

HALDIA INSTITUTE OF TECHNOLOGY

INTERNAL QUALITY ASSURANCE CELL

Academic Audit 2023-24

Evaluation Sheet

Department Name: **Electrical Engineering**

Programme Name: **B. Tech**

Academic Year: **2023-2024**

I. PEO's, PO's and Curriculum		
Sl No	Criterion	Observations
1	PEO's and PO's attainment	The attainment of the program's POs and PSOs has shown a minor improvement.
2	Revision in curriculum and validation date (provide details)	<p>A minor modification of the existing syllabus was carried out during the Board of Studies (BOS) meeting held on April 22, 2024. The meeting witnessed active participation from all departmental members alongside esteemed external experts.</p> <p>The revision process aimed to align the syllabus with contemporary academic and industrial demands, ensuring its relevance and effectiveness. The updated structure incorporates the following key enhancements:</p> <p>1. Expert Input External experts from academia and industry provided valuable insights into current trends and future requirements. Their collaboration helped ensure that the revised syllabus remains industry-aligned and forward-thinking.</p> <p>2. Comprehensive Review Departmental faculty conducted an in-depth analysis of the existing syllabus, identifying gaps and areas for improvement. This review involved benchmarking against the syllabi of leading institutions to maintain academic excellence.</p> <p>3. Skill-Oriented Modifications The updated syllabus emphasizes skill development, practical applications, and interdisciplinary integration. It introduces advanced topics and elective courses reflecting emerging technologies and research areas in Electrical Engineering (EE).</p> <p>4. Alignment with Outcomes-Based Education (OBE) The revised structure adheres to OBE principles, ensuring that each course is explicitly linked to specific program outcomes (POs) and program-specific outcomes (PSOs).</p>

		<p>5. Focus on Research and Innovation To foster a research-driven learning environment, the syllabus now incorporates more research-oriented activities, encouraging student involvement in projects, case studies, and problem-solving tasks.</p> <p>6. Regular Assessment and Feedback A structured mechanism for periodic feedback and assessments has been introduced to ensure continuous curriculum improvement. This will help students acquire the knowledge and skills necessary to excel in their careers.</p>
3	Extent of its satisfaction with curriculum revision	<p>The comments and suggestions provided by external experts during the Board of Studies (BOS) meeting on April 22, 2024, were carefully reviewed and incorporated into the autonomous syllabus of the Electrical Engineering (EE) program.</p> <p>These expert insights played a crucial role in identifying and addressing gaps in the existing curriculum, ensuring that the revised syllabus aligns with both academic and industry standards. The integration of these recommendations led to several key enhancements:</p> <p>1. Bridging Curriculum Gaps Identified shortcomings were addressed to align the syllabus with current technological advancements and industry trends.</p> <p>2. Enhancing Practical Relevance Expert recommendations resulted in the inclusion of more practical, application-oriented topics and the redesign of lab courses to better equip students for real-world challenges.</p> <p>3. Strengthening Interdisciplinary Integration Cross-domain courses and collaborative learning opportunities were introduced to foster interdisciplinary interaction and broaden students' perspectives.</p> <p>4. Promoting Research and Innovation Recognizing the importance of research, the revised syllabus now incorporates research-driven projects and case studies to cultivate an innovative mindset.</p> <p>5. Improving Employability To meet industry expectations, the curriculum now includes skill-development modules, relevant elective courses, and soft skills training, enhancing students' career readiness.</p>

II. Faculty information and their contribution		
Sl No	Criterion	Observations
1	Teacher-Student ratio	1:16.60
2	Faculty Cadre ratio	2:4:19
3	Faculty qualifications	PhD: 8, M. Tech: 17
4	Average experience of faculty	11 years
5	Faculty contribution in writing	
	Books	0
	Chapters	7
6	Members in Editorial boards	NIL
7	Faculty in professional organizations	Faculty members hold professional memberships in IEEE, IETE, IETI, and other organizations, actively participating in workshops, seminars, faculty development programs, and conferences.
8	Awards/ Rewards received	1. Best Paper Award in “CHEMEEE, 2024” 19 th -21 st Feb, 2024 at IPE, Visakhapatnam
9	Industry Collaborative Projects	NIL
10	Faculty as resource persons in workshops/ training activities	16
11	National level events organized	
	Conference	0
	Workshops/Seminars-	0
	FDPs	1
	International level events organized	0
	Conferences-	1 (ASPCON 2023)
	Workshops Seminars	0
12	Number of conferences /seminars workshops/ FDP's any exclusive programs attended for enrichment of teaching learning process	80

III. Teaching-Learning Process and Evaluation		
Sl No	Criterion	Observations
1	Curricular aspects	<p>Under autonomous status, the Board of Studies (BOS) has been established, comprising a diverse group of members, including representatives from mentoring and senior institutes, industry professionals, and faculty members from the department. The BOS is responsible for designing and implementing the curriculum and syllabus for the Electrical Engineering (EE) program, ensuring alignment with both academic standards and industry requirements.</p> <p>As part of the curriculum enhancement, value-added courses (VAC) have been introduced in the 2nd and 3rd years. These courses go beyond the core syllabus, allowing students to explore specialized fields and broaden their knowledge base. Designed to enhance practical skills and interdisciplinary learning, these courses prepare students for diverse career opportunities and emerging industry trends.</p> <p>This holistic approach ensures that students not only gain expertise in their core discipline but also develop additional competencies that improve their employability and readiness for professional challenges.</p>
2	Mechanism and activities for slow learners for their improvement outcomes	<ul style="list-style-type: none"> • Remedial and Extra Classes Special remedial or extra classes are organized for slow learners based on a preliminary assessment. These sessions focus on specific subjects or topics where students require additional support. • Individual Academic Counselling Subject teachers provide personalized academic counselling to address individual challenges and enhance students' understanding of course material. • Student Mentoring System Regular mentoring sessions are conducted by departmental faculty mentors, ensuring continuous guidance and support. Academic performance and progress records are systematically maintained and shared with parents to keep them informed. • Departmental Oversight The Head of the Department (HoD) closely monitors the mentoring system to ensure its effectiveness and consistency.

		<ul style="list-style-type: none"> • Hands-On Learning through Mini Projects Students engage in group-based mini projects, providing practical, hands-on learning experiences to reinforce their conceptual understanding. • Encouraging Online Learning Slow learners are encouraged to enroll in online courses to expand their knowledge base and gain deeper insights into their subjects.
3	Student counselling mentoring mechanism	<p>The Student Mentorship Program is a structured initiative designed to provide students with continuous academic and personal support. Each student is assigned a dedicated faculty mentor who guides them throughout their academic journey, helping them overcome challenges and achieve their goals.</p> <p>Key Objectives of the Program:</p> <ol style="list-style-type: none"> 1. Comprehensive Counselling Mentors offer both academic and non-academic counselling; ensuring students receive holistic guidance for their personal and professional growth. 2. Access to Preparatory Courses Students receive guidance on preparatory resources, including skill development programs, bridge courses, and academic support systems, enhancing their preparedness and success. 3. Motivation and Goal Setting The program encourages students to set clear learning objectives and work towards them effectively, leading to improved academic performance. 4. Holistic Guidance and Well-Being Mentors actively engage with students, addressing their academic concerns while also supporting their mental, emotional, and physical well-being. When needed, they connect students with appropriate resources or referrals. 5. Encouraging Engagement and Curiosity The program fosters enthusiasm for academics and institutional activities, creating a dynamic and engaging learning environment.

4	Tutorial classes	<p>Tutorial classes incorporate interactive and engaging learning methods to strengthen students' problem-solving abilities and teamwork skills. Key features of these sessions include:</p> <ol style="list-style-type: none"> 1. Collaborative Problem-Solving Students are divided into groups and assigned different problems to solve together. This approach encourages peer learning, enhances group discussion skills, and promotes collaborative problem-solving. 2. Dynamic and Engaging Methodologies Quizzes and other innovative learning techniques are periodically introduced to keep sessions interactive, stimulating, and intellectually engaging. 3. Faculty-Guided Discussions All activities are conducted under the supervision of a faculty member, ensuring that discussions remain focused, productive, and enriched with expert guidance. 4. Application of Theoretical Concepts Students deepen their understanding by applying theoretical knowledge to real-world and practical scenarios, reinforcing key concepts. 5. Skill Development for Success Tutorial session's help students develop essential skills for planning and executing tasks effectively, contributing to their academic growth and goal achievement.
5	<p>Monitoring of teaching-learning process</p> <ol style="list-style-type: none"> (a) E-learning models: (b) Assessment of teaching process in classrooms (c) Innovative teaching process in presented if any (d) Verification of course files: 	<p>(a) Types of Assessment Activities</p> <p>To ensure comprehensive learning and evaluation, a variety of assessment methods are employed:</p> <ol style="list-style-type: none"> 1. Interactive Study Materials Study materials include ungraded activities with built-in feedback mechanisms. These resources are made accessible to students via e-content uploaded to the institute's online repository. 2. Self-Assessment Tools Quizzes and tests allow students to evaluate their understanding and track progress independently. 3. Structured Feedback Assignments are reviewed by instructors, peers,

		<p>workplace colleagues, or mentors, providing valuable feedback for concept enhancement.</p> <p>4. Informal Learning Support Regular interactions with instructors and peers help students clarify doubts and reinforce their understanding.</p> <p>5. Practice Assessments Ungraded tests help students prepare for formal evaluations, reducing exam anxiety and improving performance.</p> <p>(b) Assessment of the Teaching Process in Classrooms</p> <p>To evaluate teaching effectiveness, various assessment strategies are implemented:</p> <ol style="list-style-type: none"> 1. Initial Knowledge Assessment Faculty members assess students' prior knowledge before introducing a new topic, tailoring teaching methods accordingly. 2. Continuous Evaluations Ongoing assessments, such as quizzes, group discussions, and classroom participation, help monitor student progress. 3. Periodic Examinations Mid-semester and end-of-semester exams provide a structured evaluation of student learning outcomes. 4. Interactive Assessments Faculty members use spontaneous methods, such as open-ended questions and discussions, to gauge understanding dynamically. <p>This multi-faceted approach ensures an effective evaluation of teaching strategies and student learning, facilitating continuous improvement.</p> <p>(c) Innovative Teaching Approaches</p> <ul style="list-style-type: none"> • Students receive preparatory materials—such as video lectures, e-books, and interactive content—after attending class. • These materials introduce key concepts, allowing students to engage in deeper discussions and hands-on learning during in-class sessions.
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		<p>(d) Verification of Course Files</p> <ul style="list-style-type: none"> • At the end of each semester, course files undergo thorough verification to ensure completeness and accuracy. • This process includes reviewing lesson plans, assessment records, and other documentation to uphold academic standards and accountability.
6	Training/Skill Development Programs conducted for students	Industrial vocational training programs and internships have been conducted across various industries throughout India.
7	Students feedback& steps taken	Online student feedback for faculty is collected twice each semester within the department. Based on the feedback, faculty members receive guidance and recommendations for improvement.
8	Scope for Self-learning Certified course Online courses	Students are encouraged to enroll in online courses through platforms like NPTEL, Coursera, and others to enhance their knowledge and skill set.
9	Results Analysis	Semester-wise result analysis for each subject is conducted by the respective subject teachers in coordination with the Head of the Department.
10	Parents meeting on evaluations of student's progress	The department regularly organizes parent meetings to keep them informed about their child's academic progress and overall development. These meetings, held at the end of each semester or academic year, aim to foster effective communication and collaboration between faculty and parents.
11	Student involvements in extra Curricular & Co-curricular activities:	Students actively participate in the institute's sports programs and cultural events, as well as engage in departmental student technical club and societies such as Illuminate and IEEE Student Branch . The department regularly organizes workshops, seminars, and webinars to enhance student involvement. Additionally, students are encouraged to take part in various activities and competitions organized by AICTE IDEA Lab in HIT and other institutes to broaden their learning experiences.

IV. Research, Consultancy and Extension		
Sl No.	Criterion	Observations
1	Faculty publications in Journals National- International-	0 18
2	Publications in Conference National- international-	0 9
3	PhDs-Registered Awarded Pursuing	1 10
4	Funded R & D projects Applied Sanctioned Ongoing Completed	1 1 2 0
5	Patent applied Patent awarded	0 5
6	In-house R & D Grants & Projects	0
7	New research facilities/ laboratory facilities provided	✓ Induction motor Condition Monitoring setup ✓ Transformer Condition Monitoring setup
8	MOU's with industries/ R & D/ Premier Institutes	✓ MoU with Industry 4 ✓ MoU with Academic Institutions 15 ✓ MoU or Internship 3
9	Research centers of excellence established	NIL

V. Infrastructure and Learning Resources		
SI No	Criterion	Observations
1	Adequacy of infrastructural facilities to improve the teaching learning process Class rooms: Laboratories: ICT/e-class rooms: Seminar halls:	5 12 3 1
2	Internet facilities for faculty & students	Yes
3	Modern/ new equipment added in laboratories	Yes
4	Details of computing facilities and improvement	Control System Lab – 41 nos. Power Electronics Lab – 10 nos. Power System Lab-06 nos. Measurement Lab-01 no. Departmental Library-01 no. Others – 06 nos.
5	Department level library resources	No. of Title: 525 nos. No. of Books: 1337 nos.

VI. Student information, Support and Progression		
Sl. No.	Criterion	Observations
1	Department student clubs	The IEEE Student Branch and Illuminate Club offer students the opportunity to become members and actively participate in seminars, workshops, technical quiz competitions , and various academic events. These platforms provide valuable opportunities for skill enhancement, networking, and professional growth , helping students stay engaged with the latest advancements in their fields.
2	Details of coaching provided for GATE/ GRE/ any other competitive exams for higher studies	The department has implemented several initiatives to support students preparing for competitive exams such as GATE (Graduate Aptitude Test in Engineering) and similar examinations. These efforts include: <ul style="list-style-type: none"> • Access to Study Materials: The departmental library is well-stocked with GATE preparation books, covering both foundational concepts and specialized topics in Instrumentation Engineering.

		<ul style="list-style-type: none"> • Preparatory Guidance: Mentors, subject teachers, and reference materials, including NPTEL courses, guide students in GATE preparation, with faculty providing assistance in resolving doubts and problems. <p>Through these initiatives, the department ensures that students receive the necessary resources and guidance to excel in competitive examinations.</p>
3	Industrial visits and academic visits	<p>Industrial Visits and Internships are essential components of the engineering curriculum, providing students with practical exposure to real-world industrial environments and enriching their learning experience. The college regularly organizes industrial visits and internships, particularly in Haldia, which is a major industrial hub with numerous manufacturing units, power generation plants, and oil refineries. This strategic location allows students to gain firsthand industry experience and develop a deeper understanding of engineering applications in real-world settings.</p>

VII. SWOC Analysis of the Department		
Sl. No.	Criterion	Observations
1	Strength:	<p>Highly Qualified Faculty – Experienced and well-trained faculty members committed to academic excellence and student development.</p> <p>Efficient Administration – Well-organized administrative processes ensure smooth academic and departmental operations.</p> <p>Engaging Intra-Departmental Activities – Regularly conducted events, workshops, and technical sessions enhance student learning and collaboration.</p> <p>Strong Industry Interaction – Active collaborations with industries provide students with valuable exposure through internships, industrial visits, and expert lectures.</p> <p>Innovative Student Projects – Students undertake high-quality, industry-relevant projects that showcase creativity, technical skills, and problem-solving abilities.</p>
2	Weakness:	<p>Limited Research Funding – Increased efforts are needed to secure external research grants and funding opportunities to support faculty and student research initiatives.</p> <p>Low Student Enrollment in Higher Studies – More guidance, mentorship, and awareness programs are required to encourage students to pursue postgraduate and doctoral studies.</p> <p>Enhancing Student Quality – Focused efforts on admissions, skill development programs, and academic mentoring can help improve the overall quality and preparedness of students.</p>

3	Opportunities	<p>Strategic Location & Connectivity – Proximity to Haldia’s core industrial hubs and Kolkata’s SECTOR V, IT hub provides excellent opportunities for industry collaboration, internships, and placements.</p> <p>Aspiring Students & Dedicated Faculty – A motivated student community and committed faculty members create a strong foundation for academic excellence, research, and innovation.</p> <p>Emerging Industry Demands – Growing opportunities in Machine Learning (ML), Artificial Intelligence (AI), Automation, IoT, and Renewable Energy open new avenues for curriculum enhancement, research, and industry partnerships.</p>
4	Best practice/ Innovative:	<p>The department has implemented several forward-thinking reforms and initiatives to enhance education quality, making learning more engaging, practical, and collaborative. Below are key strategies and improvements:</p> <ol style="list-style-type: none"> 1. Experiential & Active Learning Teaching methods have been restructured to incorporate experiential learning, encouraging students to actively participate in their education. The focus is on discussions, problem-solving activities, and collaborative projects rather than passive knowledge absorption. 2. Collaborative Projects The curriculum emphasizes teamwork, with students engaging in group projects that develop practical skills and foster peer learning. 3. Industry-Relevant Exposure Students gain hands-on experience throughout the entire product development cycle—from concept and prototyping to final execution—helping them understand real-world industry challenges. 4. Technology-Driven Project Exhibitions The department organizes exhibitions featuring innovative student projects in emerging technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), Machine Learning, and Data Science. These events provide a platform for students to present their work to industry experts, faculty, and peers.

		<p>5. Structured Course Mapping</p> <p>A systematic approach aligns course learning outcomes with overall program objectives, ensuring a cohesive and goal-oriented educational experience.</p>
5	Future plans:	<p>The department has implemented several key strategies to enhance infrastructure, faculty expertise, student development, and overall educational quality. Below are the core initiatives:</p> <ol style="list-style-type: none"> 1. State-of-the-Art Infrastructure Continuous upgrades ensure that facilities remain aligned with technological advancements, catering to the evolving needs of modern engineering education. 2. Faculty Development & Industry Collaboration The department prioritizes continuous professional growth for faculty through workshops, seminars, training programs, and collaborations with industry experts to stay updated with the latest technological trends. 3. Attracting High-Achieving Students By showcasing career opportunities, advanced teaching methodologies, and modern infrastructure, the department aims to attract top-performing students. 4. Industry-Relevant Curriculum Updates The curriculum is regularly revised to integrate emerging technological trends, ensuring students acquire up-to-date knowledge and industry-relevant skills. 5. Enhancing Communication Skills Special emphasis is placed on improving English communication skills, particularly for students from rural and semi-urban backgrounds, to boost their confidence and career prospects. 6. Holistic Student Development Beyond academics, the department fosters social, cultural, and environmental awareness to develop well-rounded individuals. 7. Encouraging Sports & Co-Curricular Activities Recognizing the role of extracurricular engagement in personal growth, the department actively supports sports and other co-curricular activities. 8. Strengthening Career Guidance & Mentorship The department provides enhanced career guidance, helping students align their academic journey with their long-term professional goals.

Academic Audit Report 2023-24

1. Name of Department: Electrical Engineering
2. No of full time permanent faculty: 25
3. No of part time Visiting temporary contractual faculty: 2
4. No of PG/UG courses: PG- 1/ UG- 1
5. Curriculum Revisions during the year: Yes
6. Research: Publications in journals: International- 18 National- Nil
7. PhD Awarded:1
8. Faculty guiding Ph.D:03
9. Number of Conferences/Lectures Organized: 01
10. Ongoing Sponsored projects & amount: 01 – Rs. 19,25,000/-
11. No of Faculty using: ICT & PPT: 25
12. New Equipment and Infrastructure added: Yes
13. Student feedback on Curriculum (Yes/ No): Yes
14. Strengths:
 - ✓ The department maintains well-organized administrative processes, ensuring seamless academic and operational management.
 - ✓ Faculty's extensive research contributions enhance the department's academic reputation.
 - ✓ Strong mentorship and career development efforts improve student outcomes.
 - ✓ Student welfare initiatives ensure continuous support and guidance.
15. Weaknesses:
 - ✓ Limited research funding restricts the growth of research initiatives.
 - ✓ More efforts are needed to motivate students toward higher education.
 - ✓ Enhancing student involvement in research can cultivate a stronger research culture.
 - ✓ Promoting interdisciplinary collaborations will encourage innovative learning.
16. Suggestions for improvement
 - ✓ Regular curriculum updates align the program with industry trends.
 - ✓ Increasing national-level publications and Ph.D. guidance can boost research productivity.
 - ✓ Additional research funding and consultancy efforts will drive innovation.

- ✓ Efforts should be made to add new equipment and infrastructure to enhance resources for teaching and research.
- ✓ Hosting conferences and securing more sponsored projects can strengthen academic collaborations.

17. Departmental Coordinator: Dr. Pratyay Konar, Convener of Academic Audit Committee and Associate Professor, EE Department

18. Academic Auditors: Dr. Ujjwal Mandal, Associate Professor, Instrument Engineering, Dept. of Applied Physics, University of Calcutta.



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