



## Sapthagiri College of Engineering

(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE, New Delhi)  
#14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru – 560057  
Phone: 080-28372800/1/2 www.sapthagiri.edu.in Fax: 080-28372797

### Department of Electrical and Electronics Engineering

#### 1.3.1 Institution integrates cross-cutting issues relevant to Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum

#### PROGRAM EDUCATIONAL OBJECTIVES (PEO)

The program educational objectives of Bachelor of Engineering in Electrical and Electronics at Sapthagiri College of Engineering are broadly defined on following four counts.

**PEO 1: Employability:** An ability to contribute to industrial services and/or government organizations by applying their skills through formal education and co-operative educational experiences.

**PEO 2: Core Competence:** An ability to apply Scientific, Mathematics and Engineering fundamentals gained to comprehend, analyze, design and create novel products and solutions for real life problems.

**PEO 3: Professionalism:** An ability to embrace professional and ethical attitude/effective communication skills, team skills, multidisciplinary approach to resolve problems and inform, educate and persuade diversified audiences.

**PEO 4: Learning Environment & Socialism:** A skill to update knowledge with emerging technologies by professional communities, higher education to nourish ever-developing careers and to strengthen human values and social responsibilities to contribute towards society.

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## PROGRAM SPECIFIC OUTCOMES (PSO)

At the end of the B.E Electrical and Electronics engineering program, the students are expected to have developed the following program specific outcomes.

**PSO 1:** The application and fundamental knowledge to identify, formulate and investigate various real time problems of electrical machines, power electronics, control systems, high voltage engineering, power systems and microcontroller.

**PSO 2:** The application of recent technique along with modern software tools (like MATLAB, AUTOCAD-ELETRICAL, Mi POWER etc) for designing, simulating and analyzing electrical systems as well as electronics system to engage in life-long learning.

**PSO 3:** The utilization of knowledge regarding project management techniques and sustainable technologies for developing projects in various applications like renewable energy, power systems, high voltage engineering, industrial drives and microcontroller.

## PROGRAM OUTCOMES (POs)

Program outcomes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge and behavior. Graduation of **Bachelor of Electrical and Electronics Engineering** program at Sapthagiri College of Engineering will attain the following program outcomes **in the field of Electrical and Electronics**.

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

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

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

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

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

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

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

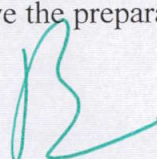
**PO 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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

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

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

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

  
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**Courses that integrates with Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum.**

Sl. No.	Subject	Subject Code	Curriculum	Deployment Strategy and Tool	PO	PSO	CO	Cross-cutting issues integrated
1	Transformers and Generators	15EE33	To create sustainability of environment by learning the concept of design and operation of eco-friendly Transformers and generators	Chalk and Talk method You tube PPT	PO 1,2,3,7,12	PSO1,3	CO-(1-4)	Environmental Sustainability
2	Analog Electronic Circuits	15EE34	To learn the knowledge for the analysis of transistor circuits. Develop skills to design the electronic circuits like amplifiers and oscillators which used in power protection.	Chalk and Talk method You tube PPT	PO 1,2,3,7,12	PSO1,3	CO-(1-4)	Environmental Sustainability
3	Digital System Design	15EE35	To Understand the structure of HDL module, operators, data types, Comparison between VHDL and Verilog and Understand the concept of data-flow description To Understand Design combinational logic circuit, synchronous sequential circuits Mealy and Moore synchronous sequential circuit models	Chalk and Talk method You tube PPT	PO 1,2,3,4,5,7,9,10,11,12	PSO1,2,3	CO-(1-5)	Environmental Sustainability
4	Power Generation And Economics	15EE42	Understand the working of different power generating plants, the economic aspects of Power System operation and its effects & explain the	Chalk and Talk method PPT	PO1,2,3,6,7,12	PSO1	CO-(1-4)	Environmental Sustainability

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			importance of power factor improvement					
5	Transmission And Distribution	15EE43	Emphasize the importance of different transmission systems. To evaluate the parameters & assess the performance of the line & different types of distribution systems.	Chalk and Talk method PPT	PO 1,2,3,4,6,7,9	PSO1	CO-(1-4)	Environmental Sustainability & human values
6	Electric Motors	15EE44	To create sustainability of environment by learning the concept of design and operation of eco-friendly electrical motors	Chalk and Talk method You Tube PPT	PO 1,2,3,4,7,12	PSO1,2	CO-(1-4)	Environmental Sustainability
7	Operational Amplifiers And Linear Ic's	15EE46	To create the economic sustainability of environment by understanding the design of various circuits using Linear ICs, for use in different hardware Projects.	Chalk and Talk method PPT	PO1,2,3,7,12	PSO1,3	CO-(1-5)	Environmental Sustainability
8	Operational Amplifiers And Linear Ic's lab	15EEL48	To create the economic sustainability of environment by understanding the design of various circuits using Linear ICs.	Chalk and Talk method PPT	PO1,2,3,7,12	PSO1,3	CO-(1-4)	Environmental Sustainability
9	Electrical Machines Laboratory	15EEL47	To create sustainability of environment by learning the concept of design and operation of eco-friendly electrical motors	Chalk and Talk method PPT	PO1,2,3,4,7,12	PSO1,2	CO-(1-4)	Environmental Sustainability
10	Management and Entrepreneurship	15EE51	To understand the concept of human relationship, role of manager, importance and types of planning, staff recruitment and selection process, managerial control in	Chalk and Talk method PPT	PO,6,7,8,9,10,11,12	PSO3	CO-(1-5)	Human values and business ethics

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			business development	economic				
11	Microcontroller	15EE52	To create environment sustainability by learning the use of applications of microcontroller using 8051C	Chalk and Talk method, you tube video  PPT	PO1,2,3,7,12	PSO1,2,3	CO-(1-5 )	Environmental Sustainability
12	Power Electronics	15EE53	To create sustainability of environment by learning the concept of better design of the rectifiers , controllers & converters in power electronics	Chalk and Talk method  PPT	PO1,2,3,4,7, 12	PSO1,3	CO-(1-4 )	Environmental Sustainability
13	Renewable Energy Sources.	15EE563	To familiarize scarcity, present scenario of the energy and ability to think the producing power from renewable sources	Chalk and Talk method  PPT	PO 1,2,3,4,6,7,12	PSO1,2,3	CO-(1-5)	Environmental Sustainability
14	Microcontroller Lab	15EEL57	To create environment sustainability by learning the use of applications of microcontroller using 8051C	Chalk and Talk method  PPT	PO 1,2,3,4,5,6,7,9, 11,12	PSO1,2,3	CO-(1-4 )	Environmental Sustainability
15	Power Electronics Lab	15EEL58	To familiarize with the diffent family of transistor SCR diode which helps in controlling and protection of Power	Chalk and Talk method You Tube PPT	PO1,2,3,7	PSO1,2,3	CO-(1-4)	Environmental Sustainability
16	Control Systems	15EE61	To create sustainability of environment by learning the concept of designing of controllers for the operation and stability of power systems	Chalk and Talk method You tube PPT	PO1,2,3,4,6,7, 9,10,11,12	PSO1,2,3	CO-(1-7)	Environmental Sustainability

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17	Power system analysis -I	15EE62	To create sustainability of environment by learning steady state & fault analysis of power system.	Chalk and Talk method You Tube PPT	PO1,2,3,7	PSO1,2,3	CO-(1-5)	Environmental Sustainability
18	Electrical Machine Design	15EE64	To create sustainability of environment by designing Eco friendly and energy saving AC and DC machines	Chalk and Talk method  PPT	PO1,2,3,4,5,6,7,11,12	PSO1	CO-(1-6)	Environmental Sustainability
19	Computer aided Electrical Drawing	15EE651	To Understand the Design of DC and AC armature windings, DC and AC machines. To understand sectional views of transformers, DC machine, its parts and alternator and its parts.	Chalk and Talk method  PPT	PO1,2,3,4,7,12	PSO1,2,3	CO-(1-5)	Environmental Sustainability
20	Power System Analysis – 2	15EE71	Create awareness in students about renewable in power system for the economic development of the nation and aid provided by the government for start-ups in renewables, Empower the students about the need for well-operated power system for overall development of a country	Chalk and Talk method  PPT	PO 1,2,3,5,7,8,12	PSO1,3	CO-(1-6)	Environmental Sustainability and Professional ethics
21	Power System Protection	15EE72	Empower students through the concepts of Power System Protection.	Chalk and Talk method You tube	PO1,2,7,12	PSO1,3	CO-(1-6)	Environmental Sustainability

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22	High Voltage Engineering	15EE73	To create better environment and sustainability by learning the concept of insulation for different applications in High Voltage Engineering	PPT Chalk and Talk method You tube PPT	PO 1,2,3,5,7,12	PSO1,3	CO-(1-6)	Environmental Sustainability
23	Utilization of Electric Power	15EE742	To create sustainability of environment by learning the laws of illumination and design of interior and exterior lighting system., motor used on traction application and its performance characteristics.	Chalk and Talk method You Tube PPT	PO1,2,3,4,5,7	PSO1,2,	CO-(1-5)	Environmental Sustainability
24	Testing and Commissioning of Power system apparatus.	15EE752	To Understand the process to plan, control and implement commissioning of electrical equipment's. To Identify the tools and equipment's used for installation and maintenance of electrical equipment	Chalk and Talk method  PPT	PO1,2,3,4,5,7	PSO1,2	CO-(1-5)	Environmental Sustainability
25	Project Phase 1	15EEP78	Apply engineering, management and ethical principles for Project management and finance. Understand the impact of the engineering solutions in societal and environmental contexts for Sustainable development with commit to professional ethics.	PPT	PO1,2,3,4,5,6,7,8,9,10	PSO1,2,3	CO-(1-5)	Environmental Sustainability  Human Value and Professional ethics
26	Power System Operation and Control	15EE81	Instruct the importance of power system operation and control as a social responsibility	Chalk and Talk method	PO1,2,3,5,7,12	PSO1,,3	CO-(1-8)	Environmental Sustainability

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			Create awareness in students about operations and control in power system for the economic development of the nation.	PPT				
27	Industrial Drives and Applications	15EE82	Empower students to selecting Eco friendly Electrical drives for industrial applications and to analyse performance of drives for sustainability of environment	Chalk and Talk method	PO1,3,4,7,12	PSO 1,2,3	CO-(1-6)	Environmental Sustainability
28	Integration Of Distributed Generation	15EE833	To understand power generation by alternate energy source like wind power and solar power. To Understand selection of size of units and location for wind and solar systems help in protection of electrical energy.	Chalk and Talk method  PPT	PO1,2,3,4,5,7	PSO1,2	CO-(1-4)	Environmental Sustainability
29	Internship/professional Practice	15EE84	Analyze and design solutions for engineering problems and to Demonstrate apt workplace attitude and ethics.	PPT	PO1,2,3,4,5,6, 7,8,9,10	PSO1,2,3,4	CO-(1-4)	Human Value and Professional ethics
30	Project work Phase 2	15EEP85	Apply engineering, management and ethical principles for Project management and finance. Understand the impact of the engineering solutions in societal and environmental contexts for Sustainable development with commit to professional ethics.	PPT	PO1,2,3,4,5,6, 7,8,9,10	PSO1,2,3,	CO-(1-5)	Environmental Sustainability  Human Value and Professional ethics

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31	Seminar	15EES86	Prepare power point presentation (PPT), communicate and answer the queries on the topic like environmental sustainability, Good laboratory Practices, Professional ethics and Human Values	PPT	PO1,2,3,4,5,6, 7,8,9,10	PSO1,2,3,	CO-(1-5)	Environmental Sustainability  Human Value and Professional ethics
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