

CRITERION 7	Continuous Improvement	75
	Marks Claimed	69

7.1. Actions taken based on the results of evaluation of each of the POs & PSOs (30)

Claimed 28

It has been observed that POs 1, 3, 6, 7, 11 and 12, and PSO 3 have been mostly meeting target levels. Furthermore, POs 2, 4 and PSOs 1, 2 have also been met or maintained close to target levels. Attainment levels in POs 5, 8, 9, and 10 have not been significantly good, owing to less socio-cultural interactions of students in the academic atmosphere, and the raging COVID pandemic in Spring 2020. However, gradual improvement is seen in these as well. Moreover, these POs are mostly of social or managerial nature. While students have been fairing well in the technical spheres, lack of exposure to social challenges faced by an engineer is the reason behind this shortfall. To combat this challenge, group activities, counselling sessions, interactions and technical tours are encouraged, where emphasis is laid on the environmental, social and political impacts of electrical engineering facilities. Extracurricular activities such as debates, technical and cultural events are held for honing communication skills of students while teaching them to work as a team.

It was seen that CO attainments were poor in Power Electronics. This was attributed to weak fundamentals in mathematical tools such as Fourier series, transform theory etc. To address the issue, more practice sets were given to students per semester, and emphasis was laid on mathematical techniques used in the subject. Similarly, in the course on Electrical Machine Design, video lectures, animations, and laboratory visits were facilitated, that enabled a better understanding through vivid imagination.

POs & PSOs Attainment Levels and Actions for improvement

Assessment/Analysis of Programme Outcomes (Pos)				
POs	Target and Attainment Level 2017-18	Target and Attainment Level 2018-19	Target and Attainment Level 2019-20	Observations
PO1: Engineering Knowledge:	To Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			

PO1	Target: 2.1	Target: 2.2	Target: 2.15	Electrical engineering curriculum requires the strong foundation of theoretical and practical knowledge of science and mathematics, which the students study in their first year and are able to apply and correlate well over the next years. A marginal dip is observed in CAY 2018-2019, and subsequently attainment level is observed to improve above target level.
	Attainment: 2.18	Attainment: 2.04	Attainment: 2.15	

Action 1: Mathematical analysis of engineering problems is encouraged so that students can learn fundamental concepts and be able to apply them in problem solving

PO2: Problem analysis: Identify, formulate, review research literature, and analyse complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2	Target: 2	Target: 2	Target: 2	Although students are mostly capable to understanding and analysing text book literature, they are seen to slightly lag in amalgamating their knowledge with state of art research. There is a dip and then gradual improvement in attainment levels, to meet the target level in near future.
	Attainment: 1.89	Attainment: 1.84	Attainment: 1.86	

ACTION 1: Industrial visits are expected to help students gain knowledge on complex engineering problems

ACTION 2: Students are encouraged to observe, their homes and surroundings to gain insight into real life engineering problems and think of possible approaches/solutions to these problems.

ACTION 3: Research oriented final year B.Tech Projects are encouraged to develop and hone their research skills.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate considerations for the public health and safety, and the cultural, societal, and environmental considerations.

PO3	Target: 1.75 1.74	Target: 1.75	Target: 1.75	Some of the projects developed by students as minor projects/major projects (final year) are not very industry compatible in terms of economy or footprint. Due to actions and measures taken, target level has
	Attainment: 1.74	Attainment: 1.67	Attainment: 1.79	

				been met in the latest assessment year.
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ACTION1: Students are motivated to include all standard parameters and constraints according to National and International safety norms and to address environmental concerns, while focussing on innovative designs for their projects. PCB based converter designs have been initiated to make the work of students at par with industrial standards.

PO4: 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.

PO4	Target: 1.7	Target: 1.7	Target: 1.5	It is observed that research based studies are not very likely at undergraduate level. Therefore, target levels have been slightly reduced such that targets are met in the last assessment year.
	Attainment: 1.54	Attainment: 1.49	Attainment: 1.57	

ACTION1: Students are encouraged for hardware implementation and experimentation, thereby enabling better productivity during final year project, and to provide initial exposure to research.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO5	Target: 2	Target: 2	Target: 2	It is observed that up-gradations of tools and resources are necessary to meet the industry standards and research. There is a dip in attainment levels, as students have not been able to use latest lab tools during the period post revocation of article 370 and during the covid pandemic.
	Attainment: 1.38	Attainment: 1.32	Attainment: 1.31	

ACTION1: Continuous up gradation of lab infrastructure is undertaken so as to meet the rapidly going needs of academia. Some purchases include power quality analysers, DSpace, FPGA boards etc.

ACTION2: Simulation software such as Matlab/Simulink, MiPower, are been taught to students and simulation of circuits is encouraged in many courses, such as Power Electronics, High Voltage Engineering, Control Systems.

ACTION3: B.Tech projects using latest modeling and control techniques, such as machine learning, predictive control, and optimization techniques etc, are encouraged.

PO6: 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.

PO6	Target: 1.4	Target: 1.5	Target: 1.5	The courses floated in are addressing the safety and social concerns regarding engineering practices in real life. Target level has been mostly met.
	Attainment: 1.45	Attainment: 1.43	Attainment: 1.58	

ACTION1: To understand the safety concerns and social aspects, student industry visits are encouraged to expand their practical knowledge with the effect of improved practices in engineering. Besides this some mandatory humanities courses ensure that students are repeatedly reminded of their social responsibilities as electrical engineers.

PO7: 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.

PO7	Target: 1.5	Target: 1.55	Target: 1.5	The issues of global and environmental awareness among the student should be improved, and they should be made more aware of their responsibilities towards energy efficiency. Target level has been mostly met.
	Attainment: 1.54	Attainment: 1.51	Attainment: 1.52	

ACTION1: Students are encouraged to indulge in projects, in which global and environmental issues are improved, with respect to consumption of energy and utilization of renewable energy resources. Also a course of Non-Conventional Energy Sources is floated to present renewable energy as the next main technology for electrical engineers.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO8	Target: 1.5	Target: 1.5	Target: 1.5	The students are doing better in improving the overall expertise in field of engineering but due to lack of communications and other ethical and moral knowledge, some are lagging in
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	Attainment: 1.24	Attainment: 1.14	Attainment: 0.98	real life situations. Also a lot of courses are not mapping well to PO8 due to the strictly technical nature of engineering curriculum.
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ACTION1: Career readiness program, corporate lectures and motivational talks are arranged to overcome the above observations. Class Assessments are encouraged via Open Book exams to help students become self-reliant.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO9	Target: 1.5	Target: 1.5	Target: 1.5	There was gradual improvement in attainment levels initially, followed by mild deterioration due to suspension of team work during the covid pandemic. It is expected that target levels will be met in near future.
	Attainment: 1.38	Attainment: 1.40	Attainment: 1.35	

ACTION1: Institute holds cultural programs and alumni meets where students are encouraged to volunteer as organisers. This provides them with a platform to work as individuals as well as in groups, helping students groom their skills like leadership and team spirit.

ACTION2: Final Year projects are also aligned in such a way that students learn to work and operate as a team.

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.

PO10	Target: 1.5	Target: 1.5	Target: 1.5	The communication, presentation and report writing skills are to be further improved among the students. There is gradual improvement in attainment levels, and with more concentrated efforts, it is expected that the target level will be met in future.
	Attainment: 1.10	Attainment: 1.24	Attainment: 1.34	

ACTION1: Soft skills training is imparted to students to enhance various aspects of communication/technical talks by group discussions, presentations and new learning outcomes. Regular seminars and presentations are held to help students communicate technical ideas well.

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.

PO11	Target: 1.5	Target: 1.55	Target: 1.6	Few humanities based courses of the curriculum are directed towards teaching management principles, project management and financial implications and in multidisciplinary environments. Target levels are met.
	Attainment: 1.55	Attainment: 1.57	Attainment: 1.69	

ACTION1: Awareness is created among the student regarding the management principles and managing projects. Also, with many management based recruiters offering placements in the campus, students are expected to realise the importance of management in engineering.

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.

PO12	Target: 1.5	Target: 1.55	Target: 1.55	Pre-final year and final year courses of the programme are demonstrating resources for contemporary issues and lifelong learning. There is gradual improvement in attainment levels and target levels have been consistently met.
	Attainment: 1.52	Attainment: 1.56	Attainment: 1.57	

ACTION1: Through advanced level courses that are expected to hold relevance throughout their careers, students are eased into learning skills that have long term benefits.

Assessment/Analysis of Programme Specific Outcomes (PSOs)

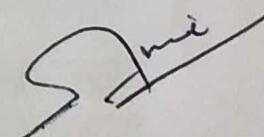
PSO1: Students should be competent, creative and imaginative electrical engineers employable in fields of design, research, manufacturing, safety, quality and technical services.

PSO1	Target: 1.8	Target: 1.8	Target: 1.8	Although students are made well aware and equipped with basic understanding of simulation software that are used in various spheres of electrical engineering, they are observed to slightly lag in
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	Attainment: 1.82	Attainment: 1.71	Attainment: 1.78	experimentation, hardware development, and research skills.
<p>ACTION1: Workshops for technical writing and simulation of electrical systems are being organised.</p> <p>ACTION2: More hardware based projects are being undertaken.</p>				
<p>PSO2: Students should be able to progress through advanced degree, certificate programs or participate in continuing education in electrical engineering, business, and other professionally related fields.</p>				
PSO2	Target: 1.9	Target: 1.95	Target: 1.9	The courses of the program are demonstrating the resourcefulness for contemporary issues. The project titles of the final year students are addressing the real life problems. Target levels are mostly met.
	Attainment: 1.95	Attainment: 1.81	Attainment: 1.89	
<p>ACTION1: Students are motivated to take up the real life problems during their project work so that they can design, analyze and find solution which gives exposure to latest technologies.</p>				
<p>PSO3: Students should take lead in innovation and entrepreneurship activities with high professional standards and moral ethics and prove themselves beneficial to society at large.</p>				
PSO3	Target: 1.4	Target: 1.4	Target: 1.4	It is required to inculcate ethics, good interpersonal relationships, ability to communicate, leadership and project management skills in students. There is gradual improvement in attainment levels to meet the target in near future.
	Attainment: 1.4	Attainment: 1.43	Attainment: 1.45	
<p>ACTION1: Motivational lectures are arranged to encourage students regarding these activities.</p> <p>ACTION2: Student chapters of IEEE and IET have been started that encourage students to understand their roles as engineers in the society, and to support them in maintaining high engineering standards.</p>				

List of Ph.D. Awarded (Autumn 2017- Spring 2021)

S.No	Name	Title of Thesis awarded	Supervisor(s)	Awarded Year
01	Deepak Sharma	Performance Investigation of a Three-Phase Improved Power Quality Converter for Supply Side Perturbations	Prof. A. H. Bhat & Prof. Aijaz Ahmad	2018
02	Mubashir Yaqoob Zargar	Adaptive Predictive Control of Superconducting Magnetic Energy Storage System for Power Quality Improvement of a Standalone Wind-Diesel Power System	Prof. S.A. Lone & Prof. M.D. Mufti	2018
03	Zahid Nabi Dar	Intelligent application of FACTS devices in wind penetrated power system	Prof. M.D. Mufti	2019
04	Hailiya Ahsan	Predictively Controlled Energy Storage Devices for Power System Stability Studies	Prof. M.D. Mufti	2020
05	Shubendra Pratap Singh	Performance Investigation of Dynamic Voltage Restorer for Mitigation of various Power Quality Problems	Prof. A. H. Bhat	2020
06	Anupam Kumar	Performance Investigation of Dual Active Bridge Converter in DC Microgrid	Prof. A. H. Bhat & Prof. Pramod Agarwal	2020
07	Satyavir Singh	Improved Algorithms for Nonlinear Model Order Reduction	Dr. M. A. Bazaz	2020
08	Hadhiq Khan	Model Order Reduction of Power Electronic Circuits	Dr. M. A. Bazaz & Dr. Shahkar Nahvi	2020
09	Viqar Yousuf	Analysis and Assuagement of Sub-Synchronous Resonance in Power System using FACTS devices	Prof. Aijaz Ahmad	2021

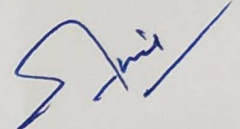

 Dr. M.A Bazaz

(Head EED)

Short-Term Courses (STCs)/ Workshops

S. No	Event	Sponsoring Agency	Date/Period
01	Power System Control – A Smart Approach	TEQIP-III NIT Srinagar	11 th -15 th Dec, 2020
02	One week workshop on “Application of MATLAB in Engineering Applications”	TEQIP-III NIT Srinagar	26 th -30 th Nov, 2020
03	One week Online Short-Term Course (STC) on “Smart Power & Energy Systems”	TEQIP-III NIT Srinagar	30 th Oct-3 rd Nov,2020
04	Webinar on IET and its importance to Engineering students jointly organized by IET On campus NIT Srinagar Student Chapter and IET Delhi Local Nework.	TEQIP-III NIT Srinagar	22 nd Oct, 2020
05	One-week STC on “Large Scale Grid Integration of renewable sources; Challenges, issues, modelling and solutions” under TEQIP-III	TEQIP-III NIT Srinagar	23 rd -27 th Sept,2020
06	One-week STC on “Recent Techniques in Condition Monitoring of Electrical Apparatus”.	TEQIP-III NIT Srinagar	7 th -11 th Sept,2020
07	One Week STC on Application of Artificial Intelligence in Electrical Energy Systems		17 th -21 st August, 2020
08	One-week Online Faculty Development Program on Soft Computing Techniques - 2020 (SCT-2020) under TEQIP-III	TEQIP-III NIT Srinagar	25 th -30 th July, 2020
09	Renewable Energy in Science, Engineering and Technology (RESET-2019)	TEQIP-III NIT Srinagar	1 st -5 th July,2019
10	Introduction to MATLAB, PSCAD and LaTeX for researchers under TEQIP-III	TEQIP-III NIT Srinagar	24 th -28 th June,2019

11	Scientific & Technical Document Using Latex	TEQIP-III NIT Srinagar	8 th -9 th June,2019
12	Basic Programming Skill Using MATLAB and PHYTHON	TEQIP-III NIT Srinagar	8 th -9 th June,2019
13	One-week STC on "Introduction and Basics of Programming skill using MATLAB and PYTHON"	TEQIP-III NIT Srinagar	27 th -31 st May, 2019
14	One week Workshop on "Power Electronics: Applications in Renewable Energy Systems"	TEQIP-III NIT Srinagar	22 nd -26 th April, 2019



Dr. M.A Bazaz
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