1. **Program name:** B.Sc. (Hons.) in Physics

2. **Vision:**
To provide students with a competitive knowledge base to be a world class Physics Discipline and a leader in developing the knowledge economy of Bangladesh.

3. **Mission:**
To provide students with a quality education in physical science, conduct valuable need oriented research, serve the national and international societies and contribute to the knowledge economy of Bangladesh through learning, creativity, the use of current and developing technologies and effective global partnership.

4. **Program objectives:**
1. Establish excellence in all fields of research in physical science.
2. Maintain a distinctive faculty processing the highest credentials and abilities.
3. Provide graduate students with the best educational and opportunities that will enhance their knowledge, skills and relevant experiment.
4. Building bridges locally, nationally and internationally.
5. Ensure a suitable environment for the pursuit of excellence.
6. Establish flexibility and accountability.
7. Encourage research activities in the discipline and induce collaboration with other researcher in physics around the globe.

5. **Learning outcomes:**
Graduates of this program are expected to –
1. Demonstrate a substantial knowledge and understanding of the core aspects of Physics;
2. Apply the theoretical insights and methods of inquiry from their fields of study in considering issues and problems in other contexts;
3. Investigate complex problems and develop creative solutions with limited guidance, using insights from their own and other related fields of study;
4. Engage in independent learning using scholarly reviews and secondary sources of information;
5. Participate in activities to keep up to date with developments in their field and enhance their own knowledge, understanding and skills;
6. Exercise initiative, personal responsibility and accountability in the professional environment/work place;
7. Handle laboratory instruments and follow technical protocols with safety;
Use practical skills effectively to develop new scientific technologies for the welfare of the mankind.

6. **Course structure:**
Program duration: 4 Years
Number of terms: 8
Term duration: 13 Weeks
Total number of credit hours available: 180.25
Minimum credit hours is required to earn to be a graduate: 162.25

6.1 Summary of the total available credits (core and optional) from different areas of study

Distributions of credits available in different areas of study

Areas of study	Theory		Sessional / Field Work		Core/optional		
	Core	Optional	Core	Optional	Core	Optional	Total
Physics	99	9.0	16.5	-	115.5	27	142.5
Basic Science & Computer	23	-	6.75	-	29.75	-	29.75

Arts & Humanities and Social Science	8.0	-	-	-	8.0	-	8.0
Total	**130.0**	**9.0**	**23.25**	**0.00**	**146.5**	**27.0**	**180.25**

Distributions of minimum credits to be earned in different years

Year	**Term**	**Theory**		**Sessional/ Field Work**		**Total**
		Core	Optional	Core	Optional	
First	First	18.00	0.00	3.50	0.00	21.00
	Second	16.00	0.00	3.75	0.00	19.75
Second	First	19.00	0.00	3.00	0.00	22.00
	Second	17.00	0.00	3.00	0.00	20.00
Third	First	18.00	0.00	1.50	0.00	19.50
	Second	15.00	3.00	3.00	0.00	21.00
Fourth	First	15.00	3.00	3.00	0.00	21.00
	Second	12.00	3.00	3.00	0.00	18.00
Total		130.00	9.00	23.25	0.00	162.25

6.2 Course outline:

Term-wise course outline for the entire program

First Year First Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-1101	Vector Analysis	3-0	03
Phy-1103	Mechanics & Properties of matter	3-0	03
Phy-1105	Waves & Oscillation	3-0	03
Phy-1100	Mechanics Lab	0-3	0.75
Phy-1102	Acoustic Lab	0-3	0.75
Chem-1121	Physical Chemistry	2-0	02
Chem-1122	Chemistry Sessional – I	0-3/2	0.75
Math-1151	Mathematics-I	3-0	03
Eng-1153	Basic Skills Development in English	2-0	02
CSE-1155	Computer Fundamentals	2-0	02
CSE-1156	Computer Fundamentals Sessional	0-3/2	0.75
Total	**Theory: 7 Core + 0 Optional Sessional: 4 Core + 0 Optional**	**18-6**	**21.00 Core 21 Optional 0**

First Year Second Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-1201	Mathematical Methods in Physics-I	3-0	03
Phy-1203	Heat & Thermodynamics	3-0	03
Phy-1205	Electricity & Magnetism	3-0	03
Phy-1200	Heat & Thermodynamics Lab	0-3	0.75
Phy-1202	Electricity Lab-I	0-3	0.75
Chem-1221	Inorganic & Organic Chemistry	2-0	02
Chem-1222	Chemistry Sessional – II	0-3/2	0.75
Math-1251	Mathematics-II	3-0	03
CSE-1253	C – Programming	2-0	02
CSE-1254	C – Programming Sessional	0-3	1.5
Total	**Theory: 6 Core + 0 Optional Sessional: 4 Core + 0 Optional**	**16-7.5**	**19.75 Core 19.75 Optional 0**

Second Year First Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-2101	Mathematical Methods in Physics-II	3-0	03
Phy-2103	Atomic & Molecular Physics	3-0	03
Phy-2105	Geometrical optics & Optical Instrument	3-0	03
Phy-2100	Optics Lab-I	0-3	0.75
Phy-2102	Electricity Lab-II	0-3	0.75
Stat-2121	Statistics	3-0	03
Math-2151	Calculus	3-0	03
CSE-2154	Database Sessional	0-3	1.5
Econ-2155	Principle of Economics	2-0	02
SOC-2161	Government & Sociology	2-0	02

Total	**Theory: 7 Core + 0 Optional Sessional: 3 Core + 0 Optional**	**19-6**	**22.00 Core 22 Optional 0**

Second Year Second Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-2201	Statistical Mechanics & Radiation	3-0	03
Phy-2203	Basic Electronics & Semiconductor Physics	3-0	03
Phy-2205	Physical Optics	3-0	03
Phy-2207	Theory of Relativity	3-0	03
Phy-2200	Optics Lab- II	0-3	0.75
Phy-2202	Electricity Lab-III	0-3	0.75
Math-2251	Mathematics-III	3-0	03
CSE-2254	MAT LAB	0-3	1.5
BA-2255	Accounting	2-0	02
Total	**Theory: 6 Core + 0 Optional Sessional: 3 Core + 0 Optional**	**17-6**	**20.00 Core 20 Optional 0**

Third Year First Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-3101	Renewable Energy	3-0	03
Phy-3103	Electronics-I	3-0	03
Phy-3105	Electromagnetic Theory	3-0	03
Phy-3107	Crystallography	3-0	03
Phy-3109	Nuclear Physics – I	3-0	03
Phy-3111	Classical Mechanics	3-0	03
Phy-3100	Electromagnetic Lab-I	0-3	0.75

Phy-3102	Electronics Lab-I	0-3	0.75
Total	**Theory: 6 Core + 0 Optional Sessional: 2 Core + 0 Optional**	**18-3**	**19.50 Core 19.50 Optional 0**

Third Year Second Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-3201	Quantum Mechanics- I	3-0	03
Phy-3203	Electronics-II	3-0	03
Phy-3205	Electrodynamics	3-0	03
Phy-3207	Solid State Physics – I	3-0	03
Phy-3209	Nuclear Physics – II	3-0	03
Phy-3200	Electromagnetic Lab-II	0-3	1.5
Phy-3202	Electronics lab-II	0-3	1.5
Option-1		3-0	03
Total	**Theory: 5 Core + 1 Optional Sessional: 2 Core + 0 Optional**	**18-6**	**21.00 Core 18 Optional 3**

Students will have the option to select any one course from the following courses

Phy-3211	Meteorology	3-0	03
Phy-3213	Astronomy & Cosmology	3-0	03

Fourth Year First Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-4101	Quantum Mechanics –II	3-0	03
Phy-4103	Digital Electronics	3-0	03
Phy-4105	Radiation and Health Physics	3-0	03
Phy-4107	Solid State Physics – II	3-0	03
Phy-4109	Nuclear Physics- III	3-0	03
Phy-4100	Nuclear Physics Lab/Thesis	0-3	1.5/(for thesis group 03)
Phy-4102	Digital Electronics Lab	0-3	1.5

Option-I		3-0	03
Total	**Theory: 5 Core + 1 Optional Sessional: 2 Core + 0 Optional**	**18-6**	**21.00 Core 18 Optional 3**

Students will have the option to select any one course from the following courses

Phy-4111	Computational Physics	3-0	03
Phy-4113	X-ray Crystallography	3-0	03
Phy-4115	Plasma Physics	3-0	03

Fourth Year Second Term			
Course No.	**Course Title**	**Contact Hours per Week**	**Credit Hours**
Phy-4201	Quantum Mechanics –III	3-0	03
Phy-4203	Elementary Particle Physics	3.0	03
Phy-4205	Reactor Physics	3.0	03
Phy-4207	Magnetism & Superconductivity	3.0	03
Phy-4200	Thesis /Project/Field Work	0-6	03
Option- I		3.0	03
Total	**Theory: 4 Core + 1 Optional Thesis /Project/Field Work: 1 Core + 0 Optional**	**15-6**	**18.00 Core 15 Optional 3**

Students will have the option to select any one course from the following courses

Phy-4209	Geophysics	3.0	03
Phy-4211	Spectroscopy	3-0	03
Phy-4213	Methods of Experimental Physics	3-0	03
Phy-4215	Materials Science	3-0	03