SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
(Deemed-To-Be-University)
LONOGOWAL-148106

ACADEMIC AUDIT (2021-22) (Period 01.07.2021-30.06.2022)

PROFORMA OF ASSESSMENT

1. **Name of the Department: MECHANICAL ENGINEERING**
2. **Reviewer (Name, Designation & Address): Dr. N. M. Suri, Professor (Production & Industrial Engineering), PEC University, Chandigarh.**
3. **Date of Review: 17.11.2022**

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).	10	10
2.	Equivalence and Relevance of curriculum at national level	10	10
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	07	06
6.	Effectiveness of Assisted Learning, Tutorial System for ICD Students/ Seminars (Refer Course File)	10	08
7.	Faculty Mentoring/Faculty Advisor System for Students/Class of Students	10	08
8.	Practical activities, non-academic and totally related to a specific trade for skill development and *developing expertise in a particular group of techniques.*	10	08
9.	Linkage of ICD programs to outcome based vocational education (Industry linkage)	10	09
10.	Availability of workshop type lab/laboratory for providing hand on training to the students for skill development	10	09
	Total Score (out of 100)	97/100	88/100

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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	08
3.	Relevance of contents of courses taught to the students and scope of improvement (revision of syllabus, addition of new experiments)	10	09
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	10	09
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	10	09
8.	Tour/Training/Industrial visits/Internship opportunities	10	08
9.	(a) Effectiveness of Assisted Learning in Tutorial classes/seminars for Students	10	09
	(b) Faculty Mentoring/Faculty Advisor System for Students/Class of Students		
10	Placement %age/higher studies options (last three years)	06	06
	Total Score (out of 100)	96/100	88/100

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	10	09
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	10	09

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6.	Technical Societies/ Colloquium for Students i. Departmental Society ii. Student Chapter(s) of Professional Societies	04	05
7.	Tour/Training/Industrial visits/Internship opportunities	08	08
8.	Collaboration with other departments (within institute)	09	08
9.	Faculty Mentoring/Faculty Advisor System for Students/Class of Students	10	09
10.	Monitoring and continuous evaluation of the project work assigned to the students (mechanism)	10	09
	Total Score (out of 100)	91/100	87/100

A.4	**Doctoral (Ph.D.) Programmes**	**Score**	
		Self-assessment	Expert assessment
1.	Intake of Ph.D. Students	08	07
2.	Admission Process	10	10
3.	Pre-Ph.D. Courses and Evaluation Process	10	10
4.	Breadth and Depth of Knowledge of Students	08	08
5.	Seminar/ Presentations and Technical Communication	10	09
6.	Research Facilities available in the Department	09	09
7.	*Average No. of Research Students/Faculty	--	--
8.	Average No. of Research Papers of Ph. D. Students (Indexed Journals)	08	08
9.	Average Duration to Complete Ph.D. (years)	05	05
10.	Participation of Research Scholars in Conferences/Workshops	08	08
	Total Score (out of 100)	81/90 scaled to (90/100)	74/90 scaled to (82/100)

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B. RESEARCH

B.1	Research and Industrial collaboration	Score	
		Self-assessment	Expert assessment
1.	Research Ambience in the Department	10	10
2.	Research Awareness among Doctoral Students	09	09
3.	Thrust areas of research in the department	09	09
4.	Quality of Research	--	--
5.	Collaborations with other departments (within the institute) and at National, and international level.	09	08
6.	Impact and Quality of Publications	09	09
7.	Relevance of Research to Knowledge Generation and Social Relevance	09	09
8.	Student Exposure for Attending Quality Conferences/Symposia	09	09
9.	Inter departmental collaborations	08	08
10.	Industry/externally funded sponsored research (Numbers and amount)	06	05
	Total Score (out of 100)	78/90 scaled to (86/100)	76/90 scaled to (84/100)

General Comments on,

1. **Plan of action of the department for the next five years (in view of NEP 2020):**
   (a) More emphasis to be laid down on Skill development courses
   (b) Setting up of two Centres of Excellence in (i) *Materials processing & Characterization* (ii) *Material testing & Evaluation Centre*
   (c) On Job training (OJT) to be offered in the department especially in the following areas:
   (i) Welding (ii) CNC machining (iii) Product fabrication (iv) Material testing
   (d) Software training modules on Softwares like Auto-CAD, ANSYS, Solid works, Pro-E, CATIA etc. to be developed as a part of in-house training as per the curriculum requirements.
   (e) Externally funded/Sponsored research projects by the faculty would be submitted by the faculty of the deptt.
   (f) International and National conferences would be planned.
   (g) FDP, STC, Workshops/Seminars (at least once every year) would be organized.
   (h) Collaborative research especially in the thrust areas would be focused.
   (i) Interdisciplinary research with other departments would be planned with special focus on UG, PG and Ph. D. projects.

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

(i) **Patents Filed/granted/published/licensed**

Name of Faculty	Patent/application Number	Title of the patent	Year of Award of patent	Date of filing/granting /publishing /licensing
Shankar Singh	4077/MUM/2015	Regenerative Electromagnetic Shock Absorber	First Examination Report (FER) under review	Reply to FER have been submitted to the Indian Patent Office Kolkata and is under review.
Dhiraj Sud	*202011034056* 08/08/2020	A portable apparatus for	Published	

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Anil Kumar Singla Anuj Bansal		cleansing fruits and vegetables and method thereof		
Anuj Bansal, Jonny Singla, Anil Kumar Singla, Deepak Kumar Goyal, Jagtar Singh	202211037172 29/06/2022	A portable mud based curvy and cone heat sinker system for outdoor air conditioner unit	Filed	

(ii) **Training programmes held for teachers and Staff**

S No	Name of the program	Duration	No of participants	Sponsoring Agency if any	Remarks
1	Robotics and Automation-2021	July 26-30, 2021	125	Self-Sponsored Course	Coordinator Dr. Sunil Kumar
2	Smart Manufacturing Technologies & Applications' (SMTA 2021)	Dec. 20th-24th 2021	66	Grant in Aid	Coordinator: Prof. Shankar Singh
3	Application of MATLAB in Engineering, Sciences and Research (AMESR-2021)	Dec 27-31, 2021	39	Self-Sponsored Course	Convenor: Prof. Pardeep Gupta and Prof. Rajesh Kumar Coordinators: Mr. Surinder Kumar and Dr. Harish Arya
4	Quality Management: New trends and Applications (QMNTA-2021)	March 21-25, 2022	59	Grant in Aid	Convenor Prof. Pardeep Gupta and coordinator Mr. Sumit Kumar

(iii) Training programmes held for students

S No	Name of the program	Duration	No of participants	Sponsoring Agency if any	Remarks
01	On-line Industrial Training for Mechanical students 2018 & 2019 batch	1st July2021-31st July 2021	160	Self-Sponsored	Coordinator: Dr. J.S Gill Dr. Indraj Singh Dr. Mohd Majid

(iv) Invited/Expert talks by the faculty

a) Dr Shankar Singh, Professor (Mechanical) delivered an expert talk on "Advanced Manufacturing and Industry 4.0" (11th to 17th Jan. 2022) sponsored by AICTE-ISTE sponsored Faculty Refresher Program and organized by Department of Malout Institute of Management & Information Technology (MIMIT) Malout (Pb.)

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b) One expert lecture on "Hands-on 3D Printing (FDM) of Polymers" by Rajesh Kumar in ATAL course on 3D printing -December 2021.
c) Dr. A. S. Shahi delivered an expert lecture on 'Wire arc additive manufacturing' (WAAM)-introduction, scope & practical demonstration" in the ATAL Faculty Development Program (FDP) on "Manufacturing and Characterization of 3D Printed Materials (MC3DPM-2021)" held from 13th –17th December 2021 by the Mechanical Engineering department, SLIET, Longowal.
d) Dr. A. S. Shahi delivered a keynote address on the topic 'MATERIAL CHARACTERIZATION OF ENGINEERING MATERIALS USED FOR CRITICAL APPLICATIONS' in the ICMMIT-2022 - (International Conference on Materials, Machines & Information Technology - 2022) held from 24-25 January 2022 and organized by Amity University Jharkhand, Ranchi, India.
e) Dr. A. S. Shahi Conducted a one-day workshop on 'Welding safety' for Tata Structura (a group of Tata steel) for the Welding Fabricators of Palampur (Himachal) on 28th May 2022.

3. Placement record of the department (Last three years):
UG students: 2019-20 =35; 2020-21 = 33; 2021-22 = 100

4. Scope for training of faculty/staff for further strengthening the teaching-learning process for strengthening the curriculum with the addition of new courses having relevance at National and International levels.
   (i) Faculty of the department would be encouraged for learning through Industrial trainings/Workshops/Seminars/FDPs/STCs etc. especially pertaining to the topics related to thrust areas in Mechanical Engineering that are largely aligned with the industrial needs. Faculty would also be encouraged to strengthen the existing curriculum besides adding new courses of relevance in accordance with the National accordingly.
   (ii) Technicians would also be encouraged to have more hands-on learning on various Research and testing equipments via enhancing their learning through attending various workshops/training programmes held across the country.

5. Effective/Continuous monitoring of faculty/staff in delivery the course contents (at departmental level) for enhancing the teaching-learning process.
   - There is a Class monitoring committee in the department that periodically monitors the conduct of classes as well as quality of delivery of course contents.

6. Technical Societies/ Colloquium for Students
   (i) Departmental Society
      (a) SLIET Mechanical Engineering Society (SMES)
   (ii) Student Chapter(s) of Professional Societies
      (a) Institution of Engineers (India), Kolkata-Student Chapter

7. Scope of improvement in the present teaching – learning process
   (i) Teaching-learning process can be further enhanced by delivering course contents through interactive videos related to fundamental as well as applied topics.
   (ii) Case studies can be included in the curriculum.
   (iii) Industrial visits can be more effectively utilized.

8. The skill and expertise of the faculty/Technical staff in the department (specific)
   - Faculty expertise includes areas like Thermal, Design, Manufacturing, Welding, Industrial Engineering etc.

9. Strengthening laboratory infrastructure (adding of new equipment's and use of present facility for optimum use)
Laboratory infrastructure has been strengthened as per the plans of the department. The present facility is also being optimally used by the students as well as the faculty of the department for catering to the curriculum, project as well as research needs.

10. Any other point:
Specific suggestions by the external expert:
   - Industrial training should be strictly monitored by the faculty.
   - Projects should focus more on industrially oriented problems.

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C. Departmental Infrastructure

C.1	Departmental resources	Score	
		Self-assessment	Expert assessment
1	Adequacy of Class Rooms and Multi-Media Facility	08	08
2	Availability of Laboratories	10	10
3	Availability of Conference/Seminar Room, etc	08	09
4	Availability of Seating Space for Faculty and Research Students	10	10
5	Availability of Internet Services in Research Labs and Class Rooms	10	10
6	Departmental Library and E-Resources	10	10
7	Computing Facilities and Software	10	10
8	Adequacy of Offices and Furnishing for Faculty	10	10
9	Faculty- Student Ratio	06	06
10	Support Staff (Technical/Administrative) Adequacy	04	04
	Total Score (out of 100)	86/100	87/100

SWOT analysis by the department:

Strengths:

- The department has experienced faculty. More than 70% of the faculty is Ph. D. and their retention rate is also high.
- Laboratory infrastructure is adequate.
- Faculty is motivated towards research and strives to achieve higher quality levels of teaching-learning process.

Weaknesses:

- Institute-industry interaction is lacking.
- Teachers do not monitor the training of the students.

Opportunities:

- Sufficient laboratory infrastructure is available in the department to offer vocational courses in different areas like Welding, Machining, etc. that can help in generating IRG for the institute.
- New courses can be designed and offered for skilling and upskilling of manpower of industry as well as academic institutes in line with the faculty expertise and laboratory infrastructure.
- Industrial consultancy can be improved with active institute-industry interaction.
- Students' projects should be focused on industrial problems.

Challenges:

- Declining trend of admissions especially at the PG and Ph. D. level.
- Mindset of the students is slightly more inclined towards IT jobs rather than their core filed.
- Communication skills of the students need significant improvement.

Suggestions for improvement:

- More emphasis needs to be laid down on providing hands-on practice to the students by way of offering On-job training (OJT).
- Faculty should develop fundamental lectures as well as videos (especially animated ones) for better understanding of engineering concepts.
- Virtual labs should be created.
- More case studies should be included in the curriculum.
- Curriculum should include at least 3 companies/industries for all students after completion of their 3rd semester.
- PG students should also be included in Departmental societies/committees meant for the students where currently only UG students are majorly involved.

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ACADEMIC AUDIT (2021-22)

SUMMARY SHEET

1.	Name of the Department	Mechanical Engineering	
2.	Name of Reviewer Designation & Address	**From Academia**	**From Industry**
		Dr. N. M. Suri, Professor (Production & Industrial Engineering), PEC University, Chandigarh.	Nil
3.	Date of Meeting	17.11.2022	

Score Summary							
Academics (A)				Research (Max Score 100)	Departmental Infrastructure (Max Score 100)	Outcome (Max Score 100)	Total Score (700)
ICD Programme (Max Score 100)	UG Programme (Max Score 100)	PG Programmme (Max Score 100) (Average of all PG programs)	Doctoral Programmme (Max Score 100)				
(A.1)	(A.2)	(A.3)	(A.4)	(B)	(C)	(D)	(A+B+C+D)
88	88	87	82	84	87	63	579/700 (82.71 %)

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.

Name & Signature of HOD

Prof. M. B. Bera (FET) Prof. Mahesh Arora (M & H) Prof. P. K. Singh (ME) Dean (FSW)

Prof. N.M. Suri (External Expert) HOD (Mechanical Engineering) 22/12/2022