# Department of Physics

## MISSION, OBJECTIVES AND OUTCOMES

### Mission Statement

- To provide an outstanding national educational experience to our students for developing human resource as an effective future leadership in the field of Science and Technology and academia.
- To perform frontier research in pure and applied Physics and related areas of technological importance.
- To provide the institutional knowledge base in Physics and to disseminate the current knowledge through interaction with other research and academic institutions.
- To provide quality education to the young student community at large for raising the standard of existing scientific world in achieving the goals of technologically developed nation.

# M. Sc Physics Program

## (Program Mission, Objectives and Outcomes)

**Standard 1-1: The program must have documented measurable objectives that support faculty / college and institution mission statements**

### Mission Statement for M. Sc Physics

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- To perform frontier research in pure and applied Physics and related areas of technological importance.
- To provide the institutional knowledge base in Physics and to disseminate the current knowledge through interaction with other research and academic institutions.
- To provide quality education to the young student community at large for raising the standard of existing scientific world in achieving the goals of technologically developed nation.

### Program objectives

The Department of Physics has the following objectives:

1. Apply their knowledge for creating new technology and improving the existing one.
2. Design and run the project independently by seeking solutions to the project objectives both theoretically and experimentally in accordance with the physical laws.
3. Be able to work both as team member or leader with effective written and oral communication skills.
4. Impart the knowledge effectively to the coming generations in Physical Sciences.

5. Apply their knowledge for environmental studies for enhancing the environmental quality.
6. Be able to work in the energy development sector.
7. Become active participant of modern technologies in computers, communication, nanotechnology, remote sensing etc.
8. Develop computational skills for solving physical problems with complicated mathematical formulation occurring in natural science and engineering.
9. Develop comprehensive understanding of latest observed physical phenomena in Physics.
10. Train skillful Physics educationists.

| **Objective** | **How measured** | **When measured** | **Improvement identified** | **Improvement made** |
|---|---|---|---|---|
| 2,3,7,8,9 | Student Course Evaluation Questionnaire | 2012 | Lack of course organization, Lack of learning resources, lack of practical material, Shortage of books. | |
| 1,2,4,6,10 | Survey of Graduating Students | 2012 | ➢ Program objectives achievements need more attention<br>➢ Infrastructure Improvement in lab work<br>➢ Student teacher interaction | |

**Standards1-2**: **The program must have documented outcome for graduating students .It must be demonstrated that the outcome support the program objective and that graduating students are capable of performing these outcomes**.

## Program Outcomes

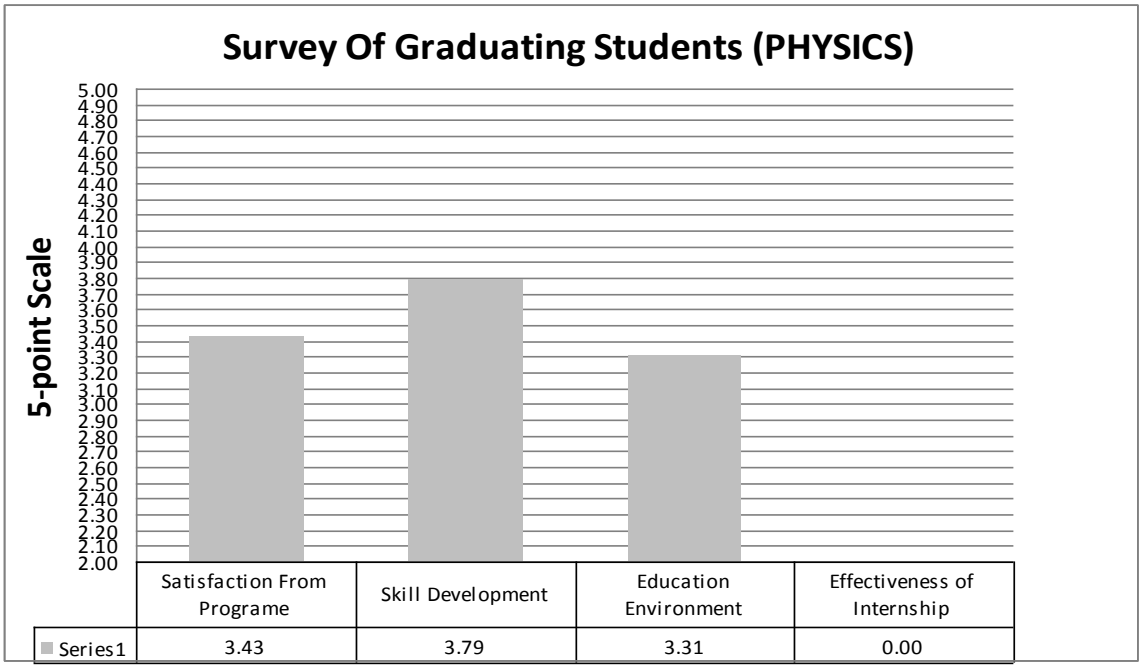
Program objectives will result in following outcomes:

1. Students are able to apply their knowledge for creating new technology.
2. Students are able to design and run the projects independently.
3. Students are able to work both as team member or leader with effective written and oral communication skills.
4. Students are able to impart the knowledge of Physical Sciences to the coming generations.
5. Students are able to apply their knowledge for enhancing the environmental quality.
6. Students are able to work in the energy development sector.
7. Students are able to become active participant of modern technologies in computers, communication, nanotechnology, remote sensing etc.
8. Students have computational skills for solving physical problems occurring in natural science and engineering.
9. Students have understanding of latest observed physical phenomena in Physics.
10. Students become skillful Physics educationists after completion of M. Sc. Physics.

| Program Objectives | Program Outcomes | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1 | √ | | | | √ | √ | √ | √ | | |
| 2 | | √ | | | | √ | | √ | | |
| 3 | | | √ | √ | | | | | | |
| 4 | | | √ | √ | | | | | | |
| 5 | | √ | | | √ | | | | | |
| 6 | | √ | | | | √ | | | | √ |
| 7 | √ | | | | | | √ | √ | | √ |
| 8 | √ | √ | | | | | √ | √ | | √ |
| 9 | | | | | | | | | √ | |
| 10 | | | | | | √ | √ | √ | | √ |

**Standard 1-3: The results of programs assessment and the extent to which they are used to improve the program must be documented**

After the assessment of Graduating students' survey, the strength and weaknesses are identified.



- **Areas for improvement**
  - Program objective achievement need more attention
  - Infrastructure
  - Improvement in lab work
  - Student teacher interaction

**Describe the actions taken based on the results of periodic assessments**

Actions to be taken on the recommendations of AT visits.

- **Strength and weakness of the program**

  **Strengths:**

  - Program smoothness
  - Independent thinking and teamwork
  - Skill Development

  **Weaknesses:**

  - Education environment
  - Lack of Responsibilities in official work.
  - Lack of lab work
  - Oral & Written Communication Skill

- **List future development plan for the program**
  - New Department Block
  - New and improved curriculum
  - Stress on Lab Work/ Research Work
  - Latest Labs Equipments

**Standard 1-4: The department must asses its overall performance periodically using quantifiable measures.**

Number of students appeared in 2009, 2010 and 2011 Annual Examination and number of graduating students of M. Sc. Physics

| Years | No. of students | No. of graduate students |
|---|---|---|
| 2011 | 49 | 40 |
| 2010 | 57 | 48 |
| 2009 | 61 | 52 |

# Criterion 2: Curriculum Design & Organization

**A. Title of Degree Program:** M. Sc Physics

**B. Definition of credit hour:** One credit hour means a class of one hour per week for one term/ semester. One term means 15 weeks continuous duration program. However in case of Lab work, two hours Lab work means one credit hour.

**C. Degree Plan:** The table-1 shows the course division of the program.

**D. Curriculum breakdown:** No breakdown available for the courses. Needs improvement

Following matrix links courses in the program to program outcomes

| | Courses | Program Outcomes | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | 10 |
| **1st Year Courses** | | | | | | | | | | | |
| **1st term** | Mathematical Methods of Physics-I | | √ | | | | | | √ | | √ |
| | Classical Mechanics | | | | √ | | | | | | √ |
| | Quantum Mechanics -I | | | | | | | | √ | | √ |
| | Electronics | √ | | | | | | √ | | | √ |
| | English-I | | | √ | | | | | | | |
| | Applied Radiation Physics Practical | √ | | | | | | √ | | | √ |
| | Electronics Practical | √ | | | | | | √ | | | √ |
| **2nd term** | Mathematical Methods of Physics -II | | √ | | | | | | | | √ |
| | Quantum Mechanics -II | | | | √ | | | | | | √ |
| | Atomic Physics | | | | | √ | √ | √ | | | √ |
| | Nuclear Physics | | | | | √ | √ | √ | | | √ |
| | Solid State Physics | √ | | | | | | √ | | | √ |
| | English-II | | | √ | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nuclear Physics Practical | | | | | √ | √ | √ | | | √ |
| | Atomic Physics/ Solid State Physics Practical | | | | | √ | √ | √ | | | √ |
| | **2nd Year Courses** | | | | | | | | | | |
| **3rd term** | Electromagnetic Theory-I | √ | | | √ | | √ | √ | | | √ |
| | Special Theory of Relativity | | | | √ | | | | | | √ |
| | Computational Physics | | √ | | | | | | √ | | √ |
| | Special Paper A-I (Radiation Physics) Formation of Tracks in passive detectors | | | | √ | √ | | √ | | | √ |
| | Special Paper A-I (Particle Physics) Relativistic Quantum Mechanics and Scattering Theory | | √ | | | | | | √ | √ | √ |
| | Special Paper A-I (Electronics) Digital Electronics | √ | | | | | | √ | | | √ |
| | Special Paper A-I (Nuclear Physics) Nuclear Decays | | | | | √ | √ | √ | | √ | √ |
| | Special Paper A-I (Plasma Physics) Plasma Physics-I | | | | | | √ | √ | | | √ |
| | Special Paper A-I (Computational Physics) Computational Methods –I | | √ | | | | | | √ | √ | √ |
| | Special Paper B-I (Nuclear + Plasma+ Radiation Physics) Nuclear Reactions | | | | | √ | √ | √ | | √ | √ |
| | Special Paper B-I (Particle Physics) Theory of finite groups | | √ | | | | | | √ | √ | √ |
| | Special Paper B-I (Electronics) Electronics Lab | √ | | | | | | √ | | | √ |
| | Special Paper B-I (Computational Physics) Computational Methods –II | | √ | | | | | | √ | √ | √ |
| **4th term** | Electromagnetic Theory-II | √ | | | | | | | | | √ |
| | Statistical Mechanics | √ | | | | | | | | | √ |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Special Paper A-II (Radiation Physics) Application of Passive Detectors | | | | √ | √ | | | | √ | √ |
| | Special Paper A-II (Particle Physics) Quarks and Laptons | | | | √ | | | √ | | √ | √ |
| | Special Paper A-II (Electronics) Electronics Instrumentation | √ | √ | | | | | √ | | | √ |
| | Special Paper A-II (Nuclear Physics) Nuclear Forces and Models | | | | | √ | √ | √ | | √ | √ |
| | Special Paper A-II (Plasma Physics) Plasma Physics-II | | | | | | √ | √ | | | √ |
| | Special Paper A-II (Computational Physics) Computer Solutions of Physics Problems | | √ | | | | | | √ | √ | √ |
| | Special Paper B-II (Radiation Physics) Radiation Physics Projects | √ | √ | | | √ | √ | √ | | √ | √ |
| | Special Paper B-II (Particle Physics) Theory of continues Lei groups | | √ | | | | | | √ | √ | √ |
| | Special Paper B-II (Electronics) Electronics Projects | √ | √ | | | | √ | √ | | | √ |
| | Special Paper B-II (Nuclear Physics) Nuclear Physics Projects | √ | √ | | | √ | √ | √ | | √ | √ |
| | Special Paper B-II (Plasma Physics) Theoretical Projects of Plasma Physics | | | | | | √ | √ | | √ | √ |
| | Special Paper B-II (Computational Physics) Numerical Solution of Physical Problems | | √ | | √ | | | √ | √ | | √ |

Table 1: Courses versus program outcomes

**Standard 2-2: Theoretical background, problems analysis and solution design must be stressed within the program's core material.**

| **Automation and Control Concentration (Regular Stream)** | |
|---|---|
| **Elements** | **Courses** |
| Theoretical | Mathematical Methods of Physics-I, Mathematical Methods of Physics-II, Mechanics, Electromagnetic Theory-I, Electromagnetic Theory-II, Special Theory of Relativity, |

| | |
|---|---|
| | Statistical Mechanics, Quantum Mechanics –I, Quantum Mechanics –II |
| Problem Analysis | Atomic Physics, Solid State Physics, Nuclear Physics, Radiation Physics, Plasma Physics, Particle Physics |
| Solution Design | Computational Methods -I, Computational Methods –II, Computer Solutions of Physics Problems, Project( Numerical Solution of Physical Problems), Plasma Physics-I, Plasma Physics-II, Theoretical Projects of Plasma Physics, Digital Electronics, Electronics Lab, Electronics Instrumentation, Electronics Projects, Relativistic Quantum Mechanics and Scattering Theory, Theory of finite groups, Quarks and Laptons, Theory of continues Lei groups, Formation of Tracks in passive detectors, Application of Passive Detectors, Radiation Physics Projects (Heavy ion reaction study, Environmental study), Nuclear Decays, Nuclear Reactions, Nuclear Forces and Models, Nuclear Physics Projects( Theoretical calculation of cross sections for Nuclear Reactions, α,β,γ- Spectroscopy with applications), Nuclear reactors/ Nuclear Energy |

Table 2: Fulfilling requirements in standard 2-2

**Standard2-3: The curriculum must satisfy the mathematics and basic sciences requirements for the program as specified by the respective accreditation body**

The Department of Physics offers courses of Mathematical Methods of Physics-I and Mathematical Methods of Physics-I to its students in 1$^{st}$ and 2$^{nd}$ Term to enable them to work out all their mathematical problems independently. This satisfies the basic science requirements of the program as specified by the respective accreditation body.

**Standard 2-4: The curriculum must satisfy the major requirements for the program as specified by the respective accreditation body**

The curriculum of Physics has been designed by various committees comprising of experts in the relevant fields therefore, it fulfill all the requirements and objectives of the program as specified by the respective accreditation body.

**Standard 2-5: The curriculum must satisfy humanities, social sciences, arts, ethical, professional and other discipline requirements for the program as specified by the respective accreditation body**

Table 3 indicates the program offered in Physics which fulfill the requirements specified in standards 2-3 and 2-4. English is an additional subject which is also being taught in 1st and 2nd Term. Moreover, efforts are under way to include all the courses as specified in standard 2-5.

| M. Sc Physics | Mathematics and Basic Sciences | | Chemistry Topics | | | | Humanities and Social Sciences | |
|---|---|---|---|---|---|---|---|---|
| | | | Core | | Elective | | | |
| | Required | Present | Required | Present | Required | Present | Required | Present |
| | 2 | 2 | 16 | 16 | 22 | 18 | 2 | 2 |

Table.3: Standard 2-3, 2-4, 2-5 requirements

**Standard 2-6: Information technology component of the curriculum must be Integrated throughout the program**

Information technology component is the part of curriculum which delivers the knowledge of different software and computerized lab equipments. This area has been given all due importance in the program and integrated all over the program.

**Standard 2-7: Oral and written communication skills of the students must be developed and applied in the program**

Much importance has been given in the program for improvement of oral and written communication skills of the students. They are required to deliver seminars on different topics, collect and analyze research data, write projects reports and have group discussion

during the course of the program. The whole process is monitored by the respective teachers.

Moreover, tutorial classes are arranged weekly for all students which facilitate them to display their skills in terms of written and oral presentation.

## Criterion 03: Physics Lab

| Lab Title | Location & area | Objectives | Adequacy for Instruction | Courses Taught | Major apparatus and Equipments | Safety regulations |
|---|---|---|---|---|---|---|
| Applied Radiation Physics Lab. | WxL 20× 27 | To train M. Sc students in Radiation Physics and to provide research facility to M. Phil & Ph. D scholars | M. Sc Prev. M. Sc Final M. Phil, Ph. D. | Applied Radiation Physics Practical, Radiation Physics Projects (Heavy ion reaction study, Environmental study), M. Phil and Ph. D research ((Heavy ion reaction study, Environmental study) | 1. Microscopes 2. Etching Apparatus 3. Three CR-39 Plastic Track Detector Sheets 4. Electronic Balance 5. Chemicals (NaOH, KOH, Ethanol) for Etching 6. Multimedia 7. Two Computers for research students | Fire extinguisher available |
| Modern Physics Lab | WxL 20× 27 | To train M. Sc students in Atomic Physics/ Solid State Physics | M. Sc Prev. | Atomic Physics/ Solid State Physics Practical | 1. Frank- Hertz Apparatus 2. Millikan Apparatus 3. Hall's effect Apparatus 4. Plank's constant Apparatus 5. Interferometer 6. Zeman's effect Apparatus | Fire extinguisher available |
| Nuclear Physics Lab | WxL 20× 27 | To train M. Sc students in Nuclear Physics | M. Sc Prev. M. Sc Final | Nuclear Physics Practical, Nuclear Physics Projects(α,β,γ-Spectroscopy with applications) | 1. Geiger Muller counter 2. Wilson cloud chamber 3. NaI (Tl) Scintillation Detectors 4. Plastic Scintillators 5. Gamma-ray Angular distribution/ Compton scattering 6. Ortec (USA) Pulse processing electronic set for Gamma-spectroscopy 7. Multichannel Analyzers 8. Surface barrier Detectors 9. Ortec (USA) Pulse processing electronic | Personal dosimeter available |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | set for charged particle spectra<br>10. Vaccum chambers/ Vaccum pumps<br>11. Radioactive (α, β, γ) standard sources (4 sets) | |
| Computational Physics Lab | WxL<br>20× 27 | To train M. Sc students in Computational Physics and to provide research facility to M. Phil &<br>Ph. D scholars | M. Sc Final<br>M. Phil,<br>Ph. D. | Computational Physics Practical,<br>Project(Numerical Solution of Physical Problems)<br>M. Phil and Ph. D research (Monte Carlo Simulation, Numerical approximation by Interpolation, Numerical Solution of Physical Problems) | 1. Computers<br>2. Printer<br>3. Scanner | Fire extinguisher available |
| Electronics Lab | WxL<br>20× 27 | To train M. Sc students in Electronics | M. Sc Prev.<br>M. Sc Final | Electronics Practical, Electronics Projects | 1. Oscilloscopes<br>2. Digital Multimeters<br>3. Pistol Soldering guns<br>4. Analog Trainer Heath Kits (Digital Training System) | Fire extinguisher available |
| Plasma Lab | WxL<br>20× 27 | To provide research facility to M. Phil &<br>Ph. D scholars | M. Phil,<br>Ph. D | M. Phil and Ph. D research | 1. Mcpherson Monochrometer<br>2. R-F Generator<br>3. Discharge Chamber<br>4. Avantis Spectrometer<br>5. Adwards Double Stage Vacuum Pump<br>6. Oscilloscope<br>7. DC Power Supply (0-5KV) | Fire extinguisher available |

**Standard- 3-1: (Lab manuals/documentation/instruction for experiments must be available and readily accessible to faculty and students.**

Lab manuals and instruction for each experiment are available in all the laboratories for guidance of the faculty and students.

**Standard 3-2: There must be adequate support personal for instruction and maintaining the computing laboratories**

Lab. technician and an attendant are available for maintenance of computer lab. They have been assigned the responsibility to assist and guide the students and resolve their difficulties associated with operation of computers.

**Standard 3-3: The university computing infrastructure and facilities must be adequate to support programs objectives.**

A computer lab equipped with computers and internet facility is available in the department. Students have access to take benefits from Digital library and other e-learning facilities. However, there are limited number of computers available to the students which are not sufficient to meet their demand.

## Criterion 4: Student Support and Advising

**Standard 4.1: Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner**.

The required courses are offered based on the needs of the students. All these courses are first examined and discussed in the meeting of the departmental Board of studies. The recommendations are then placed before the Board of Faculty meeting comprising of some senior professors of the university and experts of curriculum from other universities and affiliated colleges. The recommendations of the board are further submitted to Academic Council and then finally to the Syndicate for its approval. In this way the courses are thoroughly analyzed and screened through a number of academic and administrative bodies.

**Standard 4-2: Courses in the major areas of study must be structured to ensure effective interaction between student, faculty and teacher assistants.**

Students are offered courses according to the approved syllabi by the HEC whereby due importance is been given to the interaction between faculty members and students.
The faculty members always encourage and welcome the students to come up with their academic related problems and try their level best for its resolution. The Chairman of the Department is also available to interact with the students regularly to listen to their problems.

**Standard 4-3 Guidance on how to complete the program must be available to all students and access to academic advising must be available to make course decisions and careers choices**.

The students receive counselling from the teachers. All the faculty members of the department have been assigned the responsibility to discuss and coordinate with student in taking specialization. They can also contact the relevant teachers whenever they face any academic problem. Moreover, information about the program requirements are also provided to the students through the office of the head of the department.
However, there is no counselling cell as such in the department

# Criterion 5: Process Control

**Standard 5-1: The process by which students are admitted to the Program must be based on quantitative and qualitative criteria and clearly documented. The process must be periodically evaluated to ensure that it is meeting its objectives.**

The admissions are advertised is in the Daily News Papers by the Academic Section as per approved criteria and rules of admission**.**

For admission in M. Sc. Physics pre-requisites are B. Sc. with Physics and Mathematics and at least 40% marks in Physics. Applications are scrutinized by the Admission Committee. Final merit is based on 60% Academic merit and 40% Entry Test (NAT) (Formula given below). After interviews of the eligible candidates, category wise merit lists are displayed on the notice board. The second and if required third merit lists are also prepared and displayed as per University rules. The last date for submission of fee is also mentioned on each merit list.

Final merit is based on 60% Academic merit and 40% Entry Test (NAT).

Merit formula for 60% Academic merit:

SSC ×1 = X

HSSC×2 = Y

B. Sc×3 = Z

60% Academic merit = X+Y+Z / 6

**Standard 5-2: The process by which students are registered in the program and monitoring of students progress to ensure timely completion of the program must be documented**.

The candidates who have been offered admission are required to deposit their dues in the designated branch of Bank by due date. The Department office then prepares a detailed list of students who have paid their dues and forward it to the Academic section of the University for Proper Registration.

Students are evaluated through tests and assignments during the term. To monitor the performance of students there is internal as well as external based evaluation system. In every term at least 2 tests are conducted along with assignments which carry 20 % marks. The external exam is allocated 80 % marks and the result of a student is based on over all combined assessment/result.

**Standard 5-3: The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation.**

Recruitment policy developed by the university is in accordance with the criteria as laid down by the HEC. All vacant and newly created positions in the Department are advertised in the National newspapers / University Web Page for wide publicity. Applications are received by the Registrar office and the documents of the candidate are thoroughly scrutinized by a scrutiny committee. Call letters are then issued to the short–listed candidates for written test and interview as per approved policy. Candidates are then interviewed by the University Selection Board and the candidates recommended by the selection board are placed before the University Syndicate for final decision. The appointed persons are then informed through appointment letters.

Evaluation of the Faculty is done by the students at the end of each academic year. The evaluation results are shown to each faculty member. The evaluation results are taken very seriously by the Faculty. Based on the students evaluation the faculty tries to improve its overall process of teaching and guidance so that the students are benefited to the highest possible level.

**Standard 5-4: The process and procedures used to ensure that teaching and delivery of course material to the students emphasize active learning and that course learning outcome is met. The process must be periodically evaluated to ensure that it is meeting the objectives.**

In order to provide excellent teaching and learning environment not only the courses are updated from time to time, but emphasis is also placed on the delivery of the lectures. All

faculty members keenly observe their individual class performance through assignments, presentations and lab work.

At the beginning of the each term, courses and practical works are assigned to the Faculties. The Faculty follow the approved syllabi and make sure to complete it within the time period. The progress is regularly reviewed in the staff meetings.

**Standard 5-5: The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.**

It is ensured by the faculty members that all their students meet objectives of the program. The faculty keenly observes individual and collective class performance.

The students are evaluated through their class attendance and their performance in the lab work, assignments and presentations which are given to them on different topics. Requirement of degree program is based on the evaluation of four terms. Students who complete their four terms with at least 40% marks are declared to have met the requirement of the program.

# Criterion 06: Faculty

**Standard 6-1: There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas / courses, continuity and stability. The interests and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. The majority of the faculty must hold a Ph. D. in the Discipline.**

Universities are always recognized by their Faculties and Researchers. Therefore, the Faculty plays a crucial and important role in the up lift of Universities. The Department has a very strong faculty both in number and the quality and diversity of their areas of expertise.

The detail of program areas and number of faculty in each area are shown in the following table.

| Program Area | Courses in the area and average number of sections per year | Number of faculty members in each area | Number of faculty with PhD |
|---|---|---|---|
| **Applied Radiation Physics** | Formation of Tracks in passive detectors, Application of Passive Detectors, Radiation Physics Projects (Heavy ion reaction study, Environmental study), Radiation Physics Practical | 3 | 1 |
| **Computational Physics** | Computational Methods -I, Computational Methods –II, Computer Solutions of Physics Problems, Project( Numerical Solution of Physical Problems) | 2 | 1 |
| **Electronics** | Digital Electronics, Electronics Lab, Electronics Instrumentation, Electronics Projects, Electronics Practical | 2 | Nil |
| **Nuclear Physics** | Nuclear Decays, Nuclear Reactions, Nuclear Forces and Models, Nuclear Physics Projects( Theoretical calculation of cross sections for Nuclear Reactions, α,β,γ- Spectroscopy with applications), Nuclear reactors/ Nuclear Energy, Nuclear Physics Practical | 2 | Nil |
| **Particle Physics** | Relativistic Quantum Mechanics and Scattering Theory, Theory of finite groups, Quarks and Laptons, Theory of continues Lei groups | 4 | Nil |
| **Plasma Physics** | Plasma Physics-I, Plasma Physics-II, | 2 | 2 |

| | | | |
|---|---|---|---|
| | Theoretical Projects of Plasma Physics, | | |
| | **Total :** | **15** | **4** |

It is clear from the above table that the information provided about the faculty members meet the contention as specified in standard 6-1.

**Standard 6-2: All faculty members must remain current in the discipline and sufficient time must be provided for scholarly activities and professional development. Also, effective programs for faculty development must be in place.**

The Faculty members are encouraged to develop and improve their professional skills and remain up to date in their area of specialization. They are given support and opportunities to attend different conferences, workshops and training program at national and international level. The university waves off the full tuition fee if any faculty member is enrolled in M. Phil & Ph. D, in this way they are encouraged to improve their qualification.

**Standard 6-3: Faculty members should be motivated and have job satisfaction to excel in their profession**

The Faculty gets the following benefits for its motivation and Job Satisfaction**.**

1. Attractive salary packages
2. Hard area allowance
3. Research allowance for Ph. D Degree holders
4. Education to their children in university Schools, Colleges and Departments at subsidized rate
5. Free medical treatment at public sector hospitals and some private hospitals
6. Quota is reserved for employee's children in all academic programs being run by the University including professional colleges

# Criterion 07: Institutional Facilities

**Standard 7-1: The institution must have the infrastructure to support new trends in learning such as e-learning**

The faculty members and students of the department of Physics have access to computers, internet facility, and a significant number of books. Technical support for problems related to hardware and software is also available. These facilities are helpful in providing favourable environment for imparting quality education to the students and producing good quality research.

**Standard 7-2 : The library must possess an up to date technical collection relevant to the program and must be adequately staffed with professional personnel**

The departmental library has the collection of latest books. The total numbers of books in the library are 5,806. The Department's Library is equipped with latest books in almost all important branches of Physics, including some back volumes of International Physics Journals. A professionally trained full time Assistant Librarian who takes keen interest in the up gradation and organization of the library is always available to assist the staff and students in finding their desired books and journals etc. The working environment in the library is also good. There is however problem of space, number of books and furniture to meet the requirements of increasing number of students in near future.

| Name of Item | Quantity |
|---|---|
| Books | 5,806 |

## Central Library:

The Central Library of the University has very limited facility both in terms of number of books, journals and periodicals. The overall environment of the library is not conducive for research. However, due to sufficient space, the seating facilities in the reading room are quite good. The library is centrally air conditioned which provides an excellent environment for reading in summer season. There is no printing and photocopy facility available at the library and it is quite expensive to make copies in the market. This

problem has multi dimensional impacts on teaching and research and therefore, an immediate solution is needed for the problem.

**Standard 7-3: Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities**

Space in terms of faculty offices and class rooms is one of the main problems of the department. The situation of class rooms in the department is very poor. The number of class rooms is not only limited but also very small in size to accommodate increasing number of students. It also lacks most of the basic facilities. There is no multi media in the class rooms and all the furniture is old fashioned. The class rooms also lack air conditioning and in summer it becomes very difficult to deliver lectures in these class-rooms.

Moreover, there is shortage of labs too for carrying out practical exercises and conducting M. Phil and Ph. D research programme effectively. This badly affects the quality of teaching and delivering of lectures. There is no hall or auditorium for seminars/interim exams.

The problem of faculty offices is also very grave. The offices are not well equipped and in some cases rooms are shared by the Faculty members. This badly affects their capacity of work and preparation for classes.

## Criterion 08: Institutional Support

**Standard 8-1: There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teacher and scholar.**

The university administration is trying to provide all the possible facilities to the department and has been struggling hard for its up gradation. The university is also trying

to attract highly qualified faculty. All the financial matters of Department of Physics are being run by University Finance Directorate. It provides all the financial support needed to run the programs of studies in the Department as well as facilitating the faculty and other supporting staff for maintenance of their competence and standard.

The Faculty members are fully supported to perform all kinds of research and teaching activities and give opportunities to present work of scholarly level at all forums.

**Standard 8-2: There must be an adequate number of high quality graduate students, research assistants and PhD students.**

A strict merit policy is observed to ensure intake of high quality graduate, M. Phil and Ph. D students. The intake is once in a year and qualifying Departmental test/GRE/NTS is mandatory for all the candidates. The number of seats for admission of M. Phil. And Ph. D are determined in accordance with the facilities available.

**Standard 8-3: Financial resources must be provided to acquire and maintain library holding, laboratories and computer facilities**

The department of Physics has established its own departmental library having almost 5,806 books, research laboratories with necessary facilities for the students to perform their experimental work and a computer lab. which has the facility of internet and digital library. However, it has got meager financial resources which do not fulfill the departmental needs particularly for the purchase of most up-to-date books, major and minor equipments and all other relevant accessories etc.

There is a need for increasing the financial resources allocated to the department to acquire and maintain library, laboratories and computer facilities. The university should plan for future to provide enough space for the department for library, faculty offices and class rooms etc.