2	2	-	-	2	-	-	-	2	-
EE 8403.5	2	2	2	2	1	1	2	-	1	-	2	-
EE 8403	3	2	2	2	1	1	2	-	1	-	2	-

JUSTIFICATION OF THE MAPPING:

EE 8403.1	By gaining the knowledge of fundamentals elements and characteristics of instruments, it attributes to moderate Engineering knowledge (PO1). By analyzing the engineering science, it results in weak problem solving technique (PO2). This promotes moderate design and development of solution for the public health and safety (PO3). It contributes weak research based knowledge (PO4) for instruments. It applies reasoning to public health and environmental sustainability, thus mapping weakly and medium (PO6 & PO7) respectively. It contributes to weak mapping, in managing projects in multi disciplinary environments (PO11).
EE 8403.2	By interpreting the knowledge of construction of various types of meters, it attributes to medium Engineering knowledge (PO1). By analyzing different types of energy, frequency and phase meters, it results in medium problem solving (PO2). Design of various AC and DC meters results in medium design and developments solutions (PO3). In investigation of complex problems (PO4) it contributes moderately as the student gains knowledge about various design parameters of meters. The knowledge of various meters leads to environment and sustainability moderately (PO7). It promotes individual and team work (PO9) and project management (PO11) weakly.
EE 8403.3	It attributes to strong Engineering knowledge for calculating R, L, and C values in bridge circuits, grounding and interference concept (PO1). By analyzing AC and DC bridges, it results in medium problem solving (PO2). This promotes design and development of solutions and research based knowledge (PO3&PO4) for measurements moderately. In solving complex engineering problems, it promotes weakly (PO5) due to problem solving in bridges. The concepts of interference and grounding relates to environmental and sustainability, thus mapping weakly (PO7). It promotes weak individual and team work (PO9) and also promotes projects in multi disciplinary environments (PO11) weakly.
EE 8403.4	By interpreting the concept of various storage and display devices in the practical environment, it leads to medium Engineering knowledge (PO1). This promotes medium problem solving (PO2), and medium design and development of solution (PO3) by analyzing the working of display devices. The knowledge of storage devices contributes to analysis and interpretation of data, contributes moderately (PO4). It contributes moderate mapping in environment and sustainability (PO7) as the knowledge on various storage and display devices are gained by the student. The idea about these devices promotes moderately for the projects in multi disciplinary environments (PO11).

EE 8403.5	By learning the different types of transducers gains a systematic approach for analysis and design which leads to medium Engineering knowledge (PO1). This promotes medium problem solving (PO2), design and development of solution (PO3) and investigating complex problems by analyzing the parameters (PO4) involved in transducers. It promotes weak modern tool usage for transducers and engineer society relation (PO5&PO6), helps in medium environment and sustainability (PO7). It promotes individual and team work (PO9) weakly and contributes moderately for projects in multi disciplinary environments (PO11).
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MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES

CO	PSO 1	PSO 2	PSO 3
EE 8403.1	1	-	2
EE 8403.2	1	-	2
EE 8403.3	2	1	2
EE 8403.4	1	1	1
EE 8403.5	2	1	2
EE 8403	2	1	2

JUSTIFICATION OF THE PSO MAPPING:

EE 8403.1	The knowledge of design parameters in meter modeling leads to weak (PSO1) logical and technical skills. In integrating green energy to meet the increasing demand of the society for analyzing different meters, it promotes moderately (PSO3).
EE 8403.2	The knowledge of design parameters in meter modeling leads to weak (PSO1) logical and technical skills. In integrating green energy to meet the increasing demand of the society for analyzing different meters, it promotes moderately (PSO3).
EE 8403.3	To study the comparison methods of measurements, leads to logical and technical skills, thus mapping (PSO1) moderately. This contributes weakly for the integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2). In integrating green energy to meet the increasing demand of the society by minimizing interfering, it promotes moderately (PSO3).
EE 8403.4	The knowledge on various storage and display devices contribute to usage of logical & technical skills, integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2) and integrating green energy (PSO3) weakly.
EE 8403.5	Moderate usage of logical & technical skills to model, simulate and analyze electrical components and integration of power electronics (PSO1) with the knowledge of transducers. This contributes weakly for the integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2). The study of transducers contributes to the increasing demand of the society moderately (PSO3).

Course/Branch	:	B.E /Electrical & Electronics Engineering	Total no. of hours given in syllabus:	
Subject Code	:	EE 8451	Lecture	: 45
Subject Title	:	Linear Integrated circuits & applications	Tutorials	: --
Year/Semester	:	IV/4	Practical	: --
Faculty Name	:	Dr.J.Gowri Shankar	TOTAL	: 45

COURSE OBJECTIVES:

- i. To study the IC fabrication procedure.
- ii. To study characteristics; realize circuits; design for signal analysis using Op-amp ICs.
- iii. To study the applications of Op-amp.
- iv. To study internal functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits, ADCs.

COURSE OUTCOME

Students will be able to

EE8451.1	Design linear and non linear applications using op – amps.
EE8451.2	Design of Instrumentation Amplifier and Filters
EE8451.3	Design ADC and DAC using op – amps.
EE8451.4	Generate waveforms using op – amp circuits.
EE8451.5	Analyze special function ICs like voltage regulators, SMPS, LM380, VCO, PLL.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8451.1	3	3	3	2	3	1	1	1	1	1	1	2
EE8451.2	3	3	3	2	3	1	1	1	1	1	1	2
EE8451.3	3	3	3	2	3	1	1	1	1	1	1	2
EE8451.4	3	3	3	2	3	1	1	1	1	1	1	2
EE8451.5	3	3	3	1	3	1	1	1	1	1	1	2
EE8451	3	3	3	2	3	1	1	1	2	1	1	2

CO –PSO MATRIX

CO	PSO1	PSO2	PSO3
EE8451.1	1	2	-
EE8451.2	1	1	-
EE8451.3	1	1	1
EE8451.4	2	2	-
EE8451.5	2	1	-
EE8451	2	2	1

Justification of mapping:

EE8451.1	Design of linear and non linear applications of op – amps needs strong knowledge of Mathematics and specification of opamp (PO1) Identify, analyses the problem and come to a conclusion for a non linear design (PO2) and Design solutions that meet all the specifications including societal factors (PO3) and interpretation of design at various stages and outputs (PO4) require moderate knowledge, weak usage of IT tools (PO5) and weak contribution towards society (PO6)and multidisciplinary team work(PO9), comprehend and write design documentation(PO10) and lifelong learning of circuits(PO12) require moderate knowledge.
EE8451.2	Design of Amplifiers and filters needs strong knowledge of Mathematics and specification of opamp (PO1). Identify, analyses the problem and come to a conclusion for a optimum design (PO2) and Design solutions that meet all the specifications including societal factors (PO3)interpretation and analysis of data at various stages of design(PO4) require moderate knowledge, weak usage of IT tools(PO5)and contribution towards society(PO6), Multidisciplinary team work(PO9), comprehend and write design documentation(PO10) require moderate knowledge, and life- long updating the new design methodologies PO12).
EE8451.3	Design of ADC and DAC needs strong knowledge of Mathematics, Circuits and specification of opamp (PO1).Analyses the problems and application and come to a conclusion for a specific ADC or DAC (PO2) and Design solutions that meet all the specifications including safety factors (PO3) Analysis the output stages of design(PO4) require moderate knowledge, weak usage of IT tools(PO5) and contribution towards society(PO6), Multidisciplinary team work(PO9), comprehend and write design documentation(PO10) require moderate knowledge, and life- long updating the new recent developments (PO12).
EE8451.4	Generating different waveforms for specific application (PO1), Identification and analysis (PO2), well designed circuits (PO3) need strong knowledge of Mathematics and Circuits, Analysis of outputs at various stages (PO4), weak usage of IT tools(PO5) and contribution towards society (PO6), Multidisciplinary team work(PO9), comprehend and write design documentation(PO10) require moderate knowledge, and life- long updating the new recent

	developments (PO12), require moderate knowledge.
EE8451.5	Analysis of special function ICs knowledge of Circuits and Science(PO1), Selection of components (PO3), analysis of the output at various levels(PO4), week usage of IT tools(PO5), , maintaining records of design (PO10), factors like current requirement ,Protection, current boosting requires life- long learning (PO12).

Course/Branch	: B.E/ EEE	Total no. of hours given in syllabus
Subject Code	: IC8451	Lecture : 45
Subject Title	: Control Systems	Tutorials : 30
Year/Semester	: II/IV	Practical : -
Faculty Name	: Dr.E,Kaliappan, Prof &HOD/EEE Mr.P.Marish kumar Associate Professor/EEE	TOTAL : 75

COURSE OBJECTIVES:

- To understand the use of transfer function models for analysis physical systems and introduce the control system components.
- To provide adequate knowledge in the time response of systems and steady state error analysis.
- To accord basic knowledge in obtaining the open loop and closed–loop frequency responses of systems.
- To introduce stability analysis and design of compensators.
- To introduce state variable representation of physical systems.

COURSE OUTCOMES:

Students should have the

CO1: Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals.

CO2: Ability to do time domain and frequency domain analysis of various models of linear system.

CO3: Ability to interpret characteristics of the system to develop mathematical model.

CO4: Ability to design appropriate compensator for the given specifications.

CO5: Ability to come out with solution for complex control problem.

CO6: Ability to understand use of PID controller in closed loop system.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

Control Systems	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
IC8451.1	3	2	3	-	2	-	-	-	-	-	-	-	3	1	-
IC8451.2	3	3	1	3	1	-	-	-	-	-	-	-	3	-	1
IC8451.3	2	3	3	1	1	-	-	-	-	-	-	1	3	1	1
IC8451.4	3	3	2	1	2	-	-	-	-	-	-	2	3	-	1
IC8451.5	3	3	3	3	3	-	-	-	-	-	-	2	3	2	1
IC8451.6	2	3	3	1	2	-	-	-	-	-	-	-	3	2	1
IC8451	3	3	3	2	2	-	-	-	-	-	-	1	3	2	1

JUSTIFICATION FOR MAPPING:

IC8451.1	By understanding the systems and their representation and to design their transfer function Models, it attributes to strong Engineering knowledge (PO1) , as the student will know how to obtain mathematical model for electrical and mechanical systems. This moderately helps in analyzing the systems (PO2). In designing system components (PO3) it highly helps in obtaining solutions for the various systems. It helps in developing knowledge for modeling of system (PO5). It has strong usage of logical & technical skills to model the given system and to obtain their transfer functions. (PSO1), It also contributes for integrating systems with power electronics for control (PSO2)
IC8451.2	By providing adequate knowledge in time & frequency response of the systems, it attributes to strong Engineering knowledge (PO1), as it imparts the knowledge of plotting the time & frequency responses of SISO linear systems . This will help in problem analysis (PO2) strongly like determining time/frequency domain specifications and obtaining the steady state error of the given systems. In design and development of solution (PO3) it contributes weakly by knowing the values of time domain specifications. Using knowledge of time & frequency response analysis, a high level of analysis and comparison for transient response of system (PO4) can be done by using modern tools (PO5). It has high usage of logical & technical skills to analyze the time response of the systems (PSO1). Analysis in time response of systems contribute for smart power grid control operation (PSO3)

<p>IC8451.3</p>	<p>Understanding the characteristics of a system for development of mathematical model clearly relates the usage of Engineering knowledge (PO1), as it impart the knowledge of modeling a system. This enhances problem analysis (PO2) skills strongly, since for determining the characteristics of the given systems complete knowledge about the system need to be understood. In design and development of solution (PO3) it contributes highly towards calculation of transfer function of system. In investigation of complex problem (PO4) and modern tool usage (PO5) it relates weakly with the development of systems. It has strong usage of logical & technical skills to analyze various types of systems and their characteristics. (PSO1). It contributes weakly for the smart power grid control operation (PSO3)</p>
<p>IC8451.4</p>	<p>Developing the knowledge of compensators design for given specifications relates with Engineering knowledge highly (PO1) as the fundamental knowledge of Mathematics is highly required in designing compensators. It moderately improves skills in problem solving (PO2), as the designing calculation for different compensators requires strong knowledge for solving complex problem. In design and development of solution (PO3) it contributes strongly towards the arrival of designing complex systems. It weakly relates to investigation of complex problem (PO4) and moderately with usage of modern tools (PO5) as the research level knowledge is very less useful and modern tools are highly preferred for designing systems. It contributes for lifelong learning (PO12) moderately. It has strong usage of logical & technical skills for designing compensators. (PSO1). It contributes for the development of smart power grid(PSO3) using the concepts of stability.</p>
<p>IC8451.5</p>	<p>Developing the skill of bringing solution for complex control attributes strongly to Engineering knowledge (PO1), as it imparts the complete knowledge about various systems and controllers. This enhances problem analysis (PO2) skills strongly. For developing a solution for a control system requires high level of knowledge and analytical skills. In design and development of solution (PO3) it contributes strongly towards calculation and designing of suitable controller parameters. In investigation of complex problem (PO4) it attributes strongly as the student needed to analyze, compare the performance of various controllers for developing a good solution. For development of control systems for huge network, the usage of modern control tools (PO5) are at very high level as the tedious calculations cannot be made manually. It relates to lifelong learning (PO12) moderately. It has strong usage of logical & technical skills to analyze various types of controllers (PSO1). The knowledge of fundamental electronics is integrated (PSO2) moderately in the circuit design of controllers for better reliability. Various controllers are designed for the societal needs (PSO3) weakly as the fundamental knowledge about the controllers and their performance are studied.</p>
<p>IC8451.6</p>	<p>By understanding and using the PID controllers in closed attributes to moderate Engineering knowledge (PO1) as the students design the compensators to meet the given specifications. This will help in problem solving skills like finding the various parameters gains for the controllers (PO2) strongly. In design and development of solution (PO3) it contributes strongly towards calculation of controller parameters according to the given specification. In investigation of complex problem (PO4) it attributes weakly as the student will not be needing research level knowledge for PID controller design. In modern tool usage (PO5) it attributes moderately as the student uses certain tools for analysis and design of the controllers. It has</p>

	strong usage of logical & technical skills to analyze various types of controllers (PSO1). The knowledge of fundamental electronics is integrated (PSO2) moderately in the realization of electrical networks for PID controllers. PID controllers are designed for the control operation of societal needs (PSO3) and it relates moderately.
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V SEMESTER

Course/Branch	:	B.E /Electrical & Electronics Engineering	Total no. of hours given in syllabus:		
Subject Code	:	EE6503	Lecture	:	45
Subject Title	:	POWER ELECTRONICS	Tutorials	:	--
Year/Semester	:	III/5	Practical	:	--
Faculty Name	:	K.V.Thilagar	TOTAL	:	45

COURSE OBJECTIVES:

1. To get an overview of different types of power semiconductor devices and their switching characteristics.
2. To understand the operation, characteristics and performance parameters of controlled rectifiers
3. To study the operation, switching techniques and basics topologies of DC-DC switching regulators.
4. To learn the different modulation techniques of pulse width modulated inverters and to understand harmonic reduction methods.
5. To study the operation of AC voltage controller and various configurations

COURSE OUTCOME:

Upon completion of the course, the students will be able to...

EE6503.1	To apply the concepts of electronics switches. The essentiality of gate Triggering circuits and need of snubber circuits for the working of power converters.
EE6503.2	To analyse operation, characteristics and performance parameters of controlled converter.
EE6503.3	To analyze different topologies of DC-DC converters. The students will be able to distinguish the application of DC-DC converters in real time.
EE6503.4	To distinguish the different modulation techniques of pulse width modulated inverters and the harmonic reduction methods.
EE6503.5	To apply the concepts of AC voltage control and interpret practical application of AC voltage control.
EE6503.6	To analyse the operation of control circuits and applications of power electronic circuits

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE6503 Power Electronics	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE6503.1	3	2	2	1	1	2	1	-	-	-	1	2
EE6503.2	2	2	2	2	1	2	1	-	2	-	2	2
EE6503.3	2	3	2	2	1	2	1	-	2	-	2	2
EE6503.4	2	3	2	2	1	2	1	-	2	-	2	2
EE6503.5	2	2	2	2	1	2	1	-	2	-	2	2
EE6503.6	2	2	2	2	1	2	1	-	3	-	2	2
EE6503	3	3	2	2	1	2	1	-	3	-	2	2

EE 6503	PSO1	PSO2	PSO3
EE6503.1	3	3	1
EE6503.2	3	3	2
EE6503.3	3	3	3
EE6503.4	3	3	3
EE6503.5	3	3	2
EE6503.6	3	3	2
EE 6503	3	3	3

JUSTIFICATION FOR MAPPING:

EE6503.1	The analysis of fundamentals of electronic devices will help the students to apply engineering knowledge of uncontrolled and controlled converters which strongly aligned with (PO1)and PSO1,PSO2. This will form the basics of design of electronic converters and also to form new ideas with a moderately relation to (PO2), (PO3) and (PO6). Uncontrolled and controlled devices form the basic electric components which
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	<p>influences the electronic development of the society. Inferring the fundamentals helps the students in designing advanced semiconductor and with due consideration given to their sustainability to environment with medium mapping to (PO6). The student will be able to apply the fundamentals to his own work and keep progressing in his research field lifelong. The student takes his first step in applying his engineering knowledge for the societal by knowing the fundamentals weakly with (PO11), and (PSO3).</p>
EE6503.2	<p>By assimilating the basic concepts of uncontrolled and controlled devices the students will be able to solve, a wide variety of practical engineering problems in a logical and effective manner which attributes moderately to (PO1) and (PSO3). Controlled converters is the corner stone for the problem analysis for the control of DC motor with a moderately mapping to (PO2). The theory allows us to express design of controlled device variables using performance parameters. By interpreting these concepts the students will contribute to the development of new designs and also conduct investigations of complex problems attributing weakly to (PO3) and (PO4). The students can apply these concepts to the numerous types of electromechanical devices used in motion systems and also contribute to their sustainable development which attributes with a medium mapping to (PO6) and (PO7). Knowing the fundamentals he will be able to create his own ideas to fulfil the growing societal demand and improvise on it lifelong attributing weakly to (PO12).</p>
EE6503.3	<p>DC- DC converters are among the most common of converters found in all electrical and electronic equipments. Inferring the effects of harmonics the students will contribute to design an efficient switched mode power supply. By assimilating the different control techniques the students will be able to confirm the performance of various home equipments and to get the best performance out of a equipments the students will analyze ways of achieving the lowest possible voltage regulation by intercepting the causes of switching loss occurrence. Mastering these concepts, helps the students to apply his engineering knowledge to formulate new ideas, design transformers that meet specified needs, analyze and interpret data's attributing strongly to (PO2) and moderately to (PO1), (PO3) and (PO4). DC-DC converters play a major role in power electronics which is the need for increasing the production rates of making a better society .With a thorough knowledge of SMPS, the students will apply their knowledge to the sustainable development and a safe and a better society attributing moderately to (PO6) and (PO7). The students will also apply his engineering knowledge to his own work and meet the changing needs of the society lifelong attributing a medium mapping with (PO11) and low with (PO12). Understanding and analyzing their behaviour the students will able to model new designs and also contribute to the growing green energy attributing to (PSO1), (PSO2) and (PSO3).</p>
EE6503.4	<p>Throughout the world there is a need for optimized control techniques in many different applications. In addition to the underlying need for a public supply of electricity, there are a number of situations in which uninterrupted power supplies are needed. Inverters play a vital role in the development of uninterrupted power supplies. By analyzing their operating characteristics and apprehending the various effects like harmonics that influences the design of inverters the student will be able to be able to apply his engineering specialization to the solution of complex engineering problems attributing</p>

	<p>strongly to (PO2). The student will be able to formulate new ideas, thereby design efficient machinery by analysis and interpretation of data's attributing moderately with (PO1), (PO3) and (PO4). Operating temperature should be considered when using sensitive electronic equipment, when the environment is not at the standard 40°C. Developing state of art converters remains a challenge. Additive cooling mechanisms can be installed to counteract excessive heating of converters or the surrounding environment. By understanding the entire concepts of inverters the student will be able to contribute to the societal needs and understand the impact of electrical engineering in environmental context. The student will be able to implement the acquired knowledge to his own work and contribute to the technological change attributing a medium mapping with (PO11) and low with (PO12). The student will also be able to apply his analytical skills, model new designs and contribute to the development of smart grid attributing weakly with (PSO1), (PSO2) and (PSO3).</p>
EE6503.5	<p>Soft Speed control means intentional change of the drive speed to a value required for performing the specific work process. Speed control is either done manually by the operator or by means of some automatic control device. The impacts of load changes on terminal voltage are necessary to maintain a constant voltage level. By understanding these concepts and the various factors that affect their performance the student will be able to apply his engineering knowledge to formulate new ideas leading to new design concepts and provide valid conclusions based on the interpretation of datas attributing strongly to (PO9) and moderately to (PO2), (PO3) and (PO4). AC voltage regulators can provide a soft starting and it is also possible to obtain speed control over wide range. Many applications demand high speed control for better performance. A primary concern when deciding what type of controllers is best for your environment needs knowledge of its electrical configuration. The controllers configuration typically includes the input power, output power, over voltage and current protection that are best for an application. Knowing the various control methods the student will be able to understand the societal need and apply his knowledge to fulfil it with due importance given to its impact on the environment and its sustainability attributing moderately to (PO6) and (PO7). He will be able to apply his problem solving skills, use his logical reasoning ability towards the technological change and also contribute to the development of smart grid attributing a medium mapping with (PO11) and low with (PO12)</p>
EE6503.6	<p>By analyzing the operating characteristic curves the student will be able to illustrate the performance of dc machinery and understand their usage in different applications. Having a knowledge of the performance of machines under different conditions the student will be able to apply his engineering knowledge for problem analysis, to develop solutions for different requirements and also come to valid conclusions resulting in the development of new techniques and different kinds of models which suits for different environmental conditions and also contribute for the sustainable growth of technology attributing strongly to (PO9) and moderately with (PO2), (PO3), (PO4), (PO6) and (PO7). Having understood the different the operating characteristics that an application needs the student will implement his engineering knowledge to his own work and improvise its development by engaging in lifelong learning attributing moderately with (PO11) and low with (PO12). By acquiring the knowledge about the behaviour of</p>

machines the students will be able to trouble shoots problems in the related electrical field and work towards its sustainability. Power systems form the backbone of smart grid. Motors and generators are the pillars of power systems. Having a thorough knowledge of them , the students will be able to contribute the development of smart grid attributing weakly with (PSO1), (PSO2) and (PSO3)

Course/Branch	: BE/EEE	Total no. of hours given in syllabus:		
Subject Code	: EE 6504	Lecture	:	45
Subject Title	: Electrical Machines II	Tutorials	:	15
Year/Sem/Sec	: III/V/A&B	Practical	:	-
Faculty Name	: Ms. R. Agatha	TOTAL	:	60

Course Objective:

1. To impart knowledge on Construction and performance of salient and non – salient type synchronous generators.
2. To impart knowledge on Principle of operation and performance of synchronous motor.
3. To impart knowledge on Construction, principle of operation and performance of induction machines.
4. To impart knowledge on Starting and speed control of three-phase induction motors.
5. To impart knowledge on Construction, principle of operation and performance of single phase induction motors and special machines.

COURSE OUTCOME

CO1	Skilled to relate the knowledge on Construction and performance of salient and non – salient type synchronous generators.
CO2	Capable of narrating the knowledge on Principle of operation and performance of synchronous motor
CO3	Ability to apply the knowledge on Construction, principle of operation and performance of induction machines.
CO4	Ability to apply the knowledge on Starting and speed control of three-phase induction motors
CO5	Ability to apply the knowledge on Construction, principle of operation and performance of single phase induction motors and special machines
CO6	Ability to apply the knowledge of AC Electrical equipments and their applications in Power System

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE 6504 Electrical Machines- II	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 6504.1	3	2	2	2	-	-	-	-	-	-	-	-
EE 6504.2	2	1	1	2	-	-	-	-	-	-	-	-
EE 6504.3	3	2	2	2	-	-	-	-	-	-	-	-
EE 6504.4	1	-	1	1	-	1	2	-	-	-	-	1
EE 6504.5	1	-	1	1	-	-	-	-	-	-	-	-
EE 6504.6	2	1	1	1	-	1	2	-	1	-	2	1
EE 6504	3	2	2	2	-	1	2	-	1	-	2	1

JUSTIFICATION OF THE MAPPING:

EE 6504.1	By understanding the constructional details, parallel operation of synchronous generator it features strongly to Engineering knowledge (PO1), by knowing various methods for calculating voltage regulation help in problem solving mapping moderately with (PO2), design and development of solution (PO3) moderately and in investigation of complex problem (PO4) moderately.
EE 6504.2	By understanding the constructional details, power equations of the synchronous motor it features moderately to Engineering knowledge (PO1), by knowing Torque and power equation with phasor diagram help in problem solving mapping weakly with (PO2), design and development of solution (PO3) weakly and in investigation of complex problem (PO4) moderately.
EE 6504.3	By knowing the constructional details, principle of Three phase Induction Motor it features strongly to Engineering knowledge (PO1), by knowing equivalent circuit, torque, power equation and circle diagram help in problem solving mapping moderately with (PO2), design and development of solution (PO3) moderately and in investigation of complex problem (PO4) moderately.
EE 6504.4	By understanding the starting methods and speed control methods of Three phase Induction Motor it features weakly to Engineering knowledge (PO1), by knowing the various speed control techniques and

	braking of induction motor helps in design and development of solution (PO3) and mapping weakly and in investigation of complex problem (PO4) weakly. By understanding the starting of three phase induction motor helps in the societal health and safety mapping weakly with (PO6) and also helps in societal and environmental sustainability mapping moderately (PO7), it also helps in technological change their by mapping weakly with (PO12)
EE 6504.5	By understanding the working principle and construction of single phase induction motor and various special machines it features weakly to Engineering knowledge (PO1), by knowing the magnetic levitation system helps in design and development of solution (PO3) and mapping weakly and in investigation of complex problem (PO4) weakly.
EE 6504.6	By understanding the constructional details, power equations of AC generator and motor it features moderately to Engineering knowledge (PO1), by knowing Torque and power equation with phasor diagram help in problem solving mapping weakly with (PO2), design and development of solution (PO3) weakly and in investigation of complex problem (PO4) weakly. By understanding the starting of three phase induction motor helps in the societal health and safety mapping weakly with (PO6) and also helps in societal and environmental sustainability mapping moderately (PO7). By knowing about AC machines will help us to function effectively as an individual and as a leader in diversity their by mapping weakly with (PO9) and thus understanding the engineering principles their by mapping with (PO11) moderately and helps in lifelong learning for the power system planning by mapping with (PO12) weakly.

Course/Branch	:	B.E/ EEE		Total no. of hours given in syllabus	
Subject Code	:	IC6501		Lecture	: 45
Subject Title	:	Control Systems		Tutorials	: 15
Year/Semester	:	III/V		Practical	: -
Faculty Name	:	M. Lavanya		TOTAL	: 60

COURSE OBJECTIVES:

- i. To understand the systems and their representation and to design their transfer function
- ii. models.
- iii. To provide adequate knowledge in time response of the systems.
- iv. To understand the frequency response of the systems and their specifications.
- v. To understand the concept of stability of the systems.
- vi. To understand the concepts of feedback control.
- vii. To understand state variable representation of physical systems and study the effect of state feedback.

Course Outcomes:

CO1	Students will be able to understand the systems and their representation and can design their transfer function models.
CO2	Students will be able to perform time domain analysis of control systems.
CO3	Students will be able to perform frequency domain analysis of control systems required for stability .
CO4	Students will be able to check the stability of the given system using Routh Hurwitz, Nyquist and root locus techniques.
CO5	Students will be familiar with the various modes of feedback control.
CO6	Students will be able to design the compensators to meet the performance requirements and can perform state variable analysis for the given systems.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

Control Systems	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
IC 6501.1	3	3	2	1	-	-	-	-	-	-	-	-	3	-	-
IC 6501.2	3	3	1	1	1	-	-	-	1	-	-	-	3	-	-
IC 6501.3	2	3	2	1	1	-	-	-	1	-	-	-	3	-	-
IC 6501.4	2	3	2	1	1	2	2	-	1	-	1	1	3	-	1
IC 6501.5	3	3	2	1	-	1	1	-	1	-	1	1	3	2	1
IC 6501.6	2	3	2	1	1	2	2	-	1	-	-	-	3	2	1
IC 6501	3	3	2	1	1	2	2	-	1	-	1	1	3	2	1

Justification for mapping

IC 6501.1	By understanding the systems and their representation and to design their transfer function Models , it attributes to strong Engineering knowledge (PO1) , as the student will know how to obtain mathematical model for electrical and mechanical systems. This strongly helps in problem solving (PO2) of transfer functions for various systems. In design and development of solution (PO3) it helps to obtain solutions for the various systems moderately. In investigation of complex problem (PO4) it attributes weakly to research based knowledge. It has strong usage of logical & technical skills to model the given system and to obtain their transfer functions. (PSO1).
IC 6501.2	By providing adequate knowledge in time response of the systems, it attributes to strong Engineering knowledge (PO1), as it imparts the knowledge of plotting the time responses of SISO linear systems . This will help in problem analysis (PO2) strongly like determining time domain specifications and obtaining the steady state error of the given systems. In design and development of solution (PO3) it contributes weakly by knowing the values of time domain specifications. In investigation of complex problem(PO4) and modern tool usage(PO5) it attributes weakly as the student analyses the systems for time response and steady state error. It promotes individual and team work (PO9) weakly as the basic knowledge about the responses is gained. It has strong usage of logical & technical skills to analyze the time response of the systems (PSO1).
IC 6501.3	By understanding the frequency response of the systems and their specifications, it attributes to moderate Engineering knowledge (PO1), as it imparts the knowledge of plotting the frequency responses of SISO linear system. This enhances problem analysis (PO2) skills strongly by determining the stability of the given systems. In design and development of solution (PO3) it contributes moderately towards calculation of frequency domain specifications. In investigation of complex problem (PO4) and modern tool usage(PO5) it attributes weakly as the student gains knowledge regarding the performance of systems. It promotes individual and team work (PO9) weakly. It has strong usage of logical & technical skills to analyze various types of systems for their stability using bode and polar plots. (PSO1).
IC 6501.4	By understanding the concept of stability of the systems it attributes to moderate Engineering knowledge (PO1) as the various stability methods are studied. This will help in problem solving (PO2), strongly as the solutions relating to stability are obtained. In design and development of solution (PO3) it contributes moderately towards the arrival of conclusions towards stability. In investigation of complex problem related to it (PO4) weakly. In investigation of complex problem(PO4) and modern tool usage(PO5) it attributes weakly as the student analyses the systems using various methods. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges, uses these concepts for environment and sustainability (PO7) moderately. It promotes individual and team work (PO9) weakly. It helps in project management (PO11) and life long learning (PO12) weakly. It has strong usage of logical & technical skills to analyze various types of systems for their stability using Routh and Nyquist stability criterion. (PSO1). It contributes for the development of smart power grid(PSO3) using the concepts of stability.

<p>IC 6501.5</p>	<p>By understanding the various modes of feedback control , it attributes to strong Engineering knowledge (PO1), as it imparts the complete knowledge about various controllers . This enhances problem analysis (PO2) skills strongly for improving the performance of system using controllers. In design and development of solution (PO3) it contributes moderately towards calculation of controller parameters. In investigation of complex problem(PO4) it attributes weakly as the student analyses the performance of controllers. It promotes engineer society relation (PO6) by the use of controllers along with position control system for practical applications , uses these concepts for environment and sustainability(PO7) and it promotes individual and team work (PO9) weakly. It helps in project management (PO11) and life long learning (PO12) weakly. It has strong usage of logical & technical skills to analyze various types of controllers (PSO1). The knowledge of fundamental electronics is integrated (PSO2) moderately in the circuit design of controllers for better reliability. Various controllers are designed for the societal needs (PSO3) weakly as the fundamental knowledge about the controllers and their performance are studied.</p>
<p>IC 6501.6</p>	<p>By understanding the different methods for designing the compensators and their characteristics and state variable analysis , it attributes to moderate Engineering knowledge (PO1) as the students design the compensators to meet the given specifications. This will help in problem solving skills like finding the various parameters for the compensators and controllability and observability (PO2) strongly. In design and development of solution (PO3) it contributes moderately towards calculation of compensator parameters. In investigation of complex problem (PO4) it attributes weakly as the student analyses the performance of compensators. In modern tool usage(PO5) it attributes weakly as the student analyses the systems using various types of compensators. It promotes engineer society relation (PO6) by the use of compensators for improving stability, uses these concepts for environment and sustainability (PO7).It promotes individual and team work (PO9) weakly. It has strong usage of logical & technical skills to analyze various types of compensators and modeling using state variable analysis (PSO1). The knowledge of fundamental electronics is integrated (PSO2) moderately in the realization of electrical networks for compensators. Various compensators are designed for the societal needs (PSO3) weakly as the fundamental knowledge about the compensators and their performance are studied.</p>

EE6502.2	2	1	-	-	3	2	-	-	1	-	1	1	-	1	1
EE6502.3	2	-	-	-	3	2	-	-	1	-	1	1	-	1	1
EE6502.4	2	-	-	-	3	2	-	-	1	-	1	1	-	1	1
EE6502.5	2	1	3	2	3	2	-	-	1	-	1	1	-	2	1
EE6502.6	2	1	3	2	3	2	-	-	1	-	1	1	-	2	1
EE6502	2	1	3	2	3	2	-	-	1	-	1	1	-	2	1

JUSTIFICATION OF MAPPING:

EE6502.1	The study of fundamentals of microprocessor and microcontroller will help the students to apply engineering knowledge moderately maps with (PO1).
EE6502.2	Writing simple programs requires medium knowledge of engineering (PO1), can be implemented using software tools (PO5) students can apply these programming skills to development of society sustainable design(PO7) , strongly requires life- long updation of various upcoming processors and language(PO12).
EE6502.3	The study of fundamentals microcontroller will help the students to apply engineering knowledge moderately maps with (PO1).
EE6502.4	Understanding the concepts of various peripheral devices requires medium knowledge of engineering (PO1) ,application of software tools(PO5), Requires life- long learning (PO12) as the new processors are coming to the market.
EE6502.5	Writing simple programs requires medium knowledge of engineering (PO1), can be implemented using software tools (PO5) students can apply these programming skills to development of society sustainable design(PO7) , strongly requires life- long updation of various upcoming processors and language(PO12).
EE6502.6	Apply their programming knowledge for real time applications requires medium knowledge of engineering (PO1), good analysis which reduces errors (PO2),Optimum design algorithms (PO3), Justification of their design at various conditions(PO4), good usage of software tools to find solutions (PO5) and team work, sustainable design(PO7), explaining their concepts (PO10), strongly requires life- long updation of various upcoming processors and language(PO12) for writing efficient programs.

Course/Branch	:	B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	:	ME6701	Lecture	: 45
Subject Title	:	Power Plant Engineering	Tutorials	: -
Year/Semester	:	III/V	Practical	: -
Faculty Name	:	Dr.K.Mala	TOTAL	: 45

COURSE OBJECTIVES:

- To understand the overview about the functioning of coal based Thermal Power plant.
- To know the operation and working of diesel, Gas power plants and its components.
- To understand the layout of nuclear power plant and working of different types of reactors.
- To be familiar with the working and various methods of hydro electric power plants.
- To know about the working of various renewable energy resources.
- To understand the overview of Energy, economic and environmental issues of Power Plants.

COURSE OUTCOMES

Upon completion of the course, the students will be able to...

CO1	To identify the elements and functions of coal based thermal power plant.
CO2	To analyze the concept of various functions of diesel and gas power plant.
CO3	To analyze the concept of various functions of nuclear power plant and reactors.
CO4	To analyze the concept of various functions of hydro power plant
CO5	To analyze the concept of various functions of non-conventional power generation
CO6	To interrelate the concept of different types of power plants, functions and their flow lines and issues related to them which relate the analysis in power sectors.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OUTCOMES

ME 6401 Power Plant Engineering	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
ME 6701.1	2	2	1	2	-	-	-	-	1	-	1	1
ME 6701.2	2	2	2	2	-	-	-	-	1	-	1	1
ME 6701.3	3	1	1	2	-	-	-	-	1	-	1	1
ME 6701.4	2	1	2	2	-	-	-	-	1	-	1	1

ME 6701.5	2	1	2	2	-	-	-	-	1	-	1	1
ME 6701.6	2	-	2	2	-	-	-	-	1	-	1	1
ME 6701	3	2	2	2	-	-	-	-	1	-	1	1

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES

ME 6701 Power Plant Engineering	PSO1	PSO2	PSO3
ME 6701.1	-	-	2
ME 6701.2	-	-	2
ME 6701.3	-	-	2
ME 6701.4	-	-	3
ME 6701.5	-	-	3
ME 6701.6	-	-	2
ME 6701	-	-	3

JUSTIFICATION OF THE MAPPING:

ME 6701.1	By analyzing the basics of thermodynamics it helps in learning the working and various components of steam power plant , it attributes to moderately Engineering knowledge(PO1), as the students will know how to explain the various steam handling systems and types of fans and boilers used in steam power plant. This strongly helps in problem solving (PO2) of different thermodynamic cycles. In design and development of solution (PO3) it attributes weakly and in investigation of complex problem (PO4) it attributes moderately. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in industrial application, as it attributes to lifelong learning weakly (PO12). It has moderate usage of thermodynamic principles and power plants in green energy (PSO1).
ME 6701.2	By knowing the basics of thermodynamics it helps in learning the working and various components of gas and diesel power plant, it attributes to moderately Engineering knowledge(PO1), as the students able to know about the types of turbines, cycles and the

	<p>methods to improve the performance of power plants .This moderately helps in problem solving (PO2) as it deals with the performance and efficiency of power plant. In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts to improve the performance of the plant, as it attributes to lifelong learning weakly (PO12). It attributes to moderate usage in green energy (PSO1).</p>
ME 6701.3	<p>By discriminating the fission principle with the knowledge in physics, as the students is able to understand the principle of nuclear power plant and various reactor types, it attributes to strong engineering knowledge (PO1). This weakly helps in problem solving (PO2). In design and development of solution (PO3) it attributes weakly and in investigation of complex problem (PO4) it attributes moderately as the students able to explain about different nuclear reactors. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in mainly in industries, as it attributes to lifelong learning weakly (PO12). It attributes to moderate usage of fission principles in green energy (PSO1).</p>
ME 6701.2	<p>By analyzing the various turbines used, it helps to gain knowledge about the principle and the working of hydro power plant, it attributes to moderately Engineering knowledge (Po1), as the students will know about dams and different hydel power plant. This weakly helps in problem solving (PO2).In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately as it deals with the pumps and turbines. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in real time, as it attributes to lifelong learning weakly (PO12). It attributes to strong usage of principles and working of hydro power plants in green energy (PSO1).</p>
ME 6701.5	<p>By gaining the knowledge about the non conventional power generation, the students able to get the knowledge about various renewable energy resources like solar, wind , geothermal etc it attributes to moderately Engineering knowledge (PO1). This weakly helps in problem solving (PO2).In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately as it deals with various renewable energy sources. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in real time applications, as it attributes to lifelong learning weakly (PO12). It attributes to strong usage of non conventional power generation to maximum extent in green energy (PSO1).</p>
ME 6701.6	<p>By interrelating the concept of different types of power plants, students able to know the functions of power plants and issues related to them which relate the analysis in power sectors, it attributes to moderately Engineering knowledge (PO1).In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately. It promotes individual and team work (PO9) and helps in project management (PO11) weakly. It helps the students to apply the concepts in real time applications and also in industrial sectors, as it attributes to lifelong learning weakly (PO12). It attributes to moderate usage in green energy (PSO1).</p>

Course/Branch	: B.E. (EEE)	Total no. of hours given in syllabus:	
Subject Code	: EE 6501	Lecture	: 45
Subject Title	: Power System Analysis	Tutorials	: Nil
Year/Semester	: III/V Semester (2018-19)	Practical	: Nil
Faculty Name	: Mr.Vijeesh V Asst. Prof./ EEE	TOTAL	: 45

COURSE OBJECTIVES:

1. To apply different methods to analyse power system for the purpose of system planning and operation.
2. To develop the single line diagram and per unit analysis for the power system studies.
3. To impart the knowledge of different iterative methods for power flow studies
4. To compute the fault current and short circuit capacity for symmetrical fault
5. To analyse the various sequence networks for unsymmetrical fault studies
6. To analyse the stability of power system

Course Outcomes:

CO 1	Ability to apply different methods to analyse power system for the purpose of system planning and operation.
CO 2	Ability to develop the single line diagram and per unit analysis for the power system studies.
CO 3	Ability to select suitable iterative method for power flow studies.
CO 4	Ability to compute the fault current and short circuit capacity for symmetrical fault.
CO 5	Ability to apply the usage of various sequence networks for unsymmetrical fault studies.
CO 6	Ability to select suitable algorithm for stability analysis.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	3	2	1	1	1	-	-	-	1	1
CO2	2	3	-	1	-	-	-	-	-	-	-	-
CO3	2	2	2	1	1	-	-	-	-	-	-	1
CO4	2	3	-	2	-	1	-	-	-	-	-	-
CO5	2	3	-	2	-	1	-	-	-	-	-	-
CO6	2	2	2	2	1	1	-	-	-	-	-	1
EE6501	2	3	3	2	1	1	1	-	-	-	1	1

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

CO	PSO1	PSO2	PSO3
CO1	2	1	2
CO2	1	-	-
CO3	-	-	1
CO4	2	1	1
CO5	2	1	1
CO6	-	-	2
EE6501	2	1	2

JUSTIFICATION OF THE MAPPING:

CO 1: By developing the single line diagram and the per unit analysis it features to moderate Engineering knowledge (PO1). This will help in problem solving (PO2), design and development of solution (PO3) strongly and in investigation of complex problem (PO4). Learning the power flow analysis, fault analysis and stability analysis makes use of new software (PO5). By knowing the fault analysis safety of the people can be done (PO6). By understanding the stability analysis results in sustainable development (PO7). Power system planning helps in managing the projects (PO11) and for technological change (PO12). Ability to simulate the power system components from single line diagram (PSO1), fault analysis studies having the usage of fundamental electrical system (PSO2) and stability studies helps in designing of smart grid (PSO3).

CO 2: By developing the per unit analysis, impedance and admittance matrix it attribute to moderate Engineering knowledge (PO1). This will help in problem solving (PO2), and in investigation of complex problem (PO4). Ability to simulate the power system components from single line diagram (PSO1) and formulating the single line diagram helps in designing of smart grid (PSO3).

CO 3: By formulating the power flow equation it features to moderate Engineering knowledge (PO1). This will help in problem solving (PO2), design and development of solution (PO3) moderately and in investigation of complex problem (PO4). Learning the power flow analysis makes use of new software (PO5). Power flow studies helps for technological change (PO12). Power flow analysis supports the designing of smart grid (PSO3).

CO 4: By developing the Thevenin's method and Impedance method of fault analysis it features to moderate Engineering knowledge (PO1), this will help in problem solving (PO2), and in investigation of complex

problem (PO4). By knowing the fault analysis safety of the people can be done (PO6). Ability to simulate the symmetrical fault conditions (PSO1), symmetrical fault analysis studies having the usage of fundamental network theories (PSO2) and formulation of fault MVA helps in designing of circuit breaker which supports the designing of smart grid and satisfying the power demand (PSO3).

CO 5: By developing the unsymmetrical conditions of fault analysis it features to moderate Engineering knowledge (PO1). This will help in problem solving (PO2), and in investigation of complex problem (PO4). By knowing the unsymmetrical fault analysis safety of the people can be done (PO6). Ability to simulate the unsymmetrical fault conditions (PSO1), unsymmetrical fault analysis studies having the usage of fundamental phasor sequences (PSO2) and formulation of fault MVA helps in designing of circuit breaker which supports the designing of smart grid and increasing the power demand (PSO3).

CO 6: By developing the single bus infinite bus system for stability analysis it supports moderately the Engineering knowledge (PO1), this will help in problem solving (PO2), design and development of solution (PO3) moderately and in investigation of complex problem (PO4). Learning algorithms for stability analysis makes use of new software (PO5). By calculating the critical clearing time safety of the people can be done (PO6). Power system stability studies helps in improving the fault clearing time which helps for technological change (PO12). Stability studies helps in increasing the power demand of the society (PSO3).

VI SEMESTER

Course/Branch	: B.E /Electrical & Electronics Engineering	Total no. of hours given in syllabus:	
Subject Code	: EE8004	Lecture	: 45
Subject Title	: MODERN POWER CONVERTERS	Tutorials	: --
Year/Semester	: III/6	Practical	: --
Faculty Name	: K.V.Thilagar	TOTAL	: 45

COURSE OBJECTIVES:

To impart knowledge about the following topics:

- Switched mode power supplies
- Soft switched converters
- Matrix Converter

COURSE OUTCOMES

Upon completion of the course, the students will be able ...

EE8004.1	To learn the concepts of Switched mode DC power supplies
EE8004.2	To understand operation of phase Controlled Rectifiers
EE8004.3	To design inverters and essentiality of harmonic control in power electronic circuits.
EE8004.4	To design AC-AC converters with and without DC link harmonic control in power electronic circuits.
EE8004.5	To understand the concepts of ZVS, ZCS, Quasi resonant converters.
EE8004.6	To suggest converters for AC-DC conversion and SMPS

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE8004	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8004.1	3	2	2	1	1	2	1	-	-	-	1	2
EE8004.2	2	2	2	2	1	2	1	-	2	-	2	2
EE8004.3	2	3	2	2	1	2	1	-	2	-	2	2

EE8004.4	2	3	2	2	1	2	1	-	2	-	2	2
EE8004.5	2	2	2	2	1	2	1	-	2	-	2	2
EE8004.6	2	2	2	2	1	2	1	-	3	-	2	2
EE8004	3	3	2	2	1	2	1	-	3	-	2	2

EE 8004	PSO1	PSO2	PSO3
EE8004.1	3	3	1
EE8004.2	3	3	2
EE8004.3	3	3	3
EE8004.4	3	3	3
EE8004.5	3	3	2
EE8004.6	3	3	2
EE 8004	3	3	3

JUSTIFICATION OF THE MAPPING:

EE8004.1	The analysis of fundamentals of electronic devices will help the students to apply engineering knowledge of uncontrolled and controlled converters which strongly aligned with (PO1)and PSO1,PSO2. This will form the basics of design of electronic converters and also to form new ideas with a moderately relation to (PO2), (PO3) and (PO6). Uncontrolled and controlled devices form the basic electric components which influences the electronic development of the society. Inferring the fundamentals helps the students in designing advanced semiconductor and with due consideration given to their sustainability to environment with medium mapping to (PO6). The student will be able to apply the fundamentals to his own work and keep progressing in his research field lifelong.The student takes his first step in applying his engineering knowledge for the societal by knowing the fundamentals weakly with (PO11), and (PSO3).
EE8004.2	By assimilating the basic concepts of uncontrolled and controlled devices the students will be able to solve, a wide variety of practical engineering problems in a logical and effective manner which attributes moderately to (PO1) and (PSO3). Controlled converters is the corner stone for the problem analysis for the control of DC motor with a moderately mapping to (PO2).The theory allows us to express design of controlled device variables using performance parameters. By interpreting these concepts the students will contribute to the development of

	<p>new designs and also conduct investigations of complex problems attributing weakly to (PO3) and (PO4). The students can apply these concepts to the numerous types of electromechanical devices used in motion systems and also contribute to their sustainable development which attributes with a medium mapping to (PO6) and (PO7). Knowing the fundamentals he will be able to create his own ideas to fulfil the growing societal demand and improvise on it lifelong attributing weakly to (PO12).</p>
EE8004.3	<p>DC- DC converters are among the most common of converters found in all electrical and electronic equipments. Inferring the effects of harmonics the students will contribute to design an efficient switched mode power supply. By assimilating the different control techniques the students will be able to confirm the performance of various home equipments and to get the best performance out of a equipments the students will analyze ways of achieving the lowest possible voltage regulation by intercepting the causes of switching loss occurrence. Mastering these concepts, helps the students to apply his engineering knowledge to formulate new ideas, design transformers that meet specified needs, analyze and interpret data's attributing strongly to (PO2) and moderately to (PO1), (PO3) and (PO4). DC-DC converters play a major role in power electronics which is the need for increasing the production rates of making a better society .With a thorough knowledge of SMPS, the students will apply their knowledge to the sustainable development and a safe and a better society attributing moderately to (PO6) and (PO7).The students will also apply his engineering knowledge to his own work and meet the changing needs of the society lifelong attributing a medium mapping with (PO11) and low with (PO12). Understanding and analyzing their behaviour the students will able to model new designs and also contribute to the growing green energy attributing to (PSO1), (PSO2) and (PSO3).</p>
EE8004.4	<p>Throughout the world there is a need for optimized control techniques in many different applications. In addition to the underlying need for a public supply of electricity, there are a number of situations in which uninterrupted power supplies are needed. Inverters play a vital role in the development of uninterrupted power supplies. By analyzing their operating characteristics and apprehending the various effects like harmonics that influences the design of inverters the student will be able to be able to apply his engineering specialization to the solution of complex engineering problems attributing strongly to (PO2). The student will be able to formulate new ideas, thereby design efficient machinery by analysis and interpretation of data's attributing moderately with (PO1), (PO3) and (PO4). Operating temperature should be considered when using sensitive electronic equipment, when the environment is not at the standard 40°C. Developing state of art converters remains a challenge. Additive cooling mechanisms can be installed to counteract excessive heating of converters or the surrounding environment. By understanding the entire concepts of inverters the student will be able to contribute to the societal needs and understand the impact of electrical engineering in environmental context. The student will be able to implement the acquired knowledge to his own work and contribute to the technological change attributing a medium mapping with (PO11) and low with (PO12). The student will also be able to apply his analytical skills, model new designs and contribute to the development of smart grid attributing weakly with (PSO1), (PSO2) and (PSO3).</p>
EE8004.5	<p>Soft Speed control means intentional change of the drive speed to a value required for performing the specific work process. Speed control is either done manually by the operator or</p>

	<p>by means of some automatic control device. The impacts of load changes on terminal voltage are necessary to maintain a constant voltage level. By understanding these concepts and the various factors that affect their performance the student will be able to apply his engineering knowledge to formulate new ideas leading to new design concepts and provide valid conclusions based on the interpretation of data attributing strongly to (PO9) and moderately to (PO2), (PO3) and (PO4). AC voltage regulators can provide a soft starting and it is also possible to obtain speed control over wide range. Many applications demand high speed control for better performance. A primary concern when deciding what type of controllers is best for your environment needs knowledge of its electrical configuration. The controllers configuration typically includes the input power, output power, over voltage and current protection that are best for an application. Knowing the various control methods the student will be able to understand the societal need and apply his knowledge to fulfil it with due importance given to its impact on the environment and its sustainability attributing moderately to (PO6) and (PO7). He will be able to apply his problem solving skills, use his logical reasoning ability towards the technological change and also contribute to the development of smart grid attributing a medium mapping with (PO11) and low with (PO12)</p>
EE8004.6	<p>By analyzing the operating characteristic curves the student will be able to illustrate the performance of dc machinery and understand their usage in different applications. Having a knowledge of the performance of machines under different conditions the student will be able to apply his engineering knowledge for problem analysis, to develop solutions for different requirements and also come to valid conclusions resulting in the development of new techniques and different kinds of models which suits for different environmental conditions and also contribute for the sustainable growth of technology attributing strongly to (PO9) and moderately with (PO2), (PO3), (PO4), (PO6) and (PO7). Having understood the different the operating characteristics that an application needs the student will implement his engineering knowledge to his own work and improvise its development by engaging in lifelong learning attributing moderately with (PO11) and low with (PO12). By acquiring the knowledge about the behaviour of machines the students will be able to trouble shoots problems in the related electrical field and work towards its sustainability. Power systems form the backbone of smart grid. Motors and generators are the pillars of power systems. Having a thorough knowledge of them , the students will be able to contribute the development of smart grid attributing weakly with (PSO1), (PSO2) and (PSO3)</p>

Course/Branch	B.E /Electrical & Electronics Engineering	Total no. of hours given in syllabus:		
Subject Code	EE 8005	Lecture	:	45
Subject Title	Special Electrical Machines	Tutorials	:	--
Year/Semester	III/06	Practical	:	--
Faculty Name	D.CHANDRAKALA B.PONKARTHIKA	TOTAL	:	45

COURSE OBJECTIVES:

To impart knowledge on the

1. Construction, principle of operation, control and performance of stepping motors.
2. Construction, principle of operation, control and performance of switched reluctance motors.
3. Construction, principle of operation, control and performance of permanent magnet brushless D.C. motors.
4. Construction, principle of operation and performance of permanent magnet synchronous motors.
5. Construction, principle of operation and performance of other special Machines.

COURSE OUTCOMES

Upon completion of the course, the students will be able to...

CO1 Able to select the different types of stepper motor by knowing the working of various types of stepper motor, their characteristics, closed loop control and applications.

CO2 To describe the principle & features of variable reluctance and to select the various types of SRM based on their applications.

CO3 Able to describe the magnetic circuit analysis and the magnetic materials and working principles, EMF, Torque equation, Characteristics and applications of BLPMDC motor.

CO4 Able to describe the phasor diagram, volt-amp requirements, features, working principles, EMF, torque equation, characteristics and applications of Permanent Magnet Synchronous Motors.

CO5 Able to to analyze the working principles, applications and difference between various types of special electrical machines.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OUTCOMES

EE8005 Special Electrical Machines	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8005.1	3	3	1	1	-	-	-	-	1	-	-	2
EE8005.2	3	3	1	1	-	-	-	-	1	-	-	2
EE8005.3	3	3	1	1	-	-	-	-	1	-	-	2
EE8005.4	3	3	1	1	-	-	-	-	1	-	-	2
EE8005.5	3	3	1	1	-	-	-	-	1	-	-	2
EE8005	3	3	1	1	-	-	-	-	1	-	-	2

EE8005 Special Electrical Machines	PSO1	PSO2	PSO3
EE8005.1	1	-	1
EE8005.2	1	-	1
EE8005.3	1	-	1
EE8005.4	1	-	1
EE8005.5	1	-	1
EE8005	1	-	1

JUSTIFICATION OF MAPPING:

EE8005.1	By assimilating the basic concepts of stepper motor the students will be able to solve, a wide variety of practical engineering problems in a logical and effective manner which attributes strongly to (PO1).Step angle conversion is the corner stone for the problem analysis of designing the stepper motor (PO2).The theory allows us to express the modes of operation in terms of the stepper motor types and by interpreting these concepts the students will contribute to the development of new designs and also conduct investigations of complex problems attributing weakly to (PO3) and (PO4).The students can apply these concepts to the numerous types of stepper motor to its own work and also contribute to their sustainable development with a weak relation to (PO9). Knowing the fundamentals he will be able to create his own ideas to fulfil the growing societal demand and improvise on it lifelong attributing moderately to (PO12) and weakly to (PSO1) and (PSO3).
EE8005.2	Switched Reluctance motor is among the most common special type of electrical machine construction. Mastering these concepts, it helps the students to apply his engineering knowledge to formulate new ideas, design machines that meet specified needs, analyze and interpret data's attributing strongly to (PO1), (PO2) .The students will also apply his engineering knowledge to his own work and meet the changing needs of the society lifelong attributing a low mapping with (PO3), (PO4), (PO9) and moderately with (PO12). Understanding and analyzing their behaviour the students will able to model new designs and also contribute to the growing smart grid attributing weakly to (PSO1) and (PSO3).
EE8005.3	Throughout the world there is a need for motors in many different applications. In addition to the underlying need for a public supply of electricity, there are a number of situations in which independent supplies are needed. PMBLDC motors play a vital role in the development of industrial systems. By analyzing their operating characteristics and apprehending the various effects like armature reaction, commutation, etc, that influences the design of electrical machines the student will be able to apply his engineering specialization to the solution of complex engineering problems attributing strongly to (PO1), (PO2). The student will be able to formulate new ideas, thereby design efficient machinery by analysis and interpretation of data's attributing weakly with (PO3) and (PO4). The student will be able to implement the acquired knowledge to his own work and contribute to the technological change attributing a low mapping with (PO9) and medium with (PO12).The student will also be able to apply his analytical skills, model new designs and contribute to the development of smart grid attributing weakly with (PSO1) and (PSO3).
EE8005.4	By understanding the concepts of PMSM and the various factors that affect their performance the student will be able to apply his engineering knowledge to formulate new ideas leading to new design concepts and provide valid conclusions based on the interpretation of data's attributing strongly to (PO1), (PO2) and moderately to (PO3) and (PO4). The student will be able to implement the acquired knowledge to his own work and contribute to the technological change attributing a low mapping with (PO9) and medium with (PO12).The student will also be able to apply his analytical skills, model new designs and contribute to the development of smart grid attributing weakly with (PSO1) and (PSO3).

EE8005.5	<p>By analyzing the operating characteristic curves, Power drive circuits, closed loop control, phasor diagrams, the student will be able to illustrate the performance of special machines and understand their usage in different applications. Having a knowledge of the performance of machines under different conditions the student will be able to apply his engineering knowledge for problem analysis, to develop solutions for different requirements and also come to valid conclusions resulting in the development of new techniques and different kinds of models which suits for different environmental conditions and also contribute for the sustainable growth of technology attributing strongly to (PO1), (PO2) and low with (PO3),(PO4),(PO9). Having understood the different operating characteristics and applications the student will implement his engineering knowledge to his own work and improvise its development by engaging in lifelong learning attributing moderately with (PO12). By acquiring the knowledge about the behaviour of machines the students will be able to trouble shoots problems in the related electrical field and work towards its sustainability. The student will also be able to apply his analytical skills, model new designs and contribute to the development industry attributing weakly with (PSO1) and (PSO3).</p>
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Course/Branch	:	BE/EEE	Total no. of hours given in syllabus:	
Subject Code	:	EE 8006	Lecture	: 45
Subject Title	:	Power Quality	Tutorials	: -
Year/Semester	:	III/VI	Practical	: -
Faculty Name	:	Dr. K.Mala, Associate Prof	TOTAL	: 45

Course Objective:

CO1: Ability to understand various sources, causes and effects of power quality issues, electrical systems and their measures and mitigation.

CO2: Ability to analyze the causes & Mitigation techniques of various PQ events.

CO3: Ability to study about the various Active & Passive power filters.

CO4: Ability to understand the concepts about Voltage and current distortions, harmonics.

CO5: Ability to analyze and design the passive filters.

CO6: Ability to acquire knowledge on compensation techniques.

COURSE OUTCOME

CO1: An ability to apply the knowledge of over voltages and its protective methods in power system.

CO2: Skilled to understand the behaviour of travelling wave on different load condition using Bewleys lattice diagram.

CO3: An ability to use the concepts and methods of electrical breakdown in different medium.

- CO4:** An ability to design various AC and DC high voltage generating techniques for testing the power apparatus.
- CO5:** An ability to apply the various AC and DC high voltage and current measuring techniques in power system.
- CO6:** An ability to apply the knowledge of testing the various power apparatus to provide safety and protection for the individual.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE 8006 POWER QUALITY	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 8006.1	3	1	1	-	-	1	1	-	1	-	-	2
EE 8006.2	3	2	1	-	-	1	1	-	1	-	-	2
EE 8006.3	3	1	1	-	-	1	1	-	1	-	-	2
EE 8006.4	3	1	1	-	-	1	1	-	1	-	-	2
EE 8006.5	3	1	1	-	-	1	1	-	1	-	-	2
EE 8006.6	3	2	2	-	-	2	2	-	2	-	-	2
EE 8006	3	2	1	-	-	1	1	-	1	-	-	2

JUSTIFICATION OF THE MAPPING:

EE 8006.1	By understanding the various voltages fluctuation occurring in power system like sag and swell it features moderately mapping to Engineering knowledge (PO1), by knowing international standards of power quality (PO3) with weak mapping
EE 8006.2	By understanding the mitigation of voltage sag, Static transfer switches and fast transfer switches features moderately to Engineering knowledge (PO1), and helps in analyzing complex engineering problems mapping moderately with (PO2).
EE 8006.3	By understanding the various breakdown mechanisms in solid, liquid, gaseous and composite dielectric methods it features moderately to Engineering knowledge with fundamentals of science (PO1).

EE 8006.4	By having the knowledge of harmonic distortion, voltage and current distortions, harmonic indices, inter harmonics and resonance Harmonics and features moderately to Engineering knowledge (PO1), along with knowing IEEE and IEC standards (PO3) with weak mapping.
EE 8006.5	By knowing the Analysis and Design of Passive Shunt Compensators Simulation and Performance of Passive Power Filters it features moderately to Engineering knowledge (PO1), along with knowing the fundamentals of load compensation with the design and development of solution (PO3) with weak mapping.
EE 8006.6	By understanding the various testing methods on power quality issues it features moderately to Engineering knowledge (PO1), by knowing Computer Business Equipment Manufacturers Associations (CBEMA) curve features with the design and development of solution (PO3) with weak mapping and in to assess societal health and safety (PO6) weakly and having the impact of professional engineering solution in societal and environmental context (PO7) with weak mapping. By following the various National and International Standards for testing will helps in applying the norms of engineering practices (PO8) with weak mapping. By knowing the testing of various power quality apparatus helps to function effectively as an individual and as a member or leader in the field of power system (PO9) mapping weakly. By having the testing knowledge it helps in technological change their by having lifelong learning mapping weakly with (PO12)

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE 8006 POWER QUALITY	PSO1	PSO2	PSO3
EE 8006.1	2	2	-
EE 8006.2	2	2	-
EE 8006.3	2		-
EE 8006.4	2	2	-
EE 8006.5	2	2	-
EE 8006.6	2	2	-
EE 8006	2	2	-

JUSTIFICATION OF THE MAPPING:

EE 8006.1	By understanding the various voltages fluctuation occurring in power system like sag and swell it features moderately mapping to Engineering knowledge (PSO1), by knowing international standards of power quality (PSO2) with weak mapping
EE 8006.2	By understanding the mitigation of voltage sag, Static transfer switches and fast transfer switches features moderately to Engineering knowledge (PSO1), and helps in analyzing complex engineering problems mapping moderately with (PSO2).
EE 8006.3	By understanding the various breakdown mechanisms in solid, liquid, gaseous and composite dielectric methods it features moderately to Engineering knowledge with fundamentals of science (PSO1).
EE 8006.4	By having the knowledge of harmonic distortion, voltage and current distortions, harmonic indices, inter harmonics and resonance Harmonics and features moderately to Engineering knowledge (PSO1), along with knowing IEEE and IEC standards (PSO2) with weak mapping.
EE 8006.5	By knowing the Analysis and Design of Passive Shunt Compensators Simulation and Performance of Passive Power Filters it features moderately to Engineering knowledge (PSO1), along with knowing the fundamentals of load compensation with the design and development of solution (PSO2) with weak mapping.
EE 8006.6	By understanding the various testing methods on power quality issues it features moderately to Engineering knowledge (PSO1), by knowing Computer Business Equipment Manufacturers Associations (CBEMA) curve features with the design and development of solution (PSO1) with weak mapping and in to assess societal health and safety (PSO2) weakly and having the impact of professional engineering solution in societal and environmental context (PSO2) with weak mapping. By following the various National and International Standards for testing will helps in applying the norms of engineering practices (PSO1) with weak mapping. By knowing the testing of various power quality apparatus helps to function effectively as an individual and as a member or leader in the field of power system (PSO2) mapping weakly. By having the testing knowledge it helps in technological change their by having lifelong learning mapping weakly with (PSO1)

Course/Branch	:	B.E /Electrical & Electronics Engineering	Total no. of hours given in syllabus:	
Subject Code	:	EE8601	Lecture	: 45
Subject Title	:	Solid State Drives	Tutorials	: --
Year/Semester	:	III/06	Practical	: --
Faculty Name	:	P.MARISH KUMAR ASSOCIATE PROFESSOR	TOTAL	: 45

COURSE OBJECTIVES:

1. To understand steady state operation and transient dynamics of a motor load system
2. To study and analyze the operation of the converter/chopper fed dc drive, both qualitatively
3. To study and understand the operation and performance of induction motor drives.
4. To study and understand the operation and performance of Synchronous motor drives.
5. To analyze and design the current and speed controllers for a closed loop solid state DC motor Drives
6. To impart knowledge in design and control techniques of electrical drives

COURSE OUTCOMES

Upon completion of the course, the students will be able to...

EE8601.1	Apply concepts of Motor load dynamics and ability to discriminate steady state and transient operation.
EE8601.2	Analyse the operation of the converter / chopper fed DC drive
EE8601.3	Analyse the operation of both classical and modern induction motor drives.
EE8601.4	Develop a control structure for a drive system to improve its performance of both classical and modern synchronous motor drives
EE8601.5	Design the current and speed controllers for a closed loop solid-state DC motor drive
EE8601.6	Analyse and design open loop and closed-loop electrical drives

MAPPING OF COURSE OUTCOME(CO) WITH PROGRAMME OUTCOME(PO)

EE 8601 Solid State Drives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8601.1	3	2	3	3	-	2	2	-	1	-	-	3
EE8601.2	3	3	3	2	2	2	2	-	1	-	-	3
EE8601.3	3	3	3	2	3	2	2	-	1	-	-	3
EE8601.4	3	2	3	3	2	2	2	-	1	-	-	3
EE8601.5	3	2	3	3	2	2	2	-	1	-	-	3
EE8601.6	3	3	3	3	3	3	3	-	1	-	-	3
EE 8601	3	3	3	3	2	2	2	-	1	-	-	3

MAPPING OF COURSE OUTCOME(CO) WITH PROGRAMME SPECIFIC OUTCOME(PSO)

EE 6601 Solid State Drives	PSO1	PSO2	PSO3
EE8601.1	3	1	1
EE8601.2	3	3	3
EE8601.3	3	3	3
EE8601.4	3	3	3
EE8601.5	3	3	3
EE8601.6	3	3	3
EE 8601	3	3	3

JUSTIFICATION OF MAPPING:

EE8601.1	By analyzing the various drive systems and the application of drives leads to strong Engineering knowledge (PO1), as the student will know how to explain the dynamics of motor load system and gains knowledge about steady state, transient analysis of various drive systems. This Moderately helps in problem solving (PO2) of drive systems. In design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes Strongly. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and helps in environment and sustainability (PO7) moderately and it promotes individual and team work (PO9) weakly. It has strong usage of logical & technical skills to model, simulate and analyze electrical components and systems by applying the concept of drive systems (PSO1) and attributes (PSO2), (PSO3) weakly.
EE8601.2	By discriminating the Continuous and Discontinuous nature of the Converter fed DC drives and by developing the ability to solve the problems based on Four quadrant operation in DC drives, it attributes to strong Engineering knowledge (PO1). This will help in problem solving (PO2) strongly like finding the Armature current, Speed and Torque due to change in firing angle of a converter. In design and development of solution (PO3) and in investigation of four quadrant DC drive (PO4) like finding the conduction of Dual converter it attributes moderately. By knowing the nature motoring and braking it helps in using the commercial software (PO5) moderately and helps to promotes engineer society relation (PO6) and helps in environment and sustainability (PO7) moderately. It promotes individual and team work (PO9) weakly and lifelong learning (PO12) strongly. Strong usage of logical & technical skills to model, simulate and analyze electrical components and systems (PSO1), (PSO2), (PSO3) is possible, which attributes strongly.
EE8601.3	By assimilating the basic concepts of stator voltage control and inverter fed drives and by developing the ability to solve the problems, it attributes to strong Engineering knowledge (PO1) and this will help in problem solving related to induction motors (PO2) strongly, design and development of solution (PO3) and in investigation of complex problem related to boundary conditions (PO4) moderately. By knowing the nature of the problem it helps in using the commercial software (PO5) moderately and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) weakly. It aids lifelong learning (PO12) strongly. Strong usage of logical & technical skills to model, simulate and analyze electrical components and systems (PSO1) like analysis of the voltage and current control techniques and integrating green energy on it to meet the increasing demand of the society (PSO3) and (PSO2) strongly.
EE8601.4	By applying the differences between synchronous motor drive and induction motor drive and to learn the basics of permanent magnet synchronous motor drives attributes to strong Engineering knowledge (PO1). This will help in problem solving (PO2), design and development of solution explaining the behavior of synchronous motor (PO3) and in investigation of complex problem related to it (PO4) moderately. It helps in learning and using the commercial software (PO5) moderately and it promotes individual and team work (PO9) and aids life-long learning (PO12) strongly. Understanding and analyzing their behavior the students will be able to model new designs

	and also contribute to the growing smart grid attributing strongly to (PSO1), (PSO2) and (PSO3).
EE8601.5	By design the current and speed controllers for a closed loop solid-state DC motor drive and simulation using a software package, Engineering knowledge (PO1) is developed mode strongly. This will help in problem solving (PO2) moderately. In design and development of solution (PO3) and in investigation of complex problems like how to develop design control technique in current and speed which attributes (PO4) strongly. It helps in learning the commercial software (PO5), engineer society relation (PO6), helps in environment and sustainability (PO7) moderately and it promotes individual and team work (PO9) weakly. It helps in effective life-long learning (PO12) strongly. There is strong usage of logical & technical skills to model, simulate and analyze by design the current and speed controllers which strongly attributes to (PSO1), (PSO2) and (PSO3).
EE8601.6	Applying sound fundamentals and understand the operation of electric drives controlled from a power electronic converter and to introduce the design concepts of controllers attributes strong Engineering knowledge (PO1). This will help in problem solving like obtaining converter fed/chopper fed drives (PO2) strongly, design and development of solution (PO3) and in investigation of complex problem using induction and synchronous motors (PO4) strongly. It helps in learning the commercial software (PO5) strongly by analyzing the problems. It promotes engineer society relation (PO6) and helps in environment and sustainability (PO7) strongly and individual and team work (PO9) weakly. It helps in effective life-long learning (PO12) strongly. Strong usage of motor load systems, converter/chopper fed drives, Ac motor drives and design controllers which attributes strongly to (PSO1), (PSO2) and (PSO3).

Course/Branch	:	BE/EEE	Total no. of hours given in syllabus:		
Subject Code	:	EE8602	Lecture	:	45
Subject Title	:	Protection and Switchgear	Tutorials	:	-
Year/Semester	:	III/VI, A & B	Practical	:	-
Faculty Name	:	Dr.D.Fathema Farzana, AP Mr. G.V.Chidambarathanu, AP	TOTAL	:	45

COURSE OBJECTIVES:

To impart knowledge on the following Topics

- Causes of abnormal operating conditions (faults, lightning and switching surges) of the apparatus and system.
- Characteristics and functions of relays and protection schemes.
- Apparatus protection, static and numerical relays
- Functioning of circuit breaker

COURSE OUTCOMES:

Students will be able to

EE8602.1	To infer the different kinds of Protective Equipments in Power Systems
EE8602.2	To assimilate the concepts in theory, construction and applications of Relays for protection from over- voltages and other hazards.
EE8602.3	To demonstrate and apply the relevant protection systems for the main elements of a power system.
EE8602.4	To understand the principle of static and numerical relays for power system protection
EE8602.5	To apprehend the fundamental ideas in switching, breaking and making of breaker
EE8602.6	To perceive the significance of the construction, working principle and applications of different types of circuit Breakers.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE6702 PROTECTION AND SWITCHGEAR	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE8602.1	3	1	-	-	-	-	-	-	-	-	-	1
EE8602.2	2	1	-	1	-	-	-	-	-	-	-	1
EE8602.3	2	2	2	1	-	-	-	-	-	-	-	1
EE8602.4	1	1	2	-	-	-	-	-	1	-	-	1
EE8602.5	1	1	2	-	-	-	-	-	-	-	-	1
EE8602.6	1	-	1	-	-	-	-	-	1	-	-	1
EE8602	3	2	2	1	-	-	-	-	1	-	-	1

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE6702 PROTECTION AND SWITCHGEAR	PSO1	PSO2	PSO3
EE8602.1	1	-	1

EE8602.2	1	-	2
EE8602.3	1	-	2
EE8602.4	1	-	1
EE8602.5	1	-	2
EE8602.6	1	-	2
EE8602	1	-	2

JUSTIFICATION OF THE MAPPING:

EE8602.1	By gaining the knowledge of power system faults and its protective schemes will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and PSO2.
EE8602.2	By gaining the knowledge of different types of relays and how to protect the system from overvoltage will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2. The students will be able to analyze what type of relay is best for the protection for power system apparatus.
EE8602.3	By identifying Rotor, Stator faults, interturn faults, external faults and the protection of generators, transformers, motors, busbars and transmission line from those faults will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2.
EE8602.4	By understanding the knowledge of instrument transformers, static and numerical relays in addition to the synthesis with other relays such as distance relay, differential relay and the importance, applications of those protective devices will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and PSO2.
EE8602.5	By gaining the knowledge to apprehend the fundamental ideas in switching, breaking and making of breaker will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2.
EE8602.6	By understanding principle, operation and applications of various types of circuit breaker will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2.

Course/Branch	B.E /Electrical & Electronics Engineering	Total no. of hours given in syllabus:		
Subject Code	EE8691	Lecture	:	45
Subject Title	EMBEDDED SYSTEMS	Tutorials	:	--
Year/Semester	VI/06	Practical	:	--
Faculty Name	Mrs.K.A.Indu Sailaja	TOTAL	:	45

COURSE OBJECTIVES:

1. To introduce the building blocks of embedded system
2. To educate in various embedded development strategies
3. To introduce bus communication in processors, input/output interfacing
4. To impart knowledge in various processor scheduling algorithms
5. To Basics of Real time operating system and example tutorials to discuss on one real time operating system tool.

Course Outcomes:

EE8691.1: Students will be able to design the architecture of embedded system and select the appropriate components to design an embedded system

EE8691.2: Students are able to find the suitable communication protocols or buses for the embedded system.

EE8691.3: Students will be able to ensure quality for products and address the issues related to hard ware and software design.

EE8691.4: Students will be able to apply the concepts of Real Time Operating systems and its advantages

EE8691.5: Students will be able to design various embedded system applications

EE8691.6: Students will have thorough knowledge of embedded system terminologies, concepts, issues, various real time embedded operating system and applications.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	1	1	2	1	-	1	1	1	3
CO2	2	-	2	-	2	2	2	-	1	1	2	2

CO3	2	1	1	-	1	-	-	-	1	1	2	2
CO4	2	-	1	1	2	-	-	-	1	1	2	3
CO5	2	1	2	2	2	-	1	-	1	1	1	2
CO6	2	-	2	2	2	2	1	-	2	1	2	3
	2	1	2	2	2	2	1	-	1	1	2	2

Justification of the mapping:

EE8691.1	Design of architecture for an embedded system requires medium knowledge of engineering fundamentals (PO1), week design solution for application(PO4), week usage of IT tools(PO5), medium contribution towards society (PO6), sustainable design(PO7),multidisciplinary team work(PO9), quality of instruments decides finance of project(PO11), requires life- long learning about instruments(PO12).
EE8691.2	Selection of suitable communication protocol requires medium knowledge of engineering (PO1), good formulation of factors affects error(PO2), design methodologies (PO3), interpretation of data at various conditions(PO4), week usage of IT tools(PO5), week contribution towards society(PO6), sustainable design(PO7),ethics towards calibration methods(PO8),maintain reports of calibration(PO10), strongly requires life- long updation of calibration procedure(PO12).
EE8691.3	Measurement of very low and high values of current and voltages needs strong knowledge of Mathematics and Science(PO1), good identification of factors improves accuracy (PO2), well designed instruments (PO3), analysis of data at various conditions(PO4), week usage of IT tools(PO5), week contribution towards society(PO6), sustainable design(PO7),quality of instruments decides finance of project(PO11),creative method requires life- long learning (PO12).
EE8691.4	Measuring of low, medium and high resistances need strong knowledge of Mathematics and Science(PO1), good identification of factors affects accuracy (PO2), well designed instruments (PO3), analysis of data of various measurements(PO4), week usage of IT tools(PO5), sustainable design(PO7), quality of instruments decides finance of project(PO11), minimizing

	error requires life- long learning (PO12).
EE8691.5	Selection of quality bridges to measure capacitance and inductance based on knowledge of Mathematics and Science(PO1), good identification of factors affects accuracy (PO2), good design of bridges (PO3), analysis of data of various measurements(PO4), week usage of IT tools(PO5), sustainable design(PO7), maintaining records of measurement(PO10),decides finance of project(PO11), factors affecting error requires life- long learning (PO12).
EE8691.6	Design of all types meters and bridges requires strong knowledge of Mathematics and Science(PO1), good identification of factors improves accuracy (PO2), good design of bridges (PO3), analysis of data of various measurements(PO4), week usage of IT tools(PO5), developing sustainable design(PO7), ethics towards design methods(PO8), maintaining records of measurement(PO10), decides finance of project(PO11), good design requires life- long learning (PO12).

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

CO	PSO1	PSO2	PSO3
CO1	2	2	1
CO2	1	2	2
CO3	2	1	2
CO4	2	2	2
CO5	2	2	2
CO6	2	2	2
	2	2	2

Justification of the mapping:

EE8691 .1	PSO1 improves the ability to deign transducers PSO3 improves the ability to work in control and automation industries PSO4 improves the ability to do research in control and automation field.
EE8691 .2	PSO1 improves the ability to model transducers mathematically PSO3 improves the ability to work in control and automation industries PSO4 improves the ability to do research in control and automation field.
EE8691.3	PSO1 improves the ability to design transducers for resistive measurement PSO2 improves the ability to design processors and transducers for sensing parameters and PSO3 improves ability to develop career and PSO4 helps to develop research interest.
EE8691.4	PSO1 improves the ability to design transducers for inductive and capacitive measurement PSO2 improves the ability to design processors and transducers for sensing the parameters and PSO3 improves ability to develop career in and PSO4 helps to develop research interest.
EE8691.5	PSO1 improves the ability to design smart transducers PSO2 improves the ability to design processors and PSO3 improves ability to develop career and PSO4 helps to develop research interest.
EE8691.6	PSO1 improves the ability to design transducers PSO2 improves the ability to design processors and PSO3 improves ability to develop career and PSO4 helps to develop research interest.

Course/Branch	: BE/EEE	Total no. of hours given in syllabus:	
Subject Code	: GE8075	Lecture	: 45
Subject Title	: Intellectual Property Rights	Tutorials	: -
Year/Semester	: III/VI	Practical	: -
Faculty Name	: Mr. M.Venkatachalam, AP Srilalitha	TOTAL	: 45

COURSE OBJECTIVES:

To give an idea about IPR, registration and its enforcement

COURSE OUTCOMES:

Students will be able to

GE8075.1	To infer the knowledge about the Intellectual Property Rights.
GE8075.2	To know the secrets of laws in registrations.

GE8075.3	To identify the agreement and the act of legislation in IPR
GE8075.4	To comprehend in detail about the digital products and laws of IPR
GE8075.5	To perceive the significance of Intellectual Property Rights

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

GE8075 INTELLECTUAL PROPERTY RIGHTS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
GE8075.1	-	-	-	-	-	-	1	-	-	-	-	1
GE8075.2	-	-	-	-	-	-	-	1	-	-	1	1
GE8075.3	-	-	-	-	-	-	-	1	-	-	1	1
GE8075.4	-	-	-	-	-	-	-	1	-	-	1	1
GE8075.5	-	-	-	-	-	-	-	1	-	-	1	1
GE8075.1	-	-	-	-	-	-	-	1	-	-	1	1

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

GE8075 INTELLECTUAL PROPERTY RIGHTS	PSO1	PSO2	PSO3
GE8075.1	1	-	-
GE8075.2	1	-	-
GE8075.3	1	-	-
GE8075.4	1	-	-
GE8075.5	1	-	-

JUSTIFICATION OF THE MAPPING:

GE8075.1	By gaining the knowledge IPR will help the students to use logical and technical skills and contribute for the development of components which weekly maps with PSO1.
GE8075.2	By gaining the knowledge of registration in IPR which weekly maps with PSO1.
GE8075.3	By understand the agreement and legislation of IPR will help the students to use logical and technical skills and contribute for the development of tools which weekly maps with PSO1.
GE8075.4	By understanding the knowledge of digital products will help the students to use logical and technical skills and contribute for the development of products which weekly maps with PSO1.
GE8075.5	By gaining the knowledge to apprehend emerging issues will help the students to use logical and technical skills and contribute for the development of product or components which weekly maps with PSO1.

VII SEMESTER

Course/Branch	B.E /Electrical & Electronics Engineering	Total no. of hours given in syllabus:		
Subject Code	EE 6703	Lecture	:	45
Subject Title	Special Electrical Machines	Tutorials	:	--
Year/Semester	IV/07	Practical	:	--
Faculty Name	S. SUBASH CHANDRA BHARATHI	TOTAL	:	45

COURSE OBJECTIVES:

1. To analyze the phasor diagram, axial and radial flux motors & features, working principles and applications of synchronous reluctance motors.
2. Able to select the different types of stepper motor by knowing the working of various types of stepper motor, their characteristics, closed loop control and applications.
3. To describe the principle & features of variable reluctance and to select the various types of SRM based on their applications.
4. Able to describe the magnetic circuit analysis and the magnetic materials and working principles, EMF, Torque equation, Characteristics and applications of BLPMDC motor.
5. Able to describe the phasor diagram, volt-amp requirements, features, working principles, EMF, torque equation, characteristics and applications of Permanent Magnet Synchronous Motors.

COURSE OUTCOMES

Upon completion of the course, the students will be able to...

CO 1	To analyse the phasor diagram, axial and radial flux motors & features, working principles and applications of synchronous reluctance motors.
CO 2	Able to select the different types of stepper motor by knowing the working of various types of stepper motor, their characteristics, closed loop control and applications.
CO 3	To describe the principle & features of variable reluctance and to select the various types of SRM based on their applications.
CO 4	Able to describe the magnetic circuit analysis and the magnetic materials and working

	principles, EMF, Torque equation, Characteristics and applications of BLPMDC motor.
CO 5	Able to describe the phasor diagram, volt-amp requirements, features, working principles, EMF, torque equation, characteristics and applications of Permanent Magnet Synchronous Motors.
CO 6	Able to analyze the working principles, applications and difference between various types of special electrical machines.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OUTCOMES

EE2403 Special Electrical Machines	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE2403.1	3	3	1	1	-	-	-	-	1	-	-	2
EE2403.2	3	3	1	1	-	-	-	-	1	-	-	2
EE2403.3	3	3	1	1	-	-	-	-	1	-	-	2
EE2403.4	3	3	1	1	-	-	-	-	1	-	-	2
EE2403.5	3	3	1	1	-	-	-	-	1	-	-	2
EE2403.6	3	3	1	1	-	-	-	-	1	-	-	2
EE2403	3	3	1	1	-	-	-	-	1	-	-	2

EE2403 Special Electrical Machines	PSO1	PSO2	PSO3
EE2403.1	1	-	1
EE2403.2	1	-	1
EE2403.3	1	-	1
EE2403.4	1	-	1
EE2403.5	1	-	1
EE2403.6	1	-	1
EE2403	1	-	1

JUSTIFICATION OF MAPPING:

EE 2403.1	The basic fundamentals of electrical machines will help the students to apply engineering knowledge to all type of special machines constructions which strongly maps with (PO1) and (PO2). This will form the basics, for problem analysis and to design machine components and also to form new ideas with a weak relation to (PO3) and (PO4). The student will be able to apply the fundamentals to his own work and keep progressing in his research field lifelong with a weak relation to (PO9). The student takes his first step in applying his engineering knowledge for the societal by knowing the fundamentals with moderate mapping to (PO12) and low mapping to (PSO1) and (PSO3).
EE 2403.2	By assimilating the basic concepts of stepper motor the students will be able to solve, a wide variety of practical engineering problems in a logical and effective manner which attributes strongly to (PO1).Step angle conversion is the corner stone for the problem analysis of designing the stepper motor (PO2).The theory allows us to express the modes of operation in terms of the stepper motor types and by interpreting these concepts the students will contribute to the development of new designs and also conduct investigations of complex problems attributing weakly to (PO3) and (PO4).The students can apply these concepts to the numerous types of stepper motor to its own work and also contribute to their sustainable development with a weak relation to (PO9). Knowing the fundamentals he will be able to create his own ideas to fulfil the growing societal demand and improvise on it lifelong attributing moderately to (PO12) and weakly to (PSO1) and (PSO3).

<p>EE 2403.3</p>	<p>Switched Reluctance motor is among the most common special type of electrical machine construction. Mastering these concepts, it helps the students to apply his engineering knowledge to formulate new ideas, design machines that meet specified needs, analyze and interpret data's attributing strongly to (PO1), (PO2) .The students will also apply his engineering knowledge to his own work and meet the changing needs of the society lifelong attributing a low mapping with (PO3), (PO4), (PO9) and moderately with (PO12). Understanding and analyzing their behaviour the students will able to model new designs and also contribute to the growing smart grid attributing weakly to (PSO1) and (PSO3).</p>
<p>EE 2403.4</p>	<p>Throughout the world there is a need for motors in many different applications. In addition to the underlying need for a public supply of electricity, there are a number of situations in which independent supplies are needed. PMBLDC motors play a vital role in the development of industrial systems. By analyzing their operating characteristics and apprehending the various effects like armature reaction, commutation, etc, that influences the design of electrical machines the student will be able to apply his engineering specialization to the solution of complex engineering problems attributing strongly to (PO1), (PO2). The student will be able to formulate new ideas, thereby design efficient machinery by analysis and interpretation of data's attributing weakly with (PO3) and (PO4). The student will be able to implement the acquired knowledge to his own work and contribute to the technological change attributing a low mapping with (PO9) and medium with (PO12).The student will also be able to apply his analytical skills, model new designs and contribute to the development of smart grid attributing weakly with (PSO1) and (PSO3).</p>
<p>EE 2403.5</p>	<p>By understanding the concepts of PMSM and the various factors that affect their performance the student will be able to apply his engineering knowledge to formulate new ideas leading to new design concepts and provide valid conclusions based on the interpretation of data's attributing strongly to (PO1), (PO2) and moderately to (PO3) and (PO4). The student will be able to implement the acquired knowledge to his own work and contribute to the technological change attributing a low mapping with (PO9) and medium with (PO12).The student will also be able to apply his analytical skills, model new designs and contribute to the development of smart grid attributing weakly with (PSO1) and (PSO3).</p>
<p>EE 2403.6</p>	<p>By analyzing the operating characteristic curves, Power drive circuits, closed loop control, phasor diagrams, the student will be able to illustrate the performance of special machines and understand their usage in different applications. Having a knowledge of the performance of machines under different conditions the student will be able to apply his engineering knowledge for problem analysis, to develop solutions for different requirements and also come to valid conclusions resulting in the development of new techniques and different kinds of models which suits for different environmental conditions and also contribute for the sustainable growth of technology attributing strongly to (PO1), (PO2) and low with (PO3),(PO4),(PO9). Having understood the different operating characteristics and applications the student will</p>

	implement his engineering knowledge to his own work and improvise its development by engaging in lifelong learning attributing moderately with (PO12). By acquiring the knowledge about the behaviour of machines the students will be able to trouble shoots problems in the related electrical field and work towards its sustainability. The student will also be able to apply his analytical skills, model new designs and contribute to the development industry attributing weakly with (PSO1) and (PSO3).
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Course/Branch	: BE/EEE	Total no. of hours given in syllabus:	
Subject Code	: EE6702	Lecture	: 45
Subject Title	: Protection and Switchgear	Tutorials	: -
Year/Semester	: IV/VII	Practical	: -
Faculty Name	: Ms.E.Priya	TOTAL	: 45

COURSE OBJECTIVES:

1. To educate the causes of abnormal operating conditions (faults, lightning and switching surges) of the apparatus and system.
2. To introduce the characteristics and functions of relays and protection schemes.
3. To impart knowledge on apparatus protection.
4. To introduce static and numerical relays.
5. To impart knowledge on functioning of circuit breakers.
6. To impart knowledge on fundamental ideas of switching.

COURSE OUTCOMES:

Students will be able to

EE6702.1	To infer the different kinds of Protective Equipments in Power Systems
EE6702.2	To assimilate the concepts in theory, construction and applications of Relays for protection from over- voltages and other hazards.
EE6702.3	To identify Rotor, Stator Faults, interturn faults and the protection of generators, transformers and feeders from those faults
EE6702.4	To demonstrate and apply the relevant protection systems for the main elements of a power system.
EE6702.5	To apprehend the fundamental ideas in switching, breaking and making of breaker
EE6702.6	To perceive the significance of the construction, working principle and applications of different types of circuit Breakers.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE6702 PROTECTION AND SWITCHGEAR	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE6702.1	3	1	-	-	-	-	-	-	-	-	-	1
EE6702.2	2	1	-	1	-	-	-	-	-	-	-	1
EE6702.3	2	2	2	1	-	-	-	-	-	-	-	1
EE6702.4	1	1	2	-	-	-	-	-	1	-	-	1
EE6702.5	1	1	2	-	-	-	-	-	-	-	-	1
EE6702.6	1	-	1	-	-	-	-	-	1	-	-	1
EE6702	3	2	2	1	-	-	-	-	1	-	-	1

JUSTIFICATION OF THE MAPPING:

EE6702.1	By gaining the knowledge of protective schemes it moderately map the Life-long learning (PO12) & highly map the Engineering knowledge and weekly map the Problem analysis, design/development of solutions and individual and team work(PO1,PO2 & PO9). By learning the various types of faults it can be able to understand the effect of fault and the need of protection schemes. Various types of earthing clearly explain the protection and safety of the equipments. It is necessary to protect every part of the power system under various circumstances.
EE6702.2	By gaining the knowledge of different types of relays and how to protect the system from overvoltage it moderately map the Engineering knowledge (PO1). The students will be able to analyze what type of relay is best for the protection for power system apparatus. This will weekly map the problem analysis and conduct investigations of complex problems (PO2) & (PO4). By knowing the applications of relays it would be helpful to recognize the need for the protection for major power system apparatus and it weekly maps the life-long learning (PO12).
EE 6702.3	It is necessary to give protection for the power system apparatus to improve reliability, stability and lifetime of the apparatus. By gaining the knowledge to protect major power system components like generator, motor, transmission line, bus bar & motor it moderately map the Engineering knowledge (PO1), Problem analysis(PO2), Design/development of solutions(PO3)& weekly map the Conduct investigations of complex problems(PO4) and life-long learning (PO12).
EE 6702.4	By understanding the knowledge of instrument transformers, static and numerical relays in addition to the synthesis with other relays such as distance relay, differential relay and

	the importance, applications of those protective devices weekly maps the Engineering knowledge (PO1), Design/Development of solutions (PO3) and life-long learning (PO12).The importance and advantages of static and numerical relays when compared to the conventional electromagnetic relays plays very important role in protection areas.
EE 6702.5	By gaining the knowledge to apprehend the fundamental ideas in switching, breaking and making of breaker it moderately map the Design/Development of solutions (PO3). It is necessary to know the switching characteristics, arc formation, how to quench the arc etc., By analyzing the problems in making or breaking of circuit breaker which can be done in individual or team work to form new ideas with a weak relation to Engineering Knowledge(PO1), Problem analysis(PO2), Individual and team work(PO9) and life-long learning(PO12).
EE 6702.6	By understanding principle, operation and applications of various types of circuit breaker moderately maps the life-long learning (PO12). It is necessary to know the applications of circuit breaker under various voltage levels. By gaining the knowledge to perceive the significance of the construction, working principle and applications of different types of circuit Breakers it weekly maps the Engineering Knowledge (PO1) and Design/Development of solutions (PO3).

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE6702 PROTECTION AND SWITCHGEAR	PO1	PO2	PO3
EE6702.1	1	-	1
EE6702.2	1	-	2
EE 6702.3	1	-	2
EE 6702.4	1	-	1
EE 6702.5	1	-	2
EE 6702.6	1	-	2
EE6702	1	-	2

JUSTIFICATION OF THE MAPPING:

EE6702.1	By gaining the knowledge of power system faults and its protective schemes will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and PSO2.
EE6702.2	By gaining the knowledge of different types of relays and how to protect the system from overvoltage will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2. The students will be able to analyze what type of relay is best for the protection for power system apparatus.
EE 6702.3	By identifying Rotor, Stator faults, interturn faults, external faults and the protection of generators, transformers, motors, busbars and transmission line from those faults will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2.
EE 6702.4	By understanding the knowledge of instrument transformers, static and numerical relays in addition to the synthesis with other relays such as distance relay, differential relay and the importance, applications of those protective devices will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and PSO2.
EE 6702.5	By gaining the knowledge to apprehend the fundamental ideas in switching, breaking and making of breaker will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2.
EE 6702.6	By understanding principle, operation and applications of various types of circuit breaker will help the students to use logical and technical skills and contribute for the development of smart grid which weekly maps with PSO1 and moderately maps with PSO2.

Course/Branch	:	BE/EEE	Total no. of hours given in syllabus:	
Subject Code	:	EE 6701	Lecture	: 45
Subject Title	:	High Voltage Engineering	Tutorials	: -
Year/Semester	:	IV/VII	Practical	: -
Faculty Name	:	Mrs.M.Deva Brinda,Associate Prof	TOTAL	: 45

COURSE OBJECTIVE:

CO1: To apply the knowledge of over voltages and its protective methods in power system.

CO2: To understand the behavior of travelling wave on different load condition using Bewleys lattice diagram.

CO3: To use the concepts and methods of electrical breakdown in different medium.

CO4: To design various AC and DC high voltage generating techniques for testing the power apparatus.

CO5: To relate the various AC and DC high voltage and current measuring techniques in power system.

CO6: To apply the knowledge of testing the various power apparatus to provide safety and protection for the individual.

COURSE OUTCOME

- CO1:** An ability to apply the knowledge of over voltages and its protective methods in power system.
- CO2:** Skilled to understand the behaviour of travelling wave on different load condition using Bewleys lattice diagram.
- CO3:** An ability to use the concepts and methods of electrical breakdown in different medium.
- CO4:** An ability to design various AC and DC high voltage generating techniques for testing the power apparatus.
- CO5:** An ability to apply the various AC and DC high voltage and current measuring techniques in power system.
- CO6:** An ability to apply the knowledge of testing the various power apparatus to provide safety and protection for the individual.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

EE 6701 High Voltage Engineering	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 6701.1	2	-	1	-	-	1	1	-	-	-	-	1
EE 6701.2	2	2	-	-	-	-	-	-	-	-	-	-
EE 6701.3	2	-	-	-	-	-	-	-	-	-	-	-
EE 6701.4	2	-	1	-	-	-	-	-	-	-	-	-
EE 6701.5	2	-	1	-	-	-	-	-	-	-	-	-
EE 6701.6	2	-	1	-	-	1	1	1	1	-	-	1
EE 6701	2	2	1	-	-	1	1	1	1	-	-	1

JUSTIFICATION OF THE MAPPING:

EE 6701.1	By understanding the various over voltages occurring in power system like switching surges and lightning and the it features moderately mapping to Engineering knowledge (PO1), by knowing various methods for protection of power apparatus against over voltages features with the design and development of solution (PO3) with weak mapping
EE 6701.2	By understanding the occurrence of travelling waves during faulted condition, reflection and transmission of travelling waves and its behavior along with the usage of Bewely's Lattice diagram features moderately to Engineering knowledge (PO1), and helps in analyzing complex engineering problems mapping moderately with (PO2).
EE 6701.3	By understanding the various breakdown mechanisms in solid, liquid, gaseous and composite dielectric methods it features moderately to Engineering knowledge with fundamentals of science (PO1).
EE 6701.4	By having the knowledge of various techniques of generating high voltage AC, DC and impulse voltages and currents it features moderately to Engineering knowledge (PO1), along with knowing various triggering methods for impulse generator features with the design and development of solution (PO3) with weak mapping.
EE 6701.5	By knowing the various techniques for measuring high voltage AC, DC and Impulse voltages and current it features moderately to Engineering knowledge (PO1), along with knowing the various digital methods of measuring high voltages and currents features with the design and development of solution (PO3) with weak mapping.
EE 6701.6	By understanding the various testing methods on Insulators, Bushings, Circuit breakers, Isolators and Transformers it features moderately to Engineering knowledge (PO1), by knowing various insulation coordination methods features with the design and development of solution (PO3) with weak mapping and in to assess societal health and safety (PO6) weakly and having the impact of professional engineering solution in societal and environmental context (PO7) with weak mapping. By following the various National and International Standards for testing will helps in applying the norms of engineering practices (PO8) with weak mapping. By knowing the testing of various power apparatus helps to function effectively as an individual and as a member or leader in the field of power system (PO9) mapping weakly. By having the testing knowledge it helps in technological change their by having lifelong learning mapping weakly with (PO12)

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

EE 6701 High Voltage Engineering	PSO1	PSO2	PSO3
EE 6701.1	1	1	-
EE 6701.2	1	-	-
EE 6701.3	1	-	-
EE 6701.4	1	2	-
EE 6701.5	1	2	-
EE 6701.6	1	1	-
EE 6701	1	2	-

JUSTIFICATION OF THE MAPPING:

EE 6701.1	By understanding the various over voltages occurring in power system like switching surges and lightning and the it features weakly with modeling and analyzing the electrical components (PSO1), by knowing various methods for protection of power apparatus against over voltages helps in integrating the knowledge of fundamental electronics and power electronics for the controllability, reliability and sustainability of electrical systems (PSO2) with weak mapping.
EE 6701.2	By understanding the occurrence of travelling waves during faulted condition, reflection and transmission of travelling waves and its behavior along with the usage of Bewely's Lattice diagram features weakly mapping with modeling and analyzing the electrical systems (PSO1).
EE 6701.3	By understanding the various breakdown mechanisms in solid, liquid, gaseous and composite dielectric methods it features weakly with modeling and analyzing the electrical components (PSO1).
EE 6701.4	By having the knowledge of various techniques of generating high voltage AC, DC and impulse voltages and currents it features weakly with modeling and analyzing the electrical components (PSO1) and helps in integrating the knowledge of fundamental electronics and power electronics for the controllability, reliability and sustainability of electrical systems (PSO2) with moderate mapping.

EE 6701.5	By knowing the various techniques for measuring high voltage AC, DC and Impulse voltages and current it features weakly with modeling and analyzing the electrical components (PSO1) and helps in integrating the knowledge of fundamental electronics and power electronics for the controllability, reliability and sustainability of electrical systems (PSO2) with moderate mapping.
EE 6701.6	By understanding the various testing methods on Insulators, Bushings, Circuit breakers, Isolators and Transformers it features weakly with modeling and analyzing the electrical components (PSO1) by knowing various methods for protection of power apparatus against over voltages using insulation coordination helps in integrating the knowledge of fundamental electronics and power electronics for the controllability, reliability and sustainability of electrical systems (PSO2) with weak mapping.

Course/Branch	:	B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	:	EI6704	Lecture	: 45
Subject Title	:	Biomedical Instrumentation	Tutorials	: -
Year/Semester	:	IV/VII	Practical	: -
Faculty Name	:	Mr.G.Vignesh Mrs.S.P.Baby Shynela	TOTAL	: 45

COURSE OBJECTIVES:

- To introduce the fundamentals of biomedical engineering
- To understand the working of various transducers.
- To study the communication mechanics in a biomedical system with few examples
- To study measurement of certain important electrical and non-electrical parameters
- To study the basic principles in imaging techniques
- To have a basic knowledge in life assisting and therapeutic devices

COURSE OUTCOMES

Upon completion of the course, the students will be able to...

- C01** Analyze the fundamentals of biomedical engineering.
- C02** Interpret the communication mechanics in biomedical systems
- C03** Measure and analyze non-electrical parameters and its diagnostic procedures.
- C04** Measure and analyze electrical parameters and also electrical safety.

C05 Analyze the imaging techniques and its applications.

C06 Analyze and apply the life assisting, therapeutic and robotic devices.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO ^{PO}	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EI 6704.1	3	1	1	-	-	2	2	-	1	-	-	2
EI 6704.2	3	1	3	-	-	2	2	-	1	-	-	2
EI 6704.3	1	1	-	-	-	1	-	-	1	-	-	2
EI 6704.4	3	2	2	-	2	3	2	-	1	-	-	2
EI 6704.5	3	2	3	1	2	2	2	-	1	-	-	2
EI 6704.6	2	1	1	-	2	2	2	-	1	-	-	2
EI 6704	3	2	3	1	2	3	2	-	1	-	-	2

MAPPING OF PSO WITH COURSE OUTCOMES:

CO ^{PSO}	PSO1	PSO2	PSO3
EI 6704.1	1	-	-
EI 6704.2	1	1	-
EI 6704.3	-	-	-
EI 6704.4	2	1	-
EI 6704.5	1	1	-
EI 6704.6	1	1	-
EI 6704	2	1	-

JUSTIFICATION OF MAPPING:

EI6704.1	<p>By gaining the knowledge of fundamental biomedical systems, it attributes to strong Engineering knowledge (PO1). By analyzing the natural science, it results in weak problem solving (PO2). This promotes weak design and development of solution (PO3). It applies reasoning to public health and environmental sustainability, thus mapping medium (PO6 &PO7).It promotes individual and team work (PO9) and lifelong learning (PO12) effectively. This contributes for the design of basic electrical system in Biomedical engineering (PSO1).</p>
EI6704.2	<p>By interpreting the knowledge of fundamental biomedical system, it attributes to strong Engineering knowledge (PO1). By analyzing various transducers, it results in weak problem solving (PO2). Design of various transducers results in strong design and developments solutions (PO3). Design of transducers and study of basic biological system leads to the reasoning of public health and environment sustainability and hence it attributes medium (PO6 & PO7). It promotes individual and team work (PO9) and lifelong learning (PO12) effectively. This contributes for the design of electrical system and integration of power electronics for controllability, sustainability and reliability of electrical systems (PSO2).</p>
EI6704.3	<p>It attributes to weak Engineering knowledge and problem solving skills (PO1&PO2). It promotes individual and team work (PO9) and lifelong learning (PO12) effectively. Study of mechanics of bone and limbs, kidney and blood flow etc leads to the contextual knowledge of public health and environmental sustainability (PO6 & PO7)</p>
EI6704.4	<p>By measurement of electrical and non-electrical parameters, Engineering knowledge (PO1) is developed. This promotes problem solving (PO2), design and development of solution (PO3). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It promotes individual and team work (PO9) weakly and lifelong learning (PO12). Medium Usage of logical & technical skills to model, simulate and analyze electrical components and systems (PSO1).This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems.(PSO2).</p>
EI6704.5	<p>By analyzing the imaging techniques like CT, MRI, Retinal imaging and its recording methodology, Engineering knowledge (PO1) is developed. This promotes problem solving (PO2), design and development of solution (PO3) and investigating complex problems by analyzing the digital images (PO4). It promotes engineer society relation (PO6), helps in</p>

	environment and sustainability (PO7). It promotes individual and team work (PO9) weakly and lifelong learning (PO12). Strong Usage of logical & technical skills to model, simulate and analyze electrical components and integration of power electronics and embedded systems (PSO1) and (PSO2).
EI6704.6	It attributes to medium Engineering knowledge (PO1). This promotes problem solving (PO2), design and development of solution (PO3). It incorporates modern tools to assist patients in monitoring (PO5). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It promotes individual and team work (PO9) and lifelong learning (PO12) effectively. Strong Usage of logical & technical skills to model, simulate and analyze electrical components and systems (PSO1).This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2).

Course/Branch	:	B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	:	GE 6081	Lecture	: 45
Subject Title	:	Fundamentals of Nanoscience	Tutorials	: -
Year/Semester	:	IV/VII	Practical	: -
Faculty Name	:	Dr.R.Karpaagm	TOTAL	: 45

COURSE OBJECTIVES:

- To understand the basics of Nano Technology and Nano Science, Class of Materials, Implications and its various properties
- To study the various types of Nano level preparation and its advantages
- To understand about the various nanomaterials and their properties.
- To study about carbon nanotubes and its properties.
- To study the various characterization techniques involved in nano-level preparation.
- To study the applications of nanomaterials in interdisciplinary fields.

COURSE OUTCOMES

Upon completion of the course, the students will be able to...

- CO 1:** Interpret the fundamentals of nanotechnology and nanoscience, their properties and behavior.
- CO 2:** Demonstrate various methods for synthesis of Nanomaterials.
- CO 3:** Analyze and apply nanomaterials and nanotubes for various applications.

CO 4: Analyze the modern tools used for characterization of Nano products in a manufacturing industry.

CO 5: Apply nanomaterials in medical field for diagnosis and drug delivery.

CO 6: Apply nanomaterials in environment and information technology.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO ^{PO}	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
GE 6081.1	3	-	1	-	-	-	-	-	-	-	-	2
GE 6081.2	1	1	-	1	-	-	-	-	-	-	-	-
GE 6081.3	1	2	2	1	1	1	2	-	-	1	-	2
GE 6081.4	1	2	-	1	2	-	1	-	-	-	-	1
GE 6081.5	-	-	-	-	1	2	2	-	-	1	-	1
GE 6081.6	1	-	-	-	1	2	2	-	-	1	-	1
GE 6081	3	2	1	1	2	2	2	-	-	1	-	2

JUSTIFICATION FOR MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

GE 6081.1	Students will have the knowledge of fundamentals in Nanoscience (PO1) and they study the properties and behavior in various fields, implications for Physics, Chemistry, Biology and Engineering. It helps students to design solutions for engineering problem by considering the properties and behaviour of nanomaterials (PO3). It also leads to lifelong learning. (PO12).
GE 6081.2	Students will have the fundamental knowledge of synthesis of nanomaterials (PO1). Ability to design system components by various methods of synthesis of Nanomaterials (PO2) and design solutions for complex engineering problems (PO4) and it also aims for life-long learning (PO12).
GE 6081.3	Ability of student to understand the fundamentals of engineering specialization and the manufacturing techniques (PO1, PO2). It also provides solutions to design system components

	by appropriately selecting the method of synthesis (PO3). It aids to provide solution using modern tools (PO5) with economical consideration for the welfare of the society (PO6). It impacts for the professional engineering solutions for sustainable development (PO7). Students prepare effective reports and communicate with engineering community (PO10) and also aids for life-long learning (PO12).
GE 6081.4	Students can use various tools for characterizing the nanomaterials through imaging and other processes (PO1) (PO2). It uses modern tools for attaining solutions for complex engineering activities (PO4) (PO5). Its impact is obvious on environmental context and reaches sustainable development (PO4). It also aims for life-long learning (PO12).
GE 6081.5	Students have the ability to understand the application of nano in medical field and use research based knowledge (PO4). They will be able to use modern tools for diagnosis and drug delivery (PO5) and communicate with engineering community effectively (PO10). It makes them understand the impact of professional solution in environmental needs (PO7) and thus aiming in life-long learning (PO12)
GE 6081.6	With the help of the fundamental knowledge in Nanoscience (PO1), the student will be able to use modern IT tools and appropriate techniques in various applications in environmental and IT (PO5). It helps in aiming for societal health (Po6) and need for sustainable development (PO7). It makes them understand the impact of professional solution in environmental needs (PO7) and thus aiming in life-long learning (PO12).

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO ^{PSO}	PSO1	PSO2	PSO3
GE 6081.1	1	-	-
GE 6081.2	1	-	-
GE 6081.3	-	2	-
GE 6081.4	2	-	1
GE 6081.5	-	1	-
GE 6081.6	-	1	1
GE 6081	2	2	1

JUSTIFICATION FOR MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

GE 6081.1	Students will have the fundamental knowledge about the nanomaterials and identify the properties and behavior for its application in modeling electrical components and systems. (PSO1)
GE 6081.2	Ability to use logical skills to prepare the nanomaterials by understanding their properties and applications (PSO1)
GE 6081.3	Ability to analyze the nanomaterials by understanding the applications and integrate the knowledge of fundamental electronics to achieve controllability and reliability of the system. (PSO2)
GE 6081.4	Students will be able to apply and analyze model tools to characterize the nanomaterials through imaging techniques (PSO 1) and applying nanomaterials in power generation and obtain green energy to meet increasing demands (PSO3).
GE 6081.5	Ability to integrate fundamental electronics in nanoparticles and attain targeted drug delivery and easy diagnosis of diseases thereby achieving sustainability (PSO2).
GE 6081.6	Students can select the appropriate Nano technique for the manufacturing of Micro Electro mechanical systems and for integrating with system to meet the demands of society using various applications of nanomaterials for environment and information technology (PSO2) (PSO3).

VIII SEMESTER

Course/Branch	:	B.E/EEE	Total No. of Hours given in the syllabus	:	45
Subject Code	:	GE6083	Lecture	:	45
Subject Title	:	Disaster management	Tutorial	:	--
Year/Sem/Sec	:	IV/VIII/A and B	Practical	:	--
Faculty	:	D.CHANDRAKALA D.SUGANYA	Grand Total	:	45

COURSE OBJECTIVES:

- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
- To enhance awareness of institutional processes in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

COURSE OUTCOME:

CO1: Students obtain knowledge about various types of Disasters and its impacts.
CO2: Students are capable of explaining Disaster cycle, and gain knowledge about various approaches to disaster risk reduction
CO3: Students have got enough knowledge about the concept of Inter –Relationship between disasters and development.
CO4: Students gain knowledge about Disaster risk management in India.
CO5: Students have got enough knowledge about the field works and case studies related to Disaster management.
CO6: Students will be able to understand the type of disaster and its impacts, and disaster management.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
GE6083.1	1	3	-	1	-	1	1	1	2	1	-	2
GE6083.2	1	3	1	1	-	1	1	2	2	1	-	2

GE6083.3	1	3	-	1	-	1	1	2	2	1	-	2
GE6083.4	1	2	1	2	-	1	1	2	1	-	-	2
GE6083.5	1	2	-	1	-	1	1	1	1	2	-	2
GE6083.6	1	3	1	1	-	1	1	2	2	1	-	2
GE6083	1	3	1	1	-	1	1	2	2	1	-	2

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

CO	PSO1	PSO2	PSO3
GE6083.1	1	-	-
GE6083.2	1	1	-
GE6083.3	1	1	-
GE6083.4	-	1	-
GE6083.5	-	-	-
GE6083.6	-	-	-
GE6083	1	1	-

JUSTIFICATION OF MAPPING

GE6083.1	Study about different types of Disaster requires science and Engineering knowledge (PO1), require knowledge about natural and engineering science- (PO2), require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. (PO4),societable applications and safety(PO6), Societal and environmental context(PO7),ethical solutions(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning about impacts of disasters(PO12). PSO1 ability to do
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	<p>research in the area of Environmental science is greatly improved by studying in detail about types and impact of disasters.</p>
<p>GE6083.2</p>	<p>Study about approaches to Disaster risk reduction requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), Designing of processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations are essential for disaster risk reduction approaches(PO3) require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. (PO4) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7), Applying ethical principles and commitment to professional ethics are very much essential for disaster risk reduction approaches(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for approaching disaster risk reduction (PO9),require communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning (PO12).</p> <p>PSO1 and PSO2 ability to do research in the area of Environmental science is greatly improved by obtaining knowledge about approaches to disaster risk reduction .</p>
<p>GE6083.3</p>	<p>Study about inter-relationship between disaster and development requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7),ethical solutions(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for obtaining inter-relationship between disaster and development (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning about inter-relationship between disaster and development (PO12). PSO1 and PSO2 ability to do research in the area of Environmental science is greatly improved by obtaining knowledge about the inter-relationship between disaster and development.</p>
<p>GE6083.4</p>	<p>For obtaining knowledge about disaster risk management in India awareness about science and Engineering knowledge is essential (PO1), requires knowledge about natural and engineering science- (PO2), Designing of processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations should be proper and essential for disaster risk management in India (PO 3) require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) : Creating, selecting , and applying appropriate techniques are essential for disaster risk management in India(PO5) Application of reasoning required to assess societal, health, safety,</p>

	<p>and legal issues (PO6), Societal and environmental context(PO7) Applying ethical principles and commitment to professional ethics are very much essential for disaster management in India(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for disaster risk management in India (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning (PO12). PSO2 ability to do research in the area of Environmental science is greatly improved by obtaining specific knowledge in disaster risk management in India.</p>
<p>GE6083.5</p>	<p>Applications and case studies related to disaster requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7),ethical solutions(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations for studying about applications and case studies related to disaster , (PO10),requires life- long learning (PO12)</p>
<p>GE6083.6</p>	<p>Study about disaster management requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), Designing of processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations are essential for disaster management(PO3) require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) : Creating, selecting , and applying appropriate techniques are essential for disaster management(PO5) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7), Applying ethical principles and commitment to professional ethics are very much essential for disaster management(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for implementing disaster management (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning (PO12)</p>

Course/Branch	:	B.E/EEE	Total No. of Hours given in the syllabus	:	45
Subject Code	:	GE8074	Lecture	:	45
Subject Title	:	HUMAN RIGHTS (R13)	Tutorial	:	--
Year/Sem/Sec	:	IV/VIII/A and B	Practical	:	--
Faculty	:	Dr.J.Gowrishankar	Grand Total	:	45

COURSE OBJECTIVES:

- To sensitize the Engineering students to various aspects of Human Rights.

COURSE OUTCOMES:

CO1: Students will be able to study the structure of electric power system and to compute the parameters of transmission line.

CO2: Students will be able to model the different types of transmission line and determine its efficiency and voltage regulation.

CO3: Students will be able to calculate the sag and tension of the transmission line for different weather conditions.

CO4: Students will be able to improve voltage distribution across the string insulator and enhance its efficiency.

CO5: Students will be able to study the types, construction of cables and enhance its efficiency.

CO6: Students will be able to become familiar about different power distribution schemes and the concepts of compensation devices.

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
GE6083.1	1	3	-	1	-	1	1	1	2	1	-	2
GE6083.2	1	3	1	1	-	1	1	2	2	1	-	2
GE6083.3	1	3	-	1	-	1	1	2	2	1	-	2
GE6083.4	1	2	1	2	-	1	1	2	1	-	-	2

GE6083.5	1	2	-	1	-	1	1	1	1	2	-	2
GE6083.6	1	3	1	1	-	1	1	2	2	1	-	2
GE6083	1	3	1	1	-	1	1	2	2	1	-	2

MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

CO	PSO1	PSO2	PSO3
GE6083.1	1	-	-
GE6083.2	1	1	-
GE6083.3	1	1	-
GE6083.4	-	1	-
GE6083.5	-	-	-
GE6083.6	-	-	-
GE6083	1	1	-

JUSTIFICATION OF MAPPING

GE6083.1	<p>Study about different types of Disaster requires science and Engineering knowledge (PO1), require knowledge about natural and engineering science- (PO2), require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. (PO4),societable applications and safety(PO6), Societal and environmental context(PO7),ethical solutions(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning about impacts of disasters(PO12). PSO1 ability to do research in the area of Environmental science is greatly improved by studying in detail about types and impact of disasters.</p>
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<p>GE6083.2</p>	<p>Study about approaches to Disaster risk reduction requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), Designing of processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations are essential for disaster risk reduction approaches(PO3) require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. (PO4) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7), Applying ethical principles and commitment to professional ethics are very much essential for disaster risk reduction approaches(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for approaching disaster risk reduction (PO9),require communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning (PO12).PSO1 and PSO2 ability to do research in the area of Environmental science is greatly improved by obtaining knowledge about approaches to disaster risk reduction .</p>
<p>GE6083.3</p>	<p>Study about inter-relationship between disaster and development requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7),ethical solutions(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for obtaining inter-relationship between disaster and development (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning about inter-relationship between disaster and development (PO12). PSO1 and PSO2 ability to do research in the area of Environmental science is greatly improved by obtaining knowledge about the inter-relationship between disaster and development.</p>
<p>GE6083.4</p>	<p>For obtaining knowledge about disaster risk management in India awareness about science and Engineering knowledge is essential (PO1), requires knowledge about natural and engineering science- (PO2), Designing of processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations should be proper and essential for disaster risk management in India (PO 3) require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) : Creating, selecting , and applying appropriate techniques are essential for disaster risk management in India(PO5) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7) Applying ethical principles and commitment to professional ethics are very much essential for disaster management in India(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for disaster risk management in India (PO9),require effective communication with</p>

	<p>society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning (PO12). PSO2 ability to do research in the area of Environmental science is greatly improved by obtaining specific knowledge in disaster risk management in India.</p>
<p>GE6083.5</p>	<p>Applications and case studies related to disaster requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7),ethical solutions(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations for studying about applications and case studies related to disaster , (PO10),requires life- long learning (PO12)</p>
<p>GE6083.6</p>	<p>Study about disaster management requires science and Engineering knowledge (PO1), requires knowledge about natural and engineering science- (PO2), Designing of processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations are essential for disaster management(PO3) require, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p> <p>(PO4) : Creating, selecting , and applying appropriate techniques are essential for disaster management(PO5) Application of reasoning required to assess societal, health, safety, and legal issues (PO6), Societal and environmental context(PO7), Applying ethical principles and commitment to professional ethics are very much essential for disaster management(PO8) require individual and team work co-ordination and engaged in multidisciplinary settings for implementing disaster management (PO9),require effective communication with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, (PO10),requires life- long learning (PO12)</p>

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: EE6801	Lecture	:	45
Subject Title	: Electric Energy Generation Utilisation and Condervation	Tutorials	:	-
Year/Semester/Sec	: IV/VIII/A&B	Practical	:	-
Faculty Name	: Mr. K. V. Thilagar Mr. G. Vignesh	TOTAL	:	45

COURSE OBJECTIVES:

- To analyze the various concepts behind electric drives and traction.
- To introduce the energy saving concept by different ways of illumination.
- To understand the different methods of electric heating and electric welding.
- To introduce knowledge on Solar Radiation and Solar Energy Collectors
- To introduce concepts of Wind Energy and its utilization

COURSE OUTCOMES

Upon completion of the course, the students will be able to...

EE 6801.1	Infer the merits, control mechanism and performance of electric traction and to select a suitable motor for various drives.
EE 6801.2	Design energy efficient illumination schemes suiting various applications.
EE 6801.3	Interpret the various schemes of industrial heating and welding.
EE 6801.4	Understand the characteristics of sunlight and principles of solar thermal energy conversion.
EE 6801.5	Grasp the fundamentals of electrical power generation by concentrated solar energy conversion systems.
EE 6801.6	Comprehend the basic principles, classification and performance of wind energy conversion systems.

MAPPING OF COURSE OUTCOME(CO) WITH PROGRAMME OUTCOME(PO)

CO	PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 6801.1		1	-	2	3	1	-	2	-	-	-	-	1
EE 6801.2		2	1	3	3	1	-	2	-	-	-	-	1

EE 6801.3	1	-	3	-	1	-	2	-	-	-	-	1
EE 6801.4	3	-	-	-	2	-	2	-	-	-	-	-
EE 6801.5	2	2	1	-	2	-	2	-	-	-	-	1
EE 6801.6	3	2	2	-	1	-	2	-	-	-	-	1
EE 6801	3	2	3	3	2	-	2	-	-	-	-	1

CO	PSO	PSO1	PSO2	PSO3
EE 6801.1		1	2	3
EE 6801.2		1	2	3
EE 6801.3		1	2	3
EE 6801.4		1	-	3
EE 6801.5		1	2	3
EE 6801.6		1	1	2
EE 6801		1	2	3

JUSTIFICATION OF MAPPING:

EE 6801.1	Design of rapidly growing (PO12) electric traction systems with the help of fundamental knowledge of engineering sciences (PO1) and power electronics (PSO2) for development of sustainable (PO7) solutions (PO3) for transportation needs. Railway Electrification will play a vital role in development of smart power grid (PSO3).
EE 6801.2	Design of various evolving (PO12) energy efficient illumination systems with the help of basic knowledge fundamental knowledge of engineering sciences (PO1), electronic components (PSO2) for development of solutions (PO3) (PO4) for lighting needs. Design of energy efficient lamps will contribute towards utilizing green energy sources (PSO3).

EE 6801.3	Analyzing of various developing (PO12) schemes of industrial heating and welding with the help of fundamental knowledge of engineering sciences (PO1) and electronic components (PSO2) for development of economical and solutions (PO3) for industrial requirements of the society (PSO3).
EE 6801.4	Understanding about the characteristics of solar radiation with the help of fundamental engineering knowledge (PO1). Estimation of average solar radiation using modern simulation tools (PO5)(PSO1). Harnessing sunlight for protecting our environment and promote sustainable development through green energy (PO7) (PSO3).
EE 6801.5	Application of basic engineering knowledge of physics and electronics (PO1) (PSO2) for the design (PO3) and analysis (PO2) of concentrated solar energy conversion system with the help of certain modern simulation tools (PO5). Rapidly growing (PO12) Solar Energy Conversion Systems paves way for sustainable development through green energy (PSO3) without causing any damage to the environment (PO7).
EE 6801.6	Comprehending the evolving (PO12) green energy technology (PSO3), known as the wind energy conversion system using basic principles of engineering and electronics (PO1) (PSO2). Analysis (PO2) of selection considerations for designing (PO3) a wind energy conversion system by interpretation of wind data (PO4) using modern simulation tools (PO5) (PSO1).