6.5.2 The institution reviews its teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals through IQAC set up as per norms

Implementation of Teaching – Learning Reforms

Based on the review of Learning Outcomes the following reforms are made in the Teaching Learning Process to improve the attainment of Program Outcomes:

✓ **POs and Teaching Learning Reforms of 2015 – 2019 Batch**

POs	Teaching Learning Reforms
PO1.Engineering knowledge: Apply the knowledge of mathematics, science, electrical and electronics engineering fundamentals to the solution of complex engineering problems.	
	Reform 1: Group assignments are given to the students to solve complex problems in ElectricalCircuits and Machines. **Reform 2:** To improve the analytical skills of the students, tutorial classes are conducted regularly. **Reform 3:** Conducted workshop on "Hands-on Training for Electrical Wiring" by industrial experts to enhance practical knowledge of the students.
PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex electrical and electronics engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	
	Reform 1: Students are guided to perform proper literature survey for analyzing power electronics circuits for renewable energy systems and to do project works. **Reform 2:** Conducted more practical classes to enhance the ability of the students to analyze andsolve the power system stability problems using ETAP Software. **Reform 3:** Tutorial classes are conducted to enable the students to solve complex problems instability analysis of power system.
PO3.Design/Development of solutions: Design and develop electrical and electronic systems that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.	
	Reform 1: Students are motivated to design solutions with consideration to national and international safety norms and societal & environmental aspects in their project work.

POs	Teaching Learning Reforms
	Reform 2: Students are motivated to participate in national level project contests like Smart India Hackathon, TNSCST and AICTE Vishwakarma awards. **Reform 3:** Flipped class room methodology is used as an innovative teaching method to improve the ability to design a suitable compensator for given frequency domain specifications in Control Systems. **Reform 4:** Seminar on "Embedded System" was conducted by industry expert to develop programs for microcontroller based real time applications. **Reform 5:** Innovative Project contest was organized to help the students to design solutions for complex electrical engineering problems.
PO4. Investigation of complex problems: Investigate and analyze complex electrical and electronics engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.	
	Reform 1: Students are encouraged to use research methodologies, analytical tools, design of experiments to analyze and interpret the results to provide valid conclusions. **Reform 2:** A Workshop on "Energy auditing for Industries and commercial buildings" was conducted in order to improve the ability to investigate, analyze and interpret the data to provide valid conclusions. **Reform 3:** Case Study in "Harmonics Reduction" is given as innovative assignment to enhance the ability to analyze the power quality.
PO5.Modern tool usage: Select and Apply modern engineering and IT tools for simulation and modeling of electrical and electronic systems.	
	Reform 1: Conducted workshop on "Effective usage of Power Quality Analyzer" for enhancing the ability of students to meet the industry expectation. **Reform 2:** Conducted more practical classes to enhance the ability of the students to design andanalyze electrical machines using ANSYS Software **Reform 3:** Conducted more practical classes to enhance the ability of the students to use ETAPsoftware for fault analysis in power system.

POs	Teaching Learning Reforms
	Reform 4: Students are encouraged to use MATLAB software to analyze the Power Electronicscircuits.
PO6.The engineer and society: Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities to the professional engineering practice.	
	Reform 1: Industrial visit/in-plant training/internship is organized to get practical exposure in safety norms and standards. **Reform 2:** Students are encouraged to take up projects addressing social related issues. **Reform 3:** Students are involved in electrical appliances servicing camp in nearby rural villages through MHRD funded scheme - Unnat Bharat Abhiyan (UBA). **Reform 4:** Awareness Program on "Electrical Safety" was conducted by experts fromTamil Nadu Electricity Board. **Reform 5:** A mandatory course "Personality and Social development" is introduced for better understanding of social concerns. **Reform 6:** Students are involved in Electrical appliances service in Govt. Hospital through Rotaract Club to enhance their societal concern.
PO7.Environment and sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.	
	Reform 1: Industrial visits are arranged to understand the impact of environmental issues inelectric power generation and the need for sustainable development. **Reform 2:** Students participated in a rally themed on "Ban Plastics" in nearby rural villages through MHRD funded scheme - Unnat Bharat Abhiyan (UBA). **Reform 3:** Students are encouraged to do projects based on renewable energy sources to promoteclean environment.
PO8.Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.	

POs	Teaching Learning Reforms
Reform 1: A mandatory course 'Value Education and Human Rights' is introduced to provide the awareness about the ethical responsibilities. **Reform 2:** Guest lectures are organized to promote awareness on the responsibilities and normsof the engineering practice.	
PO9.Individualand teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.	
Reform 1: Students are encouraged to participate in national level innovative project contests to promote the ability to function as member / leader in diverse groups. Students won first prize in Smart India Hackathon 2019 Hardware edition held at IIT Delhi organized by MHRD, Govt. of India. **Reform 2:** Multidisciplinary courses, multidisciplinary projects, project work and technical project are offered to improve the students' ability to function effectively as an individual and as a member/leader of a team and in multidisciplinary settings. **Reform 3:** Internship programs are introduced in the curriculum to enhance the ability to functionas an individual and a member/leader of a team. **Reform 4:** A mandatory course 'Personality and Social Development' is introduced to encourage students to function in team through the activities of National Service Scheme, ECO Club, Rotaract Club and other Club Activities.	
PO10. 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.	
Reform 1: Students are encouraged to participate in Toastmasters Club and Speech Masters Club to enhance their communication skill. **Reform 2:** Students are encouraged to take up online courses on communication skills to communicate effectively on complex engineering activities with the engineering community. Students successfully completed NPTEL online certification courses like"Better Spoken English" and "English Language for competitive exams". **Reform 3:** A course Technical seminar/project is offered to improve presentation and report writing skills.	

POs	Teaching Learning Reforms
	Reform 4: A mandatory course 'Skill Development' is introduced to promote communication and improve the effective presentation skills. **Reform 5:** To communicate effectively, write effective reports and design documentation the course "Speak better Write better" is introduced. **Reform 6:** Special training programs on communication and soft skills are organized through internal and external resource persons to improve the communication skills among the students.
PO11.Project management and Finance: Demonstrate knowledge and understanding of 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.	
	Reform 1: The cost estimation is included as a part of project assessment to enhance the knowledge regarding project management and finance. **Reform 2:** Students are encouraged to participate in state level and national level innovativeproject contest which improves their project managing capability. **Reform 3:** Case studies are discussed in the class of the courses related to project managementand finance. **Reform 4:** Students are encouraged to do projects in multidisciplinary environments as a memberand a leader in a team.
PO12.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.	
	Reform 1: Students are motivated to do online certification courses through which they can earnadditional credit and get the ability of independent life-long learning. **Reform 2:** Conducted seminar on "Hybrid Electric Vehicles and their Technical Challenges" to enhance the students ability in life-long learning addressing current scenario. **Reform 3:** Self-learning courses are introduced with credits to improve their knowledge for theirpersonal and professional developments. **Reform 4:** Students successfully completed in the SWAYAM courses and secured Elite grades.

✓ **PSOs and Teaching Learning Reforms of 2015 – 2019 Batch**

PSOs	Teaching Learning Reforms
PSO1: Demonstrate technical competency in the design and analysis of electrical machines.	
	Reform 1: Value added course on "Simulation of Electrical Machines using ANSYS Software" is conducted to enhance the ability to analyze the performance of the electrical machines. **Reform 2:** Students are involved in R&D project "Design and development of compact electric drive for various applications" funded by DRDO-ARMREB, Pune to enhance the ability to design electrical machines for the required specifications.
PSO2: Design and analyze power electronic interfaces for renewable energy systems.	
	Reform 1: Students are encouraged to do power electronics based projects for renewable energy systems to enhance the ability to design and analyze the power electronic interfaces. **Reform 2:** Seminars are conducted on recent trends on power electronic interfaces for renewable energy. **Reform 3:** Students are involved in R&D project "Recognition and characterization of solar cell defects using combined thermography image and reconfiguration scheme" funded by DST-SERB, Govt. of India. **Reform 4:** Students visit solar and wind power plants to get practical exposure on power electronic interfaces.

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