SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

PROGRAMME STRUCTURE
Master of Science in Physics
MSc (Physics) Semester: II

Programme Outcome (PO) - For MSc Physics Programme	Master of Science program provides extended theoretical and practical knowledge of different science subjects. Master of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either seek a job or to become an entrepreneur. The students, after completion of Bachelor of Science can select the master's programme in the subject they have had at the final year or in a related discipline (depending upon eligibility criteria prescribed by university). **Programme outcomes: At the end of the program, the students will be able to** 1. Have a deep understanding of both the theoretical and practical concepts in the respective subject. 2. Understand laboratory processes and use scientific equipments and work independently. 3. Develop research temperament as a consequence of their theory and practical learning. 4. Communicate scientific information in oral and written form. 5. Understand the issues related to nature and environmental contexts and think rationally for sustainable development.] 6. The students are able to handle unexpected situations by critically analyzing the problem.
Programme Specific Outcome (PSO) - For MSc Physics Semester – II	M.Sc. Physics (Four- Semester course) is one of the Post Graduate Degree programme offered by Sardar Patel University under the Science Faculty. The student graduating with the M.Sc. Degree in Physics with the following Programme Objectives shall acquire the following Outcomes listed here. The primary objective of designing the courses for MSc Physics is to impart high quality training to the students towards understanding fundamentals of Physics and its applications in various fields leading to Research and Technology. It is a Comprehensive Course containing a total of Ten Core Theory Courses and Six Elective Courses of Four Credits each. There are other eight courses of Laboratory Training with Eight Credits at each semester. Candidates who are enrolled in the MSc Physics programme of this University are provided basic training on various fundamental and advanced courses at post graduate level in accordance with the UGC prescribed model syllabi. During the last two semesters, students are offered (currently) to choose Specialization in Condensed Matter Physics and Electronics and Communications. There are two more branches of specialization *visa-versa* Computational Physics and

Energy Science that the students can opt. These special papers are designed to impart the advanced knowledge in the respective field of specializations. Practical courses are also planned accordingly.

Specific problem-solving skills that would be developed as part of the MSc programme are essential to solve and understand different physical phenomena that occur in nature, and to tackle open-ended problems that cut across multidisciplinary boundaries of human endeavor.

The investigative and communication skills involving the ability to listen carefully, to read and understand research papers, to present complex information in a concise manner to different groups/audiences of technical or popular nature; analytical skills involving paying attention to find answers to the fundamental questions like, WHAT, HOW and WHY, to construct logical arguments using correct technical language related to the fundamental laws of Physics and ability to translate them towards an objective of developing the mathematical and ICT skills; and the ability to think independently and work in a group are the special objectives.

Thus, successful completion of the MSc Physics programme will enable the students to opt a good career in Physics as a better Researcher in Physics and can work as a teacher for all levels of School Education to Higher Education and also enable them to choose a better career in industry.

The basic training imparted to develop scientific temper; good analytical thinking and logical reasoning along with numerical and mathematical abilities enable them to pursue and excel any challenging field not only in science but also in fields related to marketing, management and administration.

After the successful completion of the MSc courses in Physics, the students will acquire

1. An in-depth Understanding of the fundamental concepts and principles of Physics that enable them to apply in R & D Projects.
2. Analytical and logical skills towards higher learning.
3. Practical knowledge in Experimental designs and methods of data collection.
4. Ability to analyze and interpret both the experimental and theoretical data.
5. Confidence to take up scientific challenges.
6. Capability for reflecting on central, ethical and scientific problems related to own work.
7. A scientific curiosity and respect for scientific values
8. A necessary foundational training to do research.
9. The ability to think independently and work in groups.

To Pass	At least 40% Marks in the University Examination in each paper and 40% Marks in the aggregate of University and Internal examination in each course of Theory , Practical & 40% Marks in Viva-voce.

Course Type	Course Code	Name Of Course	Theory/ Practical	Credit	Exam Duration in hrs	Component of Marks		
						Internal Total	External Total	Total
Core Course	PS02CPHY51	Quantum mechanics & Atomic and Molecular Physics	T	4	3	30	70	100
	PS02CPHY52	Solid State Physics-II	T	4	3	30	70	100
	PS02CPHY53	Electrodynamics	T	4	3	30	70	100
	PS02CPHY54	Practicals-I	P	4	3	30	70	100
	PS02CPHY55	Practicals-II	P	4	3	30	70	100
	PS02CPHY56	Comprehensive Viva-Theory	T	1	-	-	50	50
Elective Course	PS02EPHY51	Experimental methods in Solid State Physics	T	4	3	30	70	100
	PS02EPHY52	Solid State Electronics Devices & Solar Cells	T	4	3	30	70	100