SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY,
LONGOWAL, DISTRICT SANGRUR
(Deemed to be University)
DEPARTMENT OF ECE

Ref. No: Date :

Minutes of Meeting (Academic Audit 2023-24)

With reference to letter no. Dean(A)/1405 dated 09.10.24, regarding conduct of Academic Audit for the year 2023-24. A meeting of the committee was held on 05.12.2024 at 11.00 am in the office of HOD(ECE).

Following committee members were present in the meeting

1. Dr. Ajay Pal Singh, Professor & HOD(ECE)- Convenor
2. Dr. B.S. Saini, Professor (ECE), External Expert
3. Dr. Dilip Kumar, Professor (ECE)-Member
4. Dr. Pardeep Gupta, Professor (ME)-Member
5. Dr. Damanpreet Singh, Associate Dean (ACSS)-Member
6. Dr. Mandeep Ghai, Associate Professor(M&H)-Member

A discussion was held to finalize the evaluation based on the prescribed performa and the rubrics provided. The committee has completed the assessment of Academic Audit 2023-24.

Following were the observations of the Academic Audit committee:

1. The committee appreciated the action taken by the department as suggested in the previous Academic Audit 2022-23 (copy enclosed).
2. Admission in Ph.d program improved from previous year and steps needs to be taken to improve the admissions in PG programs.
3. Placement activities need to be further strengthen.
4. Upgradation of existing facilities for skill development needs to be strengthen.
5. Student faculty ratio needs to be improved.

The meeting ended with vote of thanks to the chair.

05/12/2024

Dr. Mandeep Ghai
Associate Professor(M&H)

5/12/24

Dr. Pardeep Gupta
Professor (ME)

05/12/24

Dr. Damanpreet Singh
Associate Dean (ACSS)

5/12/2024

Dr. Dilip Kumar
Professor (ECE)

Dr. B.S. Saini,
Professor (ECE), NIT, Jalandhar

05.12.2024

Dr. Ajay Pal Singh
Professor & HOD(ECE)

Dean (Academic)

Action Taken Report on the Observations made by the Committee of Expert and Reviewer, Academic Audit 2022-23

Observations of AA 2022-23	Action taken by the Department
1. Need to establish the Centre of Excellence in the department.	Presently, Department is establishing centre of excellence on microwave and photonics technology to cater the need of innovation and incubation services to academia and industry.
2. Lab upgradation and new lab development in the department **a.)** The Microprocessor & Microcontroller lab may be upgraded by including the advanced Microcontrollers and renamed as Embedded system lab. **b)** Development of the VLSI and IOT lab in the department.	**a)** The Microprocessor & Microcontroller lab is upgraded and renamed as Embedded system lab. **b) i)** A new VLSI Circuit Lab has been established in the department under Chips to Startup (C2S) project and a grant of Rs. 90.88 lacs by Ministry of Electronics and Information Technology (MeitY), New Delhi has been received to further enhance research and consultancy in this area. **ii)** IoT lab is also assigned in new building of the department of ECE.
3. Admission to PG n PhD program.	Number of admission in PhD program has been increased as compared to previous year. Also, the scheme and syllabus of a new M. Tech. Programme in VLSI Design is finalised as per model curriculum of AICTE implemented from academic session 2024-25.
4. Establishment of choice based credit system (CBCS) in open elective Subjects	To implement the CBCS in open electives, faculty recruitment is in process.
5. Branch perceptions needed to be improved.	Workshops are conducted to improve the branch perceptions. Also restructuring of Integrated Certificate and Diploma (ICD) programme has been done as per NSQF/NSDC from academic session 2024-25 and Certificate in Television (CTV) programme is renamed as Certificate in Telecommunication (Technician).

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LONOGOWAL-148106

ACADEMIC AUDIT (2023 - 2024)

PROFORMA OF ASSESSMENT

1. **Name of the Department: Electronics and Communication Engineering**

Reviewer (Name, Designation & Address):

- Prof. Ajay Pal Singh Chauhan, HOD (ECE)-Convener
- Dr. Mandeep Ghai, ASP (M&H)
- Prof. DamanPreet Singh, Associate Dean (ACSS)
- Dr. Dilip Kumar, Professor (ECE)
- Dr. Pardeep Gupta, Professor (ME)

External Expert:
Prof. B.S. Saini (ECE), NIT, Jalandhar (Punjab)

2. **Date of Review:** **05.12.2024**

NOTE:
i. Please grade in the box provided for the following parameters in the range of 1-10 with 10 being the highest.
ii. Leave 'blank' for 'No Comment'.
iii. Kindly give your opinion on the strength and weakness of the Department and your suggestions for future growth.

A. ACADEMICS

A.1	ICD Programme	Score	
		Self-assessment	Expert assessment
1.	Curriculum (Structure, Course Syllabi, Flexibility), Theory/ practical (contents/ratio).	6	6
2.	Equivalence and Relevance of curriculum at the national level	8	8
3.	Formal Academic Load on Students [Teaching, Laboratory/Practical, Projects(minor/major)]	10	10
4.	Evaluation Process (Continuing Evaluation and End-Term Evaluation)	10	10
5.	Tour/Training/Industrial visits/Internship opportunities provided during the year	4	4

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6.	Effectiveness of Assisted Learning, Tutorial System for ICD Students/ Seminars (Refer Course File)	8	8
7.	Faculty Mentoring/Faculty Advisor System for Students/Class of Students	10	10
8.	Practical activities, non-academic and totally related to a specific trade for skill development and *developing expertise in a particular group of techniques.*	8	8
9.	Linkage of ICD programs to outcome-based vocational education (Industry linkage)	6	6
10.	Availability of workshop-type lab/laboratory for providing hands-on training to the students for skill development	8	8
	Total Score (out of 100)	78	78

A.2	**UG Programme**	**Score**	
		Self-assessment	Expert assessment
1.	Curriculum (Structure, Course syllabi, Flexibility, Choice based credit system)	10	10
2.	Status of study material developed by faculty for students	10	10
3.	Relevance of contents of courses taught to the students and scope of improvement (revision of syllabus, addition of new experiments)	10	10
4.	Formal academic load on students [Teaching, Laboratory/Practical, Projects(minor/major)]	10	10
5.	Modern teaching methods in practice other than the conventional methods E-Assisted Learning I. Availability of Library Resources II. Multi-Media Assisted Teaching	8	8
6.	Evaluation Process (Continuing Evaluation, and End-Term Evaluation) I. Theory and tutorial II. Practical (case studies)	10	10
7.	Faculty–Student Interaction (Whether any slot is fixed for the students to interact with a teacher, after classes/labs	8	8
8.	Tour/Training/Industrial visits/Internship opportunities	6	6
9.	(a)Effectiveness of Assisted Learning in Tutorial classes/seminars for Students	8	8
	(b)Faculty Mentoring/Faculty Advisor System for Students/Class of Students		
10.	Placement %age/higher studies options (last three years)	6	6

	Total Score (out of 100)	86	86

A.3	**PG Programme (Separate for each programme)**	**Score**	
		Self-assessment	Expert assessment
1.	Curriculum (Structure, Course Syllabi, Flexibility)	10	10
2.	Formal Academic Load on Students [Teaching, Laboratory/Practical, Projects(minor/major)]	10	10
3.	Evaluation Process (Continuing Evaluation and End-Term Evaluation)	10	10
4.	Relevance of contents of courses taught to the students and scope of improvement	8	8
5.	Modern teaching methods in practice other than the conventional method E-Assisted Learning I. Availability of Library Resources and Major Search Engines (like Scopus, Web of Science) II. Multi-Media Assisted Teaching	8	8
6.	Technical Societies/ Colloquium for Students Departmental Society Student Chapter(s) of Professional Societies	8	8
7.	Tour/Training/Industrial visits/Internship opportunities	4	4
8.	Collaboration with other departments (within the institute)	6	6
9.	(a) Faculty Mentoring/Faculty Advisor System for Students/Class of Students	10	10
10.	(b) Monitoring and continuous evaluation of the project work assigned to the students (mechanism)	10	10
	Total Score (out of 100)	84	84

A.4	**Doctoral (Ph.D.) Programmes**	**Score**	
		Self-assessment	Expert assessment
1.	Intake of Ph.D. Students	10	10
2.	Admission Process	10	10
3.	Pre-Ph.D. Courses and Evaluation Process	10	10
4.	Breadth and Depth of Knowledge of Students	6	6
5.	Seminar/ Presentations and Technical Communication	10	10
6.	Research Facilities available in the Department	10	10
7.	Average No. of Research Students/Faculty	4	4

8.	Average No. of Research Papers of Ph. D. Students (Indexed Journals)	8	8
9.	Average Duration to Complete Ph.D. (years)	4	4
10.	Participation of Research Scholars in Conferences/Workshops	4	4
	Total Score (out of 100)	76	76

B. RESEARCH

B.	Research and Industrial Collaboration	Score	
		Self-assessment	Expert assessment
1.	Research Ambience in the Department	8	8
2.	Research Awareness among Doctoral Students	10	10
3.	Thrust areas of research in the department	9	9
4.	Quality of Research	9	9
5.	Collaborations with other departments (within the institute) at national and international levels.	10	10
6.	Impact and Quality of Publications	10	10
7.	Relevance of Research to Knowledge Generation and Social Relevance	9	9
8.	Student Exposure for Attending Quality Conferences/Symposia	8	8
9.	Inter-departmental collaborations	10	10
10.	Industry/externally funded sponsored research (Numbers and amount)	10	10
	Total Score (out of 100)	93	93

General Comments on,

Plan of action of the department for the next five years (in view of NEP 2020)

Action Plan (<u>Academic Standard</u>)

The quality of teaching will be improved by:

- Combining existing courses with specific hands-on learning.
- Introducing skill-development courses leading to professional advancement.
- Ensuring student-learning outcomes for each academic program.
- Arranging expert lectures by experienced faculty/scientists from National/International laboratories or institutes. Also, in hand practice by Industry experts on the latest practical developments in the subject.
- Organizing seminars, workshops, conferences, and industry visits for faculty and students.

- Encouraging students to develop industry-supported projects.

Action Plan (Student Mentoring)

- Help the students to build confidence in a stress-free environment through effective counseling.
- Encouraging students to participate in competitive examinations.
- Impart career guidance through interpersonal engagement by sharing experience and expertise.
- Constructive interaction with a mentor for active participation of students in technical and extracurricular activities.

Short term goals

- To upgrade laboratories and teaching learning infrastructure.
- Technical Knowledge/skills upgradation of faculties, staff, and students through STCs/workshops.
- Enhancement in industrial interaction and collaborations.

Long term goals

- To start the PG program in VLSI.
- To get a PG program accredited by the NBA.
- To accomplish consultancy services through industries/research organizations.
- To procure specialized/high-end equipment for Microwave Lab equipment, Machine Vision and Motion Control Lab, Wireless Communication, VLSI design and Optical Communication, Internet of Things.

1. Significant achievements of the department (faculty/Staff/Students)

The department has been awarded NBA accreditation. Also, the institute has been accredited with NAAC A grade. Dr. Dilip Kumar, Professor (ECE) and Dr Surinder Singh, Professor (ECE) has been recognized as among the top 2% of scientists in the world, according to a Stanford University survey.

2. Project funding details

I. Externally funded research project grant of Rs. 90.88 Lacs for a duration of 3½ years by the Ministry of Electronics and Information Technology (MeitY), New Delhi, under the Chips to Start-up (C2S) program. Chief Investigator: Prof. J S Ubhi and Co-Chief Investigator: Prof. Surinder Singh

II. Externally funded research project grant of Rs 16.31 Lacs for the duration of 2 years by Science & Engineering Research Board (SERB), New Delhi titled "Design and Development of Terahertz Self- Multiplex Antennas Using Substrate Integrated Waveguide for 6G Wireless Communication System". PI: Dr. Kundan Kumar

III. Externally funded research project grant of Rs 23.22 Lacs for the duration of 3 years by Science & Engineering Research Board (SERB), New Delhi titled "Design and Development of Noble C-Band Parametric Optical Frequency Comb Generator to Realize Backbone Optical Transport Network for 6G Communication". PI: Prof. Surinder Singh, ECE Department, Co-PI: Prof. J.S. Ubhi.

3. Placement record of the department (Last three years).
The number of students placed in 2021-22 is 41/61
The number of students placed in 2022-23 is 43/66
The number of students placed in 2023-24 is 14/70

4. Scope for the training of faculty/staff to further strengthen the teaching-learning process and the curriculum by adding new courses relevant to National and international levels.

All faculty and staff members are encouraged to attend the training program regularly. Recently, many faculty members have enrolled in AICTE-approved comprehensive teacher training programs. Also, recently, the BoS has been conducted, and subjects like Deep learning, AI, and Machine Learning have been approved and incorporated at appropriate levels.

5. Effective/Continuous monitoring of faculty/staff in delivering the course contents (at the departmental level) to enhance the teaching-learning process.To implement it in the ECE department, suggestions are regularly invited from the faculty members regarding revisions in the syllabus, CO-PO mapping, attainment, etc. Changes suggested by the students, if any, are also taken into consideration. Based on the suggestions received, matters are discussed in the DAAC meeting, and minutes are recorded and forwarded to the HOD(ECE)forfurther consideration in the board of studies.

6. Technical Societies/ Colloquium for Students
(i) Departmental Society
(ii) Student Chapter(s) of Professional Societies (IEI and IEEE)

7. Scope of improvement in the presenting teaching-learning process (Keywords: interactive pedagogy (flip classroom, NITTTR module)
In the wake of the challenges posed by the post-COVID era, the scope for improvement in the present teaching-learning process is both pertinent and promising. The pandemic has accelerated the need for innovative approaches to adapting to the changing educational landscape. In this context, the traditional classroom teaching model faces a re-evaluation, offering transformative change opportunities. One promising avenue is the adoption of innovative teaching approaches, such as **flipped classroom learning** and **interactive pedagogy**. Flipped classroom learning redefines the role of in-class and at-home activities, shifting traditional lectures to pre-recorded or online content accessible outside the classroom. This approach allows class time to be dedicated to interactive discussions, problem-solving, and application of knowledge, promoting deeper understanding and engagement.

Interactive pedagogy takes a learner-centric approach, emphasizing active participation, collaboration, and critical thinking. It leverages technology to create a dynamic learning environment that can transcend physical boundaries, enabling students to explore and apply concepts in real-world contexts. Integrating multimedia and peer-to-peer learning encourages students to take charge of their learning journey, fostering a sense of ownership and motivation. The post-COVID era presents an opportunity for educators to embrace these innovative teaching methods and technologies. This transformation not only enhances the quality of education but also equips students with essential skills for the digital age, such as

adaptability, problem-solving, and self-directed learning. It underscores the need for institutions to invest in teacher training, infrastructure, and digital resources to ensure the successful implementation of these approaches.

In conclusion, the post-COVID era has brought the need for reimagining classroom teaching to the forefront. By incorporating innovative teaching approaches like flipped classroom learning and interactive pedagogy, educators can create a dynamic, engaging, and future-ready learning environment that not only overcomes the challenges posed by the pandemic but also enriches the educational experience for students in the long run.

8. Strengthening laboratory infrastructure (adding new equipment and using of present facility for optimum use)

To augment the existing lab infrastructure, new hardware and software equipment are procured from time to time. The lab equipment for potential areas, including IOT applications and 5G wireless communications, has been procured in the department. TaraNG software, SYNOPSIS Tools, and EDA Tools (Siemens and Cadence) for UG and PG students have also been purchased under the MAKE IN INDIA mission. Also, for UG project lab specifically various hardware equipment has also been procured.

Also, recently the fire extinguishers have been refilled to meet the safety needs of the lab. In the recent financial year, for each lab fresh consumable has also been procured.

Any other point

C. Infrastructure

		Score		
		Self-Assessment	Marks Obtained	Remarks
1	Adequacy of Classrooms and Multi-Media Facility	10	10	11 classrooms out of which 8 classrooms are equipped with multimedia facilities, sufficient as per strength
2	Availability of Laboratories	10	10	In place
3	Availability of Conference/Seminar Room, etc	9	9	Sufficient as per requirements
4	Availability of Seating Space for Faculty and Research Students	10	10	In place
5	Availability of Internet Services in Research Labs and Classrooms	10	10	Wi-fi campus
6	Departmental Library and E-Resources	10	10	The library has more than 1000 textbooks and

				reference books. Apart from the books, the library has also a collection of Ph.D. and M.Tech theses, B.Tech and ICD project reports, and industrial training reports. The library has a reading area wherein the students and staff may go and read the study material.
7	Computing Facilities and Software	10	10	Sufficient number of commercial software's are available for RS, PG and UG students.
8	Adequacy of Offices and Furnishing for Faculty	10	10	Office rooms are sufficient as per strength however further procurement of furniture is needed to meet the requirements.
9	Faculty- Student Ratio	8	8	1:19.9 (Need to improve)
10	Support Staff (Technical/Administrative) Adequacy	9	9	Adequate
	Total Score (out of 100)	96	96	

SWOT analysis by the department

Strengths:

1. Experienced, Dedicated, and highly qualified faculty in specialized areas with a good number of publications in reputed journals (SCI/SCIE/WoS/Scopus indexed).
2. MoU with Industry, research institute for dissemination of knowledge and use of their research facilities.
3. Different research fellowships to support the research.
4. Externally funded projects
5. Well-equipped laboratories and high-end research facilities with efficient technical support.
6. Good interactions with the outer world.
7. Availability of smart classrooms and departmental library in the Department.
8. Student diversity (cultural/language/academic courses).
9. Attractive research fellowship (QIP/ADF/Visvesvaraya PhD scheme/ Grant in Aid).
10. Student Chapter(s) of Professional Societies (IEI and IEEE)

Weaknesses:

1. Limited consultancy.
2. Limited Industrial visits.
3. Student- Faculty ratio.
4. Limited Interdisciplinary research.

Opportunities:

1. To start a new PG program/ minor degree in VLSI or 5G Communications.
2. To start the formal/informal courses related to Precision Agriculture aligned with NEP 2020.
3. To address industrial requirements for developing an IoT environment towards implementation of 5G wireless communication.

Threats: Admission to the PG Program

Suggestions for improvement:

D. Outcomes

D.1	Placement/ higher studies/ Publications/ Consultancy, Ph.D. awarded etc.	Score	
		Self-assessment	Expert assessment
1	i. Placements for ICD ii. Placement of B.Tech. iii. Placement of M.Tech. Students iv. Placement of Ph. D. Students	6.5	6.5
2	Average No. of Ph. Ds Awarded per Year	10	10
3	Publications per Faculty in Indexed Journals/Year (Average of last three years)	10	10
4	Average Citations per Faculty/Year (Last-Three Years) (Web of Science/Scopus)	10	10
5	Recognitions; Awards (National/International) to Faculty/Students	8	8
6	Consultancy and Externally Funded Projects	10	10
7	No. of Ph.D. graduates who took Academics as Career (Last 5 Years)	10	10
8	Students offered for higher studies	4	4
9	No. of qualified students NET/GATE/CAT etc. (State/Central Civil Services)	6	6

10	Entrepreneurship	Nil	Nil
	Total Score (out of 100)	74.5	74.5

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ACADEMIC AUDIT (2023 - 2024)

SUMMARY SHEET

1.	Name of the Department	Electronics and Communication Engineering	
2.	Name of Reviewer Designation & Address	**From Academia**	**From Industry**
		• Prof. Ajay Pal Singh Chauhan, HOD (ECE)- Convener • Dr. Mandeep Ghai, ASP (M&H) • Prof. DamanPreet Singh, Associate Dean (ACSS) • Dr. Dilip Kumar, Professor (ECE) • Dr. Pardeep Gupta, Professor (ME) **External Expert:** Prof. B.S. Saini (ECE), NIT, Jalandhar (Punjab)	—
3.	Date of Meeting	05.12.2024	

Score Summary							
Academics (A)				Research (Max Score 100) (B)	Departmental Infrastructure (Max Score 100) (C)	Outcome (Max Score 100) (D)	Total Score (700) (A+B +C+D)
ICD Programme (Max Score 100) (A.1)	UG Programme (Max Score 100) (A.2)	PG Programmme (Max Score 100) (Average of all PG programs) (A.3)	Doctoral Programmme (Max Score 100) (A.4)				
78	86	84	76	93	96	74.5	587.5

Note: 1. Marks mentioned above are the average of the marks given by the experts.

2. If marks have not been allotted for some attributes by the experts, total score can be scaled to maximum marks.

05.12.2024

Name & Signature of HOD