MS in Physics

Program Overview:

MS Physics program, not only enables the students to scientifically understand and analyze the behavior of nature but orientate them with many interdisciplinary subjects such as Physics with Design Studies, Electro Technology, Systems and Control Engineering, Energy and Environmental Studies, the Physics of Life, Material Science and Nanotechnology.

Main Areas of Research:

- Material science
- Nanotechnology
- Plasma physics
- Quantum Optics
- Soil Physics
- Magnetic materials
- Radiation Physics
- Environmental Physics
- Renewable energy
- Applied nuclear physics

For more information, please refer to the list of faculty members for their research field on the departmental website.

Admission Requirement:

16 years of education or equivalent (e.g. BS - 4 years or M.Sc. in the relevant field) from HEC recognized university with at least 60% Marks (Annual System) or CGPA $\geq$ 2.5 out of 4.00 (Semester System).

GAT (General) with at least 50% marks or GAT (Subject) with at least 60% marks or HAT for the admission /scholarship in the specific program of study.

For more information on application deadlines, tests, and other admission requirements, please visit the admissions section of the Graduate Studies Office.

Program Requirement:

The duration of MS programs is 1.5 to 4 years. Students must meet the following requirements for graduation:

- A minimum of 24 credit hours course work with a minimum CGPA of 2.5
- Successful defense of synopsis/ research proposal and its approval from Advanced Studies and Research Board (AS&RB).
- A minimum of 6 credit hours research work/ thesis.
- Thesis defense and viva.

Program Structure:

#	Course Codes	Course Title	Credit Hours
FIRST SEMESTER			
1	PHY-587	Mathematical Methods of Physics	3 + 0
2	PHY-640	Electrodynamics	3 + 0
3	PHY-623	Methods and Techniques of Experimental Physics	3+0
4	PHY-677	Quantum Mechanics-I	3 + 0
SECOND SEMESTER			
1		Elective Course -I	3 + 0
2		Elective Course -II	3 + 0
3		Elective Course -III	3 + 0
4		Elective Course -IV	3 + 0
	THIRD SEMESTER		
1	PHY-667	Thesis	6+0

TOTAL	**6**
Total Courses	**24**
Total Credit Hours	**30**

List of elective courses

Serial #	**Code**	**Title of the Course**	**Credit Hours**
1	PHY-511	Statistical Physics	3+0
2	PHY-586	Group Theory	3+0
3	PHY-555	Atomic Physics	3+0
4	PHY-554	Atomic and Electron Physics - I	3+0
5	PHY-566	Advanced Nuclear Theory-I	3+0
6	PHY-556	Quantum Field Theory-I	3+0
7	PHY-557	Laser Physics – I	3+0
8	PHY-502	Physics of Non-linear Systems	3+0
9	PHY-531	Renewable Energy Resources	3+0
1	PHY-559	Conduction in Solids	3+0
11	PHY-532	Soil Physics	3+0
12	PHY-533	Environmental and Atmospheric Physics	3+0
13	PHY-517	Computational Physics – I	3+0
14	PHY-551	Solid State Physics	3+0
15	RES-504	Research Methodology	3+0
16	PHY-638	Electrodynamics II	3+0

17	PHY-654	Optical Properties of Solid	3+0
18	PHY-639	Magnetism in Condensed Matter	3+0
19	PHY-679	Quantum Optics-I	3+0
20	PHY-653	Condensed Matter Theory-I	3+0
21	PHY-676	Quantum Information Theory-I	3+0
22	PHY-658	Plasma Physics	3+0
23	PHY-651	Particle Physics	3+0
24	PHY-649	Plasma Physics-II	3+0
25	PHY-681	General Relativity and Cosmology	3+0
26	PHY-659	Accelerator Techniques for Materials	3+0
27	PHY-680	Solid State Theory	3+0
28	PHY-655	Atomics and Electron Physics II	3+0
29	PHY-656	Advanced Nuclear Theory-II	3+0
30	PHY-647	Quantum Field Theory – II	3+0
31	PHY-648	Laser Physics – II	3+0
32	PHY-617	Computational Physics – II	3+0
33	PHY-622	Advanced Techniques of Experimental	3+0
34	PHY-650	Micro-Electronics and Semi-Conductor Devices	3+0
35	PHY-681	Optoelectronics	3+0
36	PHY-660	Advanced Medical Physics	3+0
37	PHY-668	Ferrite Technology	3+0
38	PHY-682	Quantum Opto mechanics	3+0

39	PHY-693	Photovoltaics Materials	3+0
40	PHY-694	Dielectric Properties of Materials	3+0
41	PHY-641	Permanent Magnetic Materials	3+0
42	PHY-631	Physics of Solar Cells	3+0
43	PHY-632	Solar Energy	3+0
44	PHY-633	Wind Energy	3+0
45	PHY-642	Hard Magnetic Alloys	3+0
46	PHY-634	Refining and Recycling of Silicon	3+0
47	PHY-623	Methods and Techniques of Experimental Physics	3+0
48	PHY-677	Quantum Mechanics-I	3+0
49	PHY-678	Quantum Mechanics II	3+0
50	PHY-669	Nanophysics and Nanotechnology I	3+0
51	PHY-692	Materials Science	3+0
52	PHY-657	Applied Nuclear Physics	3+0
53	PHY-637	Magnetic Materials	3+0
54	PHY-623	Methods and Techniques of Experimental Physics	3+0
55	PHY-695	Spintronics	3+0
56	PHY-671	Theory of Nanomaterials	3+0
57	PHY-672	Thin Films Technology	3+0
58	PHY-670	Applications of Nanostructures	3+0
59	PHY-697	Crystallography and Structural Analysis	3+0
60	PHY-624	Radiation Physics	3+0
61	PHY-625	Radiation Protection and Health Physics	3+0

62	PHY-626	Radiation Detection and Measurements	3+0
63	PHY-627	Method and Applications of Nuclear Tracks	3+0
64	PHY-611	Advanced Environmental Physics	3+0

Contact Information:

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