

# **ACADEMIC AUDIT REPORT**

**(FACULTY OF SCIENCE)**

**For the Year 2022-23**



**Internal Quality Assurance Cell**

**TRIPURA UNIVERSITY  
(A CENTRAL UNIVERSITY)  
SURYAMANINAGAR, TRIPURA - 799022**

## **Academic Audit Report for the Year 2022-23**

Academic audit report for the year 2022-23 for Science Faculty of Tripura University was conducted from 19/09/2023 to 20/09/2023. The academic audit committee consisted of the following members critically examined the audit related documents submitted by the various Departments and visited each department of the Science Faculty and different facilities of the University for preparing this report.

1. Prof. Sankar K Ghosh, External Expert and Chairman, Former Vice Chancellor, Kalyani University, Professor, Department of Biotechnology, Assam University
2. Prof. Badal Kumar Datta, Dean, Faculty of Science, Tripura University
3. Prof. B.C. Tripathy, Former Director, IQAC, Tripura University
4. Prof. Shaon Ray Chaudhuri, Director, IQAC, Tripura University

### **General Points:**

1. Each department should have at least five faculties that need to be filled if those departments have a smaller number of faculties. The criteria may also be filled up by adjunct faculties. Ratio of a filled position to a sanctioned position (teacher).
2. Revisit the different departments and schools based on NEP 2020. A national-level committee is to be constituted to frame out.
3. Recommend the interdisciplinary courses and departments among the faculty members of the different departments, such as genomics, nanotechnology, food and nutrition, data science, etc.
4. Implementation of different need-based vocational courses for skill enhancement programmes.
5. Outreach programmes by various departments to be strengthened for the stakeholders of the state, particularly focused on different mission modes of the government of India in the areas of solar energy, digital India, and climate change.
6. A consortium project can be proposed, involving more departments in a focused area along with the collaboration of national and international institutes.
7. The national and international seminars are to be conducted in an interdisciplinary mode, and eminent resource persons from the respective fields should be invited from national and international reputed institutes, like big data, IoT, DNA barcoding, NGS, precision medicine, biomanufacturing, etc.

8. Language laboratory-educational platforms that use advanced multimedia technologies need to be established.
9. Master's students are encouraged to submit a research paper or review on systematic or meta-analysis in a peer-reviewed journal with a mentor.
10. Publications by the faculty need to increase department-wise per capita. Administration can help with APC fees for better-impacted journals and papers.
11. Updating advanced technology-driven research needs to be implemented. In this connection, an instrument facility should be used, or outsourcing can be done from another institute or private organisation.
12. Placement cells should be strengthened in departments or similar kinds of departments. Requested to make a database with different companies.
13. The university, faculty, and departmental alumni need to be strengthened.
14. There are a couple of national and international collaborations on a personal level requested to strengthen the MoU with those reputed institutes required for all departments. MOU, MOC, or mutually beneficial agreements signed with academic institutions, industries, or other agencies.
15. Similar subjects should jointly organise coaching for NET/SLET with the final objective of enhancing the number of NET/SLET-qualified students to promote the research ecosystem.
16. Job-oriented certificate or diploma courses based on locally available resources and expertise need to be promoted.
17. Arrangement of dedicated power supply to all the science department.
18. Workshops on Swayam and MOOCs for the students may be coordinated for all.
19. Appropriate faculties for differently abled students include maintenance of infrastructure. AMC of costly instruments to be done.
20. Particularly for the engineering departments, the intake capacity and demand ratio are to be improved.
21. The institution receives a significant quantity of research grants from external agencies. The institution receives a significant quantity of research grants from external agencies. Every faculty member needs to submit a project to the different funding agencies of different ministries of the Govt. of India or state.
22. Appointment or engagement of additional faculty to teach new programmes or modern areas of study.

## **Department wise Report for the Academic Year 2022-23**

### **Department of Botany**

1. Academic and research progress is good for the academic year 2022–23.
2. More emphasis should be given to technology-driven research, bamboo-based startups, mushroom culture, etc.
3. Student involvement in various outreach activities needs to be improved.
4. The department should offer and promote summer programmes for MSc. and Ph.D. scholars in reputed national/international institutions.
5. Resource persons for the seminar or workshop should invite national or international
6. The latest technology-based taxonomy of the Flora of the State needs to be explored by the researchers for their M.Sc. project or doctoral thesis.

### **Department of Forestry and Biodiversity**

1. Publications and research work carried out by the department are satisfactory.
2. Degree nomenclature (M.Sc. Forestry and Biodiversity) needs to be revised as per commonly accepted nomenclature and get accredited from SRA like ICAR/ICFRE for better job and carrier prospects of the department.
3. At least one skill development course may be started to encourage self-employment
4. A certificate course or vocational course on mushroom, vermicomposting, or bamboo-based technology may be initiated with other experts at the university.
5. Startups need to be registered by encouraging students in the department.

### **Department of Mathematics**

1. The focus should be on bringing more projects into collaboration with other departments and institutions.
2. Books to be written by the faculty members for making mathematics easy, especially for school-going and college students, respectively.
3. The department syllabus needs to be updated regularly, and the inclusion of MOOCs needs to be encouraged.
4. Consortium projects need to be initiated, involving more departments in a focused area along with the collaboration of national and international institutes.
5. More data-related research should be Big data analysis using a server may be initiated.
6. International conferences may be organised regularly.
7. Departmental coaching for NET/SLET may be started. The number of Ph.D. intake per faculty member needs to be increased.

### **Department of Statistics**

1. Papers were published satisfactorily, and a few projects received grants.
2. Research scholars need to be involved further in helping faculties with various academic activities.
3. Student projects need courage for the development of innovative ideas.
4. Students shall be exposed to various open-access software's like Python and R software for students and faculty through workshops.
5. Big data analysis, IoT, AI, etc. need to apply for funding (NEC/GoI).

### **Department of Pharmacy**

1. Faculties are appreciated for their efforts in raising grants for research projects.
2. Students' projects are to be made in a collaborative manner at the university or reputed national institute.
3. Improve department-industry interaction.
4. State-of-the-art facilities can be provided to university students and other institutions on a payment basis for future maintenance of those instruments.
5. Encourage the students to start up projects in the field of pharmacy or Ayurveda.
6. A national workshop to be conducted with a greater use of high-end instruments

### **Department of Geography and Disaster Management**

1. The scope of improvement is research output per faculty, especially in Scopus-indexed journals.
2. The data analysis of GIS systems using GPS has been appreciated and advised to be projected further.
3. More focus should be given to the student activity, highlighting novel initiatives.
4. Remote Sensing and GIS-based PG Diploma Certificate/B.Voc courses may be started.
5. The vocational courses can be started in the area of remote sensing and GIS in the form of a PG diploma or certificate.

### **Department of Zoology**

1. Student activities and teaching and learning activities shall be improved.
2. Contribution of Senior faculties in terms of research funding, Publications, Ph.D. and Research grants need to strengthen.
3. A seminar or workshop will be conducted on biodiversity and molecular taxonomy.
4. Explore the animal diversity of the state in collaboration, like ZSI/Other Institute

5. The latest technology-based taxonomy of the fauna of the state needs to be explored by the researchers for their MSc project or Ph.D. work.
6. More projects need to submit for funding and publications.

#### **Department of Electrical Engineering**

1. Master Students shall be encouraged to take up projects that may lead to quality publications and product development.
2. Student progression and placement records are to be updated.
3. Less admission of students: Look into the matter seriously.
4. Faculties need to apply for research grants from various funding agencies.
5. Faculty members are appreciated for practicing good teaching and learning.
6. Retired professors or guest teachers may be appointed as adjunct faculty members for smooth
7. Popularisation of solar energy among students and other stakeholders

#### **Department of Computer Science and Engineering**

1. Faculty members appreciated practicing good teaching and learning.
2. The department must encourage students to take up at least one MOOC course for credit transfer.
3. At least publications in two good journals are encouraged.
4. At least two research grants are to be applied for by faculty members per year.
5. Conferences focused on big data analysis should be conducted for the university in collaboration with other departments.
6. Interdisciplinary projects should be submitted to the funding agencies.

#### **Department of Information Technology**

1. In spite of having 45 seat capacities, very few students were admitted. Serious efforts are required to fill the vacant seats.
2. Sincere efforts need to be made by offering common courses in different programmes that will cover the syllabus properly.
3. The research output of the department needs further improvement.
4. Faculties need to apply for at least 2 research grants and target at least 2 publications per year.
5. At least one paper needs to be made compulsory for MTech as review or research.
6. Highly reputed experts may be invited to provide greater exposure to the students and research scholars.
7. Efforts should be made to conduct different programmes under Digital India.

8. Initiatives to be taken for the language lab at the university in collaboration.

### **Department of Electronics and Communication Engineering**

1. Tech students shall have the courage to take up projects that could lead to startups/publication(s).
2. Efforts should be made for the application of their findings to society.
3. Prospective ideas to be supported for forming startup.
4. Sensor-based work is to be done, leading to a patent.
5. Incubation Centre to be established
6. The quality of publication needs to be improved.

### **Department of Human Physiology**

1. Appreciate the PG/UG and faculty activities in teaching and research publication.
2. Collaborative research projects are explained nicely, and more emphasis is to be placed with the medical fraternity.
3. healthcare-based national or international workshop or conference(s) to be conducted with the medical fraternity.
4. More focus on Ph.D. research and their publication
5. Encourage NCDs and nutritional-based activities in society.

### **Department of Microbiology**

1. The department is doing well in research and innovation.
2. Students' involvement needs to be well projected and encouraged for various
3. Power backup should be there for the department for teaching and research activities.
4. To explore molecular microbial diversity and create a local microbial database.
5. Explore the possibility of the patent for textile entrepreneurship.
6. Metagenomics, including fungal diversity, need to be studied.

### **Department of Molecular Biology and Bioinformatics**

1. In spite of a single faculty department, the progress of the department in terms of research and publication is appreciated.
2. The department can involve more faculties (guests or adjuncts) to help with better teaching.
3. Infrastructure for practical purposes needs to be improved.
4. The students should be motivated for higher studies.
5. Hands-on workshops for PG and research scholars in collaborations (internal and external) are held on a regular basis.
6. Different kinds of exposures are necessary in the area of bioinformatics.

### **Department of Library and Information Science**

1. Teaching and learning are quite satisfactory.
2. Research publication needs to be improved, and faculty must try to raise more grants.
3. More student involvement is required at the university. The students may be placed in various sections of the library and help the library remain open for longer hours.
4. The department should take responsibility for the SWAYAM/MOOC courses for the university.

### **Department of Chemistry**

1. The number of Ph.D. outputs per faculty member needs to be increased.
2. Collaboration with top-tier institutes in the country and abroad needs to be improved.
3. Improvements in the M.Sc. Chemistry placement scenario are required.
4. Appropriate MOOC courses need to be promoted further.
5. Major facilities are to be highlighted.
6. Efforts are to be made to promote collaboration through MoUs between other reputed institutes.

### **B.Voc: Rubber Technology**

1. B. Voc in Rubber Technology is appreciated, especially the placements, which were praised.
2. Workshops to be conducted with industries like JK Tyres, Dunlop, and others
3. Infrastructure and the maintenance of instruments are to be improved.
4. A collaborative project can be initiated with the company (IPP model) with a MoU.
5. Regular faculty are required for the programme.

### **B.Voc: Film and Production**

1. Studio to be established for the department/university for mass media
2. Regular faculty are required for the programme.
3. Infrastructure and the maintenance of instruments are to be improved.
4. Invite experts for the above programme from time to time.

### **Department of Chemical and Polymer Engineering**

1. Emphasis is to be given to increasing student turnout.
2. A feasibility study may be exercised to make B. students eligible for the M.Tech. programme.
3. The innovative ideas and IPR developed by the department are well
4. Student involvement in research publications, student/faculty awards, and product development is well appreciated.



5. More patents and startups will be attempted.
6. Programmes on device manufacturing are to be conducted. Projects can be submitted for devices under the Government of India's Make in India programme.

#### **Department of Material Science and Engineering**

1. Emphasis should be given to increasing the student
2. More patents and startups need to be formed.
3. PhD. output and research project grants are not encouraging.
4. Workshop on solar power and instructions to be given to local people for the implementation of solar energy.

#### **Department of Physics**

1. The department is well organised, and faculty members are found to be good at teaching, research, and publication.
2. They can take up more initiatives to encourage students to participate in product development and register for start-ups in light of Make in India/Start-up.
3. An instrument repair workshop or facility may be started within the department to significantly help maintain the scientific equipment of the university.
4. Commercialization of patents on air pollution and alcohol detection by technology transfer Projects can be submitted for devices under the Government of India's Make in India programme.
5. Students mobilise by sending them to different reputed organisations (India and abroad).

#### **Central Instrumentation Facility**

1. The sophisticated analytical facilities have been appreciated.
2. The research infrastructure opened to external users at a nominal rate has also been appreciated.
3. State-of-Art Instrument based workshop is to be conducted regularly for great exposure for researchers in NER.
4. AMC or technical help is needed to sustain the costly instruments.
5. Make necessary acknowledgement of publication (mandatory)

#### **State Biotech Hub**

1. Outreach activities will be enhanced further in the near future.
2. Maintenance of the costly instruments is needed to make them functional.
3. Regular basis activities such Hands-on workshops, conferences, and seminars need to be strengthened.

**Photo Plate 1: Interaction with Department/Centre by Academic Audit Expert team**



**Botany Dept.**



**Forestry and Biodiversity Dept.**



**Mathematics Dept.**



**Statistics Dept.**



**Pharmacy Dept.**



**Geography and Disaster Mgt Dept.**

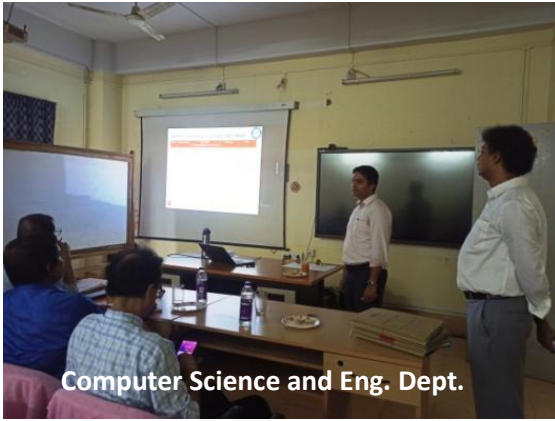


**Zoology Dept.**



**Electrical Engineering Dept.**

**Photo Plate 2: Interaction with Department/Centre by Academic Audit Expert team**



**Computer Science and Eng. Dept.**



**Information Technology Dept.**



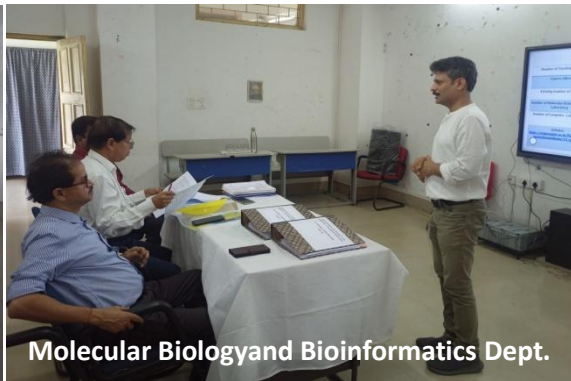
**Electronic and Communication Eng.**



**Human Physiology Dept.**



**Microbiology Dept.**



**Molecular Biology and Bioinformatics Dept.**



**Library and Information Science Dept.**



**Chemistry Dept.**

**Photo Plate 3: Interaction with Department/Centre by Academic Audit Expert team**



**B.Voc**



**Material Science and Engineering Dept.**



**Chemical and Polymer Eng. Dept.**



**Physics Dept.**



**Biotech Hub**



**Animal House**



**Exit Meeting**



**Submission of Academic Audit Report**

The Academic Audit Committee visited in two days i.e. 19<sup>th</sup> September, 2023 and 20<sup>th</sup> September, 2023 for the Academic Year 2022-2023. The members of this Academic Audit Committee visited different laboratories, Twenty departments and Centres. The members interacted with the faculties after power point presentation by the HoDs. They visited different labs and interacted with the Research Scholars along with the lab incharges. They also interacted with the Master degree students. Overall performances made by most of the departments are satisfactory. There are some scopes for further improvement observed by the members and that is reflected in general as well as the department specific report.



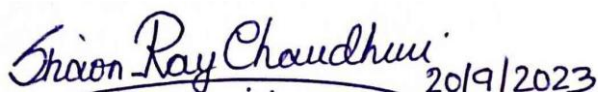
Handwritten signature of Prof. Badal Kumar Datta, dated 20/09/2023.

**Prof. Badal Kumar Datta**  
Dean, Faculty of Science,  
Tripura University



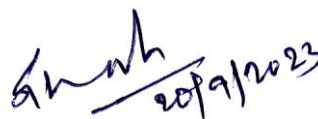
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**Prof. B. C. Tripathy**  
Former Director, IQAC,  
Tripura University



Handwritten signature of Prof. Shaon Ray Chaudhuri, dated 20/09/2023.

**Prof Shaon Ray Chaudhuri**  
Director, IQAC  
Tripura University



Handwritten signature of Prof. Sankar K Ghosh, dated 20/09/2023.

**Prof Sankar K Ghosh**  
External Expert and Chairman,  
Former Vice Chancellor,  
Kalyani University,  
Professor, Department of Biotechnology,  
Assam University

## Action taken Report

In view of the general observations, suggestions and recommendations of the Academic Audit expert team who visited all the departments of the Faculty of Science on September 19-20, 2023, steps have been taken over the last two years by all the departments are as follows:

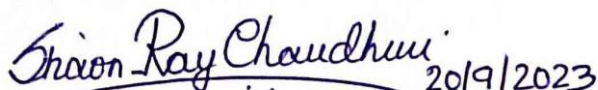
- I. In general, the faculty members improved the quantity and quality of publications.
- II. The faculty members tried to submit different projects from different funding agencies.
- III. Regarding the placement, students, Research Scholars got number of placements.
- IV. Classes and project work of the students are satisfactory with a short of faculty members in some departments.
- V. Number of students from other states has increased.
- VI. ICT enabled teaching is satisfactory.
- VII. IPR need to be frequently discussed to increase the patent.



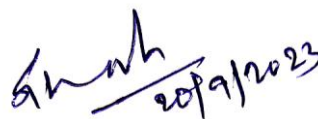
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