SANT LONGOWAL INSTITUTE OF ENGINEERING & TECHNOLOGY
LONGOWAL, DISTT. SANGRUR
(Deemed to be University under Ministry of Education, Govt. of India)

DEPARTMENT OF PHYSICS

Ref. No. : SLIET/Phy./285 Dated : 14-9-2021

From : HOD(Physics) 14/9/2021

To : Dean(Academics)

Subject : Conduct the Academic Audit for the Academic Year 2020-21.

Please refer to office order endst. No. SLIET/Dean(A)/2021/752 dated 05.08.2021 on the subject cited above.

Enclosed please find herewith the Academic Audit Report for the Academic Year 2020-21 of Physics Deptt.

14/9/2021
HOD(Physics)

R.No. Dean (Acad.) 880
Dated 14/09/2021

SANT LONGOWALINSTITUTE OF ENGINEERING & TECHNOLOGY

ACADEMIC AUDIT (2020 - 2021)

PROFORMA OF ASSESSMENT

1. **Name of the Department:Physics**

Reviewer (Name, Designation & Address):

1. Dr. Ashavani Kumar, Professor, . N.I.T.Kurukshetra–External Expert
2. Dr. J.S. Dhillon, Coordinator IQAC cell & Dean (Academics)
3. Dr. H.R. Ghatak, Prof (ChE) -Member
4. Dr. Mandeep Ghai, AsP (M & H) -Member
5. Dr. K.S. Mann, Prof (Phy) & HOD Nominee
6. Dr. M.M. Sinha, HOD (Physics)- convener

Date of Review:31.08.2021

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 Program	Score		Remarks
		Self-assessment	Expert assessment	
1.	Curriculum (Structure, Course Syllabi, Flexibility), Theory/ practical (contents/ratio).	7	7	• Curriculum is structured through BOS meeting (which includes external experts and is held once every two years) to cater the need of the students to understand the concepts of Physics at early stage of technical education. • No flexibility is there in the curriculum. • All the practicals are designed keeping correlation with theory in mind both for PH-111 and PH-121, however the same may be re-looked into in future to have even better correlation.
2.	Equivalence and Relevance of curriculum at national level	8	8	On comparing with 'Model Curriculum for Diploma courses in Engg & Tech 2019'of AICTE, it is found that physics curriculum is almost equivalent and relevant at National level.
3.	Formal Academic Load on Students [Teaching,	8	8	Academic load per week is L=4, T=0 and P=2 for both PH-111

31.8.21 (K.S. Mann) (Dr. Mandeep Ghai)

(M.M. Sinha) (Ashavani Kr.) 1/9/2021

	students and scope of improvement (revision of syllabus, addition of new experiments)			course for all branches of engineering. From time to time syllabi has been revised and new experiments have been added accordingly.
4.	Formal Academic Load on Students [Teaching, Laboratory/Practical, Projects(minor/major)]	8	8	Academic load/week is L=3, T=1 and P=2.
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	7	Difficult to apply modern teaching methods because of limited availability of required teaching tools.
6.	Evaluation Process (Continuing Evaluation, and End-Term Evaluation) (i) Theory and tutorial (ii) Practical (case studies)	7	7	Due to large group of students proper student teacher interaction is inadequate and needs to be improved tutorials and practical.
7.	Faculty–Student Interaction (Whether any slot is fixed for the students to interact with a teacher, after classes/labs	7	6	No particular slot exists in the central time table; however individual teachers generally interact with the students and pay individual attention during scheduled class itself.
8.	Tour/Training/Industrial visits/Internship opportunities	8	7	Being a basic course, physics laboratory trains the students in using various measuring instruments (e.g Vernier calipers and screw gauge)etc. which are useful in the industry. Also during the physics lab, the students learn to verify some of the physical laws.
9.	Effectiveness of Assisted Learning in Tutorial classes/seminars for Students	2.5(5)	2	Due to large class size, conducting tutorial class is not so effective.
	Faculty Mentoring/Faculty Advisor System for Students/Class of Students	3.5(5)	4	From time to time HOD physics advises the faculty to further strengthening the teaching-learning process
10	Placement %age/higher studies options (last three years)	10	10	Department of physics is not concerned with this activity.
	Total Score (out of 100)	77	73	

31.08.21

31/8/21

	(mechanism)			presentations are held to monitor the student's progress.
	Total Score (out of 100)	77	72	

A.4	**Doctoral (Ph.D) Programmes**	**Score**		
		Self-assessment	Expert assessment	
1.	Intake of Ph.D Students	6	5	No student was admitted during 2020-21. It may be noted that 4 students had appeared for SET entrance exam in July/Aug-2020, but no-one could qualify it as per UGC norms. During even semester no exam was conducted due to COVID scenario.
2.	Admission Process	8	8	Students are admitted through SET/NET/GATE. Interview of qualified students is held at the departmental level and after that the students are admitted on the basis of overall merit.
3.	Pre-Ph.D Courses and Evaluation Process	8	8	Pre-Ph.D course comprises of two subjects Research Methodology and Research related subject. Continuous evaluation process is there as per institute norms.
4.	Breadth and Depth of Knowledge of Students	7	6	To test the breadth and depth of student's knowledge entrance test/interview are held before the admission.
5.	Seminar/ Presentations and Technical Communication	7	6	Two seminars are compulsory during the pre-Ph.D course and after that progress of students is monitored by holding seminars at least once per semester.
6.	Research Facilities available in the Department	7	7	Adequate state-of-the-art research facilities are available in the department.
7.	Average No. of Research Students/Faculty	7	7	One student per faculty
8.	Average No. of Research Papers of Ph. D Students (Indexed Journals)	7	7	05
9.	Average Duration to Complete Ph.D (years)	8	8	Based on last five year's data: Average Duration for full time students:4.5 years(approx.) Average Duration for part time students:6 years(approx.)
10.	Participation of Research Scholars in Conferences/Workshops	9	8	Two conference/workshop attended by per students during 2020-2021.
	Total Score (out of 100)	74	70	

B. RESEARCH

31.08.21

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

   Comments: Start of 5 year integrated BSc(Hons) + MSc Programme

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

   Comments:
   - Organized TEQIP-III (online mode) on 'Materials synthesis and characterization techniques' at NIT Uttarakhand, Srinagar Campus under twinning programme during 7-11 Sept 2020 under the coordinator-ship of Prof. M M Sinha
   - Prof. M M Sinha has delivered invited talk to participant of TEQIP-III sponsored online STTP (online mode) on 10th Sept 2020.
   - Organized self-financed short term course on 'Advanced functional materials (AFMAT-2020) (online mode) during Sept 28, 2020-Oct 02, 2020 under the chairmanship of Prof. M M Sinha and coordinator-ship of Dr P Kaur and Ms K Aggarwal
   - Organized 5th National e-conference on advanced materials and radiation physics (AMRP-2020) during 9-11 Nov 2020 under the chairmanship of Prof. M M Sinha and coordinator-ship of Prof. S S Verma
   - Organized TEQIP-III (online mode) on 'Recent advances in optical and magnetic materials' at NIT Uttarakhand, Srinagar campus under twinning programme durinf 14-18 Dec, 2020 under the chairmanship of Prof. M M Sinha

   MSc students:

Pass –out batch	2019	2020	2021
Students Qualifiled NET/GATE/TET	5	2	2(25)
Placed/Higher Studies	9**(19)	6*(18)	--
%age	47.3%	33.3%	8%

   Research Scholars:

   SLIET Quality Publication Award (SQPA) has been received by Dr Jagdeep Singh, Dr Pardeep Bhatia, Ms Yuhit and Ms Tavneet Kaur

3. Placement record of the department (Last three years)

   Comments: 47.3% of PG students are placed.

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.

31.08.21

21/8/21

Comments:
Scope exists and during 2020-21 following courses attended by faculty members of the department:

1. Ms. Kanika Aggarwal, AP (Physics) and Dr. Prabhdeep Kaur, AP (Physics) have attended one week on-line Short Term Course on "Materials Synthesis and Characterization Techniques" sponsored by TEQIP-III (under twinning activity) jointly organized by Department of Physics NIT Uttarakhand, Department of Physics SLIET Longowal and Department of Physics HNBGU Srinagar Garhwal during 7-11 September, 2020.
2. Ms. Kanika Aggarwal, AP (Physics) and Dr. Prabhdeep Kaur, AP (physics) have attended "5-day online FDP on Universal Human Values for DEEKSHARAMBH (Student Induction Program)" organized by NIT Patna during 21 - 25 September 2020.
3. Ms. Kanika Aggarwal, AP (Physics) has attended TEQIP-III Sponsored One Week Online Short Term Course on "Recent Advances in Nanoscience and Nanotechnology (STCRANN-2020) organised by NIT Srinagar during, 24-28 August 2020
4. Dr. Prabhdeep Kaur, AP (Physics) has attended ONE WEEK FACULTY DEVELOPMENT PROGRAM on Developing Multimedia enriched Powerful Presentations, during 11-16 August 2020, organized by Guru Angad Dev Teaching Learning Centre SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of MHRD.

5. Effective/Continuous monitoring of faculty/staff in delivery the course contents (at departmental level) for enhancing the teaching-learning process.

Comments:
From time to time, HOD (Physics) advises/instructs/monitors faculty/technical staff to enhance the teaching–learning process.

6. Technical Societies/ Colloquium for Students
   (i) Departmental Society:

   Comments:
   Physics Societyfor MSc students was established in 2018 and it is still in existence.
   (ii) Student Chapter(s) of Professional Societies

   Comments: NIL

7. Scope of improvement in the presenting teaching –learning process

Comments:
- By introducing adequate number of more regular faculty and also the technical staff in the department.
- More rooms are required to accommodate the guest faculty and also the research scholars working in computational physics.
- More space for MSc labs is desired.
- Smart class-rooms for UG and ICD are also required.

31.08.21

8. The skill and expertise of the faculty/Technical staff in the department (specific)

Comments:

Sr. No.	Faculty	Expertise/Areas of research
1.	Dr K S Kahlon	Atomic Physics
2.	Dr A S Dhaliwal	Nuclear Physics and Materials Science
3.	Dr M M Sinha	Theoretical condensed matter Physics
4.	Dr S S Ghumman	Nuclear Physics and Materials Science
5.	Dr S S Verma	Theoretical Plasmonics Physics
6.	Dr K S Mann	Atomic Physics and Materials Science
7.	Dr P Kaur	High Energy Physics and Materials Science
8.	Ms K Aggarwal	Materials Science

9. Strengthening laboratory infrastructure (adding of new equipment's and use of present facility for optimum use)

Comments:
Every year from time to time new equipment are being added. Some major equipment procured during 2020-21 are as follows:
Hall Effect apparatus, x-band microwave Test bench (Klystron Tube), x-band microwave Gunn diode, Density meter, computer workstation.

10. Any other point
- To reduce the gap between offline and online teaching for ICD students a number of videos have been prepared by Prof. K S Kahlon & team for PH-111 and PH-121 experiments which have been found very useful by ICD students. The same are available at:
- https://online.fliphtml5.com/gscha/rlyc
- https://online.fliphtml5.com/gscha/otnk/#p=1
- To cope-up with the COVID-19 situation special week-end classes were scheduled to provide the hands-on experience in labs via offline classes for UG/20 first year students.
- E-lab manuals for computational Physics (M.Sc) have been prepared and are available at:
- https://online.fliphtml5.com/gscha/nyso/
- In addition to this proper reading material was provided to the students in addition to holding online classes via Google classroom/zoom etc.

C. Departmental Infrastructure

		Score	

31.05.21

		Self-assessment	Expert assessment	
1.	Adequacy of Class Rooms and Multi-Media Facility	6	6	Class-rooms are adequate whereas multimedia facility is available only to MSc students
2.	Availability of Laboratories	7	7	Laboratories are available to all ICD and UG programme but it is not adequate (in terms of space) to M.Sc. programme
3.	Availability of Conference/Seminar Room, etc	6	6	No independent conference/seminar room is available. For this purpose, generally rooms such as ISTE Hall / Computer auditorium/ Training placement hall are used.
4.	Availability of Seating Space for Faculty and Research Students	7	6	Seating space for guest faculty as well as research scholars working in theoretical physics is inadequate.
5.	Availability of Internet Services in Research Labs and Class Rooms	9	8	Available in research labs and in smart class rooms only (i.e. not available in all class rooms)
6.	Departmental Library and E-Resources	7	7	Department library is well equipped and is handled by one of the laboratory attendant of department of physics. E-resources are available as per provisions made by the central library.
7.	Computing Facilities and Software	7	7	Computational lab exists in the department for M.Sc. students. Various software like quantum espresso, FDTD are being used in the department for research purpose.
8.	Adequacy of Offices and Furnishing for Faculty	7	7	More rooms are required to accommodate the guest faculty in the department.
9.	Faculty- Student Ratio	5	5	As per the load allocated to department during 2020-21, the average Faculty-Student ratio is 1:61.
10.	Support Staff (Technical/Administrative) Adequacy	5	5	Inadequate number of technical staff in laboratory.
	Total Score (out of 100)	66	64	

SWOT analysis by the department

31.08.21

Strengths:

- Well-equipped labs provide quality education to students.
- Students belonging to various states of India have got admission in M.Sc.programme.
- Faculty have published good number of research papers in various national and international referred journals.
- Research labs are equipped with state-of-the-art equipment such as Electrically cooled X-ray detector, Electrochemical work station, Electron gun, Vector Network Analyzer, X-ray and gamma-ray spectrometers.
- Licensed software such as FDTD, Fortran.
- National conferences organized by the department attract good number of researchers/ experts from all over the India.
- Work-station computing facility and presently it makes use of Quantum Expresso software.
- Many MSc (physics) pass-out students have got admission for higher studies in well-known institutes such as IITs
- Good number of books are available in departmental library.

Weaknesses:

- Inadequate number of regular faculty.
- More space for MSc labs is desired.
- Inadequate number of technical staff in labs.
- More rooms are required to accommodate the guest faculty and also the research scholars working in computational physics.

Opportunities:

- faculty as well as students can enhance their knowledge through available e-resources as well as from well-equipped laboratories.
- adequate research facilities in the fields of materials science, radiation and theoretical physics, are available.

Threats:

Suggestions for improvement:

- More regular faculty members are required so as work related with tutorials and labs can be handled effectively and moreover it will be very helpful to implement the UGC choice based system in MSc (physics) program as well as to float more optional elective subjects to UG students.
- Adequate number of technical staff is desired in labs for better functioning of labs for the students.
- To accommodate the guest faculty as well as research scholars especially working in theoretical physics more rooms are required and also more laboratory space is needed for MSc(Physics) course.
- Faculty members should be encouraged to submit research projects.

31.08.21

- Ways should be evolved to attract a good number of bright students for Ph.D as well as for M.Sc(Physics) program.
- The OBE based scheme needs a bit more improvement and understanding by the faculty.
- ICD load is required to be increased (4-1-2 instead of 4-0-2) to complete the syllabus with optimum tutorial classes.
- There shall be 20 students/teacher in labs in order to demonstrate the experiments effectively. So if more students are there number of teachers should be increased accordingly.
- For students opting for repeat there should be separate classes as there is always overlap between their actual class and repeat one.
- The structure of SET for Ph.D may be reviewed to enhance number of Ph.D admissions.

31.08.21

31/8/21

D. Outcomes

		Score		
		Self-assessment	Expert assessment	
1.	i. Placements for ICD ii. Placement of B.Tech iii. Placement of Masters Student iv. Placement of Ph.D Students	2.5(5) 5(5)	2.0 5	Placement Data for M.Sc. Students is provided at page number 8 (under General Comments on column) 100% of Ph.D Students are placed.
2.	Average No. of Ph.Ds Awarded per Year	7	7	1.8 (Based upon data of last 3 years)
3.	Publications per Faculty in Indexed Journals/Year (Average of last three years)	8	8	3
4.	Average Citations per Faculty/Year (Last-Three Years) (Web of Science/Scopus)	6	6	36
5.	Recognitions; Awards(National/International) to Faculty/Students	0	0	No awards was conferred during 2020-2021
6.	Consultancy and Externally Funded Projects	0	0	No consultancy & externally funded project granted during 2020-21.
7.	No. of Ph.D. graduates who took Academics as Career (Last 5 Years)	10	9	8 out of 8 (for last five years) took Academics as Career.
8.	Students offered for higher studies	7	7	18.9%% based on 2019, 2020 pass out batches.
9.	No. of qualified students NET/GATE/CAT etc (State/Central Civil Services)	6	6	18.9% based on 2019, 2020 pass out batches.
10.	Entrepreneurship	3	3	PG students are always encouraged to go for entrepreneurship.
	Total Score (out of 100)	54.5	53	

Comments & Suggestions for Improvement:

- Faculty members should be encouraged to submit research projects.
- Mock test series for PG students may be started to increase their pass percentage in NET/GATE/CAT etc.
- Research scholars of the department will be encouraged to do quality research work and present the same effectively at various platforms.

31.08.21

SANT LONGOWALINSTITUTE OF ENGINEERING & TECHNOLOGY

ACADEMIC AUDIT (2020 - 2021)

SUMMARY SHEET

1.	Name of the Department	Physics	
2.	Name of Reviewer Designation & Address	**From Academia**	**From Industry**
		1. Dr. Ashavani Kumar, Professor, N.I.T.Kurukshetra–External Expert 2. Dr. J.S. Dhillon, Coordinator IQAC cell & Dean (Academics) 3. Dr. H.R. Ghatak-Prof. (ChE) - Member 4. Dr. Mandeep Ghai, AsP (M & H) -Member 5. Dr. K.S. Mann, Prof (Physics) - HOD (Physics) Nominee 6. Dr. M.M. Sinha, HOD (Physics)- Convener	--
3.	Date of Meeting	31-08-2021	

Score Summary

Academic				Research (Max Score 100)	Departmental Infrastructure (Max Score 100)	Outcome (Max Score 100)	Total Score (700)
ICD Program (Max Score 100)	UG Program (Max Score 100)	PG Programs (Max Score 100) (Average of all PG programs)	Doctoral Program (Max Score 100)				
71	72	72	70	73	64	53.0	475

Note: 1. Marks mentioned above is 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.

31.08.21

(Prof. K.S. Mann)
HOD Nominee

(Dr. Mandeep Ghai)
Member

(Prof. H.R. Ghatak)
Member

(Prof. J.S. Dhillon)
Coordinator IQAC cell

(Prof. Ashavani Kumar)
External Expert

31/8/2021

(Prof. M M Sinha)
HOD (Physics)