

HALDIA INSTITUTE OF TECHNOLOGY

INTERNAL QUALITY ASSURANCE CELL

Academic Audit 2023-2024

Evaluation Sheet

Department Name: **Applied Electronics and Instrumentation Engineering**

Programme Name: B.Tech,

Academic Year: **2023-2024**

I. PEO's, PO's and Curriculum		
Sl No	Criterion	Observations
1	PSO's and PO's attainment	The attainment of all the program's POs and PSOs has shown a slight improvement.
2	Revision in curriculum and validation date (provide details)	<p>Minor modification of the existing syllabus is done during the Board of Studies (BOS) meeting held on 31st March 2023. The meeting included active participation from all departmental members along with esteemed external experts.</p> <p>The revision process aimed to align the syllabus with contemporary academic and industrial demands, ensuring that students acquire the knowledge and skills needed to excel in their careers. The updated structure incorporates the following key highlights:</p> <ol style="list-style-type: none"> Input from Experts <p>The presence of external experts from academia and industry provided valuable insights into current trends and future requirements. This collaboration ensured that the revised syllabus remains relevant and industry-aligned.</p> Comprehensive Review <p>Departmental faculty members conducted an in-depth analysis of the existing syllabus, identifying gaps and areas for improvement. This included benchmarking against syllabi of other leading institutions.</p> Skill-Oriented Modifications <p>The revised syllabus places a greater emphasis on skill development, practical application, and interdisciplinary integration. It introduces advanced topics and elective courses that reflect emerging technologies and research areas in AEIE.</p>

		<p>4. Alignment with Outcomes-Based Education (OBE)</p> <p>The structure has been designed to comply with Outcomes-Based Education principles, linking each course with specific program outcomes (POs) and program-specific outcomes (PSOs).</p> <p>5. Focus on Research and Innovation</p> <p>The syllabus now incorporates more research-oriented activities, promoting student involvement in projects, case studies, and problem-solving tasks.</p> <p>6. Regular Assessment and Feedback</p> <p>A mechanism for periodic feedback and assessments has been included to ensure continuous improvement and relevance of the curriculum.</p>
3	Extent of its satisfaction with curriculum revision	<p>The comments and suggestions provided by all the external experts during the Board of Studies (BOS) meeting held on 31st March 2023 were thoroughly reviewed and incorporated into the autonomous syllabus of the Applied Electronics and Instrumentation Engineering (AEIE) program.</p> <p>These expert inputs were instrumental in identifying and addressing gaps in the existing curriculum, ensuring that the revised syllabus meets both academic and industry standards. The incorporation of these comments helped to:</p> <ol style="list-style-type: none"> 1. Bridge Curriculum Gaps <p>Specific shortcomings in the syllabus were identified and rectified, aligning the curriculum with current trends and technological advancements in the field.</p> <ol style="list-style-type: none"> 2. Enhance Practical Relevance <p>Expert recommendations led to the inclusion of practical, application-oriented topics and the redesign of lab courses to better prepare students for real-world challenges.</p> <ol style="list-style-type: none"> 3. Strengthen Interdisciplinary Integration <p>Suggestions to improve interdisciplinary interaction were implemented, introducing cross-domain courses and collaborative opportunities to broaden students' perspectives.</p> <ol style="list-style-type: none"> 4. Promote Research and Innovation

		<p>Experts emphasized the importance of integrating research activities, resulting in the addition of research-oriented projects and case studies in the curriculum.</p> <p>5. Improve Employability</p> <p>Comments related to skill development and industry expectations were addressed by including relevant elective courses, soft skills training, and industry-specific modules.</p>
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II. Faculty information and their contribution		
Sl No	Criterion	Observations
1	Teacher-Student ratio	1:16.58
2	Faculty Cadre ratio	1:2:9
3	Faculty qualifications	PhD: 6, M.Tech: 6
4	Average experience of faculty	15 years
5	Faculty contribution in writing	
	Books	0
	Chapters	5
6	Members in Editorial boards	0
7	Faculty in professional organizations	0
8	Awards/ Rewards received	0
9	Industry collaborative projects	0
10	Faculty as resource persons in workshops/ training activities	2
11	National level events organized	
	Conference	
	Workshops/Seminars-	2
	FDPs	1
	International level events organized	
	Conferences-	0
	Workshops Seminars	0
12	Number of conferences /seminars workshops/ FDP's any exclusive programs attended for enrichment of teaching learning process	37

III. Teaching-Learning Process and Evaluation		
Sl No	Criterion	Observations
1	Curricular aspect	<p>Under the autonomous status, the Board of Studies (BOS) has been established, consisting of a diverse group of members. This includes representatives from our mentoring and senior institutes, as well as industry professionals, alongside faculty members from our department. The primary responsibility of the BOS is to frame and implement the curriculum and syllabus for the Applied Electronics and Instrumentation Engineering (AEIE) program, ensuring that the academic structure aligns with industry requirements and academic standards.</p> <p>In addition to the core curriculum, the updated syllabus also includes value-added courses offered in the 3rd and 4th years. These courses are designed to supplement and extend students' knowledge beyond the mandatory subjects, allowing them to explore different fields and specialized areas of interest. The value-added courses enhance students' skills, preparing them for a wide range of career opportunities and fostering interdisciplinary learning.</p> <p>This approach ensures that students are not only well-versed in their chosen discipline but also equipped with additional competencies that enhance their employability and readiness for various professional challenges.</p>
2	Mechanism and activities for slow learners for their improvement outcomes	<ul style="list-style-type: none"> • Remedial and Extra Classes <p>Special remedial or extra classes are conducted for slow learners after a preliminary assessment, focusing on specific subjects or topics where students need additional support.</p> <ul style="list-style-type: none"> • Individual Academic Counseling <p>Subject teachers provide personalized academic counseling to address individual challenges and enhance understanding of the subject matter.</p> <ul style="list-style-type: none"> • Student Mentoring System <p>Regular mentoring sessions are conducted by departmental mentors (faculty guardians). Academic records, including performance and progress, are meticulously maintained and shared with parents to keep them informed about their wards.</p> <ul style="list-style-type: none"> • Departmental Oversight

		<p>The Head of the Department (HOD) closely monitors the mentoring system to ensure its effectiveness and consistency.</p> <ul style="list-style-type: none"> • Hands-On Learning through Mini Projects <p>Group-based mini projects are assigned to students, offering practical, hands-on learning opportunities to strengthen their understanding of concepts.</p> <ul style="list-style-type: none"> • Encouraging Online Learning <p>Slow learners are motivated to enroll in various online courses to enhance their knowledge and gain additional insights into the subject matter.</p>
3	Student counseling mentoring mechanism	<p>The Student Mentorship Program is a structured initiative that assigns faculty members as "Mentors" to support and guide students throughout their academic journey. Each student is paired with a dedicated mentor who helps them overcome challenges and achieve their academic and personal goals.</p> <p>The primary objectives of the program include:</p> <ol style="list-style-type: none"> 1. Comprehensive Counseling <p>Mentors provide students with both career-oriented and non-academic counseling, addressing their holistic development.</p> <ol style="list-style-type: none"> 2. Access to Preparatory Courses <p>Students are guided about preparatory resources, including skill development courses, bridge programs, and other academic support systems, ensuring their preparedness and success.</p> <ol style="list-style-type: none"> 3. Motivation and Goal Setting <p>The program focuses on motivating students to set clear learning objectives and achieve them effectively, thereby improving their academic performance.</p> <ol style="list-style-type: none"> 4. Holistic Guidance and Well-Being <p>Mentors actively engage with students to guide them through their academic life while addressing their physical, mental, and emotional well-being. They offer advice, listen patiently, and connect students to appropriate resources or</p>

		<p>referrals as needed.</p> <p>5. Promoting Engagement and Curiosity</p> <p>The program aims to cultivate curiosity and enthusiasm among students for academics and institutional activities, fostering a vibrant learning environment.</p> <p>This mentorship framework not only supports students in overcoming hurdles but also nurtures their overall development, making them well-rounded individuals equipped for future challenges.</p>
4	Tutorial classes	<p>In tutorial classes, a variety of interactive and engaging learning methods are employed to enhance students' problem-solving abilities and teamwork skills. Key features of these classes include:</p> <ol style="list-style-type: none"> 1. Students are divided into groups and assigned different problems to solve collaboratively. This approach fosters group discussion skills and encourages peer learning while tackling unfamiliar challenges. 2. Quizzes and other innovative learning methodologies are periodically introduced, keeping the sessions dynamic and stimulating. 3. All activities are conducted under the guidance of a faculty member, ensuring that discussions remain focused and productive while providing expert input when required. 4. These measures help students deepen their understanding of the subject matter by applying theoretical concepts to practical scenarios. 5. Students develop skills for effective planning and execution of tasks, aiding them in achieving their goals and improving their overall academic performance. <p>By combining collaborative learning with active faculty involvement, tutorial classes create a supportive environment that promotes both intellectual growth and essential teamwork skills.</p>
5	<p>Monitoring of teaching-learning process</p> <p>(a) E-learning models:</p> <p>(b) Assessment of teaching process in classrooms</p> <p>(c) An innovative</p>	<p>a) Types of Assessment Activities</p> <p>To ensure comprehensive learning and evaluation, a variety of assessment activities are employed:</p> <ol style="list-style-type: none"> 1. Study materials are enriched with ungraded activities and built-in feedback mechanisms. These are made accessible to students via e-content uploaded to the institute's repository on the website.

	<p>teaching process is presented if any</p> <p>(d) Verification of course files:</p>	<ol style="list-style-type: none"> 2. Quizzes and tests are provided to enable learners to evaluate their understanding and progress independently. 3. Instructors, peers, workplace colleagues, or mentors provide structured feedback on assignments to enhance learning and application of concepts. 4. Regular informal interactions with instructors and peers offer additional avenues for learners to clarify doubts and improve their understanding. 5. Ungraded tests are conducted to help students prepare for formal graded assessments, reducing exam anxiety and enhancing performance. <p>b) Assessment of Teaching Process in Classrooms</p> <p>The teaching process in classrooms is evaluated through diverse assessment strategies:</p> <ol style="list-style-type: none"> 1. Faculty members assess students' prior knowledge and understanding at the start of a topic to tailor teaching methods accordingly. 2. Continuous evaluations during the teaching process include quizzes, group discussions, and classroom participation to monitor and support student progress. 3. Periodic evaluations, such as mid-semester and end-of-semester exams, provide a comprehensive assessment of students' learning outcomes. 4. Faculty members use spontaneous and interactive assessments, such as open-ended questions and discussions, to gauge understanding in a less structured manner. <p>This combination of assessment methods ensures a thorough evaluation of both teaching efficacy and student learning, supporting the continuous improvement of the teaching process.</p> <p>c) An innovative teaching process is presented if any</p> <p>Students are assigned preparatory materials, such as video lectures, e-books, or interactive content, to study before attending class. These materials introduce the concepts and provide foundational knowledge.</p> <p>d) Verification of Course Files</p> <p>At the conclusion of each semester, course files are thoroughly verified to ensure completeness and accuracy.</p>
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		<p>This includes checking lesson plans, assessment records, and other relevant documentation to maintain high academic standards and accountability.</p> <p>These measures collectively ensure a robust learning environment, with a focus on continuous improvement for both students and faculty.</p>
6	Training programs conducted for students	Industrial vocational trainings and internships have been conducted at various industries around in India.
7	Students feedback & steps taken	Online student feedback for faculty is conducted in the department twice in every semester and based on the comments faculties are guided and instructed accordingly.
8	Scope for Self-learning Certified course Online courses	Students are instructed for attending online courses through NPTEL, COURSEERA, and other online courses etc. To enhance their knowledge.
9	Results Analysis	Semester-wise result analyses for individual subjects are carried out by the respective subject teachers and Head of the Department.
10	Parents meeting on evaluations of student's progress	The Department organizes regular parents' meetings to keep parents informed about their child's academic progress and overall development. These meetings are held at the end of each academic year or semester and aim to provide a comprehensive analysis of students' performance.
11	Student involvements in extra Curricular & Co-curricular activities:	Students participate in the institute's sports program and cultural meet. Students also join the departmental students chapters (ISA and ISoI) activities actively. Various workshops, seminars and webinars are organized in the department as well as AICTE IDEA lab for the involments of the students. Students are also motivated to participate various other actiuvities organized by other binstitutes.

IV. Research, Consultancy and Extension

Sl No.	Criterion	Observations
1	Faculty publications in journals National- International-	0 4
2	Publications in conference National- International-	0 0

3	PhDs-Registered	0
	Awarded	1
	Pursuing	6
4	Funded R & D projects	
	Applied	3
	Sanctioned	
	Ongoing	0
	Completed	0
5	Patent applied	2
	Patent awarded	1
6	In-house R & D grants & projects	0
7	New research facilities/ laboratory facilities provided	0
8	MOU's with industries/ R & D/ Premier institutes	0
9	Research centers of excellence established	NIL

V. Infrastructure and Learning Resources		
Sl No	Criterion	Observations
1	Adequacy of infrastructural facilities to improve the teaching learning process Class rooms: Laboratories: ICT/e-class rooms: Seminar halls:	2 class rooms including 1 smart classroom available. 8 laboratories available. 2 e-class rooms 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 Laboratory and

		Microprocessor laboratory
5	Department level library resources	Yes

VI. Student information, Support and Progression		
Sl. No.	Criterion	Observations
1	Department student clubs	ISA and ISoI Student chapter are now available where students can take membership as well as can participate in various seminar, workshop, technical quiz competition etc. Under these student chapter.
2	Details of coaching provided for GATE/ GRE/ any other competitive exams for higher studies	In the department, several initiatives are taken to support students preparing for competitive exams like GATE (Graduate Aptitude Test in Engineering) and other similar exams. These include providing access to essential study materials and offering preparatory classes. The Department ensures that a wide range of GATE preparation books which are available in the departmental library. These books cover various subjects and include both foundational texts and specialized guides for Instrumentation Engineering streams. Also preparatory classes have been taken to revise the subject knowledge for different competitive examinations.
3	Industrial visits and academic visits	Industrial Visits and Internships are integral parts of an engineering college's curriculum, offering students practical exposure to real-world industrial environments and enhancing their learning experiences. College organizes industrial visits and internships frequently especially inside hadia though Haldia itself a industrial belt and so many manufacturing, power generating, oil refinery industries present here.

VII. SWOC Analysis of the Department		
Sl. No.	Criterion	Observations
1	Strength:	<ol style="list-style-type: none"> 1. Qualified faculty. 2. Organized administrative activities. 3. Organised intra-departmental activities. 4. Good industry interactions. 5. Good projects done by students.
2	Weakness:	<ol style="list-style-type: none"> 1. Less research funding. 2. Student involving in higher studies. 3. Quality of students are not satisfactory.

3	Opportunities	<ol style="list-style-type: none"> 1. Location and connectivity (Proximity to HALDIA core industry hubs and SECTOR V IT hub in KOLKATA). 2. Aspiring students, faculty members. 3. New industry demands on machine learning (ML), AI, automation, IoT, renewable energy, etc.
4	Best practice/ Innovative:	<p>The department has undertaken several reforms and initiatives to enhance the quality of education and provide a more engaging, practical, and collaborative learning experience. Here is an elaboration on the key reforms and strategies:</p> <ol style="list-style-type: none"> 1. The department has reformed its teaching methods to include experiential learning, where students actively participate in their learning process. The department also emphasizes active learning, where students are encouraged to engage in discussions, problem-solving activities, and collaborative work, rather than passively receiving information. 2. The curriculum places a strong emphasis on collaborative projects, where students work in groups to execute practical projects. 3. Students are provided with exposure to the full cycle of product development, from concept to prototype to final execution. By working on live projects, they are exposed to the real-life challenges faced in industries. 4. The department organizes student project exhibitions focusing on cutting-edge technologies such as Artificial Intelligence (AI), Internet of Things (IoT), Machine Learning, and Data Science. These exhibitions provide students with a platform to showcase their innovative projects to industry experts, peers, and faculty. 5. The department follows a systematic course mapping process, where the learning outcomes of each course are aligned with the overall program objectives.
5	Future plans:	<p>The department has implemented several strategies aimed at improving infrastructure, faculty skills, student development, and overall educational quality. Here's an elaboration of the key initiatives:</p> <ol style="list-style-type: none"> 1. The department is continually upgrading its infrastructure to keep pace with the rapid advancements in technology and to meet the evolving needs of modern engineering education. 2. To keep up with the rapid technological advancements in the market and industries, the department ensures continuous professional development such as Workshops, Seminars, Training Programs, Collaborations with Industry experts etc. for its faculty members. 3. The department focuses on attracting high-achieving students by showcasing the potential career opportunities, advanced teaching methodologies, and modern infrastructure available. 4. The curriculum is routinely updated to incorporate new and emerging technological trends. This ensures that students are equipped with the latest knowledge and skills required by the industry. 5. A major focus is placed on improving the English communication skills of

		<p>students, particularly those from rural and semi-urban backgrounds.</p> <p>6. The department emphasizes providing students with holistic development, which includes instilling social, cultural, and environmental values.</p> <p>7. The department recognizes the importance of sports and co-curricular activities in the holistic development of students.</p> <p>8. The department actively works towards enhancing career guidance for students, helping them align their academic pursuits with their future goals.</p>
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Academic Audit Report 2023-24

1. Name of Department:	Applied Electronics and Instrumentation Engineering	
2. No of full time permanent faculty:		12
3. No of part time Visiting temporary contractual faculty:		Nil
4. No of PG/UG courses:		UG-1,
5. Curriculum Revisions during the year:		Yes
6. Research: Publications in journals: International- 4		National- Nil
7. PhD Awarded:		1
8. Faculty guiding Ph.D:		1
9. Number of Conferences/Lectures Organized:		0
10. Ongoing Sponsored projects & amount:		Nil
11. No of Faculty using: ICT & PPT		12
12. New Equipment and Infrastructure added:		Yes
13. Student feedback on Curriculum (Yes/ No):		Yes

14. Strengths:

- Faculty members contribute significantly to academic advancements through publications in national and international peer-reviewed journals, as well as authoring books, chapters, and other scholarly works..
- The department consistently works to improve students' career prospects by taking additional classes, frequently mentoring, conducting mock test etc. reflected in a success rate of recruitment in past few years.
- Graduates from the department form a thriving alumni community, excelling as professionals in esteemed academic, corporate, and industrial sectors worldwide.
- A considerable number of alumni are venturing into small-scale entrepreneurial endeavors, showcasing innovative thinking and initiative.
- The department prioritizes student welfare through strong mentorship programs, regular guidance, counseling sessions, and open communication between students and faculty.

15. Weaknesses:

- The department faces constraints in securing adequate funding for research initiatives.
- Efforts are being made to encourage and prepare students to pursue advanced studies.
- Greater emphasis is needed to actively involve students in research projects and activities.
- There is a need to foster more interactions and collaborations across different disciplines.

16. Suggestions for improvement

- **Curriculum Updates:** The department's effort to revise the curriculum during the year is commendable and demonstrates a proactive approach to keeping the program aligned with current industry trends and academic advancements.
- **Research Productivity:** While the department has achieved four international journal publications and one Ph.D. awarded, there is scope to enhance national-level publications and increase the number of faculty actively guiding Ph.D. scholars.
- **Infrastructure Development:** The addition of new equipment and infrastructure is a positive development, contributing to improved resources for both teaching and research activities.
- **Event and Collaboration Opportunities:** The lack of organized conferences or ongoing sponsored projects suggests untapped potential in fostering academic collaboration and securing external funding, which could strengthen the department's research and academic outreach.

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