

FAREAST INTERNATIONAL UNIVERSITY

SYLLABUS FOR BACHELOR OF SCIENCE IN PHYSICS

DEGREE TITLE: BACHELOR OF SCIENCE (B.Sc.) IN PHYSICS

INTRODUCTION

FIU is one of the institutions that offer a B.Sc. (Hon's) and M.S. degree in Physics. B.Sc. (Hon's) and M.S. degree will broaden knowledge and skills, which will enhance employability. Our goal is to educate the students and to do everything possible to support students as they work toward their degrees and to prepare students for their independent careers in industry or academics. Physics, the most basic of the sciences, has intellectual and useful aspects. Many of the technological advances in our modern society flow directly from physics laboratories, such as the many applications of lasers, or the possibility of high speed levitated trains relying on high temperature superconductors. Much of the equipment and technology used by other scientists and medical doctors were originally developed by physicists, including x-rays, lasers, and MRIs. These are just several examples of exciting applications which resulted from intellectual endeavors in physics. In addition, productive citizens in this technological age must have a basic understanding of physics. The goal of the graduate program is to train students at the leading edge of physics research and to prepare them to become the next generation of leaders in academic and industry. Physics students learn how the laws of nature can be used to explain the many phenomena of our world. This program is designed to prepare students for a wide variety of opportunities, from further graduate or professional studies, to careers in Physics education, or positions in the information and communication technology based industries. Possible careers with a degree in physics: Medicine , Engineering , Biophysics , Astronomy, Chemistry , Patent Law , Management , Education , Environmental Science , Computer Science, Mathematics , Radiology , Meteorology , Imaging, Technician.

ADMISSION REQUIREMENT:

Students entering the Bachelor of Science in Physics program for a B.Sc. in Physics degree, must have completed SSC and HSC with Science or equivalent level of education such as O'Level (Five subjects including Physics, Chemistry and Mathematics) and A'Level (with three major subjects - Physics, Chemistry & Mathematics) .

The students with S.S.C. and H.S.C. background must have at least 2nd Division in both the exams separately.

- The students with S.S.C. and H.S.C. under CGPA system must have at least a minimum CGPA of 3.00 in both the exams separately.
- The students with O-Level and A-Level must have an average grade of B.

If an applicant doesn't meet these requirements, she/he will not be accepted for Admission. Admission counselors should be consulted for an evaluation of the grades.

COURSE WAIVER:

Considering some of the course content/outline courses under taken during the previous degree/diploma the grade point of waiver shall not exceed of the total credit hour 138.

TRANSFER OF CREDIT HOURS

For transferring the credit hours for a student desires to admit in the department the maximum limit of credit hours considered shall be less than fifty percent of the whole(138 credits). In this case the transferred subjects and grades should be considered after the approval of the advisor and the Equivalent committee.

BASIC STRUCTURE:

The total credit requirement for the degree of Bachelor of Science in Physics (B. Sc in Physics) is 138 credits. A regular student should take about 12 credits per semester. Depending on the student's academic standing and the advisor's recommendation a student may take maximum 14 credits and minimum 9 credits for any semester. Considering the even distribution of the credits

the length of study for the degree in Bachelor of Science in Physics (B. Sc in Physics) is recommended to be 4 years (12 semesters). However if any student fails to earn 138 credits in 4 years he/she may allowed 3 years to complete the degree. If any student again fails to complete 8 years he may apply to the Academic council for special permission.

DISTRIBUTION OF COURSES(TABLE-1):

The B.Sc. in Physics program in the department of Physics consists of 42 courses carrying 138 Credits Hours. The following table shows typical credits for theory and laboratory courses.

Courses	Credit Hour's
Physics theory	81
Physics laboratory	16.5
Viva / Seminar	6
Chemistry theory	6
Chemistry laboratory	3
Mathematics theory	9
Statistics theory	3
Computer theory	3
Computer laboratory	3
Fundamentals of English	3
Thesis	4.5

A wide variety of graduate courses are offered, including:

DEPARTMENTAL COURSES ARE:

1. Mathematical Physics	10. Magnetism	19. Electronics
2. Mechanics	11. Statistical Mechanics	20. Astrophysics
3. Properties of Matter	12. Electrodynamics	21. Atmospheric Physics
4. Wave Oscillation & Acoustics	13. Solid State Physics	22. Cosmology
5. Thermal Physics	14. Quantum Mechanics	23. Plasma Physics
6. Thermodynamics & Radiation	15. Relativity	24. Medical Physics
7. Classical Mechanics	16. Nuclear Physics	25. Laser Physics
8. Optics	17. Atomic Physics	26. Biophysics
9. Electricity	18. Molecular Physics	27. Geophysics

NON-DEPARTMENTAL COURSES ARE:

Department	Courses
Chemistry	1. Fundamentals of Chemistry
	2. Physical Chemistry
Mathematics	1. Basic Courses in Mathematics
	2. Differential Calculus & Coordinate geometry
	3. Integral Calculus & Differential Equation
Statistics	1. Statistics
Computer Science	1. Fundamentals of Computer
English	1. Fundamentals Of English
	2. Composition & Communication skills

STATUS OF THE STUDENT

The status of a student shall be determined by the cumulative credit hour earned by the student. Following table-2 expresses the status of a student:

Cumulative Credit Hour	Registered/ Completed	Status of a Student	Cumulative Credit Hour	Registered/ Completed	Status of a Student
12	Registered	1 year 1 semester	78.0	Completed	3 year 2 semester
12	Completed	1 year 2 semester	90.0	Completed	3 year 3 semester
22.5	Completed	1 year 3 semester	100.5	Completed	4 year 1 semester
33.0	Completed	2 year 1 semester	112.5	Completed	4 year 2 semester
45.0	Completed	2 year 2 semester	121.5	Completed	4 year 3 semester
55.0	Completed	2 year 3 semester	132	Completed	Degree Earned
67.5	Completed	3 year 1 semester			

ACADEMIC CALENDAR

According to the academic calendar, there are three semesters: semester 1 (Spring), semester 2 (Summer), and semester 3 (Fall) in a year (52 weeks). Semester 1 and semester 3 contain 17 weeks (lecture-14 weeks and jury, exam, checking of scripts, result short vacation etc. 3 weeks) and semester 2 contains 18 weeks (lecture-12 weeks and jury, exam, checking of scripts, result, long vacation etc. 6 weeks).

Table-3

SEMESTER 1 (Spring)	Lecture Jury, Exam, Checking of Scripts , Result, Vacation	14 weeks , 3 weeks,	Total-17 weeks
SEMESTER2 (Summer)	Lecture Jury, Exam, Checking of Scripts Result, Vacation	12 weeks, 6 weeks,	Total-18 weeks
SEMESTER 3 (Fall)	Lecture Jury, Exam, Checking of Scripts , Result, Vacation	14 weeks 3 weeks,	Total-17 weeks
			Total-52 weeks

COURSE NUMBERING

For identification of a course in the program, the following code plan has been adapted: A 7-8 characters identification code will be used. First 3-4 characters will be alphabetic characters (e.g., EEE or CHEM for example) and last three characters will be numeric. Of the three numeric digits, First Digit stands for Year, the Second Digit stands for Semester ,the Third digit stands for whether the subject is theoretical or Sessional.

Further, an odd number in the third digit has been assigned to theory course and the even number has been assigned to laboratory course.

ASSESSMENT OF SESSIONAL COURSES

The marks distribution for Sessional courses is as follows:

Each course will have 100 marks for Sessional courses, out of which

- 50% marks is allotted for running assessment and
- 50% marks are for Sessional exam, viva, quiz, etc at the end of semester final examination.
- Total 100%

THESIS PROJECT

The Thesis undertaken by students of 4th year 3rd semester in partial fulfillment of the requirement of the degree of Bachelor of Science in Physics (B.Sc. in Physics) is termed as Thesis Project. Each student needs to defend his/her thesis project in a Final Committee who will decide the acceptability of the thesis. The thesis/project enables students to fully articulate their concepts and understanding of Physics as a discipline. It provides them to career opportunities in a multitude of industries, research Centre including Bangladesh Atomic Energy Commission, Bangladesh Council of Scientific and Industrial Research, Power, Communications etc. At the same time the thesis/ projects enable the examiners to assess the maturity, competence and the ability of the students, to handle projects independently. The student prepares and submits a thesis/project proposal for approval of the department. The Thesis/Project should reflect a minimum standard of professional competence.

SEMESTER WISE COURSES:

The B.Sc. (Hons.) in Physics consists of the following theoretical and laboratory courses spread over four academic years: Part-I, Part-II, Part-III, Part-I, and every year divide three semesters: Spring, summer, Fall and carries a total of 4750 marks.

1st Semester

Courses Title	Credit Hours
Mathematical Physics-I	3
Mechanics	3
Properties Of Matter	3
Physics Lab- I	1.5
General Chemistry Laboratory	1.5
Total	12

2nd Semester

Courses Title	Credit Hours
Wave Oscillation & Acoustics	1.5
Thermal Physics	1.5
Basic Course in Mathematics	3
Composition & Communication skills	3
Physics Lab-II	1.5
Total	10.5

3rd Semester

Courses Title	Credit Hours
Thermodynamics & Radiation	3
Statistics	3
Fundamentals of Chemistry	3
Fundamental English	Non Credit
Physics Lab-III	1.5
Viva Vocie	1.5
Total	12

PART-2: 2nd Year

1st Semester

Courses Title	Credit Hours
Mathematical Physics-II	3
Classical Mechanics-I	1.5
Optics	1.5
Physical Chemistry	3
Physics Lab-IV	1.5
Physical Chemistry Laboratory	1.5
Total	12

2nd Semester

Courses Title	Credit Hours
Electricity	1.5
Magnetism	1.5
Classical Mechanics-II	1.5
Differential Calculus & Coordinate Geometry	3
Physics Lab-V	1.5
Structured Programming Lab	1.5
Total	10.5

3rd Semester

Courses Title	Credit Hours
Statistical Mechanics	3
Fundamentals of Computer	3
Integral Calculus & Differential Equations.	3
Physics Lab-VI	1.5
Digital Logic Design	1.5
Viva Vocie	1.5
Total	13.5

PART-3: 3rd YEAR

1st Semester

Courses Title	Credit Hours
Electrodynamics	3
Solid State Physics-1	3
Quantum Mechanics-1	3
Physics Lab-VII	1.5
Total	10.5

2nd Semester

Courses Title	Credit Hours
Relativity	3
Nuclear Physics-I	3
Atomic Physics	3
Molecular Physics	1.5
Physics Lab-VIII	1.5
Total	12

3rd Semester

Courses Title	Credit Hours
Electronics-I	3
Solid State Physics-II	3
Quantum Mechanics-II	3
Physics Lab-IX	1.5
Viva Vocie	1.5
Total	12

PART-4: 4th YEAR

1st Semester

Courses Title	Credit Hours
Electronics-II	3
Nuclear Physics-II	3
Astrophysics	1.5
Atmospheric Physics	3
Physics Lab-X	1.5
Total	12

2nd Semester

Courses Title	Credit Hours
Cosmology	1.5
Plasma Physics	3
Medical Physics	3
Physics Lab-XI	1.5
Total	9

3rd Semester

(N.B.: Students have to take two courses from offered three courses)

Courses Title	Credit Hours
Laser Physics	3
Biophysics	3
Geophysics	3
Thesis/Project	4.5
Viva Vocie	1.5
Total	12

Grand Total

Credit= 138