

**University School of Vocational Studies and Applied Sciences
(USoVSAS)
Department of Applied Physics**

**M.Sc. Physics
(Specialization in Quantum Technology)**

COURSE STRUCTURE



MSc in Physics (Specialization in Quantum Technology)

Program Objectives:

Core Proficiency: To provide a comprehensive understanding of fundamental and advanced physics concepts.

Analytical Skills: To develop strong analytical and problem-solving abilities applicable to diverse physical phenomena.

Research Readiness: To prepare students for research careers through exposure to advanced topics and practical laboratory experience.

Specialized Knowledge: To offer specialized knowledge in areas like quantum computation and applied photonics through elective courses.

Program Outcome:

Foundational Mastery: Graduates will demonstrate a deep understanding of classical and quantum mechanics, electrodynamics, statistical physics, and related mathematical tools.

Experimental Competence: Graduates will be proficient in conducting physics experiments and analyzing data through laboratory courses and projects.

Advanced Application: Graduates will be able to apply advanced physics concepts to specialized areas such as quantum optics, quantum computation, and photonics.

Research and Problem-Solving: Graduates will possess the skills necessary to conduct independent research and solve complex problems in physics and related fields.

M.Sc. Physics (specialization in Quantum Technology) : Course Structure & Syllabus (w.e.f., Session 2025-26)					
S. No	CODE	COURSE NAME	Category	L-T-P	CREDITS
	SEMESTER-I				
1	PHM401	Classical Mechanics and Relativity	C	4-0-0	4
2	PHM403	Electrodynamics	C	4-0-0	4
3	PHM405	Quantum Mechanics-I	C	3-0-0	3
4	PHM407	Mathematical Physics	C	5-0-0	5
5	PHM409	Statistical Physics	C	4-0-0	4
6	PHM411	Physics Laboratory-I	C	0-0-8	4
		TOTAL		20-0-8	24
		Total Contact Hours		28	
	SEMESTER-II				
1	PHM402	Quantum Mechanics-II	C	3-0-0	3
2	PHM404	Solid State Physics	C	4-0-0	4
3	PHM406	Electronics	C	4-0-0	4
4	PHM408	Nuclear and Particle Physics	C	4-0-0	4
5	PHM410/ PHUD412	Optical metrology/ Fundamentals of Electrooptics & Photonics	SEC	3-0-0	3
6	PHM414	Physics Laboratory-II		0-0-4	4
7	PHM416	Computer Programming Laboratory		0-0-4	0
		TOTAL		21-0-8	22
		Total Contact Hours		26	
	SEMESTER-III				
1	PHM501	Atomic and Molecular Physics	C	4-0-0	4
2	PHQ503	Quantum Optics and Quantum Communication	C	4-0-0	4
3	PHQ505	Quantum Metrology and Quantum Sensing	C	4-0-0	4
4	PHQ410	Quantum Computation	C	3-0-0	3
5		General Elective	GE*	3-0-0	3
6	PHQ507	Quantum Simulation Lab/Minor project	C	0-0-8	4
		TOTAL		18-0-8	22
		Total Contact Hours		26	
	SEMESTER-IV				
1	PHM502	Major Project	Project	0-0-32	16
2		DSE-I	DSE	3-0-0	3
3		DSE-II	DSE	3-0-0	3
		TOTAL		6-0-32	22
		Total Contact Hours		38	
	Total credits for all semesters				90
	* GENERIC ELECTIVE (GE): Course taken from other Departments				
S.No.	CODE	COURSE NAME	CREDITS		
DISCIPLINE SPECIFIC ELECTIVES (DSE-I)					
1	PHM504	Computational Physics	3		
2	PHP506	Laser Physics	3		
DISCIPLINE SPECIFIC ELECTIVES (DSE-II)					
1	PHM510	Quantum Field Theory	3		
2	PHP514	Nonlinear Optics	3		
3	PHM512	Advanced Instrumental Method for analysis	3		
4	PHP516	Photonic Materials and Devices	3		
			3		
New course structure will be effective from admissions in 2025-2026. School/Department will not be bound to run all the courses. Minimum number of students may be fixed to run any elective course. New elective courses may be added as per requirement.					