

Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat

Department of Physics

B.Tech. (Engineering Physics)

CURRICULUM SCHEME

(Ref. 64th Senate of SVNIT dtd. 24.04.2025)

Sr. No.	Subject	Code	Scheme L-T-P	Credits (Min.)	Notional hours of Learning (Approx.)
First Semester (1st year of UG)					
1	Waves and Mechanics	EP101	3-1-0	4	70
2	Basics of Electronics	EP103	3-0-2	4	85
3	Thermodynamics	EP105	3-1-0	4	70
4	Numerical Methods and Computer Programming	EP107	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	40
			Total	22	420
7	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	EPV01 / EPP01	0-0-10	5	200 (20 x 10)
Second Semester (1st year of UG)					
1	Basics of Electromagnetics	EP102	3-1-0	4	70
2	Introduction to Python Programming	EP104	3-0-2	4	85
3	Quantum Physics and Applications	EP106	3-1-0	4	70
4	Mathematics for Physical Sciences-II	MA118	3-1-0	4	70
5	English and Professional Communication	HS110	3-1-0	4	70
			Total	20	365
6	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	EPV02 / EPP02	0-0-10	5	200 (20 x 10)
Third Semester (2nd year of UG)					
1	Solid State Physics	EP201	3-0-2	4	85
2	Classical Mechanics	EP203	3-1-0	4	70
3	Statistical Mechanics	EP231	3-1-0	4	70
4	Elective #1	EP2AA	3-1-0	4	70
5	Professional Ethics, Economics and Business Management	MG210	3-1-0	4	70
			Total	20	365
6	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	EPV03 / EPP03	0-0-10	5	200 (20 x 10)
Fourth Semester (2nd year of UG)					
1	Introduction to Mathematical Physics	EP202	3-1-0	4	70
2	Semiconductor Physics	EP204	3-0-2	4	85
3	Electrodynamics and its Applications	EP232	3-1-0	4	70
4	Elective #2	EP2BB	3-X-X	4/5	70/100
5	Artificial Intelligence	CS232	3-0-2	4	85
			Total	20	380/410
6	Minor / Honor (M/H#1)	EP2CC	3-1-0	4	70
7	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	EPV04 / EPP04	0-0-10	5	200 (20 x 10)

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	Fifth Semester (3rd year of UG)				
1	Atomic and Molecular Physics	EP301	3-1-0	4	70
2	Digital Electronics	EP303	3-0-2	4	85
3	Introduction to Nuclear and Particle Physics	EP331	3-0-2	4	85
4	Elective #3	EP3AA	3-X-X	4	70/85
5	Institute Elective #1	EP3BB / CYXXX	3-X-X	3/4	55/70
			Total	19/20	365/395
6	Elective #4 (MOOC)	EP3CC	X-0-0	3/4	55/70
7	Minor / Honor (M/H#2)	EP3CC	3-1-0	4	70
8	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	EPV05 / EPP05	0-0-10	5	200 (20 x 10)
	Sixth Semester (3rd year of UG)				
1	Optics, Laser and Photonics	EP302	3-0-2	4	85
2	Introduction to Quantum Computation	EP304	3-1-0	4	70
3	Plasma Science and Applications	EP332	3-1-0	4	70
4	Elective #5	EP3CC	3-X-X	4	70/85
5	Institute Elective #2	EP3DD	3-X-X	3/4	55/70
6	Machine Learning	EC328	3-0-2	4	85
			Total	24	435/465
7	Minor / Honor (M/H#3)	EP3EE	3-1-0	4	70
8	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	EPV06 / EPP06	0-0-10	5	200 (20 x 10)
	Seventh Semester (4th year of UG)				
1	Microprocessor and Microcontrollers	EP401	3-0-2	4	85
2	Elective #6	EP4AA	3-1-0	4	70
3	Elective #7	EP4BB	3-X-X	4	70/85
4	Elective #8	EP4CC	3-1-0	4	70
5	Elective #9	EP4DD	3-1-0	4	70
			Total	20	365/380
6	Minor / Honor (M/H#4)	EP4EE	3-1-0	4	70
7	Minor / Honor (M/H#5) Mini Project	EP4FF	0-0-4	2	70
8	Vocational Training / Professional Experience (Optional) (Mandatory for Exit)	EPV07 / EPP07	0-0-10	5	200 (20 x 10)
	Eighth Semester (4th year of UG)				
1	Industrial Internship / Professional Experience (Mandatory)	EP402	0-0-40	20	800 (20 x 40)
			Total	20	800

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No.	Electives	Code	Scheme (L-T-P)
	Elective #1 (3rd semester)		
1	Advanced Quantum Mechanics	EP251	3-1-0
2	Discrete Mathematical Structure	MA205	3-1-0
3	Energy and Environmental Engineering	EG110	3-0-2
	Elective #2 (4th semester)		
1	Data Structure	CS102	3-1-2
2	Interpretative Molecular Spectroscopy	CY302	3-1-0
3	Introduction to Quantum Field Theory	EP252	3-1-0
	Elective #3 (5th semester)		
1	Remote sensing	EP351	3-1-0
2	Density Functional Theory and Applications	EP353	3-0-2
3	Low-Dimensional Physics and Applications	EP355	3-1-0
	Institute Elective #1 (5th semester)		
1	Basics of Astronomy and Astrophysics	PH355	3-1-0
2	Basic Course on Relativity	PH357	3-1-0
3	Sensors and Transducers	EC361	3-0-0
	Elective #4 (5th semester)		
1	NPTEL, SWAYAM or any other Massive Open Online Course (MOOC)	EP357	3-0-0/4-0-0
	Elective #5 (6th semester)		
1	Microwave Plasma Technology	EP352	3-0-2
2	Non-Destructive Testing	EP354	3-1-0
3	Thin Films and Vacuum Technology	EP356	3-1-0
4	Particle Physics and Applications	EP358	3-1-0
5	Nuclear Science and Technology	EP360	3-0-2
	Institute Elective #2 (6th semester)		
1	Solar Cell Technology	PH356	3-1-0
2	Computer Vision	EC362	3-0-0
3	MEMS	EC364	3-0-0
4	Semiconductor Packaging	VL364	3-0-0
	Elective #6 (7th semester)		
1	Astrophysics and Space Science	EP451	3-1-0
2	Advanced Quantum Computation	EP453	3-1-0
3	Electromagnetic Communication	EP455	3-1-0
	Elective #7 (7th semester)		
1	Characterization Techniques	EP457	3-0-2
2	Materials Science and Engineering	EP459	3-1-0
	Elective #8 (7th semester)		
1	Advanced Condensed Matter Physics	EP461	3-1-0
2	General Theory of Relativity	EP463	3-1-0
3	Research Methodology	EP465	3-1-0
	Elective #9 (7th semester)		
1	Nanoscience and Nanotechnology	EP467	3-1-0
2	Laser Technology and Applications	EP469	3-1-0

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Minor Degree in Engineering Physics
(Total Credit: 18)

Sr. No.	B. Tech. (AI, CE, ChE, CSE, ECE, EE, ME) (Minor in Engineering Physics)	Code	Scheme L-T-P	Credits
1.	Quantum Physics and Applications	EP106	3-1-0	4
2.	Solid State Physics	EP201	3-0-2	4
3.	Statistical Mechanics	EP231	3-1-0	4
4.	Electrodynamics and its Applications	EP232	3-1-0	4
5.	Mini Project	EP473	0-0-4	2

Optional Core Subjects

Sr. No.	Optional Core	Code	Scheme L-T-P
1.	Statistical Mechanics	EP231	3-1-0
2.	Electrodynamics and its Applications	EP232	3-1-0
3.	Introduction to Nuclear and Particle Physics	EP331	3-0-2
4.	Plasma Science and Applications	EP332	3-1-0

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