

**EASWARI ENGINEERING COLLEGE**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**Regulation – 2019**

**II SEMESTER**

Course/Branch	:	B.E/EEE	Total no. of hours given in syllabus: 30		
Subject Code	:	191LEH201T	Lecture	:	30
Subject Title	:	Professional Communication	Tutorials	:	-
Year/Semester	:	I/II	Practical	:	-
Faculty Name	:	Ms.A.Christina	TOTAL	:	30

**COURSE OBJECTIVES:**

- 1.To make the students understand the nuances of soft skills.
- 2.To make the students to present their ideas in public. To help them to prepare and present seminar with ppt.
- 3.To improve their confidence in participating in GDs and to shine job interviews
- 4.To make effective presentations.
- 5.Develop soft skills, inter personal skills and to enhance performance at placement interviews, group discussions and other recruitment exercises

**COURSE OUTCOMES:**

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

<b>CO1</b>	Listen and respond appropriately
<b>CO2</b>	Participate in group discussions
<b>CO3</b>	Make effective presentations
<b>CO4</b>	Participate confidently and appropriately in conversations both formal and informal

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191LEH201T	-	-	1	1	1	2	-	2	2	2	1	-

## JUSTIFICATION OF CO-PO MAPPING

<b>191LEH201T.1</b>	PO3 provides opportunity to participate in language tasks like role play, discussions on cultural, social and environmental issues and design solutions. PO5 enables the use of ICT for oral presentations. PO10 helps to communicate with clarity and precision using flawless language
<b>191LEH201T.2</b>	PO4 facilitates smooth transition from campus to corporate by implementing various methodologies with relation to survey and analyze the data collected, represent them in graphics and provide valid conclusions; participating in situation based tasks and exhibit critical thinking , problem solving and leadership skills (PO6); Understanding the theory of multiple intelligence and allocate tasks based on the ability of the team members during the group tasks (PO11)
<b>191LEH201T.3</b>	PO8, PO9 helps to perform in recruitment process by participating in discussions on the impact of technological developments on the society and environment and suggest recommendations for overcoming negative factors; Involving in tasks like ethical dilemma where an opportunity is provided to exhibit and enhance their emotional intelligence and managerial skills; taking part in group discussions and group tasks and showcase interpersonal skills and group dynamics.
<b>191LEH201T.4</b>	PO4, PO9 help to inculcate listening skills by exposing students to texts of different genres, thereby develop soft skills that are required to face challenges in life

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191MAB201T	Lecture	:	60
Subject Title	: Engineering Mathematics – II	Tutorials	:	
Year/Semester	: I/II	Practical	:	-
Faculty Name	: Dr.C.Subramanian	TOTAL	:	60

### COURSE OBJECTIVES:

1. The goal of this course is to achieve conceptual understanding and to retain the best traditions of traditional calculus.
2. The objective of this course is to familiarize the prospective engineers with techniques in ordinary differential equations, complex variables and complex integration.
3. The various methods of complex analysis can be used for efficiently solving the problems that occur in various branches of engineering disciplines.
4. The Study of Laplace transform help to solve the differential equations that occur in various branches of engineering disciplines.

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
<b>CO1</b>	The students are familiar with the Particular Integral using operator and Method of variation of parameters and also in Homogenous equation of Euler's and Legendre's type.
<b>CO2</b>	The students are able to investigate problems by transforming the problems into a new domain, using Laplace Transform, in which it is easier to solve.
<b>CO3</b>	The students have understood the concepts of vector calculus needed for solving problems in all Engineering disciplines easily.
<b>CO4</b>	They have understood the standard techniques of complex variable theory so that they can apply them in areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.
<b>CO5</b>	The students have grasped the basics of complex integration and the concept of contour integration which are important for evaluating certain integrals encountered in engineering and technology.
<b>CO6</b>	The students have developed the fundamentals and basic concepts in Differential Equations, Laplace Transform, Vector Calculus, and Complex Functions so that they can solve problems arising in engineering applications

#### **MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
191MAB201T.1		3	2	-	-	-	-	-	-	-	-	-
191MAB201T.2	3	3	2	-	-	-	-	-	-	-	-	-
191MAB201T.3	3	3	2	-	-	-	-	-	-	-	-	-
191MAB201T.4	3	3	2	-	-	-	-	-	-	-	-	-
191MAB201T.5	3	3	2	-	-	-	-	-	-	-	-	-
191MAB201T.6	3	3	2	-	-	-	-	-	2	-	-	2
191MAB201T.7	3	3	2	-	-	-	-	-	2	-	-	2

<b>JUSTIFICATION OF THE MAPPING:</b>	
<b>191MAB201T.1</b>	Knowledge in finding the solutions of ordinary differential equations are useful to find the solutions of Complex engineering problems (PO1). To analyze Complex Engineering problems (PO2), Ordinary Differential equation is useful. Design of solutions for Complex Engineering problems (PO3) uses the concepts of Ordinary Differential equations.
<b>191MAB201T.2</b>	To acquire engineering knowledge (PO1) one requires the knowledge of Laplace transform. To formulate and analyze complex engineering problems (PO2) methods of Laplace transform is helpful. To develop

	solutions for problems arising in engineering and technology (PO3) Laplace transform is used as a tool.
<b>191MAB201T.3</b>	Vector calculus is used to learn complex engineering problems (PO1). To analyze complex engineering problems (PO2), the study of Gradient, divergence and curl are vital. Vector calculus is useful in designing the solutions for complex engineering problem (PO3).
<b>191MAB201T.4</b>	To find the solution of complex engineering problem (PO1) the analytic function plays an important role. The conformal mapping is useful to analyze the complex engineering problems (PO2). The concept of Analytic function is useful in designing the solutions for complex engineering problem (PO3)
<b>191MAB201T.5</b>	The concept of Complex integrals is a backbone to acquire knowledge to obtain solutions of complex engineering problems (PO1). Contour integration used in formulating problems in engineering and technology (PO2). Laurent's series help to design and develop the solutions for complex engineering problems (PO3)
<b>191MAB201T.6</b>	In general, Differential Equations, Laplace transforms, vector calculus, analytic functions, and complex integration are very useful in acquiring engineering knowledge, analyzing problems, designing and developing solutions for complex problems that occur in engineering.

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191PYB201T	Lecture	:	45
Subject Title	: Physics for Electronics Engineering	Tutorials	:	
Year/Semester	: I/II	Practical	:	-
Faculty Name	: Dr.S.Nirmala	TOTAL	:	45

### COURSE OBJECTIVES:

To enrich the understanding of various types of materials and their applications in electronics, communication, electrical and instrumentation.

### COURSE OUTCOMES:

Upon completion of the course, the students will be able to..	
<b>CO1</b>	Gain knowledge on classical and quantum electron theories, and the mathematical theory of density of states
<b>CO2</b>	Acquire knowledge on basics of semiconductor physics and its applications in various devices
<b>CO3</b>	Get knowledge on magnetic and superconducting properties of materials

<b>CO4</b>	Have the necessary understanding on the functioning of dielectric materials for capacitor and transformer
<b>CO5</b>	Understand the preparation, properties and applications of various advanced engineering materials
<b>CO6</b>	Acquire knowledge on real life applications of conductors, semiconductors, magnetic, superconducting, dielectric and advanced engineering materials.

### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191PYB201T.1	3	3	2	-	2	-	1	-	-	-	-	2
191PYB201T.2	3	3	3	-	2	-	2	-	-	-	-	2
191PYB201T.3	3	3	3	-	1	-	2	-	-	-	-	1
191PYB201T.4	3	3	2	-	2	-	-	-	-	-	-	2
191PYB201T.5	3	3	2	-	2	-	1	-	-	-	-	1
191PYB201T.6	3	3	2	-	2	-	1	-	-	-	-	2
191PYB201T	3	3	3	-	2	-	2	-	-	-	-	2

### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

CO/PSO	PSO1	PSO2	PSO3	PSO4
191PYB201T.1		-	-	-
191PYB201T.2	-	-	-	-
191PYB201T.3	-	-	-	-
191PYB201T.4	-	-	-	-
191PYB201T.5	-	-	-	-
191PYB201T.6	-	-	-	-
191PYB201T	-	-	-	-

### JUSTIFICATION OF THE MAPPING:

<b>191PYB201T.1</b>	Applying the concepts of classical and quantum electron theories, and energy band structures strongly (PO1) helps to analyse the problems strongly (PO2). This will help in design and development of solution to some extent (PO3). This may help to know the modern tool usage moderately (PO5). PO7 gives the knowledge of engineering solutions in society and environment weakly and PO12 recognizes the need for life-long learning to some extent.
<b>191PYB201T.2</b>	Applying the fundamentals and applications of semiconductors in Engineering field strongly (PO1) helps in problem analysis to greater extent

	(PO2). This may help in design and development of solutions strongly (PO3). PO5 attributes to the usage of modern tools to some extent and to assess the health and safety of society as well as environment and sustainable development moderately (PO7). Semiconductors may be of some use to know the life-long technological changes in electronic devices (PO12).
<b>191PYB201T.3</b>	Concepts of various magnetic materials, superconducting materials and its application attribute to strong Engineering knowledge (PO1). This will help in problem solving (PO2) as well as design and development of solution (PO3) to a greater extent. Developing simple model helps to learn the techniques (PO5) weakly. PO7 helps to understand the impact of magnetic and superconducting materials to environment to some extent and PO12 recognizes the need for life-long learning weakly.
<b>191PYB201T.4</b>	While understanding the nature, properties and application of dielectric materials for capacitor and transformer, strong Engineering knowledge (PO1) is developed. This will help in problem solving (PO2) strongly and design and development of solution (PO3) to some extent. Dielectric materials help in applying appropriate techniques and tools with an understanding of the limitations (PO5) moderately. Dielectric materials may be of some use to know the life-long technological changes in electrical and electronics (PO12).
<b>191PYB201T.5</b>	Understand the basics of modern material structures and their applications in electronics, robotics, computers, sensors, mobile electronic devices attributes to strong Engineering knowledge (PO1). This will help in problem solving (PO2) as well as design and development of solution (PO3) to a greater extent. Selecting suitable algorithm helps in learning the commercial software (PO5) to some extent. PO7 gives the knowledge of engineering solutions in society and environment moderately. PO12 recognizes the need for life-long learning to some extent.
<b>191PYB201T.6</b>	Real life application of conductors, semiconductors, magnetic, superconducting, dielectric and advanced engineering materials attributes to strong Engineering knowledge (PO1). This will help in problem solving (PO2) as well as design and development of solution (PO3) to a greater extent. Developing simple model helps to learn the techniques (PO5) moderately. PO7 helps to understand the impact of engineering materials to environment to some extent and PO12 recognizes the need for life-long to some extent.

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	: 191GES203T	Lecture	:
Subject Title	: <b>Basic Civil and Mechanical Engineering</b>	Tutorials	:
Year/Semester	: I/II	Practical	: -
Faculty Name	: Mr.C.Joel	TOTAL	:

**COURSE OBJECTIVES:**

1.To impart basic knowledge on Mechanical Engineering.

2.To enable the students to distinguish the components and working principle of power plant units and IC engines

3.To provide the basic knowledge on working of Refrigeration and Air conditioning systems

**COURSE OUTCOMES:**

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

191GES203T.1	Appreciate the Mechanical Engineering components of Projects.
191GES203T.2	Identify the components used in Power plant cycle.
191GES203T.3	Demonstrate working principles of Petrol and Diesel engine.
191GES203T.4	Elaborate the components of Refrigeration and Air conditioning cycle.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191GES203T.1	3	2	2	2	---	2	1	---	1	1	1	1
191GES203T.2	3	2	---	---	---	---	---	---	---	---	---	--
191GES203T.3	3	2	2	---	---	2	---	---	---	---	---	---
191GES203T.4	3	2	2	---	---	---	---	---	---	---	---	---
191GES203T	3	2	2	2	---	2	1	---	1	1	1	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191GES203T.1	---	---	---
191GES203T.2	---	---	---
191GES203T.3	---	---	---
191GES203T.4	---	---	---
<b>191GES203T</b>	---	---	---

**JUSTIFICATION OF THE MAPPING:**

<b>191GES203T.1</b>	Student will be able to apply the basic knowledge of mechanical concepts (PO1) to do investigation (PO2), design (PO3) and analyze solutions (PO4) to engineering real time applications.(PO6)
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<b>191GES203T.2</b>	Students can identify, analyze engineering problems and reach substantial conclusions only if they have basic knowledge in the Power plant cycle (PO1), problem solving ability (PO2) and Develop solutions.
<b>191GES203T.3</b>	Students can select the appropriate design process (PO3) and design the various machine elements (PO2) in Petrol and Diesel engine only if they have basic knowledge in the subject (PO1)
<b>191GES203T.4</b>	Student will be able to assess the societal safety (PO3) and practice professional engineering only if they have basic knowledge in the subject (PO1), understands the societal needs (PO2)

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	: 191GES203T	Lecture	:
Subject Title	: <b>Basic Civil and Mechanical Engineering</b>	Tutorials	:
Year/Semester	: I/II	Practical	: -
Faculty Name	: R.SHEEJA	TOTAL	:

<b>COURSE OBJECTIVES:</b>
To educate the students on the Surveying and Civil engineering materials and building components and structures

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
191GES203.1	Apply and appreciate the civil engineering disciplines.
191GES203.2	Apply the usage and proper selection of construction materials and usage of modern surveying instruments.
191GES203.3	Analyze different components of building for good foundation of the structure.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191GES203T.1	2	1	1	1	2	1	2	2	1	-	1	-
191GES203T.2	1	1	1	3	3	3	2	1	1	-	-	1



191GES203T.3	-	2	1	2	3	2	3	2	1	-	1	1
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**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191GES203T.1	---	---	---
191GES203T.2	---	---	---
191GES203T.3	---	---	---

**JUSTIFICATION OF THE MAPPING:**

<b>191GES203T.1</b>	<p>Knowledge on overall view of civil engineering will bring insight to students to know about the happenings in civil areas. Students will understand the scope of civil engineering in future. Thus be able to understand the various sub disciplines available in civil engineering. Firstly knowledge on water resources and environmental engineering and its techniques creates attributes to strong engineering background (PO1) , This will help in understanding problem available to certain limit (PO2) ;Secondly attaining knowledge on Structural engineering helps the students to understand the various functions and methods present to solve the complex problem (PO3). Thirdly, construction engineering helps the engineer society to plan and prepare layouts with the help of maps (PO9) and in improving the environment in a sustainable manner serving engineering ethics (PO7) to certain limit. Fourthly , learning Geotechnical engineering is studied to know the different soil properties and communicate to the students (PO8) to manage the projects in this field work. PSO1 namely the engineering fundamentals of various disciplines of civil engineering (PSO1)will helps to contribute the welfare of the society needs (PO2) and also able to give engineering solution to the present necessity of society (PSO3).</p>
<b>191GES203T.2</b>	<p>Learning about fundamentals of surveying attribute to good engineering knowledge (PO1) , And helps in problem solving (PO2) ,design and development of solution (PO3) . PSO1 namely the engineering fundamentals of various disciplines of civil engineering is fulfilled by learning the engineering properties of construction materials and helps to cater the industrial needs (PO2). The various building components and materials could able to give engineering solution to the present necessity of construction material needs (PSO3).</p>
<b>191GES203T.3</b>	<p>Knowledge on building components like Superstructure, beams, columns,</p>

	roofing and internal and external forces,(PO1), This will help in understanding problem solving (PO2) ,and the way of providing solution (PO3).Knowledge on different structures of building helps the engineering society(PO9) in improving the environment especially in rain water harvesting construction strongly and also helps in committing to professional Ethics(PO7). By learning different components of building, it makes the students capable to manage the projects in field weakly(PO10).PSO1 namely the namely the engineering fundamentals of various disciplines of civil engineering is attained by learning how to determine the soil properties according to present industrial needs (PSO2) .Analyzing the possibilities and importance of affordable structures could able to give engineering solution to the present necessity of society (PSO3).
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Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEEC201T	Lecture	:	45
Subject Title	: Circuit Theory	Tutorials	:	
Year/Semester	: I/II	Practical	:	-
Faculty Name	: Ms.J.Lydia	TOTAL	:	45

<b>COURSE OBJECTIVES:</b>
1 To introduce electric circuits and its analysis.
2 To impart knowledge on solving circuit equations using network theorems and two port networks.
3 To introduce the phenomenon of resonance in coupled circuits.
4 To educate on obtaining the transient response of circuits.
5 To introduce Phasor diagrams and analysis of three phase circuits.

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
<b>CO1</b>	Ability to analyze electrical circuits in any given network, Ohm's law, Kirchoffs laws, voltage and current through any circuit.
<b>CO2</b>	Ability to apply circuit theorems to reduce any complex circuits by circuit reduction method, simplify star and delta networks by conversion techniques, can able to solve circuit problems using the theorems and find parameters of two port networks.
<b>CO3</b>	Ability to analyze AC and DC Circuits by realizing the importance of resonance, Q-factor and bandwidth they can solve problems on series and parallel resonance circuits. After understanding the principle of self and mutual inductance they can have wide ideas on electrical machines and its applications. Ability to solve problems on tuned circuits by understanding the concepts of Tuning techniques.

<b>CO4</b>	Ability to analyse AC and DC Circuits by learning the transient change in current in an inductor and the transient change in voltage across any capacitor and to derive the transient response of RLC circuit for both AC and DC inputs.
<b>CO5</b>	Ability to analyse AC and DC Circuits by understanding the need of 3 $\phi$ supply for household applications. They can able to compare 3 $\phi$ supply over 1 $\phi$ supply. They can able to calculate power and power factor.
<b>CO6</b>	Gain knowledge about the applications and apply the concepts in various industrial fields.

#### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>191EEC201T.1</b>	3	3	2	1	2	2	2	1	1	-	-	2
<b>191EEC201T.2</b>	3	3	2	1	2	1	2	1	2	-	-	2
<b>191EEC201T.3</b>	3	3	2	1	2	1	1	1	1	-	-	2
<b>191EEC201T.4</b>	3	3	2	1	1	2	2	1	2	-	-	2
<b>191EEC201T.5</b>	3	3	2	1	1	1	1	1	2	-	-	2
<b>191EEC201T.6</b>	3	3	1	1	1	1	1	2	2	-	-	1
<b>191EEC201T</b>	3	3	2	1	2	2	2	2	2	-	-	2

#### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

CO/PSO	PSO1	PSO2	PSO3
<b>191EEC201T.1</b>	3	2	-
<b>191EEC201T.2</b>	3	1	-
<b>191EEC201T.3</b>	3	2	-
<b>191EEC201T.4</b>	3	2	-
<b>191EEC201T.5</b>	3	2	2
<b>191EEC201T.6</b>	3	1	2
<b>191EEC201T</b>	3	2	2

#### JUSTIFICATION OF THE MAPPING:

<b>191EEC201T.1</b>	Design the analysis of circuits requires strong knowledge of engineering fundamentals (PO1), good formulation for problem analysis (PO2) and design methodologies (PO3), weak design solution for application(PO4), moderate usage of IT tools(PO5), medium contribution towards society (PO6) and sustainable design(PO7) of circuits, weakly mapped to ethics
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	towards analysis methods(PO8) and multidisciplinary team work(PO9),and moderately mapped to life- long learning about circuit design(PO12).
<b>191EEC201T.2</b>	Reduction of complicated circuits requires strong knowledge of engineering (PO1), good formulation for problem analysis (PO2), moderate design methodologies (PO3), weak interpretation of data at various conditions(PO4), moderate usage of IT tools(PO5), weak contribution towards society(PO6), moderately mapped to sustainable design(PO7),weak mapped with ethics towards calibration methods(PO8), moderate multidisciplinary team work(PO9), moderately requires life- long updation of calibration procedure(PO12).
<b>191EEC201T.3</b>	Measuring the values of inductance and coupled circuits needs strong knowledge of Mathematics and Science(PO1), good identification of factors improves accuracy (PO2), well designed networks (PO3), weak in analysis of data at various conditions(PO4), moderate usage of IT tools(PO5), weak contribution towards society(PO6), sustainable design(PO7), ethics towards calibration methods(PO8), multidisciplinary team work(PO9), creative method requires life- long learning (PO12).
<b>191EEC201T.4</b>	Measuring of transient current needs strong knowledge of Mathematics and Science(PO1), good identification of factors affects accuracy (PO2), well designed instruments (PO3), weak in research analysis of data of various measurements(PO4), weak usage of IT tools(PO5), moderate contribution towards society(PO6), sustainable design(PO7), ethics towards methods(PO8) is weakly mapped, moderate multidisciplinary team work(PO9) and knowing the transient values requires life- long learning (PO12).
<b>191EEC201T.5</b>	Selection of three phase systems to measure balanced and unbalanced current based on strong knowledge of Mathematics and Science(PO1), good identification of factors affects accuracy (PO2), good design of bridges (PO3), weak analysis of data of various measurements(PO4), weak usage of IT tools(PO5), weak contribution towards society(PO6), sustainable design(PO7), ethics towards methods(PO8), moderate multidisciplinary team work(PO9) and factors affecting error requires life- long learning (PO12).

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191CYM201T	Lecture	:	
Subject Title	: Environmental Science	Tutorials	:	
Year/Semester	: I/II	Practical	:	-
Faculty Name	: Dr.Anitha Devi	TOTAL	:	

### **COURSE OBJECTIVES:**

1. Graduates will have fundamental and broad knowledge in Electrical Sciences relating to industrial applications and research to design, analyze and synthesize information from various sources and think differently to provide solutions to their discipline.

2. Graduates will become entrepreneurs, employees of reputed organizations, pursue higher studies and research for developing advanced skills in Electrical and Electronics Engineering
3. Graduates will exhibit technical and intellectual competency and will be amenable for life-long learning
4. Graduates will demonstrate technical knowledge and ethical values for professional development to meet the societal needs
5. Graduates will be able to work in multi-disciplinary environment by providing solutions to real time problems

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
191CYM201T.1	Environmental education initiates an awareness, deeper understanding and sensitivity to the environment and environmental challenges.
191CYM201T.2	Acquired knowledge about the principles of nature, environment and their protection
191CYM201T.3	Created an involvement to the public to implement environmental laws effectively.
191CYM201T.4	Environmental education allows an individual to explore and think about the modern lifestyle has lead to serious environmental disasters and should develop the skills to make responsible decisions.
191CYM201T.5	Acquired skills to behave ecofriendly.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>191CYM201T.1</b>	2	2	-	1	3	-	1	3	2	2	-	2
<b>191CYM201T .2</b>	3	-	1	3	3	-	1	3	2	2	-	2
<b>191CYM201T .3</b>	3	3	2	2	3	1	1	3	2	2	1	3
<b>191CYM201T .4</b>	3	2	2	2	3	1	1	3	2	2	1	1
<b>191CYM201T .5</b>	2	1	2	2	3	-	1	3	1	2	1	2

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191CYM201T.1	-	2	1
191CYM201T .2	2	1	-
191CYM201T .3	2	1	2
191CYM201T .4	2	2	1
191CYM201T .5	2	1	2

## JUSTIFICATION OF MAPPING:

191CYM201T.1	Could apply the knowledge nature facts about solving complex engineering problems (PO1) strongly. This help in problem analysis (PO2) strongly; helps in development of process to meet the specified needs (PO3) could help in interpret data (PO4); Modern methods are used to solve various engineering needs(PO5); This helps in addressing societal issues lightly (PO6); It could help in providing engineering solution in societal context like conservation of biodiversity (PO7) student could engage in lifelong learning (PO12).
191CYM201T.2	Could apply the knowledge to implementing scientific technology in solving complex engineering problems (PO1) strongly. This help in problem analysis (PO2) strongly; helps in development of process to meet the specified needs (PO3) could help in design of experiments (PO4); Modern methods are used to solve various engineering, agriculture, medicinal needs(PO5); This helps in addressing societal issues strongly (PO6); It could help in providing engineering solution in societal context line utilization of natural resources and its conservation (PO7) student could engage in it.
191CYM201T.3	Could apply the knowledge interrelationship of living organism in solving complex engineering problems (PO1) strongly. This help in problem analysis (PO2) strongly; helps in development of process to meet the specified needs (PO3) could help in interpret data (PO4); Modern methods are used to solve various engineering needs(PO5); This helps in addressing societal issues lightly (PO6); It could help in providing engineering solution in societal context like pollution prevention (PO7) student could engage in lifelong learning (PO12).
191CYM201T.4	Could apply the dynamic processes and understand the features of the earth's interior in surface engineering problems (PO1) strongly. This help in problem analysis (PO2) strongly; helps in development of process to meet the specified needs (PO3) could help in interpret data (PO4); Modern methods are used to solve various engineering needs(PO5); This helps in addressing societal issues lightly (PO6); It could help in providing engineering solution in societal context like Sustainable development – Equitable use of resources for sustainable lifestyle (PO7) student could engage in lifelong learning (PO12).
191CYM201T.5	Students could apply the knowledge to solve engineering problems (PO1); process could be designed for finding solutions (PO3); Research based knowledge could be applied for providing valid conclusions (PO4) Modern tools could be used (PO5) They could provide solutions in environmental contexts like Waste management and resource recovery (PO7). They will able to engage in lifelong learning.

Course/Branch	: B.E/EEE		Total no. of hours given in syllabus:		
Subject Code	: 191EEC211L		Lecture	:	-
Subject Title	: ELECTRIC CIRCUITS LAB		Tutorials	:	
Year/Semester	: I/II		Practical	:	60
Faculty Name	: Mrs.J.LYDIA		TOTAL	:	60

### COURSE OBJECTIVES:

1. To provide practical experience with simulation of electrical circuits and verifying circuit theorems

### COURSE OUTCOMES:

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

<b>CO1</b>	Understand, apply basic laws and circuit theorems and concepts for evaluating voltage and current.
<b>CO2</b>	Convert any complex circuits into simpler ones and to evaluate the circuit parameters using various theorems for DC and AC input.
<b>CO3</b>	Design and simulate resonant and network circuits.
<b>CO4</b>	Use oscilloscopes for measurements.
<b>CO5</b>	Solve and analyze RC and RLC circuits in transient conditions for both DC and AC circuits.

### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>191EEC211L.1</b>	3	3	1	1	3	-	-	-	2	1	3	2
<b>191EEC211L.2</b>	3	3	1	1	3	-	-	-	2	1	3	2
<b>191EEC211L.3</b>	3	2	1	1	3	-	1	-	2	1	3	2
<b>191EEC211L.4</b>	2	-	-	1	-	-	-	-	2	1	3	2
<b>191EEC211L.5</b>	3	3	1	1	3	1	1	-	2	1	3	2

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

	PSO1	PSO2	PSO3
191EEC211L.1	1	1	-
191EEC211L.2	2	1	-
191EEC211L.3	3	2	2
191EEC211L.4	-	1	-
191EEC211L.5	2	2	2
191EEC211L	3	2	2

<b>JUSTIFICATION OF THE MAPPING:</b>	
<b>191EEC211L.1</b>	By solving circuits in different ways, it attributes to strong Engineering knowledge (PO1) and Problem analysis (PO2) skills. It promotes design development (PO3) and complex problem investigation (PO4) weakly. It promotes modern tool usage (PO5) effectively and individual and team work (PO9) moderately. It helps in project management (PO11) strongly and lifelong learning (PO12) moderately.
<b>191EEC211L.2</b>	By applying theorems in practical applications, it attributes to the strong Engineering knowledge (PO1) and promotes Problem analysis (PO2). It promotes design development (PO3) and complex problem investigation (PO4) weakly. It promotes modern tool usage (PO5) strongly by simulating circuits in different ways and individual and team work (PO9) moderately. Solution of circuits using theorems helps in project management (PO11) strongly and lifelong learning (PO12) moderately.
<b>191EEC211L.3</b>	By the design and simulation of resonant circuits and network circuits, it attributes to strong Engineering knowledge (PO1) and promotes Problem analysis (PO2) moderately. It promotes design development (PO3) and complex problem investigation (PO4) weakly. By simulating the resonant circuits it promotes modern tool usage (PO5) strongly. It promotes Environment and sustainability (PO7) weakly and individual and team work (PO9) moderately. Design and simulation studies help in project management (PO11) strongly and lifelong learning (PO12) moderately.
<b>191EEC211L.4</b>	The study of oscilloscopes and measurement using them attributes to moderate Engineering knowledge (PO1). It promotes complex problem investigation (PO4) weakly and team work (PO9) moderately. The usage of oscilloscope helps in project management (PO11) strongly and lifelong learning (PO12) moderately.



<b>191EEC211L 5</b>	The study of transients, attributes strongly to Engineering knowledge (PO1) and Problem analysis (PO2). It promotes design development (PO3) and complex problem investigation (PO4) weakly. Simulating transients promotes modern tool usage (PO5) effectively. It promotes engineer and society(PO6) relationship weakly. It promotes Environment and sustainability (PO7) weakly and individual and team work (PO9) moderately. Design and simulation studies helps in project management (PO11) strongly and lifelong learning (PO12) moderately.
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Course/Branch	: B.E/EEE		Total no. of hours given in syllabus:		
Subject Code	: 191GES211L		Lecture	:	60
Subject Title	: Engineering Practices Laboratory		Tutorials	:	
Year/Semester	: I/II		Practical	:	-
Faculty Name	: Mr.Joel / Dr.D.Fathema Farzana		TOTAL	:	60

### **COURSE OBJECTIVES:**

1. To provide exposure to the students with the concepts involved in product realization by carrying out manufacturing shop exercises. Hands-on practice with manufacturing shop exercises and assembly leading to realization of a new product in a group.

### **COURSE OUTCOMES:**

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

<b>CO1</b>	Fabricate carpentry components and pipe connections including plumbing works
<b>CO2</b>	Use welding equipments to join the structures
<b>CO3</b>	Carry out the basic machining operations
<b>CO4</b>	Make the models using sheet metal works
<b>CO5</b>	Carry out basic home electrical works and appliances and Measure the electrical quantities
<b>CO6</b>	Elaborate on the components, gates, soldering practices.
<b>CO7</b>	Troubleshoot plumbing, Welding, Electrical, and Electronics Problems.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>191GES211L.1</b>	3	-	3	-	-	-	-	-	3	-	-	-
<b>191GES211L.2</b>	3	-	3	-	-	-	-	-	3	-	-	-
<b>191GES211L.3</b>	3	-	3	-	-	-	-	-	3	-	-	-
<b>191GES211L.4</b>	3	-	3	-	-	-	-	-	3	-	-	-
<b>191GES211L.5</b>	3	1	2	1	-	1	1	1	2	1	1	1
<b>191GES211L.6</b>	3	1	2	1	1	1	1	1	2	1	1	1
<b>191GES211L.7</b>	3	1	2	1	-	1	1	1	2	1	1	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

	PSO1	PSO2	PSO3
<b>191GES211L.1</b>	-	-	-
<b>191GES211L.2</b>	-	-	-
<b>191GES211L.3</b>	-	-	-
<b>191GES211L.4</b>	-	-	-
<b>191GES211L.5</b>	1	1	-
<b>191GES211L.6</b>	1	1	-
<b>191GES211L.7</b>	1	1	-

**JUSTIFICATION OF THE MAPPING:**

<b>191GES211L.1</b>	Engineering knowledge (PO1) on carpentry and plumbing activities gained by the student through hands on experience in designing and fabricating (PO3) required components individually and with a team (PO9).
<b>191GES211L.2</b>	Engineering knowledge (PO1) on welding and metal joining is gained by the student through hands on experience in designing and fabricating (PO3)

	required components individually and with a team (PO9).
<b>191GES211L.3</b>	Engineering knowledge (PO1) on machining is gained by the student through hands on experience in designing and fabricating (PO3) required components individually and with a team (PO9).
<b>191GES211L.4</b>	Engineering knowledge (PO1) on sheet metal works is gained by the student through hands on experience in designing and fabricating (PO3) required components individually and with a team (PO9).
<b>191GES211L.5</b>	To get experience in wiring practice basics of engineering knowledge is required (PO1). By efficient wiring methods solutions to complex engineering problems can be obtained by analyzing the problem and conducting suitable investigations on it by applying the basic circuit laws (PO2) (PO3) (PO4) (PSO1). The innovative and novel wiring techniques with proper ethical standards will lead to development of new technologies that are sustainable (PO6) (PO7) (PO8) (PSO2). New techniques in wiring practice will lead to an economic and efficient project design (PO9)(PO10) (PO11). The art of measurement of electrical signals keeps evolving with the advent of new challenges and requirements of the industry (PO12).
<b>191GES211L.6</b>	To gain knowledge about basic electronic components a sufficient understanding of engineering knowledge is needed (PO1). Developing solutions to complex engineering problems involves analyzing the problem and conduct investigations on it by applying the basic characteristics and parameters of the electronic components (PO2) (PO3) (PO4) (PSO1). By simulating the designed electronics circuits using Simulink software, this highly attributes to the modern tool usage (PO5). The study of electronic components and its applications should lead to development of new technologies that are sustainable and useful to the society at large (PO6) (PO7)(PO8) (PSO2). New techniques in designing the electronics circuits will lead to an economic and efficient project design (PO9)(PO10) (PO11). The skill of developing miniature electronic circuits has been evolving with the advent of new challenges and requirements of the industry (PO12).
<b>191GES211L.7</b>	To troubleshoot the problems in electrical and electronics circuits basics of engineering knowledge are required (PO1). Solutions to complex engineering problems can be obtained by analyzing the problem and conducting suitable investigations on it by applying the basic circuit laws (PO2) (PO3) (PO4) (PSO1). The real-time and accurate techniques will lead to development of new technologies that paves way for a sustainable development in electrical design (PO6) (PO7) (PO8) (PSO2). Identifying and fixing the problems will lead to an economic and efficient project design (PO9) (PO10) (PO11). The ability to perform root cause analysis of the

	problem will aid in developing the ability to engage in independent and life-long learning in the broadest context of technological change (PO12).
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### III SEMESTER

Course/Branch	: B.E/EEE		Total no. of hours given in syllabus:		
Subject Code	: 191MAB301T		Lecture	:	60
Subject Title	: Transforms and Partial Differential Equations		Tutorials	:	
Year/Semester	: II/III		Practical	:	-
Faculty Name	: Mrs.Arulmozhi		TOTAL	:	60

<b>COURSE OBJECTIVES:</b>
1. To introduce the basic concepts of PDE for solving standard partial differential equations.
2. To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems.
3. To acquaint the student with Fourier series techniques in solving heat flow problems used in various situations.
4. To acquaint the student with Fourier transform techniques used in wide variety of situations.
5. To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
<b>CO1</b>	Understand how to solve the given standard partial differential equations.
<b>CO2</b>	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
<b>CO3</b>	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations
<b>CO4</b>	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering
<b>CO5</b>	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191MAB301T.1		3	2	-	-	-	-	-	1	-	-	1
191MAB301T.2	3	2	1	-	2	-	-	-	2	-	-	2
191MAB301T.3	3	2	3	2	2	-	-	-	2	-	-	-
191MAB301T.4	3	2	1	2	2	-	-	-	2	-	-	-
191MAB301T.5	3	2	1	2	2	-	-	-	2	-	-	-
191MAB301T.6	3	3	1	2	2	-	-	-	2	-	-	1
191MAB301T	3	3	3	2	2	-	-	-	2	1	-	2

**JUSTIFICATION OF THE MAPPING:**

<b>191MAB301T.1</b>	Formation and solution of Partial differential equation are used to apply to engineering fundamentals and an engineering specialization to the solution of the complex engineering problems (PO1). Partial differential equation is used to formulate and analyze engineering problems (PO2). Partial differential equation design the solutions for complex engineering problem (PO3). Formation and solution of Partial differential equations are used effectively in multi-disciplinary settings. (PO9) Partial differential equations have the preparation and ability to engage in independent and lifelong learning in engineering (PO12)
<b>191MAB301T.2</b>	Any periodic functions which can be represented as Fourier series are used to apply to engineering fundamentals and an engineering specialization to the solution of the complex engineering problems (PO1). Fourier series is used to formulate and analyze engineering problems (PO2). Fourier series design the solutions for complex engineering problem (PO3). Fourier series is used to create, select and apply appropriate techniques in engineering activities with understanding of the limitations (PO5). Fourier series are used effectively in multi-disciplinary settings. (PO9). Fourier Series has the preparation and ability to engage in independent and lifelong learning in engineering (PO12)
<b>191MAB301T.3</b>	One dimensional wave and heat equations and two dimensional heat equations are used to find the solution of the complex engineering problems (PO1). Heat and wave equations are used to formulate and analyze engineering problems (PO2). Heat and wave equations design the solutions for complex engineering problem (PO3). Solution of heat and wave equations used to provide valid conclusions to complex engineering problems (PO4) Heat and wave equations are used to create, select and apply appropriate techniques in engineering activities with understanding of the limitations (PO5). Wave and heat equations are used effectively in multi-disciplinary settings. (PO9). Wave and heat equations have the preparation and ability to engage in independent and lifelong learning in engineering (PO12)
<b>191MAB301T.4</b>	Fourier transform is used in engineering specialization to the solution of the engineering problems (PO1). Fourier Transform is used to formulate and

	analyze engineering problems(PO2). Fourier Transform design the solutions for complex engineering problem(PO3). Fourier transform is used to provide valid conclusions to complex engineering problems(PO4) Fourier transform is used to create, select and apply appropriate techniques in engineering activities with understanding of the limitations(PO5). Fourier transform is used effectively in multi disciplinary settings.(PO9).Fourier transform has the preparation and ability to engage in independent and lifelong learning in engineering(PO12)
<b>191MAB301T.5</b>	Z transform is used in engineering specialization to the solution of the engineering problems(PO1). Z transform is used to formulate and analyze engineering problems(PO2). Z transform design the solutions for complex engineering problem(PO3). Z transform is used to provide valid conclusions to complex engineering problems (PO4) Z transform is used to create, select and apply appropriate techniques in engineering activities with understanding of the limitations (PO5). Z transform is used effectively in multi-disciplinary settings.(PO9). Z transform have the preparation and ability to engage in independent and lifelong learning in engineering(PO12)

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EES301T	Lecture	:	45
Subject Title	: Electronic Devices and Circuits	Tutorials	:	-
Year/Semester	: II/III	Practical	:	-
Faculty Name	: Dr.K.V.Thilagar/P.Pusphakarthick	TOTAL	:	45

### COURSE OBJECTIVES:

1. To understand the structure of basic electronic devices.
- 2 .To be exposed to active and passive circuit elements.
3. To familiarize the operation and applications of transistor like BJT and FET.
- 4 .To explore the characteristics of amplifier gain and frequency response.
- 5 .To learn the required functionality of positive and negative feedback systems.

### COURSE OUTCOMES:

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

<b>CO1</b>	know the fundamental concepts of PN junction diode and Zener diode and its application.
<b>CO2</b>	know the fundamental concepts of different types of transistors and can design biasing circuits.
<b>CO3</b>	understand how BJT & MOSFET can be used for Current & Voltage Amplification.

<b>CO4</b>	understand the working of differential amplifier and different types of power amplifiers.
<b>CO5</b>	understand different types of feedback amplifiers and oscillators
<b>CO6</b>	understand the working of semiconductor devices and able to design the rectifiers, oscillators ,Amplifiers

#### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

<b>191EES301T</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
191EES301T.1	3	1	3	-	-	-	-	-	1	-	-	2
191EES301T.2	2	3	-	-	-	-	-	-	1	-	-	2
191EES301T.3	2	2	1	-	-	-	-	-	1	-	-	2
191EES301T.4	2	2	1	-	-	1	1	-	1	-	-	1
191EES301T.5	2	2	1	-	-	1	1	-	1	-	-	1
<b>191EES301T</b>	3	3	3	-	-	1	1	-	1	-	-	2

#### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
191EES301T.1	3	3	2
191EES301T.2	3	3	2
191EES301T.3	3	3	2
191EES301T.4	3	3	2
191EES301T.5	3	2	3
<b>191EES301T</b>	3	3	2

#### JUSTIFICATION OF THE MAPPING:

<b>191EES301T.1</b>	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 reliability of electrical systems .(PSO2)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 reliability of electrical systems .(PSO2)Understanding semiconductor physics is the basic criteria needed to design any electronic system(PSO1), A
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	good knowledge about basic semi conductors will help a candidate in his/her higher studies and research(PSO3,4)
<b>191EES301T.2</b>	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 Field effect devices and thyristors are the major components used in process industries(PSO1), FET's and thyristors are the basic building blocks of analog and digital systems(PSO2),A good knowledge about thyristors will help a candidate to excel in the field of electrical engineering, Industrial automation etc(PSO3,4)
<b>191EES301T.3</b>	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. Amplifiers are the major components which is used strengthen deteriorated signals in process industries(PSO1), A good knowledge in amplifier circuitry will help a candidate to design digital and analog systems(PSO2), A good knowledge about amplifiers will help in design amplifiers(PSO3,4)
<b>191EES301T.4</b>	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). Feedback principles are the indispensable part of measurement and control systems(PSO1), A good knowledge in feedback principles will help a candidate to design digital and analog systems(PSO2), A good knowledge about feedback amplifiers and oscillators will help a candidate for design electronics industryPSO3,4)
<b>191EES301T.5</b>	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). 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). Pulse shaping circuits and voltage regulators are major components of a process industry(PSO1), A good knowledge in voltage regulator design will help a candidate to design digital and analog systems(PSO2), A good knowledge about pulse shaping and voltage regulators will help a candidate to excel in the field of Electrical Engineering(PSO4)
<b>191EES301T.6</b>	It promotes individual and team work (PO9) weakly and lifelong learning (PO12). 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). Pulse shaping circuits and voltage regulators are major components of a process industry(PSO1), A good knowledge in voltage regulator design will help a candidate to design digital and analog systems(PSO2), A good knowledge about pulse shaping and voltage regulators will help a candidate to excel in the field of Electrical Engineering(PSO4)A good knowledge about basic semi conductors will help a candidate in his/her higher studies and research(PSO3,4)
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Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEEC301T	Lecture	:	45
Subject Title	: Electromagnetic theory	Tutorials	:	-
Year/Semester	: II/ III	Practical	:	-
Faculty Name	: Mrs.J.Lydia & Mrs.N.Priya	TOTAL	:	45

### 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..

<b>CO1</b>	To analyze the various coordinate systems and to analyze the application of Coulomb's and Gauss's law.
<b>CO2</b>	To discriminate the symmetrical and unsymmetrical nature of the problem and the ability to solve the problems based on boundary conditions in electric field.
<b>CO3</b>	To discriminate the symmetrical and unsymmetrical nature of the problem and the ability to solve the problems based on boundary conditions in magnetic field.
<b>CO4</b>	To apply the Maxwell's equation relating to the electric and magnetic fields and the applications in the machines.
<b>CO5</b>	To analyze the characteristics of radio waves, TVsignals, radar beams and light rays.
<b>CO6</b>	To apply basic science, circuit theory and Electro-magnetic field theory to electrical engineering problems.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEC301T.1	3	3	2	2	1	1	-	-	1	-	1	-
191EEC301T.2	3	3	2	2	2	-	1	-	1	-	1	1
191EEC301T.3	3	3	2	2	2	-	1	-	1	-	1	1
191EEC301T.4	3	2	2	2	2	-	-	-	1	-	2	-
191EEC301T.5	2	3	2	2	1	1	1	-	1	-	2	-
191EEC301T.6	3	3	2	2	2	1	-	-	1	-	1	-
191EEC301T	3	3	2	2	2	1	1	-	1	-	2	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191EEC301T.1	3	-	-
191EEC301T.2	3	-	-
191EEC301T.3	3	-	-
191EEC301T.4	-	-	1
191EEC301T.5	3	-	-
191EEC301T.6	3	-	-
191EEC301T	3	-	1

**JUSTIFICATION OF THE MAPPING:**

<b>191EEC301T.1</b>	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).
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<b>191EEC301T.2</b>	<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 &amp; 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>
<b>191EEC301T.3</b>	<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 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 &amp; technical skills to model, simulate and analyze electrical components and systems (PSO1) like analysis of the magneto static fields.</p>
<b>191EEC301T.4</b>	<p>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.</p>
<b>191EEC301T.5</b>	<p>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 &amp; technical skills to model, simulate and analyze electrical components and systems and used to derive the characteristics of uniform plane waves (PSO1).</p>

<b>191EEEC301T.6</b>	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).
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Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:60		
Subject Code	: 191EEEC302T	Lecture	:	30
Subject Title	: Digital Logic Circuits	Tutorials	:	30
Year/Semester	: II/III	Practical	:	-
Faculty Name	: Dr.P.MARISH KUMAR	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..

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

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

<b>191EEC302T Digital Logic Circuits</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
191EEC302T.1	1	1	-	-	-	-	-	-	-	-	-	-
191EEC302T.2	3	3	2	2	-	-	-	-	-	-	-	-
191EEC302T.3	1	-	-	1	-	-	-	-	-	-	-	-
191EEC302T.4	2	1	1	2	-	1	2	-	-	-	-	-
191EEC302T.5	2	1	1	-	-	-	-	-	-	-	-	-
191EEC302T.6	1	-	-	1	3	-	-	-	1	-	2	1
191EEC302T	3	3	2	2	3	1	2	-	1	-	2	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

<b>191EEC302T Digital Logic Circuits</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
191EEC302T.1	1	-	-
191EEC302T.2	1	1	-
191EEC302T.3	-	1	-
191EEC302T.4	3	1	-
191EEC302T.5	-	1	-
191EEC302T.6	3	1	-
191EEC302T	3	1	-

**JUSTIFICATION OF THE MAPPING:**

191EEC302T.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).
191EEC302T.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).
191EEC302T.3	By understanding the working of different flipflops it features weakly with analyzing the electrical components (PSO1).
191EEC302T.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).
191EEC302T.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).
191EEEC302T.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	: 191EEEC303T	Lecture	:	45
Subject Title	: Linear Integrated Circuits	Tutorials	:	-
Year/Semester	: II/III	Practical	:	-
Faculty Name	: Ms.B.Ponkarthika	TOTAL	:	45

### COURSE OBJECTIVES:

- 1.To study the IC fabrication procedure.
- 2.To study characteristics; realize circuits; design for signal analysis using Op-amp ICs.
- 3.To study the different applications of Op-amp and to design circuits.
- 4.To impart adequate knowledge about the internal functional blocks and the applications of timers, VCO, PLL Multiplier ICs.
- 5.To study the various applications of ICs like regulator, SMPS.

### COURSE OUTCOMES:

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

<b>CO1</b>	To analyze the monolithic IC technology and fabrication of ICs procedure.
<b>CO2</b>	To analyze the characteristics, realize circuits and to design for signal analysis Using Op-amp ICs.
<b>CO3</b>	To apply the concept of linear and non-linear applications of operational amplifiers and the design of filters using ICs.
<b>CO4</b>	To design the A/D & D/A converters using ICs and working of timer IC.
<b>CO5</b>	To analyze the working of Phase Locked Loops and to study internal functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits, ADCs.
<b>CO6</b>	To apply the concept of regulators and special functions ICs.

### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEEC303T.1	3	2	2	-	-	2	-	-	1	1	-	-

191EEC303T.2	3	3	2	2	-	1	1	-	1	-	-	-
191EEC303T.3	3	3	2	2	2	1	1	-	1	-	2	-
191EEC303T.4	3	3	2	2	2	1	1	-	1	-	1	-
191EEC303T.5	3	3	2	2	1	1	1	-	1	-	2	-
191EEC303T.6	3	3	2	2	2	-	1	-	1	-	2	-
<b>191EEC303T</b>	3	3	2	2	2	2	1	-	1	1	2	-

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO /PSO	PSO1	PSO2	PSO3
191EEC303T.1	1	2	-
191EEC303T.2	1	1	-
191EEC303T.3	1	1	1
191EEC303T.4	2	2	-
191EEC303T.5	2	1	-
191EEC303T.6	2	1	-
<b>191EEC303T</b>	2	2	1

**JUSTIFICATION OF THE MAPPING:**

<b>191EEC303T.1</b>	By gaining the knowledge of fabrication process, it attributes to strong Engineering knowledge (PO1). It results in medium problem solving skill (PO2), design and development of solution (PO3). 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 for communication (PO10) weakly. Incorporate the basics of monolithic IC fabrication process (PSO1) weakly and contributes for the integration of electronics for reliability of the system. (PSO2) moderately.
<b>191EEC303T.2</b>	By analyzing the performance and characteristics of the circuit, it features to Engineering knowledge (PO1); This will help in problem solving (PO2) strongly, design and development of solution (PO3) and in investigation of complex problem moderately. (PO4). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It promotes individual and team work (PO9) weakly. Usage of technical skill to design and analyze the characteristics of the circuits (PSO1).This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems. (PSO2) weakly.
<b>191EEC303T.3</b>	By applying the concepts of linear and non-linear applications of operational amplifiers and the design of filters using ICs for solving

	<p>engineering problems. It attributes to strong Engineering knowledge (PO1) and promotes problem solving (PO2), design and development of solution (PO3) and in investigation of complex problem moderately. (PO4). Construct use of and select moderately the tool for designing the filter (PO5). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It promotes individual and team work (PO9) weakly. It helps in managing the projects (PO11) effectively. Usage of logical &amp; 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) and helps in designing of smart grid (PSO3) weakly.</p>
<p><b>191EEC303T.4</b></p>	<p>By developing the A/D &amp; D/A converters using ICs for Engineering knowledge. It attributes to strong Engineering knowledge (PO1) and promotes problem solving (PO2), design and development of solution (PO3) and in investigation of complex problem moderately. (PO4). Construct use of and select moderately the tool for designing the converter circuits (PO5). It promotes engineer society relation (PO6), helps in environment and sustainability (PO7). It promotes individual and team work (PO9) weakly. It helps in managing the projects (PO11) weakly. Moderate Usage of logical &amp; 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>
<p><b>191EEC303T.5</b></p>	<p>By analyzing the operation of PLL circuit and functional blocks, Engineering knowledge (PO1) is developed. It attributes to strong Engineering knowledge (PO1) and promotes problem solving (PO2), design and development of solution (PO3) and in investigation of complex problem moderately. (PO4). Construct use of and select the tool for operation of PLL and control circuit (PO5) and it promotes engineer society relation (PO6), helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) weakly. It helps in managing the projects (PO11) moderately. Strong Usage of logical &amp; 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) weakly.</p>
<p><b>191EEC303T.6</b></p>	<p>To strongly apply the concepts of regulators and special functions ICs for engineering knowledge. It attributes to strong Engineering knowledge (PO1) and promotes problem solving (PO2), design and development of solution (PO3) and in investigation of complex problem moderately. (PO4). Construct use of and select the tool for designing the control circuits (PO5) and it promotes engineer society relation (PO6) effectively and it helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) weakly and lifelong learning (PO12) effectively. Moderate Usage of logical &amp; 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) weakly.</p>



Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EES311L	Lecture	:	60
Subject Title	: Electronic Devices and Circuits Laboratory	Tutorials	:	-
Year/Semester	: II/III	Practical	:	-
Faculty Name	: D.Chandrakala & K.A.Indu Sailaja	TOTAL	:	60

### COURSE OBJECTIVES:

1. To study experimentally the characteristics of diodes, BJT's and FET's.
2. To verify practically the response of various special purpose electron devices.
3. To impart knowledge practically on the working principles of rectifiers.
4. To understand the application of different electronic devices and simple circuits.
5. To realize different types of passive filters

### COURSE OUTCOMES:

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

<b>CO1</b>	To apply the concept of operation of PN Junction Diode and Zener diode.
<b>CO2</b>	To analyze and design the various types of rectifier circuits
<b>CO3</b>	To apply the concept of operation of various Transistors.
<b>CO4</b>	To analyze and design the various amplifier circuits using BJT and FET.
<b>CO5</b>	To analyze and design the various oscillator circuits using BJT and UJT.
<b>CO6</b>	To analyze the response of various types of passive filters.

### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EES311L .1	3	2	3	2	3	-	-	-	1	1	1	1
191EES311L .2	2	2	2	2	3	-	-	-	1	1	1	1
191EES311L .3	3	3	3	3	3	-	-	-	2	2	1	2
191EES311L .4	3	3	3	3	3	-	-	-	2	2	1	2
191EES311L .5	3	3	3	3	3	-	-	-	2	2	1	2
191EES311L .6	3	2	3	3	3	-	-	-	2	2	1	2
191EES311L	3	3	3	3	3	-	-	-	2	2	1	2

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191EES311L .1	-	-	-
191EES311L .2	-	-	-
191EES311L .3	2	1	-
191EES311L .4	2	1	-
191EES311L .5	2	1	-
191EES311L .6	2	1	-
191EES311L	2	1	-

**JUSTIFICATION OF THE MAPPING:**

<b>191EES311L .1</b>	By using the basic equipments, Students will be able to learn engineering fundamentals which maps weakly with PO1. Students can analyze complex engineering problems which improves his/her problem analysing skills which maps moderately with PO2. It results in strong design development (PO3). Investigation Of Complex Problems can be done using basic equipments which attributes to PO4. Students can able to model the circuits using modern engineering tools strongly (PO5). It promotes individual and team work (PO9) and Communication (PO10) effectively. Students can implement their knowledge in engineering and for lifelong learning (PO11) and (PO12).
<b>191EES311L .2</b>	By applying concept of diodes, Students will have adequate knowledge to solve engineering problems which maps moderately with (PO1). Students can analyze complex engineering problems which improves his/her problem analysing skills which maps moderately with (PO2). It results in moderate design development (PO3). Investigation of complex problems can be done using basic laws to some extent which attributes to moderate (PO4). Students can able to model the circuits using modern engineering tools (PO5). It promotes individual and team work (PO9) and Communication (PO10) effectively. Students can implement their knowledge in engineering and for lifelong learning (PO11) and (PO12).
<b>191EES311L .3</b>	By designing the basic electronic circuits, Students will have adequate knowledge to solve engineering problems which maps to some extent with (PO1). Students can analyze complex engineering problems which improves his/her problem analysing skills which maps to some extent with (PO2). It results in design development (PO3). Investigation of complex problems can be done using basic laws to some extent which attributes to strong (PO4). Students can able to model the circuits using modern engineering tools (PO5). It promotes individual and team work (PO9) and Communication (PO10) effectively. Students can implement their knowledge in engineering and for lifelong learning (PO11) and (PO12). This contributes to model, simulate and analyse electrical components and systems (PSO1) and to integrate the knowledge of fundamental electronics,

	power electronics and embedded systems (PSO2).
<b>191EES311L .4</b>	By analyzing and designing rectifier circuits, Students will have adequate knowledge to solve engineering problems which maps strongly with (PO1). Students can analyze complex engineering problems which improves his/her problem analysing skills which maps strongly with (PO2). It results in strong design development (PO3). Investigation of complex problems can be done using basic laws to some extent which attributes to strong (PO4). Students can able to model the circuits using modern engineering tools effectively (PO5). It promotes individual and team work (PO9) and Communication (PO10) effectively. Students can implement their knowledge in engineering and for lifelong learning (PO11) and (PO12). This contributes to model, simulate and analyse electrical components and systems (PSO1) and to integrate the knowledge of fundamental electronics, power electronics and embedded systems (PSO2).
<b>191EES311L .5</b>	By designing amplifier and filter circuits, Students will have adequate knowledge to solve engineering problems which maps strongly with (PO1). Students can analyze complex engineering problems which improves his/her problem analysing skills which maps strongly with (PO2). It results in strong design development (PO3). Investigation of complex problems can be done using basic laws to some extent which attributes to strong (PO4). Students can able to model the circuits using modern engineering tools (PO5). It promotes individual and team work (PO9) and Communication (PO10) effectively. Students can implement their knowledge in engineering and for lifelong learning (PO11) and (PO12). This contributes to model, simulate and analyse electrical components and systems (PSO1) and to integrate the knowledge of fundamental electronics, power electronics and embedded systems (PSO2).
<b>191EES311L .6</b>	By designing oscillator circuits, Students will have adequate knowledge to solve engineering problems which maps to some extent with (PO1). Students can analyze complex engineering problems which improves his/her problem analysing skills which maps to some extent with (PO2). It results in design development (PO3). Investigation of complex problems can be done using basic laws to some extent which attributes to strong (PO4). Students can able to model the circuits using modern engineering tools (PO5). It promotes individual and team work (PO9) and Communication (PO10) effectively. Students can implement their knowledge in engineering and for lifelong learning (PO11) and (PO12). This contributes to model, simulate and analyse electrical components and systems (PSO1) and to integrate the knowledge of fundamental electronics, power electronics and embedded systems (PSO2).

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEEC311L	Lecture	:	-
Subject Title	: Linear and Digital Integrated Circuits Laboratory	Tutorials	:	-
Year/Semester	: II/III	Practical	:	45
Faculty Name	: Ms.B.PonKarthika & Mr. G.Vignesh	TOTAL	:	45

**COURSE OBJECTIVES:**

1.To learn design, testing and characterizing of circuit behavior with digital and analog ICs.

**COURSE OUTCOMES:**

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

CO1	Understand and implement Boolean Functions.
CO2	Understand the importance of code conversion.
CO3	Design and implement 4-bit shift registers
CO4	Acquire knowledge on Application of Op-Amp and timer IC.
CO5	Design and implement counters using specific counter IC.
CO6	Understand the concepts of Variability Voltage Regulator and Voltage to frequency converter.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEEC311L.1	3	2	2	2	2	1	1	-	2	1	-	-
191EEEC311L.2	3	3	3	2	2	1	1	-	2	-	-	-
191EEEC311L.3	3	3	3	2	2	1	1	-	2	-	1	-
191EEEC311L.4	3	3	3	2	2	1	1	-	2	-	1	-
191EEEC311L.5	3	3	3	2	2	1	1	-	2	-	1	-
191EEEC311L.6	3	3	3	2	2	1	1	-	2	-	1	-
191EEEC311L	3	3	3	2	2	1	1	-	2	1	1	-

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191EEEC311L.1	1	2	-
191EEEC311L.2	1	1	-

191EEC311L.3	1	1	-
191EEC311L.4	2	1	-
191EEC311L.5	2	1	-

**JUSTIFICATION OF THE MAPPING:**

<b>191EEC311L.1</b>	By analyzing the linear and digital electronic circuits, it attributes to strong Engineering knowledge (PO1), as the student will gain knowledge about implementation of various functions and circuits. It helps in problem solving (PO2) of coordinate systems, design and development of solution (PO3) and in investigation of complex problem (PO4) it attributes moderately. Analyzing the various functions and circuits, helps in learning the commercial software (PO5) moderately. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) moderately and helps for communication (PO10) weakly. It has weakly usage of logical & technical skills to model, simulate and analyze electrical components and systems by analyzing various circuits and its functions (PSO1) and contributes for the integration of electronics for reliability of the system (PSO2) effectively.
<b>191EEC311L.2</b>	By applying the number system concepts and to simplify the logical expressions using Boolean functions, it features to Engineering knowledge (PO1); This will help in problem solving (PO2), design and development of solution (PO3) strongly and in investigation of complex problem moderately. (PO4). Analyzing the logical expression and implementation, it helps in learning the commercial software (PO5) moderately. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) moderately. Usage of technical skill to design and analyze the characteristics of the circuits (PSO1). This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2) weakly.
<b>191EEC311L.3</b>	By analyzing and implementation of the combinational circuits, it features to Engineering knowledge (PO1); This will help in problem solving (PO2), design and development of solution (PO3) strongly and in investigation of complex problem moderately. (PO4). Analyzing and implementation of the circuits, it helps in learning the commercial software (PO5) moderately. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) moderately and helps for Project and management (PO11) weakly. Usage of technical skill to analyze and implement the combinational circuits (PSO1). This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2) weakly.

<b>191EEC311L.4</b>	By designing the various synchronous and asynchronous circuits, it features to Engineering knowledge (PO1); This will help in problem solving (PO2), design and development of solution (PO3) strongly and in investigation of complex problem moderately. (PO4). Analyzing and implementation of the circuits, it helps in learning the commercial software (PO5) moderately. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) moderately and helps for Project and management (PO11) weakly. Moderate Usage of technical skill to design and implement the synchronous and asynchronous circuits (PSO1).This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2) weakly.
<b>191EEC311L.5</b>	By developing and designing the linear and non-linear applications of operational amplifiers, it features to Engineering knowledge (PO1); This will help in problem solving (PO2), design and development of solution (PO3) strongly and in investigation of complex problem moderately. (PO4). For designing the filter circuit, it helps in learning the commercial software (PO5) moderately. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) moderately and helps for Project and management (PO11) weakly. Strong Usage of technical skill to develop and design the applications of op-amp (PSO1).This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems (PSO2) weakly.
<b>191EEC311L.6</b>	By applying the concept of internal functional blocks and the applications of special ICs, it features to Engineering knowledge (PO1); This will help in problem solving (PO2), design and development of solution (PO3) strongly and in investigation of complex problem moderately. (PO4). Analyzing the functions and applications, it helps in learning the commercial software (PO5) moderately. It promotes engineer society relation (PO6) by connecting engineering concepts and practical applications to real world challenges and helps in environment and sustainability (PO7) weakly. It promotes individual and team work (PO9) moderately and helps for Project and management (PO11) weakly. Strong Usage of technical skill to develop and applying the concept of special ICs (PSO1).This contributes for the integration of electronics for controllability, sustainability and reliability of electrical systems. (PSO2) and also contribute to the growing smart grid attributing weakly (PSO3).



191MAB402T.3	3	3	2	3	1	2	-	-	-	-	-	1
191MAB402T.4	3	3	3	2	2	1	2	-	-	-	-	1
191MAB402T.5	3	3	3	3	2	2	1	-	-	-	-	2
191MAB402T.6	3	3	3	2	2	2	1	-	-	-	-	1
191MAB402T	3	3	3	2	2	2	1	-	-	-	1	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191MAB402T.1	3	3	1
191MAB402T.2	3	3	2
191MAB402T.3	1	2	3
191MAB402T.4	3	3	2
191MAB402T.5	3	3	2
191MAB402T.6	3	3	2
191MAB402T	3	3	2

**JUSTIFICATION OF THE MAPPING:**

<b>191MAB402T.1</b>	Solutions of algebraic equations and transcendental equations concept is useful to find the solution of complex engineering problems (PO 1). This method helps to analyze (PO 2) the complex engineering problems. It gives solutions for the complex engineering problems to meet the specified needs of environmental considerations (PO 3). This method helps to interpret the data to give valid conclusion (PO 4). Power method concept models, the complex engineering problems with understanding the limitations (PO5). The concept related to matrix applied in the professional engineering practices (PO6). It is also useful in societal and environmental context (PO7). The matrix concept is very much useful in the technological change (PO12).
<b>191MAB402T.2</b>	Interpolation data is applied to find the solution of the complex engineering problems (PO1). The cubic spline concept helps to get at the conclusion of the complex engineering problems (PO2). Interpolation formula designs the specified needs with appropriate consideration for the societal and the environmental considerations (PO3). Interpretation of data using this interpolation formula provides valid conclusions (PO4). This technique is used in modeling complex engineering activities with understanding of the limitations (PO5). Formula relevant to numerical data are applied to professional engineering practices (PO6). Interpolating the data is applied in the broadest context of technological change (PO12).
<b>191MAB402T.3</b>	Numerical differentiation and integration are applied to find the solution of complex engineering problems (PO1) It helps to analyze complex



	<p>engineering problems (PO2). Numerical differentiations design the solutions for complex engineering problems relevant to public health, safety and environmental consideration (PO3). Numerical integration interprets the data to provide valid conclusions (PO4). With understanding of the limitations, we apply the numerical integration techniques for modeling complex engineering activities (PO5). We can give reasoning to assess societal issues relevant to professional engineering practices (PO6) using this knowledge. This concept is useful in technological change (PO12).</p>
<b>191MAB402T.4</b>	<p>Single step and multi methods with boundary conditions are applied to find the solution of complex engineering problems (PO1), helps to analyze complex engineering problems (PO2) and designs the solutions with appropriate considerations for environmental considerations (PO3). Single step method gives valid conclusions (PO4). Multi step method predicts complex engineering activities with understanding of the limitations (PO5). Multi step method's predictor and corrector formula helps to asses' cultural issues and consequent responsibility relevant to professional engineering practices (PO6). This concept helps for sustainable development (PO7). It is very useful in broadest context of technological change (PO12).</p>
<b>191MAB402T.5</b>	<p>Solutions of PDE in numerical data help to find the solution of the complex engineering problems (PO1). The second order PDE analyzes complex engineering problems and gives sustained conclusion (PO2). This model designs the solutions for complex engineering problem with appropriate considerations for the environmental considerations (PO3). Second order PDE solutions provide valid conclusion after interpretation the data (PO4). This technique predicts the modern engineering activities with understanding of the limitations (PO5). This knowledge of PDE in numerical data helps to assess societal safety and consequent responsibility relevant to professional engineering practices (PO6). This model understands the impact of professional engineering solution in environmental context (PO7). This structure has the ability in lifelong learning in broad technological change (PO12).</p>
<b>191MAB402T.6</b>	<p>Finding solutions for algebraic equations and transcendental equations gives solutions of the complex engineering problems. The matrix concept gives sustained conclusion. Solutions of numerical data design the solution for complex engineering problems. Interpretation of data using numerical integration and differentiation provide valid conclusion. Single step method and multi step method with boundary conditions predict the complex engineering activity. Boundary value problems help to assess safety issues, relevant to professional engineering practices. Interpolation concept informs impact of professional engineering solution in environmental for sustainable development. Numerical data helps to recognize the need for and have the preparation and ability to engage in lifelong learning in the technological change.</p>

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	: 191EEC401T	Lecture	: 45
Subject Title	: Measurement and Instrumentation	Tutorials	: -
Year/Semester	: II/IV	Practical	: -
Faculty Name	: Dr.Fatheema farzana & Mrs.Chandrakala	TOTAL	: 45

### COURSE OBJECTIVES:

To impart knowledge on the following Topics

- 1.Fundamentals of electrical and electronic instruments
2. Comparison between various measurement techniques
3. Various storage and display devices
- 4.Various transducers and the data acquisition systems
- 5,Virtual instruments

### COURSE OUTCOMES:

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

<b>CO1</b>	Students will be able to analyze the characteristics of instruments, evaluate the errors for the measurement data and comprehend the working principle of meters.
<b>CO2</b>	Students will be able to distinguish the construction of various types of meters, working of instrument transformers and their characteristics
<b>CO3</b>	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
<b>CO4</b>	Students will be able to handle the various storage and display devices in the practical environment
<b>CO5</b>	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
191EEC401T .1	2	1	2	1	-	1	2	-	-	-	1	1
191EEC401T .2	2	2	2	2	1	-	2	-	1	-	1	2
191EEC401T .3	3	2	2	2	1	-	1	-	1	-	2	1
191EEC401T .4	2	2	2	2	-	-	2	-	-	-	2	1
191EEC401T .5	2	2	2	2	1	1	2	-	1	-	2	2
191EEC401T	3	2	2	2	1	1	2	-	1	-	2	2

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191EEC401T .1	1	-	2
191EEC401T .2	1	-	2
191EEC401T .3	2	1	2
191EEC401T .4	1	1	1
191EEC401T .5	2	1	2
191EEC401T	<b>2</b>	<b>1</b>	<b>2</b>

**JUSTIFICATION OF THE MAPPING:**

<b>191EEC401T.1</b>	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) and Life-long learning (PO12) .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).
<b>191EEC401T.2</b>	By interpreting the knowledge of construction of various types of meters, it attributes to medium Engineering knowledge (PO1). By analyzing different types of wattmeters and energy 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. Introduction to smart meters helps to promote weakly modern tool usage (PO5) The knowledge of various meters leads to environment and sustainability moderately (PO7). It promotes individual and team work (PO9) and project management (PO11) weakly and and Life-long learning (PO12) moderlately.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).
<b>191EEC401T.3</b>	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) moderately and Life-long learning (PO12)

	weakly.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).
<b>191EEC401T.4</b>	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) and Life-long learning (PO12) weakly.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.
<b>191EEC401T.5</b>	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) and Life-long learning (PO12). 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/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEC402T	Lecture	:	45
Subject Title	: Electrical Machines - I	Tutorials	:	15
Year/Semester	: II/ IV	Practical	:	-
Faculty Name	: Dr. K. V. Thilagar Mrs.N.Priya	TOTAL	:	60

### **COURSE OBJECTIVES:**

1 Introduction of magnetic materials and magnetic-circuit analysis.

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, and DC motors to study the characteristics, types and speed control.

5 Various health monitoring of machines and to study the different computer aided design of transformer.

### **COURSE OUTCOMES:**

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

<b>CO1</b>	Analyze the magnetic-circuits
<b>CO2</b>	Acquire the knowledge in constructional details of transformers.
<b>CO3</b>	Gain knowledge of concepts of electromechanical energy conversion process.
<b>CO4</b>	Acquire the knowledge in working principles of DC Generator.
<b>CO5</b>	Acquire the knowledge in working principles of DC Motor.
<b>CO6</b>	Acquire the knowledge in various losses taking place in D.C. Machines
<b>CO7</b>	Acquire knowledge in various health monitoring of machines and computer aided design

### **MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

<b>CO/PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
191EEC402T.1	3	1	1	1	-	2	2	-	-	-	1	-
191EEC402T.2	3	1	1	1	-	2	2	-	-	-	1	-
191EEC402T.3	3	2	2	2	-	2	2	-	-	-	2	1
191EEC402T.4	3	2	2	2	-	2	2	-	-	-	2	1
191EEC402T.5	3	2	2	2	-	2	2	-	-	-	2	1
191EEC402T.6	3	2	2	2	-	2	2	-	-	-	2	1
191EEC402T.7	3	2	2	2	-	2	2	-	-	-	2	1
191EEC402T	3	2	2	2	-	2	2	-	-	-	2	1

### **MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
191EEC402T.1	1	1	1
191EEC402T.2	1	1	1
191EEC402T.3	1	1	1

191EEC402T.4	1	1	1
191EEC402T.5	1	1	1
191EEC402T.6	1	1	1
191EEC402T.7	1	1	1
191EEC402T	1	1	1

<b>JUSTIFICATION OF THE MAPPING:</b>	
<b>191EEC402T.1</b>	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 .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).
<b>191EEC402T.2</b>	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).
<b>191EEC402T.3</b>	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

	<p>his engineering knowledge to formulate new ideas, design transformers that meet specified needs, analyze and interpret data attributing strongly to (PO1) and 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 be able to model new designs and also contribute to the growing smart grid attributing weakly to (PSO1), (PSO2) and (PSO3).</p>
<p><b>191EEC402T.4</b></p>	<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 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 data 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>
<p><b>191EEC402T.5</b></p>	<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 data attributing</p>

	<p>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 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).</p>
<p><b>191EEC402T.6</b></p>	<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 (PO1) and moderately with (PO2), (PO3), (PO4), (PO6) and (PO7). Having understood the different 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 shoot 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>
<p><b>191EEC402T.7</b></p>	<p>Monitoring the health of the machine enhances the knowledge of the students to identify formulate, review research literature, and analyze complex engineering problems and reaching sustained conclusion using the principle of mathematics , natural sciences and engineering sciences, IoT development, Computer aided design of electrical machines and Optimization technique leading to modern tool usage in applying ethical principles and commit to professional ethics and responsibilities and norms of engineering practices to design system components that meet the specified needs with appropriate considerations and to recognize the need for and have the preparation and ability to engage in independent and life long learning in the broadest context of technological change attributing strongly to PO1, moderately to PO2,PO3,PO4,PO6, PO7 and PO11, moderately to PO12. Having a thorough knowledge of the above, the students will be able to contribute the development of smart grid attributing moderately with (PSO1), (PSO2) and (PSO3).</p>



Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEC403T	Lecture	:	45
Subject Title	: Transmission and Distribution	Tutorials	:	-
Year/Semester	: II/IV	Practical	:	-
Faculty Name	: Dr.Mala & Ms.B.PonKarthika	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 to determine voltage regulation and efficiency.
- 3 To understand the mechanical design of transmission lines and to analyze the voltage distribution in insulator strings to improve the efficiency.
- 4 To study the types, construction and grading of cables.
- 5 To study about distribution systems, types of substations, methods of grounding, EHVAC, HVDC and FACTS.

### COURSE OUTCOMES:

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

CO1	Understand the importance and the functioning of transmission line parameters.
CO2	Acquire knowledge on the performance of Transmission lines.
CO3	Understand the concepts of Lines and Insulators.
CO4	Acquire knowledge on Underground Cables
CO5	Understand the importance of distribution of the electric power in power system.
CO6	Become familiar with the function of different components used in Transmission and Distribution levels of power system and modelling of these components.

### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEC403T.1	2	3	2	2	2	1	-	-	-	-	-	1
191EEC403T.2	2	3	2	1	2	1	2	-	-	-	-	1
191EEC403T.3	2	3	3	1	-	2	1	-	-	-	-	1
191EEC403T.4	2	2	2	1	-	2	2	-	-	-	-	1
191EEC403T.5	2	2	2	1	-	2	2	-	-	-	-	1
191EEC403T.6	2	2	3	2	1	1	2	-	-	-	-	1
191EEC403T	2	3	3	2	2	2	2	-	-	-	-	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/PSO	PSO1	PSO2	PSO3
191EEC403T.1	3	2	-
191EEC403T.2	1	-	2
191EEC403T.3	2	-	2
191EEC403T.4	2	-	2
191EEC403T.5	2	-	2
191EEC403T.6	1	2	2
191EEC403T	<b>3</b>	<b>2</b>	<b>3</b>

**JUSTIFICATION OF THE MAPPING:**

<b>191EEC403T.1</b>	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 apply research based knowledge of compensation devices (PO4); So societal and safety issues could be analyzed (PO6); 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).
<b>191EEC403T.2</b>	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 apply research based knowledge of compensation devices (PO4); Could use modern tools to solve equivalent circuit (PO5); So societal and safety issues could be analyzed (PO6); Engineering solution in societal context could be given (PO7); They will 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).
<b>191EEC403T.3</b>	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); Could apply research based knowledge of compensation devices (PO4); 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).
<b>191EEC403T.4</b>	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 research based knowledge of compensation devices (PO4); 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).
<b>191EEC403T.5</b>	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 research based knowledge of compensation devices (PO4); 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).
<b>191EEC403T.6</b>	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 use modern tools to solve equivalent circuit (PO5); So societal and safety issues could be analyzed (PO6); 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	: 191EEC404T	Lecture	:	45
Subject Title	: Signals and Systems	Tutorials	:	0
Year/Semester	: II/IV	Practical	:	-
Faculty Name	: Mrs.K.A.Indu Sailaja	TOTAL	:	45

**COURSE OBJECTIVES:**

- 1.To introduce the fundamentals and classifications of signals and systems
- 2.To get familiarized to system representation and stability study with Laplace transform
- 3.To analyze the continuous time signals , Fourier series and to learn to apply frequency analysis
- 4.To impart knowledge on discrete time signals and discretized systems.
- 5.To understand importance of sampling sampling theorem and its implications

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
191EEC404T.1	Analyze the basic signals and systems & acquire knowledge on mathematical representation of signals
191EEC404T.2	Apply the concepts of continuous time and discrete time systems to analyse systems in time domain Understand system stability analysis
191EEC404T.3	Apply the concepts of continuous time and discrete time systems to analyse systems in frequency domain.
191EEC404T.4	Understand implications of z-Transform in digitizing in system analysis
191EEC404T.5	Understand sampling theorem and its implications in during signal reconstruction.
191EEC404T.6	Understand the importance of Fourier transform and Z transform.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

<b>CO/PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
191EEC404T.1	3	3	3	2	-	-	-	-	-	-	-	-
191EEC404T.2	2	3	3	3	2	-	-	-	-	-	-	-
191EEC404T.3	3	3	3	2	2	-	-	-	-	-	-	-
191EEC404T.4	3	1	3	2	2	-	-	-	-	-	-	-
191EEC404T.5	3	3	2	1	1	-	-	-	-	-	-	-
191EEC404T.6	3	2	3	2	-	1	-	-	-	-	-	1
191EEC404T	3	3	3	3	2	1	-	-	-	-	-	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
191EEC404T.1	2	2	1
191EEC404T.2	1	1	-
191EEC404T.3	1	1	1
191EEC404T.4	1	1	1
191EEC404T.5	1	1	-
191EEC404T.6	1	1	2
191EEC404T	1	1	1

<b>JUSTIFICATION OF THE MAPPING:</b>	
191EEEC404T.1	The signals and systems requires a fundamental knowledge in mathematics (PO1) and requires an analytical approach to solve problems in signals and systems (PO2).It requires an understanding of design concepts (PO3) and to design complex problems in (PO4).
191EEEC404T.2	A good mathematical and engineering fundamental is required to design System performance (PO1) and hence formulate problems on implementation of filters (PO2). System parameters are analyzed by conducting experiments (PO4) and thereby develop solutions to cater to the societal needs (PO3). Usage of signal processing tools (PO5) is needed to indulge in persistent learning (PO12) and for project management (PO11).
191EEEC404T.3	Engineering background and mathematical knowledge is essential to study about Fourier Transform (PO1). Issues on analyzing the periodic signal are identified (PO2) to develop solutions for societal requirements (PO3), (PO6) by conducting experiments (PO4). Signal processing tools are utilized to observe the system performance (PO5) and gain a good project management (PO11) and long-lasting experience (PO12)
191EEEC404T.4	Analyzing the discrete time systems need applying strong Engineering knowledge of mathematics (PO1), finding Z transform for stability analysis involves problem analysis (PO2) , design solutions for complex engineering problems by using Z transforms (PO3), inverse Z transform involves research based knowledge ( PO4) , moderately Understand the impact of the Z transform in societal and environmental context ( PO7), need individual work (PO9), stability analysis using Z transform need weak life-long learning (PO12).
191EEEC404T.5	Application of Suitable LTI Systems for specific application requires thorough understanding the programming skills (PO1) requires thorough understanding of LTI System skills (PO1) to formulate the selection of appropriate LTI algorithm (PO2). Conclusions derived through experiments (PO4) are utilized to design application-specific digital system (PO3) with the aid of signal processing tools (PO5). An overall scope for updating the technological changes (PO12), a good project management (PO11) is possible for better communication (PO10), sustainability and environment (PO7).
191EEEC404T.6	Understand the concept of finite word length effects requires fundamental knowledge in mathematics (PO1), and an analytical approach to finite word length effects (PO2). It requires depth of knowledge in the design concepts (PO3) and complexity involved in the design of finite word length effects involved in various applications (PO4).It also used for application in the society purpose (PO6)&(PO12).

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	: 191CSS421T	Lecture	: 45
Subject Title	: Object Oriented Programming and Data Structures	Tutorials	: 0
Year/Semester	: II/ 04	Practical	: -
Faculty Name	: M.Lakshmanan	TOTAL	: 45

**COURSE OBJECTIVES:**

1 To comprehend the fundamentals of object oriented programming, particularly in C++.

2 To use object oriented programming to implement Inheritance and Polymorphism

3 To introduce linear data structures and their applications.

4 To introduce Non- linear data structures and their applications.

5 To enable the students to learn Sorting and Searching concepts

**COURSE OUTCOMES:**

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

<b>CO1</b>	Explain the concepts of Object oriented programming.
<b>CO2</b>	Write simple applications using C++.
<b>CO3</b>	Discuss the different methods of organizing large amount of data.
<b>CO4</b>	Understand non linear data structures and their applications
<b>CO5</b>	Implement different types of sorting and searching techniques.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

<b>CO/PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
<b>191CSC304T .1</b>	3	3	3	1	0	1	2	3	3	3	2	3
<b>191CSC304T.2</b>	3	3	3	3	0	3	2	3	3	3	2	3
<b>191CSC304T.3</b>	3	3	3	3	0	3	2	3	3	3	2	3
<b>191CSC304T.4</b>	3	3	3	3	0	3	2	3	3	3	2	3
<b>191CSC304T .5</b>	3	3	3	3	0	3	2	3	3	3	2	3

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
191CSC304T .1	1	3	3
191CSC304T.2	1	3	3
191CSC304T.3	1	3	3
191CSC304T.4	1	3	3
191CSC304T .5	1	3	3

**JUSTIFICATION OF THE MAPPING:**

<b>191CSC304T .1</b>	CO1 strongly maps with the PO1, PO2 PO3 ,PO8,PO9,PO10 and PO12 since the students use basic engineering knowledge to understand the basic concepts of Object oriented programming
<b>191CSC304T.2</b>	CO2 strongly maps with the PO1, PO2 PO3 ,PO4, PO3PO6, PO8,PO9,PO10 and with PO12 since students has to analyze the problems use basic engineering knowledge to design and develop computer system with concepts of Object oriented programming
<b>191CSC304T.3</b>	Acquired knowledge different methods of organizing large amount of data strongly maps with PO1, PO2 PO3 ,PO4, PO3PO6, PO8,PO9,PO10 and with PO12 as the students can independently upgrade with the broadest context of technological change with CO3
<b>191CSC304T.4</b>	Students can provide solution for complex engineering problem considering non linear data structures and their applications , this strongly maps PO1, PO2 PO3, PO4, PO3PO6, PO8,PO9,PO10 and PO12 with CO4
<b>191CSC304T .5</b>	CO5 strongly maps with PO1, PO2 PO3, PO4, PO3, PO6, PO8, PO9, PO10 and with PO12 as the knowledge on Implementing different types of sorting and searching techniques help them synthesis information valid conclusions.

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEC411L	Lecture	:	
Subject Title	: Electrical Machines - I Laboratory	Tutorials	:	
Year/Semester	: II/ IV	Practical	:	60
Faculty Name	: Dr. K. Mala Mrs. N. Priya	TOTAL	:	60

**COURSE OBJECTIVES:**

1. To expose the students to the operation of D.C. machines and transformers and give them experimental skill.

**COURSE OUTCOMES:**

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

191EEC411L1	To analyze the DC shunt, series and compound motor by load test and speed control.
191EEC411L2	To analyze and predetermine the efficiency by performing Swinburne's test.
191EEC411L3	To interpret the open circuit and load characteristics of DC generator.
191EEC411L4	To examine the load characteristics of DC compound generator in cumulative and differential connections

191EEC411L5	To interpret the load characteristics of single phase and three phase transformers
191EEC411L6	To analyze the single phase transformers by Separation of losses and Sumpner's test.

#### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEC411L.1	3	3	2	2	1	2	2	-	-	1	2	-
191EEC411L.2	3	3	1	1	1	1	1	-	-	1	1	-
191EEC411L.3	3	3	1	1	1	1	1	-	-	1	1	-
191EEC411L.4	3	3	1	1	1	1	1	-	-	1	1	-
191EEC411L.5	3	3	2	2	1	1	1	-	-	1	1	-
191EEC411L.6	3	3	2	2	2	2	2	-	-	1	2	-
191EEC411L	3	3	2	2	2	2	2	-	-	1	2	-

#### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:

CO/ PSO	PSO1	PSO2	PSO3
191EEC411L.1	-	2	-
191EEC411L.2	-	1	-
191EEC411L.3	-	1	-
191EEC411L.4	-	1	-
191EEC411L.5	-	1	-
191EEC411L.6	-	3	-
191EEC411L	-	3	-

#### JUSTIFICATION OF THE MAPPING:

191EEC411L.1	The analysis of fundamentals of magnetic circuits will help the students to apply engineering knowledge to devices such as rotating machines which strongly maps with (PO1). This will form the basis for problem analysis and to design magnetic system components by determining the torque, efficiency etc with relation to (PO2), (PO3) and (PO4). Rotating machineries form the basic electric components which influences the electrical development of the society (PO5). 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
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	<p>engineering knowledge for the societal by knowing the fundamentals with medium mapping to (PO10), (PO11) and strongly mapped to (PSO2).</p>
191EEC411L.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 predetermine the efficiency of a DC machine as generator and motor 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 ( PO11), (PO12) and (PSO2).</p>
191EEC411L.3	<p>By assimilating the different testing procedures available the students will be able to confirm the DC generator performance and to get the best performance out of it 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 data's attributing strongly to (PO1) and 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 (PSO3).</p>
191EEC411L.4	<p>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 data's attributing moderately with (PO2), (PO3) and (PO4). Motors and generators are the major components of the power systems. Developing state of art machinery remains a challenge. (PO5), (PO6). 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.</p>

	<p>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 (PSO3).</p>
191EEC411L.5	<p>By understanding the principle, working and 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's attributing strongly to (PO1) and moderately to (PO2), (PO3) and (PO4). Many applications demand transformers for better performance. A primary concern when deciding what type of transformer 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 fulfil it with due importance given to its impact on the environment and its sustainability attributing moderately to (PO6) and (PO7). Student 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) and a weak mapping with (PSO3).</p>
191EEC411L.6	<p>By analyzing the operating characteristic curves the student will be able to illustrate the performance 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),(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 (PSO3).</p>

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:	
Subject Code	: 191CSS431L	Lecture	:
Subject Title	: Object Oriented Programming and Data Structures Laboratory	Tutorials	:
Year/Semester	: II/ IV	Practical	: 60
Faculty Name	: Mr.P.Baskaran / Mr.C.U.Omkumar	TOTAL	: 60

### COURSE OBJECTIVES:

- 1 • Learn C++ programming language.
- 2 • Be exposed to the different data structures
- 3 • Be familiar with applications using different data structures

### COURSE OUTCOMES:

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

<b>191CSS431L.1</b>	Design and implement C++ programs for manipulating stacks, queues, linked lists, trees, and graphs.
<b>191CSS431L.2</b>	Apply good programming design methods for program development.
<b>191CSS431L.3</b>	Apply the different data structures for implementing solutions to practical problems.

### MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>191CSS431L.1</b>	<b>3</b>	<b>3</b>	<b>3</b>	--	--	--	--	<b>3</b>	<b>3</b>	<b>3</b>	--	<b>3</b>
<b>191CSS431L.2</b>	<b>3</b>	<b>3</b>	<b>3</b>	--	--	--	--	<b>3</b>	<b>3</b>	<b>3</b>	--	<b>3</b>
<b>191CSS431L.3</b>	<b>3</b>	<b>3</b>	<b>3</b>	--	--	--	--	<b>3</b>	<b>3</b>	<b>3</b>	--	<b>3</b>

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
<b>191CSS431L.1</b>	2	-	-
<b>191CSS431L.2</b>	2	-	-
<b>191CSS431L.3</b>	2	-	-

**JUSTIFICATION OF THE MAPPING:**

<b>191CSS431L.1</b>	CO1 strongly maps with the PO1, PO2 PO3 ,PO8,PO9,PO10 and PO12 since the students use basic engineering knowledge to understand the basic concepts of Object oriented programming
<b>191CSS431L.2</b>	CO2 strongly maps with the PO1, PO2 PO3 ,PO4, PO3PO6, PO8,PO9,PO10 and with PO12 since students has to analyze the problems use basic engineering knowledge to design and develop computer system with concepts of Object oriented programming
<b>191CSS431L.3</b>	Acquired knowledge different methods of organizing large amount of data strongly maps with PO1, PO2 PO3 ,PO4, PO3PO6, PO8,PO9,PO10 and with PO12 as the students can independently upgrade with the broadest context of technological change with CO3

## SEMESTER-V

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEEC501T	Lecture	:	45
Subject Title	: Control Systems	Tutorials	:	-
Year/Semester	: III/V	Practical	:	=
Faculty Name	: Dr.P.Marish Kumar	TOTAL	:	45

### COURSE OBJECTIVES:

· To understand the use of transfer function models for analysis physical systems and introduce the control system components to apply AI and Python programming for control systems applications.

· 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 understand and apply modern control tools.

### COURSE OUTCOMES:

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

191EEEC501T.1	Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals.
191EEEC501T.2	Ability to do time domain and frequency domain analysis of various models of linear system.
191EEEC501T.3	Ability to interpret characteristics of the system to develop mathematical model.
191EEEC501T.4	Ability to design appropriate compensator for the given specifications.
191EEEC501T.5	Ability to come out with solution for complex control problem.
191EEEC501T.6	Ability to understand use of PID controller in closed loop system.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEEC501T.1	3	2	3	-	2	-	-	-	-	-	-	-
191EEEC501T.2	3	3	1	3	1	-	-	-	-	-	-	-
191EEEC501T.3	2	3	3	1	1	-	-	-	-	-	-	1
191EEEC501T.4	3	3	2	1	2	-	-	-	-	-	-	2
191EEEC501T.5	3	3	3	3	3	-	-	-	-	-	-	2
191EEEC501T.6	2	3	3	1	2	-	-	-	-	-	-	-

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
191EEEC501T.1	3	1	-
191EEEC501T.2	3	-	1
191EEEC501T.3	3	1	1
191EEEC501T.4	3	-	1
191EEEC501T.5	3	2	1
191EEEC501T.6	3	2	1

**JUSTIFICATION OF THE MAPPING:**

191EEEC501T.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
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	electronics for control (PSO2)
<b>191EEC501T.2</b>	<p>By providing adequate knowledge in time &amp; frequency response of the systems, it attributes to strong Engineering knowledge (PO1), as it imparts the knowledge of plotting the time &amp; 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 &amp; 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 &amp; 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>
<b>191EEC501T.3</b>	<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 &amp; technical skills to analyze various types of systems and their characteristics. (PSO1). It contributes weakly for the smart power grid control operation (PSO3)</p>
<b>191EEC501T.4</b>	<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 &amp; technical skills for designing compensators. (PSO1). It contributes for the development of smart power grid(PSO3) using the concepts of stability.</p>

<p><b>191EEEC501T.5</b></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 &amp; 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><b>191EEEC501T.6</b></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 strong usage of logical &amp; 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.</p>



Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEEC502I	Lecture	:	45
Subject Title	: Power Electronics	Tutorials	:	
Year/Semester	: III/ V	Practical	:	30
Faculty Name	: Dr.R.Karpagam	TOTAL	:	75

### COURSE OBJECTIVES:

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

### COURSE OUTCOMES:

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

191EEEC502I.1	The students will learn the concepts of electronics switches. The essentiality of gating circuits for the working power converters need for snubber circuits
191EEEC502I.2	The students will learn the concepts of controlled converter. The students will be able to work in MATLAB simulink
191EEEC502I.3	The student will be able to analyze different topologies of DC-DC converters The students will be able to distinguish the application of DC-DC converters in real time
191EEEC502I.4	The student will be able to design inverters using MATLAB. The essentiality of harmonic controls in power electronic circuits. Practical applications of inverters
191EEEC502I.5	The students will be able to understand the concepts of AC voltage control. Students will be able to interpret practical application of AC voltage control.
191EEEC502I.6	Students will be able to interpret control of electromagnetic conversion device using the converters

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEEC502I.1	3	2	2	1	1	2	1	-	-	-	1	2
191EEEC502I.2	2	2	2	2	1	2	1	-	2	-	2	2
191EEEC502I.3	2	3	2	2	1	2	1	-	2	-	2	2
191EEEC502I.4	2	3	2	2	1	2	1	-	2	-	2	2
191EEEC502I.5	2	2	2	2	1	2	1	-	2	-	2	2
191EEEC502I.6	2	2	2	2	1	2	1	-	3	-	2	2

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
191EEEC502I.1	3	3	1
191EEEC502I.2	3	3	2
191EEEC502I.3	3	3	3
191EEEC502I.4	3	3	3
191EEEC502I.5	3	3	2
191EEEC502I.6	3	3	2

**JUSTIFICATION OF THE MAPPING:**

<b>191EEEC502I.1</b>	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). 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
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	<p>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 to (PO11), (PSO1), (PSO2) and (PSO3).</p>
<b>191EEEC502I.2</b>	<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 (PSO1), (PSO2) 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>
<b>191EEEC502I.3</b>	<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 behavior the students will able to model new designs and also contribute to the growing green energy attributing to (PSO1), (PSO2) and (PSO3).</p>

<p><b>191EEEC502I.4</b></p>	<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>
<p><b>191EEEC502I.5</b></p>	<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 data's 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</p>

	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)
<b>191EEC502I.6</b>	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 behavior 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 strongly with (PSO1), (PSO2) and (PSO3)

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEC503T	Lecture	:	45
Subject Title	: Electrical Machines - II	Tutorials	:	
Year/Semester	: III/ V	Practical	:	30
Faculty Name	: Mrs.N.Priya	TOTAL	:	75

**COURSE OBJECTIVES:**

1. To impart knowledge on Constructional details, the principle of operation and performance of salient and non – salient type synchronous generators.
2. To introduce the working Principle of operation and performance of synchronous motor.

3. To educate on the construction, principle of operation and performance of induction machines.
4. To analyse the starting and speed control of three-phase induction motors.
5. To introduce the construction, principle of operation and performance of single-phase induction motors and special machines.

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
191EEEC503T.1	Understand the construction and working principle of Synchronous Generator.
191EEEC503T.2	Understand MMF curves and armature windings.
191EEEC503T.3	Acquire knowledge on Synchronous motor.
191EEEC503T.4	Understand the construction and working principle of Three phase Induction Motor.
191EEEC503T.5	Understand the construction and working principle of Special Machines
191EEEC503T.6	Predetermine the performance characteristics of Synchronous Machines.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEEC503T.1	3	2	2	2	-	-	-	-	-	-	-	-
191EEEC503T.2	2	1	1	2	-	-	-	-	-	-	-	-
191EEEC503T.3	3	2	2	2	-	-	-	-	-	-	-	-
191EEEC503T.4	1	-	1	1	-	1	2	-	-	-	-	1
191EEEC503T.5	1	-	1	1	-	-	-	-	-	-	-	-
191EEEC503T.6	2	1	1	1	-	1	2	-	1	-	2	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
191EEC503T.1	1	1	-
191EEC503T.2	1	1	-
191EEC503T.3	1	1	-
191EEC503T.4	1	3	-
191EEC503T.5	1	2	1
191EEC503T.6	1	1	1

<b>JUSTIFICATION OF THE MAPPING:</b>	
191EEC503T.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.
191EEC503T.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.
191EEC503T.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.
191EEC503T.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)
191EEC503T.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.
191EEC503T.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	: 191EEE505T	Lecture	:	45
Subject Title	: Artificial Intelligence	Tutorials	:	-
Year/Semester	: III / 05	Practical	:	-
Faculty Name	: Mr.G.Vignesh	TOTAL	:	45

<b>COURSE OBJECTIVES:</b>
1. To study the concepts of Artificial Intelligence.
2. To learn the methods of solving problems using Artificial Intelligence.
3. To introduce the concepts of Expert Systems and machine learning.



<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
191EEE505T.1	Identify problems that are amenable to solution by AI methods.
191EEE505T.2	Identify appropriate AI methods to solve a given problem.
191EEE505T.3	Formalize a given problem in the language/framework of different AI methods.
191EEE505T.4	Implement basic AI algorithms.
191EEE505T.5	Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191EEE505T.1	3	2	2	3	2	-	-	-	-	-	1	1
191EEE505T.2	2	3	3	2	1	-	-	-	-	-	2	-
191EEE505T.3	2	3	3	2	3	-	2	-	-	1	2	1
191EEE505T.4	3	2	3	3	2	-	-	-	-	-	2	-
191EEE505T.5	3	2	3	2	2	1	-	1	2	-	2	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
191EEE505T.1	1	-	3
191EEE505T.2	1	-	-
191EEE505T.3	1	-	-
191EEE505T.4	-	2	2
191EEE505T.5	-	1	1

<b>JUSTIFICATION OF THE MAPPING:</b>	
<b>191EEE505T.1</b>	PO1 and PO4 strongly maps to CO1, since Students will be able to understand different types of AI agents Know various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms). CO1 maps to PSO1 and PSO2 as students will be able to deal with complex IT projects.
<b>191EEE505T.2</b>	PO2 and PO3 strongly maps to CO2, since Students will be able to Identify appropriate AI methods to solve a given problem and understand the fundamentals of knowledge representation. CO2 maps to PSO1 and PSO2 as students will be able to develop games software while carrying out complex IT projects.
<b>191EEE505T.3</b>	PO2 and PO3 strongly maps to CO3, since Students will be able to demonstrate working knowledge of reasoning in the presence of incomplete and/or uncertain information. CO3 maps to PSO1 and PSO2 as students will be able to design application software while carrying out complex IT projects.
<b>191EEE505T.4</b>	PO1,PO2 and PO3 strongly maps to CO4, since Students will be able to apply knowledge representation, reasoning, and machine learning techniques to real-world problems. CO4 maps to PSO1 and PSO2 as students will be able to create, design and implement the software while carrying out complex IT projects.
<b>191EEE505T.5</b>	PO1 and PO3 strongly maps to CO5 since, the Students will be able to carry out independent (or in a small group) expert systems and communicate it effectively in a seminar setting. Student can able create, design and implement the software that satisfies PSO1 and PSO2 moderately.

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EEE506T	Lecture	:	45
Subject Title	: Power Plant Engineering	Tutorials	:	
Year/Semester	: III/05	Practical	:	-
Faculty Name	: Mr. P. Pushpakarthick	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..

<b>191EEE506T.1</b>	Explain the layout, construction and working of the components inside a thermal power plant.
<b>191EEE506T.2</b>	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
<b>191EEE506T.3</b>	Explain the layout, construction and working of the components inside nuclear power plants.
<b>191EEE506T.4</b>	Explain the layout, construction and working of the components inside Renewable energy power plants.
<b>191EEE506T.5</b>	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production
<b>191EEE506T.6</b>	Explain the layout, construction and working of the components inside a thermal power plant.

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>191EEE506T.1</b>	2	2	1	2	-	-	-	-	1	-	1	1
<b>191EEE506T.2</b>	2	2	2	2	-	-	-	-	1	-	1	1

<b>191EEE506T.3</b>	3	1	1	2	-	2	-	-	1	-	1	1
<b>191EEE506T.4</b>	2	1	2	2	-	-	2	-	1	-	1	1
<b>191EEE506T.5</b>	2	1	2	2	1	-	2	-	1	-	1	1
<b>191EEE506T.6</b>	2	-	2	2	-	2	-	-	1	-	1	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

<b>CO/ PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>191EEE506T.1</b>	-	-	2
<b>191EEE506T.2</b>	-	-	2
<b>191EEE506T.3</b>	-	-	2
<b>191EEE506T.4</b>	-	-	3
<b>191EEE506T.5</b>	2	2	3
<b>191EEE506T.6</b>	2	-	2

**JUSTIFICATION OF THE MAPPING:**

<b>191EEE506T.1</b>	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).
<b>191EEE506T.2</b>	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

	<p>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>
<b>191EEE506T.3</b>	<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>
<b>191EEE506T.2</b>	<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>
<b>191EEE506T.5</b>	<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</p>

	generation to maximum extent in green energy (PSO1).
<b>191EEE506T.6</b>	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	: 191CSO501T	Lecture	:	45
Subject Title	: Programming in C	Tutorials	:	
Year/Semester	: III/V	Practical	:	-
Faculty Name	: Mrs.M.Bhanumathi	TOTAL	:	45

<b>COURSE OBJECTIVES:</b>
1.Learn to think logically and write pseudo code or draw flow charts for problem
2. Be exposed to the syntax of C.
3. To develop C Programs using basic programming constructs.
4. Learn to use arrays and strings in C.
5. To develop applications in C using functions , pointers and structures
6. To do input/output and file handling in C

<b>COURSE OUTCOMES:</b>
Upon completion of the course, the students will be able to..
<b>191CSO501T.1</b>   Develop simple applications in C using basic constructs

<b>191CSO501T.2</b>	Design and implement applications using arrays and strings
<b>191CSO501T.3</b>	Develop and implement applications in C using functions and pointers.
<b>191CSO501T.4</b>	Develop applications in C using structures.
<b>191CSO501T.5</b>	Design applications using sequential and random access file processing.

#### **MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

<b>CO/ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
<b>191CSO501T.1</b>	3	1	1	-	-	-	-	-	-	-	-	1
<b>191CSO501T.2</b>	3	2	2	1	2	-	-	-	-	-	-	1
<b>191CSO501T.3</b>	3	2	2	1	2	-	-	-	-	-	-	1
<b>191CSO501T.4</b>	3	2	2	1	2	-	-	-	-	-	-	1
<b>191CSO501T.5</b>	3	2	2	1	2	-	-	-	-	-	-	1

#### **MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

<b>CO/ PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>191CSO501T.1</b>	1	-	-
<b>191CSO501T.2</b>	1	-	-
<b>191CSO501T.3</b>	1	-	-
<b>191CSO501T.4</b>	1	-	-
<b>191CSO501T.5</b>	1	-	-

#### **JUSTIFICATION OF THE MAPPING:**

<b>191CSO501T.1</b>	PO1 strongly maps to CO1 since students will be able to acquire engineering knowledge and develop simple applications. PO2 ,PO3 are moderately maps to CO1 since the students are able to identify the problem and develop the solutions. PSO1 maps partially with CO1 since the students
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	use logical and technical skills to model, simulate and analyze the systems.
<b>191CSO501T.2</b>	PO1 strongly maps to CO2 since students will be able to design and analyze solutions for complex problems while designing various components of computers. PO2,PO3 and PO5 moderately maps to CO2 since the students can Identify, formulate, review and analyze complex engineering problems reaching substantiated conclusions. PO4 and PO12 also partially maps with CO2 since the students can use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. PSO1 partially maps with CO2 since students are exposed to model and analyze the activities of the system.
<b>191CSO501T.3</b>	PO1 strongly maps to CO3 since students will be able to apply basic fundamentals to develop the applications using strings.PO2, PO3 and PO5 moderately maps with CO3 since the students will identify the problems and design the solutions using string functions. PO4 and PO12 partially maps to CO3 CO4 since the students will be able to recognize the need for technologies, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.PSO1 also partially maps with CO3 since students are exposed to modeling complex activities.
<b>191CSO501T.4</b>	PO1 strongly maps to CO4 since students will be able to apply functions to develop the applications. PO2, PO3 and PO5 moderately maps with CO3 since the students will identify the problems and design the solutions using various functions. PO4 and PO12 partially maps to CO3 CO4 since the students will be able to recognize the need for technologies, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.PSO1 also partially maps with CO3 since students are exposed to model and stimulate complex problems.
<b>191CSO501T.5</b>	PO1 strongly maps to CO5 since students will be able to apply structure concepts to develop the applications.PO2, PO3 and PO5 moderately maps with CO3 since the students will identify the problems and design the solutions using various string functions. PO4 and PO12 partially maps to CO3 CO4 since the students will be able to recognize the need for technologies, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.PSO1 also partially maps with CO3 since students utilize the logical and technical skills to solve the complex problems in real time applications.



Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191MEO504T	Lecture	:	45
Subject Title	: Product design and development	Tutorials	:	
Year/Semester	: III/V	Practical	:	-
Faculty Name	: G.Yuvaraj	TOTAL	:	45

**COURSE OBJECTIVES:**

To learn various concepts involved to achieve the desired product quality

To gain knowledge in design for manufacturing to reduce the cost of the product

To provide knowledge in various processes of concept development to implement new product.

To gain knowledge in basic concepts of product design, product features and its architecture

To learn about common features of the product according to the needs of customer

**COURSE OUTCOMES:**

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

**191MEO504T.1** Integrate customer need, product design, and development

**191MEO504T.2** Generate various product development concepts and select suitable concept

**191MEO504T.3** Understand various product design levels and manufacturability

**191MEO504T.4** Simulate product performance and manufacturing processes

**191MEO504T.5** Understand the basic concepts of design for manufacturing and assembly

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191MEO504T.1	3	1	1	1	2	-	1	-	2	2	1	1
191MEO504T.2	3	1	2	-	-	-	1	-	-	1	-	1
191MEO504T.3	2	1	2	-	-	-	-	-	-	-	2	1
191MEO504T.4	3	2	2	-	-	-	2	-	-	-	2	1
191MEO504T.5	3	1	2	-	3	-	2	-	-	-	2	1

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
191MEO504T.1	-	-	-
191MEO504T.2	-	-	-
191MEO504T.3	-	-	-
191MEO504T.4	-	-	-
191MEO504T.5	-	-	-

**JUSTIFICATION OF THE MAPPING:**

191MEO504T.1	Understand various Design Process involved in product design and development
191MEO504T.2	NA
191MEO504T.3	NA
191MEO504T.4	NA
191MEO504T.5	Student can Understand various computer aided process planning approaches & Analysis method.(PSO4)

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191ECO501T	Lecture	:	45
Subject Title	: Embedded Systems	Tutorials	:	
Year/Semester	: III / V	Practical	:	-
Faculty Name	: Mr.V.Dinesh	TOTAL	:	45

**COURSE OBJECTIVES:**

1 To introduce the Building Blocks of Embedded System

2 To Educate in Bus Architecture and Networks

3 To impart knowledge in various scheduling algorithms

4 To introduce Real time operating systems

5 To inculcate knowledge to design an application system

**COURSE OUTCOMES:**

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

191ECO501T.1	Understand and analyze Embedded systems
191ECO501T.2	Study about the bus Communication in processors
191ECO501T.3	Acquire knowledge on various processor scheduling algorithms
191ECO501T.4	Understand basics of Real time operating system
191ECO501T.5	Suggest an embedded system for a given application
191ECO501T.6	Operate various Embedded Development Strategies

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
191ECO501T.1	3	3	3	3	2	-	1	1	-	-	-	-
191ECO501T.2	3	2	3	2	2	-	-	-	-	-	-	-
191ECO501T.3	3	3	3	3	1	-	-	-	-	-	-	2
191ECO501T.4	3	3	3	2	2	-	1	-	-	-	-	2
191ECO501T.5	3	3	3	3	1	-	-	-	-	-	-	1
191ECO501T.6	3	3	3	3	2	-	1	1	-	-	-	2

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
191ECO501T.1	-	2	2
191ECO501T.2	-	2	2
191ECO501T.3	-	-	2
191ECO501T.4	2	3	2
191ECO501T.5	-	2	-
191ECO501T.6	2	2	2

**JUSTIFICATION OF THE MAPPING:**

191ECO501T.1	Students acquired fundamental knowledge for complex systems analysis using basic principles of embedded systems (PO2)(PO4).Design and control real time control systems requires a fundamental knowledge in mathematics (PO1) and a strong analytical approach to design integrated circuits (PO2).It requires depth of knowledge in the design concepts (PO3) . It requires overview about the design tools(PO5).Mini-projects (PO11) requires teamwork (PO9).
191ECO501T.2	Strong knowledge on designing techniques to develop and implement general purpose and real time system for complex problems is acquired

	(PO3) (PO4).
191ECO501T.3	Moderate knowledge in designing complex problems (PO4) due to lack of training in embedded tools. Designing and constructing electronic circuits is minimal (PSO1). Usage of modern tools is moderate due to lack of awareness and practice in those tools (PO5). Less impact on environmental engineering solutions (PO7) awareness in getting updated about latest technological developments in Embedded field is moderate (PO12).
191ECO501T.4	Software coding in hardware requiring strong knowledge of Mathematics, Science and engineering fundamentals is acquired (PO1), moderate analysis of engineering problems using basic principles and concepts (PO2), strong knowledge in implementing concepts of embedded systems and techniques in integrated circuits design (PSO4).
191ECO501T.5	Strong knowledge of Mathematics, Science and engineering fundamentals to analyze timing constraints is acquired(PO1), strong analyzing skills of real time problems using general and real time operating system is gained(PO2).
191ECO501T.6	Hardware and software co-design concepts using basic knowledge of mathematics, science and engineering fundamentals is acquired (PO1),Complex engineering problems for real time issues using embedded system concepts were analyzed (PO2), Design techniques to investigate and develop models for real time applications (PO3)including integrated circuits design(PO4) (PSO4) is discussed.

Course/Branch	: B.E/EEE	Total no. of hours given in syllabus:		
Subject Code	: 191EIO502T	Lecture	:	45
Subject Title	: Automotive Electronics	Tutorials	:	
Year/Semester	: III/V	Practical	:	-
Faculty Name	: Mrs.R.Nagalakshmi	TOTAL	:	45

**COURSE OBJECTIVES:**

To gain knowledge on various techniques used for the measurement and control of environment parameters.

To provide a understanding of the automotive systems, vehicle dynamics and embedded

electronic systems used in automobiles
To develop the ability to analyze, simulate, design and verify electronic systems for controlling mechanical systems in automobiles.
To develop the ability to test and validate automotive electronic systems using modern tools
To conceptualize automotive electronic technologies for future

<b>COURSE OUTCOMES:</b>	
Upon completion of the course, the students will be able to..	
191EIO502T.1	Analysis all the sub-systems of an Automobile and IC Engine.
191EIO502T.2	Understand the concepts of automotive sensors and actuators, their application and uses
191EIO502T.3	Work on automobile sub-systems like Engine System, Chassis, Transmission, Power train, Braking Systems etc.
191EIO502T.4	Apply the basic mathematical and scientific concepts in the field of Automotive Electronics
191EIO502T.5	Review Intelligent Transport systems, Collision detection and avoidance systems, automated highways, platoons, and automated steering.

#### **MAPPING OF COURSE OUTCOMES WITH THE PROGRAM OBJECTIVES:**

<b>CO/ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
191EIO502T.1	2	2	2	2	-	-	2	-	1	-	-	2
191EIO502T.2	2	2	3	2	1	2	2	-	1	2	-	2
191EIO502T.3	2	-	3	2	1	2	2	-	1	1	-	2
191EIO502T.4	2	2	3	2	1	2	2	-	1	1	-	2
191EIO502T.5	2	2	3	2	1	3	2	-	1	2	-	2

**MAPPING OF COURSE OUTCOMES WITH THE PROGRAM SPECIFIC OUTCOMES:**

CO/ PSO	PSO1	PSO2	PSO3
191EIO502T.1	2	2	1
191EIO502T.2	3	1	1
191EIO502T.3	2	3	3
191EIO502T.4	3	3	3
191EIO502T.5	2	3	2

<b>JUSTIFICATION OF THE MAPPING:</b>	
191EIO502T.1	Interfacing of Automobile moderate knowledge of Mathematics (PO1) Identify, analyses the problems, (PO2) reduction of cost by optimum design (PO3)and interpretation of design at various stages and outputs (PO4).Weak usage of IT tools (PO5) and strong contribution towards society (PO6) and multidisciplinary team work (PO9), comprehend and write design documentation(PO10),weak in project management and finance(PO12).
191EIO502T.2	Writing simple programs requires medium knowledge of engineering (PO1), good analysis reduces errors (PO2), design algorithms (PO3), interpretation of algorithms at various conditions(PO4), weak usage of IT tools (PO5) and team work, sustainable design(PO7), explaining their concepts (PO10), strongly requires life- long updation of various upcoming automobile design with electronic circuits(PO12).
191EIO502T.3	Designing simple circuits requires medium knowledge of engineering (PO1), good analysis reduces errors (PO2), design analysis (PO3), interpretation of circuit and battery at various conditions(PO4), weak usage of IT tools (PO5) and team work, sustainable design(PO7), explaining their concepts (PO10), strongly requires life- long knowledge of various upcoming processors and language(PO12).
191EIO502T.4	Understanding the concepts of various electronic converters and drives requires medium knowledge of engineering (PO1),good identification of the drives improves efficiency (PO2), well designed converters (PO3), analysis the working of the converters at various conditions(PO4),strong usage of simulation tools(PO5), weak application of ethical principles (PO8).Sustainable design(PO7), Requires life- long learning (PO12) as the

	new processors are coming to the market
191EIO502T.5	Apply their knowledge for real time applications requires medium knowledge of engineering (PO1), good analysis which reduces errors (PO2), Optimum automobile design techniques for lighting (PO3), Justification of their accessories design at various conditions(PO4), weak usage of IT tools to find solutions (PO5) and team work, sustainable design(PO7), explaining their concepts (PO10), strongly requires life- long updating of various upcoming processors and language(PO12) for designing efficient accessories in Automobile system .