

**Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat**  
**Department of Physics**  
**Five Years Integrated M.Sc. Physics**  
**CURRICULUM SCHEME**

(Ref. 63rd Senate of SVNIT dtd. 24.01.2025)

Sr. No.	Subject	Code	Scheme L-T-P	Credits (Min.)	Notional hours of Learning (Approx.)
<b>First Semester (1<sup>st</sup> year of MSc)</b>					
1	Waves and Mechanics	PH101	3-1-0	4	70
2	Basic Electronics	PH103	3-0-2	4	85
3	Thermodynamics and Statistical Physics	PH105	3-1-0	4	70
4	Numerical Methods and Computer Programming	PH107	3-0-2	4	85
5	Mathematics for Physical Sciences-I	MA123	3-1-0	4	70
6	Indian Value System and Social Consciousness	HS120	2-0-0	2	35
			<b>Total</b>	<b>22</b>	<b>415</b>
7	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	PHV01 / PHP01	0-0-10	5	200 (20 x 10)
<b>Second Semester (1<sup>st</sup> year of MSc)</b>					
1	Electromagnetic Theory-I	PH102	3-1-0	4	70
2	Semiconductor physics	PH104	3-0-2	4	85
3	Mathematics for Physical Sciences-II	MA118	3-1-0	4	70
4	Fundamentals of Electrical Engineering	EE110	3-0-2	4	85
5	English and Professional Communication	HS110	3-1-0	4	70
			<b>Total</b>	<b>20</b>	<b>380</b>
6	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	PHV02 / PHP02	0-0-10	5	200 (20 x 10)
<b>Third Semester (2<sup>nd</sup> year of MSc)</b>					
1	Solid State Physics	PH201	3-0-2	4	85
2	Classical Mechanics	PH203	3-1-0	4	70
3	Optics	PH205	3-0-2	4	85
4	State and Properties of Matter	CY205	3-1-2	5	100
5	Discrete Mathematical Structure	MA205	3-1-0	4	70
			<b>Total</b>	<b>21</b>	<b>410</b>
6	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	PHV03 / PHP03	0-0-10	5	200 (20 x 10)
<b>Fourth Semester (2<sup>nd</sup> year of MSc)</b>					
1	Mathematical Methods in Physics	PH202	3-1-0	4	70
2	Quantum Mechanics-I	PH204	3-1-0	4	70
3	Electromagnetic Theory-II	PH206	3-0-2	4	85
4	Laser and photonics	PH208	3-1-0	4	70
5	Data Structure	CS102	3-1-2	5	100
			<b>Total</b>	<b>21</b>	<b>395</b>
6	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	PHV04 / PHP04	0-0-10	5	200 (20 x 10)
<b>Fifth Semester (3<sup>rd</sup> year of MSc)</b>					
1	Quantum Mechanics-II	PH301	3-1-0	4	70

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Curriculum SVNIT Surat (58<sup>th</sup> Senate, 31 May 2023; Minor modification: 61<sup>st</sup> Senate, 30 April 2024)

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2	Atomic and Molecular Physics	PH303	3-1-0	4	70
3	Nuclear Physics	PH305	3-0-2	4	85
4	Elective #1	PH3AA	3-X-X	3/4	55/70/85
5	Institute Elective #1	PH3BB	3-X-X	3/4	55/70/85
			<b>Total</b>	<b>18-20</b>	<b>335-395</b>
6	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	PHV05 / PHP05	0-0-10	5	200 (20 x 10)
<b>Sixth Semester (3<sup>rd</sup> year of MSc)</b>					
1	Plasma Physics	PH302	3-1-0	4	70
2	Elective #2	PH3CC	3-X-X	3/4	55/70/85
3	Institute Elective #2	PH3DD	3-X-X	3/4	55/70/85
4	Artificial Intelligence	CS232	3-0-2	4	85
5	Interpretative Molecular Spectroscopy	CY302	3-1-0	4	70
			<b>Total</b>	<b>20</b>	<b>335-395</b>
6	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	PHV06 / PHP06	0-0-10	5	200 (20 x 10)
<b>Seventh Semester (4<sup>th</sup> year of MSc)</b>					
1	Statistical Mechanics	PH401	3-1-0	4	70
2	Digital Electronics	PH403	3-0-2	4	85
3	Condensed Matter Physics	PH405	3-1-0	4	70
4	Elective #3	PH4AA	3-X-X	3/4	55/70/85
5	Elective #4	PH4BB	3-X-X	3/4	55/70/85
6	Elective #5 (MOOC)	PH4CC	X-0-0	3/4	55/70
			<b>Total</b>	<b>23/24</b>	<b>390-465</b>
7	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	PHV07 / PHP07	0-0-10	5	200 (20 x 10)
<b>Eighth Semester (4<sup>th</sup> year of MSc)</b>					
1	Computational Physics	PH402	3-0-2	4	85
2	Particle Physics	PH404	3-1-0	4	70
3	Elective #6	PH4DD	3-X-X	4	70/85
4	Elective #7	PH4EE	3-X-X	3/4	55/70/85
5	Elective #8	PH4FF	3-X-X	3/4	55/70/85
6	Elective #9 (MOOC)	PH4GG	X-0-0	3/4	55/70
			<b>Total</b>	<b>21-24</b>	<b>390-480</b>
<b>Ninth Semester (5<sup>th</sup> year of MSc)</b>					
1	Dissertation Final - I	PH501	0-0-40	20	800 (20 X 40)
			<b>Total</b>	<b>20</b>	<b>800</b>
<b>Tenth Semester (5<sup>th</sup> year of MSc)</b>					
1	Dissertation Final – II	PH502	0-0-40	20	800 (20 X 40)
			<b>Total</b>	<b>20</b>	<b>800</b>

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Sr. No.	Elective	Code	SchemeL-T-P
	<b>Elective #1 (5<sup>th</sup> semester)</b>		
1	Remote sensing	PH351	3-1-0
2	Nanoscience and Nanotechnology	PH353	3-1-0
	<b>Institute Elective #1 (5<sup>th</sup> semester)</b>		
3	Basic of Astronomy and Astrophysics	PH355	3-1-0
4	Basic Course on Relativity	PH357	3-1-0
	<b>Elective #2 (6<sup>th</sup> semester)</b>		
5	Many Body Physics and Relativistic Quantum Mechanics	PH352	3-1-0
6	Electronics and optical communications	PH354	3-1-0
	<b>Institute Elective #2 (6<sup>th</sup> semester)</b>		
7	Solar Cell Technology	PH356	3-1-0
8	Materials Science	PH358	3-1-0
	<b>Elective #3 (7<sup>th</sup> semester)</b>		
9	Astrophysics and space science	PH451	3-1-0
10	Microprocessor and Microcontrollers	PH453	3-0-2
11	Characterization Techniques	PH455	3-0-2
	<b>Elective #4 (7<sup>th</sup> semester)</b>		
12	Density Functional Theory	PH457	3-0-2
13	Elementary Excitations in Solids	PH459	3-1-0
14	Green's Function and Partial Differential Equations	PH461	3-1-0
	<b>Elective #5 (7<sup>th</sup> semester)</b>		
15	NPTEL, SWAYAM or any other Massive Open Online Course (MOOC)	PH463	3-0-0/4-0-0
	<b>Elective #6 (8<sup>th</sup> semester)</b>		
16	Simulations and Modelling	PH452	3-0-2
17	Advanced Crystallography	PH454	3-1-0
18	Electromagnetic Communication	PH456	3-1-0
	<b>Elective #7 (8<sup>th</sup> semester)</b>		
19	Global Navigation Satellite System	PH458	3-1-0
20	Quantum Field Theory	PH460	3-1-0
21	Thin Films and Vacuum Technology	PH462	3-1-0
	<b>Elective #8 (8<sup>th</sup> semester)</b>		
22	Nuclear Science and Technology	PH464	3-0-2
23	Non-Destructive Testing	PH466	3-1-0
24	Microwave Plasma Technology	PH468	3-0-2
	<b>Elective #9 (8<sup>th</sup> semester)</b>		
25	NPTEL, SWAYAM or any other Massive Open Online Course (MOOC)	PH470	3-0-0/4-0-0

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