BS Physics

Semester 1

S. No.	Course Code	Course Title	Credit Hours
1	COSC-1105	Introduction to ICT	2
2	COSC-1205	Introduction to ICT Lab	1
3	ENGL-1118	Functional English	3
4	HLTH-1113	Basic Health Awareness	2
5	MATH-1101	Calculus-I	3
6	PAKS-1113	Pakistan Studies	2
7	PHYS-1101	Mechanics-I	3
Total Credit Hours			16

Semester 2

S. No.	Course Code	Course Title	Credit Hours
1	ENGL-1119	Communication Skills	3
2	ISLS-1112	Islamic Studies	2
3	MATH-1102	Calculus-II	3
4	PHYS-1108	Heat and Thermodynamics	3
5	PHYS-1102	Mechanics-II	3
6	PHYS-1104	Electricity and Magnetism-I	3
7	PHYS-1201	Mechanics Lab	1
Total Credit Hours			18

Semester 3

S. No.	Course Code	Course Title	Credit Hours
1	ENGL-2111	Technical Writing and Presentation Skills	3
2	MATH-2103	Linear Algebra	3
3	PHYS-2101	Waves and Oscillations	3
4	PHYS-2210	Thermodynamics and Electromagnetism Lab	1
5	PHYS-2105	Electricity and Magnetism-II	3
6	STAT-2104	Probability and Statistics	3
Total Credit Hours			16

Semester 4

S. No.	Course Code	Course Title	Credit Hours
1	CHEM-1108	Introduction to Chemistry	3
2	COSC-2115	Introduction to Computer Program and Applications	2
3	COSC-2215	Introduction to Computer Program and Applications Lab	1
4	MATH-2122	Differential equations	3
5	PHYS-2102	Optics	3
6	PHYS-2108	Modern Physics	3
7	PHYS-2202	Waves and Optics Lab	1
8	SSCI-3120	Constitution and Legal System of Pakistan	2
Total Credit Hours			18

Semester 5

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-3101	Mathematical Methods of Physics-I	3
2	PHYS-3103	Electrodynamics-I	3
3	PHYS-3105	Classical Mechanics-I	3
4	PHYS-3113	Introduction to Computational Physics	3
5	PHYS-3211	Modern Physics & Spectroscopy Lab	2
6	PHYS-3109	Circuits and Devices	3
Total Credit Hours			17

Semester 6

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-3102	Mathematical Methods of Physics-II	3
2	PHYS-3104	Electrodynamics-II	3
3	PHYS-3106	Classical Mechanics-II	3
4	PHYS-3110	Quantum Mechanics-I	3
5	PHYS-3116	Digital Electronics	3
6	PHYS-3215	Electronics Lab	2
Total Credit Hours			17

Semester 7

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-3112	Nuclear Physics	3
2	PHYS-4105	Solid State Physics-I	3
3	PHYS-4109	Quantum Mechanics-II	3
4	PHYS-4111	Statistical Physics	3
5	PHYS-4211	Advanced Physics Lab	2
6	PHYS-XXXX	Elective-I	3
Total Credit Hours			17

Semester 8

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-4106	Solid State Physics-II	3
2	PHYS-4108	Atomic and Molecular Physics	3
3	PHYS-XXXX	Elective-II	3
4	PHYS-XXXX	Elective-III	3
5	PHYS-4360	Project	3
Total Credit Hours			15

Program Total Credit Hours	134

MSc Physics

Semester 1

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-3101	Mathematical Methods of Physics-I	3
2	PHYS-3103	Electrodynamics-I	3
3	PHYS-3105	Classical Mechanics-I	3
4	PHYS-3113	Introduction to Computational Physics	3
5	PHYS-3211	Modern Physics & Spectroscopy Lab	2
6	PHYS-3109	Circuits and Devices	3
Total Credit Hours			17

Semester 2

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-3102	Mathematical Methods of Physics-II	3
2	PHYS-3104	Electrodynamics-II	3
3	PHYS-3106	Classical Mechanics-II	3
4	PHYS-3110	Quantum Mechanics-I	3
5	PHYS-3116	Digital Electronics	3
6	PHYS-3215	Electronics Lab	2
Total Credit Hours			17

Semester 3

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-3112	Nuclear Physics	3
2	PHYS-4105	Solid State Physics-I	3
3	PHYS-4109	Quantum Mechanics-II	3
4	PHYS-4111	Statistical Physics	3
5	PHYS-4211	Advanced Physics Lab	2
6	PHYS-XXXX	Elective-I	3
Total Credit Hours			**17**

Semester 4

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-4106	Solid State Physics-II	3
2	PHYS-4108	Atomic and Molecular Physics	3
3	PHYS-XXXX	Elective-II	3
4	PHYS-XXXX	Elective-III	3
5	PHYS-XXXX	Elective-IV / Project	3
Total Credit Hours			**15**

Program Total Credit Hours	**66**

MS Physics

Semester 1

S. No.	Course Code	Course Title	Credit Hrs. Theory	Credit Hrs. Remarks
1	PHYS-5101	Mathematical Methods of Physics	3	Compulsory
2	PHYS-5103	Advanced Electrodynamics	3	Compulsory
3	PHYS-6105	Advanced Quantum Mechanics	3	Compulsory
4	PHYS-6107	Advanced Classical Mechanics	3	Compulsory
Total Credit Hours			**12**	

Semester 2

S. No.	Course Code	Course Title	Credit Hrs. Theory	Credit Hrs. Remarks
1	PHYS-6108	Statistical Physics	3	Compulsory
2	PHYS-XXXX	Graduate Level Physics Course	3	Elective-I
3	PHYS-XXXX	Graduate Level Physics Course	3	Elective-II
4	PHYS-XXXX	Graduate Level Physics Course	3	Elective-III
Total Credit Hours			**12**	

Semester 3 & 4

S. No.	Course Code	Course Title	Credit Hrs. Theory	Credit Hrs. Remarks
1	PHYS-6601	Thesis	12	Mandatory
Total Credit Hours			**12**	

Program Total Credit Hours	**36**

PhD Physics

Semester 1

S. No.	Course Code	Course Title	Credit Hrs. Theory	Credit Hrs. Remarks
1	PHYS-XXXX	Graduate Level Physics Course	3	Elective-I
2	PHYS-XXXX	Graduate Level Physics Course	3	Elective-II
3	PHYS-XXXX	Graduate Level Physics Course	3	Elective-III
Total Credit Hours			**9**	

Semester 2

S. No.	Course Code	Course Title	Credit Hrs. Theory	Credit Hrs. Remarks
1	PHYS-XXXX	Graduate Level Physics Course	3	Elective-IV
2	PHYS-XXXX	Graduate Level Physics Course	3	Elective-V
3	PHYS-XXXX	Graduate Level Physics Course	3	Elective-VI
Total Credit Hours			**9**	

Semester 3 and onwards

S. No.	Course Code	Course Title	Credit Hrs. Theory	Credit Hrs. Remarks
1	PHYS-8601	Thesis	30	Mandatory
Total Credit Hours			**30**	

Program Total Credit Hours	**48**

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List of Elective Courses

Elective Courses (BS / MSc Program)

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-4110	Plasma Physics	3
2	PHYS-4112	Methods of Experimental Physics	3
3	PHYS-4114	Introduction to Quantum Computing	3
4	PHYS-4116	Quantum Information Theory	3
5	PHYS-4118	Introduction to optoelectronics	3
6	PHYS-4120	Experimental Techniques in Particle and Nuclear Physics	3
7	PHYS-4122	Electronic Materials and Devices	3
8	PHYS-4124	Fluid Dynamics	3
9	PHYS-4126	Introduction to Photonics	3
10	PHYS-4128	Introduction to Material Science	3
11	PHYS-4130	Introduction to Nano Science and Nano-technologies	3
12	PHYS-4132	Introduction to Particle Physics	3
13	PHYS-4134	Computer Simulations in Physics	3
14	PHYS-4136	Surface Science	3
15	PHYS-4138	Computational Physics	3
16	PHYS-4140	Solid State Electronic Devices	3
17	PHYS-4142	Environmental Physics	3
18	PHYS-4144	Characterization Techniques for Nano-materials	3
19	PHYS-4146	Chemical and Physical Synthesis of Nanomaterials	3
20	PHYS-4148	Laser and Quantum optics	3
21	PHYS-4150	Quantum Field Theory	3
22	PHYS-4152	Physical and Geometrical Optics	3
23	PHYS-4154	Introduction to Laser Physics	3
24	PHYS-4156	Sub-Atomic Physics-I	3
25	PHYS-4158	Sub-Atomic Physics-II	3
26	PHYS-4160	Introduction to Quantum Information and Computation	3

Elective Courses (MS Physics Program)

S. No.	Course Code	Course Title	Credit Hours
1	MSCI-6102	Research Methodology	3
2	PHYS-6113	Semiconductor Theory	3
3	PHYS-6114	Magnetism in Condensed Matter	3
4	PHYS-6115	Methods and Techniques of Experimental Physics	3
5	PHYS-6116	Optical Properties of Solids	3
6	PHYS-6117	Nanophysics and Nanotechnology	3
7	PHYS-6118	Advanced Nanophysics and Nanotechnology	3
8	PHYS-6162	Quantum Optics	3
9	PHYS-6164	Condensed Matter Theory	3
10	PHYS-6166	Quantum Information Theory	3
11	PHYS-6125	Materials Science	3
12	PHYS-6126	Plasma Physics	3
13	PHYS-6160	Group Theory	3
14	PHYS-6129	Superconductivity	3
15	PHYS-6130	Particle Physics	3
16	PHYS-6127	Advanced Plasma Physics	3
17	PHYS-6131	General Relativity and Cosmology	3
18	PHYS-6165	Advanced Condensed Matter Theory	3
19	PHYS-6168	Experimental Plasma Physics	3
20	PHYS-6163	Advanced Quantum Optics	3
21	PHYS-6133	Atomic Physics	3
22	PHYS-6167	Advanced Quantum Information Theory	3
23	PHYS-6169	Accelerator Techniques for Materials	3
24	PHYS-6135	Solid State Physics	3
25	PHYS-6170	Solid State Theory	3
26	PHYS-6171	Atomic and Electron Physics	3
27	PHYS-6172	Advanced Atomic and Electron Physics	3
28	PHYS-6173	Nuclear Theory	3
29	PHYS-6174	Advanced Nuclear Theory	3
30	PHYS-6141	Quantum Field Theory	3
31	PHYS-6142	Advanced Quantum Field Theory	3
32	PHYS-6143	Laser Physics	3
33	PHYS-6144	Advanced Laser Physics	3
34	PHYS-6145	Computational Physics	3
35	PHYS-6146	Advanced Computational Physics	3
36	PHYS-6147	Physics of Non-linear Systems	3
37	PHYS-6148	Advanced Techniques of Experimental Physics	3
38	PHYS-6149	Applied Nuclear Physics	3
39	PHYS-6150	Magnetic Materials	3
40	PHYS-6151	Renewable Energy Resources	3
41	PHYS-6152	Conduction in Solids	3
42	PHYS-6153	Soil Physics	3
43	PHYS-6154	Environmental and Atmospheric Physics	3
44	PHYS-6155	Microelectronics and Semiconductor Devices	3
45	PHYS-6156	Optoelectronics	3
46	PHYS-6157	Thin Films Technology	3
47	PHYS-6158	X-Ray and Electron Diffraction	3
48	PHYS-6159	Defects in Solids	3
49	PHYS-6161	Structure and Properties of Materials	3
50	PHYS-6175	Nano magnetism	3

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Elective Courses (PhD Physics)

S. No.	Course Code	Course Title	Credit Hours
1	PHYS-6105	Advanced Quantum Mechanics	3
2	PHYS-6107	Advanced Classical Mechanics	3
3	PHYS-6108	Statistical Physics	3
4	MSCI-6102	Research Methodology	3
5	PHYS-6113	Semiconductor Theory	3
6	PHYS-6114	Magnetism in Condensed Matter	3
7	PHYS-6115	Methods and Techniques of Experimental Physics	3
8	PHYS-6116	Optical Properties of Solids	3
9	PHYS-6117	Nanophysics and Nanotechnology	3
10	PHYS-6118	Advanced Nanophysics and Nanotechnology	3
11	PHYS-6162	Quantum Optics	3
12	PHYS-6164	Condensed Matter Theory	3
13	PHYS-6166	Quantum Information Theory	3
14	PHYS-6125	Materials Science	3
15	PHYS-6126	Plasma Physics	3
16	PHYS-6160	Group Theory	3
17	PHYS-6129	Superconductivity	3
18	PHYS-6130	Particle Physics	3
19	PHYS-6127	Advanced Plasma Physics	3
20	PHYS-6131	General Relativity and Cosmology	3
21	PHYS-6165	Advanced Condensed Matter Theory	3
22	PHYS-6168	Experimental Plasma Physics	3
23	PHYS-6163	Advanced Quantum Optics	3
24	PHYS-6133	Atomic Physics	3
25	PHYS-6167	Advanced Quantum Information Theory	3

S. No.	Course Code	Course Title	Credit Hours
26	PHYS-6169	Accelerator Techniques for Materials	3
27	PHYS-6135	Solid State Physics	3
28	PHYS-6170	Solid State Theory	3
29	PHYS-6171	Atomic and Electron Physics	3
30	PHYS-6172	Advanced Atomic and Electron Physics	3
31	PHYS-6173	Nuclear Theory	3
32	PHYS-6174	Advanced Nuclear Theory	3
33	PHYS-6141	Quantum Field Theory	3
34	PHYS-6142	Advanced Quantum Field Theory	3
35	PHYS-6143	Laser Physics	3
36	PHYS-6144	Advanced Laser Physics	3
37	PHYS-6145	Computational Physics	3
38	PHYS-6146	Advanced Computational Physics	3
39	PHYS-6147	Physics of Non-linear Systems	3
40	PHYS-6148	Advanced Techniques of Experimental Physics	3
41	PHYS-6149	Applied Nuclear Physics	3
42	PHYS-6150	Magnetic Materials	3
43	PHYS-6151	Renewable Energy Resources	3
44	PHYS-6152	Conduction in Solids	3
45	PHYS-6153	Soil Physics	3
46	PHYS-6154	Environmental and Atmospheric Physics	3
47	PHYS-6155	Microelectronics and Semiconductor Devices	3
48	PHYS-6156	Optoelectronics	3
49	PHYS-6157	Thin Films Technology	3
50	PHYS-6158	X-Ray and Electron Diffraction	3
51	PHYS-6159	Defects in Solids	3
52	PHYS-6161	Structure and Properties of Materials	3
53	PHYS-6175	Nano-magnetism	3

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