DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code : **XXX M.Sc. (Physics)**
Department : **Department of Physics**
Year : **I**
Model : **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
Semester-I (Autumn)									
1.	PHC-521	Quantum Mechanics-I	PCC	4	3	1	0	3	0
2.	PHC-523	Advanced Mathematical Physics	PCC	4	3	1	0	3	0
3.	PHC-525	Classical Electrodynamics	PCC	4	3	1	0	3	0
4.	PHC-527	Classical Mechanics	PCC	4	3	1	0	3	0
5.	PHC-529	Atomic, Molecular and Laser Physics	PCC	3	3	0	0	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**21**					
Semester-II (Spring)									
1.	PHC-531	Condensed Matter Physics	PPI	3	3	0	0	3	0
2.	PHC-533	Statistical Mechanics	PPI	3	3	0	0	3	0
3.	PHC-535	Laboratory Work	PPI	3	0	0	6	0	4
4.	PHC-537	Elements of Nuclear and Particle Physics	PPI	3	3	0	0	3	0
5.	PHC-539	Physics of Earth’s Atmosphere	PPI	2	2	0	0	2	0
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	PHC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**19**					

DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code : **XXX M.Sc. (Physics)**
Department : **Department of Physics**
Year : **II**
Model : **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
Semester-I (Autumn)									
1.	PHC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	PHC-543	Computational Physics	PPI	3	2	0	2	3	0
3.	PHC-545	Semiconductor Devices and Applications	PPI	3	3	0	0	3	0
4.	PHC-547	Quantum Mechanics-II	PPI	3	3	0	0	3	0
5.		Program Elective-I	PPI	4	-	-	-	-	-
6.		Program Elective-II	PPI	3	-	-	-	-	-
7.	PHC-601	Project-I	PROJECT	2	-	-	-	-	-
		Total		**21**					
Semester-II (Spring)									
1.		Program Elective-III	PEC	4	-	-	-	-	-
2.		Program Elective-IV	PEC	4	-	-	-	-	-
3.	PHC-602	Project-II	PROJECT	9	-	-	-	-	-
		Total		**17**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	21	19	21	17
Total Credits	**78**			

M.Sc. (Physics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
1.	PHL-502	Physics of Nanosystems	PEC	4	3	1	0	3	0
2.	PHL-504	Fiber and Nonlinear Optics	PEC	4	3	1	0	3	0
3.	PHL-505	Quantum Optics	PEC	4	3	1	0	3	0
4.	PHL-508	Introduction to Superstring Theory	PEC	4	3	1	0	3	0
5.	PHL-510	Advanced Characterization Techniques	PEC	4	3	1	0	3	0
6.	PHL-511	Atomic and Molecular Collision Physics	PEC	4	3	1	0	3	0
7.	PHL-513	Astrophysics	PEC	4	3	1	0	3	0
8.	PHL-514	Solar-Terrestrial Physics	PEC	4	3	1	0	3	0
9.	PHL-515	General Relativity	PEC	4	3	1	0	3	0
10.	PHL-516	Computational Nuclear Physics	PEC	4	3	1	0	3	0
11.	PHL-517	Particle Physics	PEC	4	3	1	0	3	0
12.	PHL-521	Weather Forecasting	PEC	4	3	1	0	3	0
13.	PHL-522	Nuclear Instrumentation	PEC	4	3	1	0	3	0
14.	PHL-523	Physics and Technology of Thin Films	PEC	4	3	1	0	3	0
15.	PHL-524	Advanced Nuclear Reactions	PEC	4	3	1	0	3	0
16.	PHL-525	Semiconductor Photonics	PEC	4	3	1	0	3	0
17.	PHL-526	Advanced Light Sources	PEC	4	3	1	0	3	0
18.	PHL-527	Superconducting Radio Frequency for Particle Accelerators	PEC	4	3	1	0	3	0
19.	PHL-528	Advanced Condensed Matter Physics	PEC	4	3	0	3	3	0
20.	PHL-529	Advanced Atmospheric Physics	PEC	4	3	0	3	3	0
21.	PHL-530	Advanced Laser Physics	PEC	4	3	0	3	3	0
22.	PHL-531	Advanced Nuclear Physics	PEC	4	3	0	3	3	0
23.	PHL-532	Advanced Quantum Field Theory	PEC	4	3	1	0	3	0
24.	PHL-533	Quantum Computing for Many Body Systems	PEC	4	3	1	0	3	0

M.Sc. (Physics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
25.	PHL-534	Nuclear Astrophysics	PEC	3	3	0	0	3	0
26.	PHL-535	Superfluidity and Superconductivity	PEC	3	3	0	0	3	0
27.	PHL-536	Advanced Topics in Mathematical Physics	PEC	3	3	0	0	3	0
28.	PHL-537	Advanced Electroceramics Technology	PEC	3	3	0	0	3	0
29.	PHL-538	A Primer in Quantum Field Theory	PEC	3	3	0	0	3	0
30.	PHL-539	Advanced Atomic and Molecular Physics	PEC	3	3	0	0	3	0
31.	PHL-540	Quantum Theory of Solids	PEC	3	3	0	0	3	0

Science, Technology, and Advanced Research-tools Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
1.	PHT-501	Advanced Materials for Energy Harvesting and Storage	STAR	3	3	0	0	3	0
2.	PHT-502	Functional Materials	STAR	3	3	0	0	3	0
3.	PHT-503	Fundamentals of Nanoscience and Technology	STAR	3	3	0	0	3	0
4.	PHT-504	Computational Science with Python	STAR	3	2	0	2	3	0
5.	PHT-505	Quantum Simulations	STAR	3	2	0	2	3	0
6.	PHT-506	Superconducting Qubits-based Quantum Computing	STAR	3	3	0	0	3	0