

CURRICULUM & SYLLABUS



Bachelor of Science (Hons.) Physics

or

**Bachelor of Science (Hons.) Physics with Research/
Academic Projects**

(A 4 Year Undergraduate Degree Program)

Under UGC Framework - 2022 based on NEP – 2020

(w.e.f. Academic Year 2023-24)

**DEPARTMENT OF PHYSICS
FACULTY OF SCIENCE AND HUMANITIES
SRM UNIVERSITY DELHI-NCR, SONEPAT
Plot No.39, Rajiv Gandhi Education City, P.S. Rai,
Sonapat Haryana-131029**

SRM UNIVERSITY DELHI-NCR, SONEPAT (HARYANA)

VISION

SRM University Haryana aims to emerge as a leading World Class Institution that creates and disseminates knowledge upholding the highest standards of instruction in Engineering & Technology, Science & Humanities, Commerce, Management, Hotel Management & Medicine & Health Science. Along with academic excellence, our curriculum imparts integrity and social sensitivity so that our graduates may best serve the Nation and the World.

MISSION

- To create a diverse community campus that inspires freedom and innovation.
- Strengthen Excellence in educational & skill development processes.
- Continue to build productive international alliances.
- Explore optimal development opportunities available to students and faculty.
- Cultivate an exciting and rigorous research environment.

DEPARTMENT OF PHYSICS

VISION

The Department of Physics at SRM University Delhi-NCR is a young and dynamic Department. However, it is growing rapidly in every aspect. At present, we are offering a four-year B.Sc. (Hons), four-year B.Sc. (Hons) with Research/Academic Project and a two-year M.Sc. in physics. We also offer a Ph.D. program in Physics. Further, we also offer a one semester Engineering Physics course to the first year B.Tech. students of this university. Our department strives to become a centre of excellence for higher studies in Physics focused on advanced learning, innovation and knowledge transfer from lab to industry. Our vision is to establish a research-based ecosystem that will put equal stress upon the fundamental branches of physics as well as applied areas, particularly, on topics which have interfaces with other branches of physics. The faculty members as well as the research scholars at the Department are actively engaged in cutting-edge research in different areas of Physics. Our Department envisions to build an academic ambience where 'knowledge is free' of all bounds, innovative and creative ideas are encouraged, and talents are nurtured to realize their full potential.

MISSION

- We aim to offer a balanced blending of comprehensive training in the core areas of physics along with the cutting-edge recent topics of physics.
- We tried to keep a balance between the theoretical courses and experimental courses with an emphasis on problem-solving. This will help the students to develop fundamental concepts, verify them in the lab and thereby discourage the rote-learning.
- Our motto is to prepare a student with the fundamental concepts of physics as well as the skills required to apply them so that they can go on to become a professional physicist in future.
- Overall, we intend to equip a student with the right aptitude and skills so that they can go on to become a professional Physicist in future.
- Additionally, we also intends to inculcate skills like logical thinking, quantitative argumentation, and capability of analyzing a large amount of information (or data) in the students so that even those, who are not going to build a career as a professional physicist, will benefit both professionally and also as a human being.

SCIENCE GRADUATE EMPLOYMENT ATTRIBUTES

- **Able to Apply their Knowledge and Skills in the Disciplinary Area**
- **Analytical & critical thinking and problem solving skills.**
- **Scientific Temperament Towards Research & Innovation for the Betterment of Society**
- **Efficient Communication & Presentation Skills**
- **Dependability, reliability, responsibility, and independent leadership abilities**

B. Sc. PHYSICS PROGRAM EDUCATIONAL OBJECTIVES

With the main focus of its research and teaching mission, the Physics Department works to provide its students with:

- I. A comprehensive, high-quality education in the physical sciences
- II. A flexible choice based curriculum with multiple Inter-disciplinary courses / Minor Stream Courses / Skill Enhancement Courses that allows students to tailor their education according to their specific interests.
- III. A scientific temperament towards the new discovery through direct participation in faculty research.
- IV. An increased awareness of the physical processes in the surrounding world.
- V. The prerequisite knowledge, analytical, mathematical, computational tools with which they learn problem solving ability which helps them to pursue research in a variety of physics-related and other fields.
- VI. To inculcate the habit of working together as a team and also develop the leadership abilities in them by introducing them to the various teaching learning techniques and coordination programmes.

B. Sc. PHYSICS PROGRAM LEARNING OUTCOMES

Graduates from the B. Sc. Physics undergraduate degree program will be able to

- I. Demonstrate a conceptual understanding in the core areas of physics and the supporting mathematics including the range of validity of key concepts.
- II. Translate physical descriptions into mathematical equations, and conversely, explain the physical meaning of mathematical results.
- III. Use computational techniques such as coding at a level necessary to perform statistical analysis and simulations in solving complex problems.
- IV. Use basic laboratory equipment effectively in order to conduct measurements and analyze the results including the understanding of error limits.
- V. Communicate the scientific results efficiently, making use of clear and well organized writing and presentation skills, and employ equations and visualization tools as needed.

MAPPING BETWEEN THE PROGRAM EDUCATIONAL OBJECTIVES AND PROGRAM LEARNING OUTCOMES

Programme Educational Objectives (PEO's)	Program Learning Outcomes (PLO's)				
	PLO1	PLO2	PLO3	PLO4	PLO5
PEO1					
PEO2					
PEO3					
PEO4					
PEO5					
PEO6					

**Four Year B.Sc. Physics Programme Structure in alignment with NEP-
2020 in the Department of Physics, SRMUH
w.e.f. Academic Year 2023-24**

S. No.	Broad Category of Courses	No. of Courses	Credits	%
1	Major Course (Discipline Specific Course DSC)	24	$24 \times 4 = 96$	53.04
2	Interdisciplinary Course (IDC) / Minor Stream Course (MSC)	7	$7 \times 4 = 28$	15.47
3	Multi-Disciplinary Course (MDC)	3	$3 \times 3 = 9$	4.97
4	Ability Enhancement course (AEC)	4	$2 \times 4 = 8$	4.42
5	Skill Enhancement Course (SEC)	10	$10 \times 1 = 10$	5.52
6	Value Added Course (VAC)	3	$3 \times 2 = 6$	3.31
7	Project / Dissertation	4* / 3#	$1 \times 4 + 2 \times 2 + 1 \times 4 = 12^*$ $1 \times 2 + 1 \times 4 + 1 \times 6 = 12^\#$	6.63
8	Live Projects/Vocational Courses/Summer Internship	3	$3 \times 4 = 12$	6.63
Total		58* / 57#	181	100

* B.Sc. (H) Physics # B.Sc. (H) Physics with Research / Academic Project

**Four Year B.Sc. Physics Programme Structure component-wise
distribution in alignment with NEP-2020 in the Department of Physics,
SRMUH w.e.f. Academic Year 2023-24.**

S. No.	Broad Category of Courses	No. of Courses	Component	Course division	Credits	Total Credit	%
1	Major Course	24	Theory	24	$13 \times 4= 52$ $11 \times 3= 33$	96	53.04%
			Practical	11	$11 \times 1= 11$		
2	Interdisciplinary Course (IDC) / Minor Stream Course (MSC)	7	Theory	7	$7 \times 4= 28$	28	15.47%
3	Multi-Disciplinar Course (MDC)	3	Theory	3	$3 \times 3= 9$	9	4.97%
4	Ability Enhancement course (AEC)	4	Theory	4	$2 \times 4= 8$	8	4.42%
5	Skill Enhancement Course (SEC)	10	Soft SEC Practical	5	$5 \times 1 = 5$	10	5.52%
			Techi. SEC Practical	5	$5 \times 1 = 5$		
6	Value Added Course (VAC)	3	Theory	2	$2 \times 2 = 4$	6	3.31%
			Practical	1	$2 \times 1 = 2$		
7	Project / Dissertation	4*	MSC*	3*	$1 \times 4 = 4^*$ $2 \times 2 = 4^*$	12	6.63%
			Project*	1*	$1 \times 4 = 4^*$		
		3#	Theory#	1	$2 \times 1 = 2$		
			Dissertation#	2	$1 \times 4 = 4$ $1 \times 6= 6$		
8	Live Projects/Vocational Courses/Summer Internship	3	Practical	3	$3 \times 4 = 12$	12	6.63%
	Total	58* / 57#	Theory	134 = 74%		181	100%
			Practical	23 = 12.7%			
			Project	24 = 13.3 %			

* Students pursuing Honours will do 1 MSC course of 4 Credits, 2 MSC courses of 2 Credits and 1 Minor Project of 4 Credits in lieu of a Research Project/Dissertation.

Students pursuing Honours with Research would complete 2 Credits of Research Methodology, 4 credits of Minor dissertation and 6 credits of Major Dissertation.

**Four Year B.Sc. Physics Programme Credit Structure Semester-wise in
alignment with NEP-2020 in the Department of Physics, SRMUH
w.e.f. Academic Year 2023-24**

Semester	Broad Category of Courses								Total Credits	Remarks
	Major	IDC/ MSC	MDC	AEC	SEC	VAC	RP/ Dissertation	Live Projects/ Vocational Courses/Summer Internship		
I	8	4	3	2	2	2	-	-	21	Certificate: 46 Credits
II	8	4	3	2	2	2	-	4	25	
III	12	4	3	2	2	-	-	-	23	Diploma: 95 Credits
IV	12	4	-	2	2	2	-	4	26	
V	16	4	-	-	2	-	-	-	22	Degree : 145 Credits
VI	16	8	-	-	-	-	-	4	28	
VII	12	6*	-	-	-	-	6#	-	18	Honours / Honours with Research: 181 Credits
VIII	12	6*	-	-	-	-	6#	-	18	
3 Years	72	28	9	8	10	6	0	12	145	
%	49.67	19.31	6.20	5.52	6.9	4.14	0.00	8.28	100.00	
4 Years	96	28	9	8	10	6	12	12	181	
%	53.04	15.47	4.97	4.42	5.52	3.31	6.63	6.63	100.00	
* Students pursuing Honours will do 1 MSC courses for 4 Credits, 2 MSC courses of 2 Credits and 1 Minor Project of 4 Credits in lieu of a Research Project/Dissertation. # Students pursuing Honours with Research would complete 2 Credits of Research Methodology, 4 credits of Minor dissertation and 6 credits of Major Research/Dissertation.										

B. Sc. PHYSICS - SEMESTER-I

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS101	Mathematical Physics I	3	1	0	4	Major
2	23PHBS102/ 23PHBS152	Mechanics & General Properties Of Matter	3	0	2	4	Major
3		IDC-1 / MSC-1	3	1	0	4	IDC/MSC
4		MDC 1	3	0	0	3	MDC
5		Functional English-1	2	0	0	2	AEC
6		Effective Communication Skills	0	0	2	1	SEC (Soft)
7		Digital Literacy & IT Skills	0	0	2	1	SEC (Tech)
8		Indian Constitution & Polity	2	0	0	2	VAC
TOTAL			16	2	6	21	

L – Lectures, T- Tutorial, P- Practical, C- credits

B. Sc. PHYSICS - SEMESTER-II

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS201	Mathematical Physics II	3	1	0	4	Major
2	23PHBS202/ 23PHBS252	Waves and Optics	3	0	2	4	Major
3		IDC 2 / MSC2	3	1	0	4	IDC/MSC
4		MDC 2	3	0	0	3	MDC
5		Functional English-2	2	0	0	2	AEC
6		Teamwork & Interpersonal Skills	0	0	2	1	SEC (Soft)
7		Advanced Excel Skills	0	0	2	1	SEC (Tech)
8		Environmental Protection & Sustainable development	2	0	0	2	VAC
9	23PHBS271	Live Projects/Vocational Courses/Summer Internship				4	SIP
TOTAL			16	2	6	25	

L – Lectures, T- Tutorial, P- Practical, C- credits

On Exit, students shall be awarded UG Certificate (Physics) on securing the requisite 46 Credits on completion of II-Semester.

B. Sc. PHYSICS -SEMESTER-III

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS301/ 23PHBS351	Mathematical Physics III	3	0	2	4	Major
2	23PHBS302/ 23PHBS352	Electricity & Magnetism	3	0	2	4	Major
3	23PHBS303/ 23PHBS353	Thermal Physics	3	0	2	4	Major
4		IDC 3 / MSC 3	3	1	0	4	IDC/MS
5		MDC 3	3	0	0	3	MDC
6		Hindi / German / French	2	0	0	2	AEC
7		Presentation Skills	0	0	2	1	SEC (Soft)
8		Statistical Analysis with SPSS	0	0	2	1	SEC (Tech)
TOTAL			17	1	10	23	

L – Lectures, T- Tutorial, P- Practical, C- credits

B. Sc. (H) PHYSICS -SEMESTER-IV

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS401/ 23PHBS451	Mathematical Physics IV	3	0	2	4	Major
2	23PHBS402/ 23PHBS452	Electronics I	3	0	2	4	Major
3	23PHBS403/ 23PHBS453	Modern Physics	3	0	2	4	Major
4		IDC 4 / MSC4	3	1	0	4	IDC/MSC
5		Hindi / German / French	2	0	0	2	AEC
6		Professional Skills	0	0	2	1	SEC (Soft)
7		R language programming	0	0	2	1	SEC (Tech)
8		Sports, Yoga & Fitness	0	0	4	2	VAC
9	23PHBS471	Live Projects/Vocational Courses/Summer Internship				4	SIP
TOTAL			14	1	14	26	

L – Lectures, T- Tutorial, P- Practical, C- credits

On Exit, students shall be awarded UG Diploma (Physics) on securing the requisite 95 Credits on completion of IV-Semester.

B. Sc. (H) PHYSICS - SEMESTER-V

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS501	Classical Mechanics	3	1	0	4	Major
2	23PHBS502/ 23PHBS552	E.M. Theory	3	0	2	4	Major
3	23PHBS503	Quantum Mechanics I	3	1	0	4	Major
4	23PHBS504/ 23PHBS554	Electronics II	3	0	2	4	Major
5		MSC 5	3	1	0	4	MSC
6		Aptitude & Reasoning	0	0	2	1	SEC (Soft)
7		Programming with MATLAB	0	0	2	1	SEC (Tech)
TOTAL			15	3	8	22	

L – Lectures, T- Tutorial, P- Practical, C- credits

B. Sc. (H) PHYSICS - SEMESTER-VI

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS601/ 23PHBS651	Condensed Matter Physics I	3	0	2	4	Major
2	23PHBS602	Electrodynamics	3	1	0	4	Major
3	23PHBS603	Quantum Mechanics II	3	1	0	4	Major
4	23PHBS604	Laser and Non-linear Optics	3	1	0	4	Major
5		MSC 6	3	1	0	4	MSC
6		MSC 7	3	1	0	4	MSC
7	23PHBS671	Live Projects/Vocational Courses/Summer Internship				4	SIP
TOTAL			18	5	2	28	

L – Lectures, T- Tutorial, P- Practical, C- credits

On Exit, students shall be awarded B.Sc. Degree (Physics) on securing the requisite 145 Credits on completion of VI-Semester.

B. Sc. (H) PHYSICS -SEMESTER-VII

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS701	Condensed Matter Physics II	3	1	0	4	Major
2	23PHBS702	Nuclear and Particle Physics	3	1	0	4	Major
3	23PHBS703	Statistical Mechanics I	3	1	0	4	Major
4		MSC 8 *	2*	0	0	2 *	MSC *
5		MSC 9 *	3*	1*	0	4 *	MSC *
6		Research Methodology #	2#	0	0	2 #	MSC for RP #
7	23PHBS771	Minor Project / Minor Dissertation #	-	-	-	4 #	Research Project/Dissertation for RP #
TOTAL			11# / 14 *	3 #/ 4*	0	18	

L – Lectures, T- Tutorial, P- Practical, C- credits

*** Students pursuing Honours will do 1 MSC Course of 4 Credits and 1 MSC Course of 2 Credits in lieu of Research Project in 7th Semester**

Students pursuing Honours with Research will do Research Methodology of 2 Credit and Research Minor Project/ Minor Dissertation of 4 Credits.

B. Sc. (H) PHYSICS -SEMESTER-VIII

S.No.	Course Code	Course Title	L	T	P	Credits	Course Category
1	23PHBS801	Atomic and Molecular Physics	3	1	0	4	Major
2	23PHBS802	Semi-Conductor Physics	3	1	0	4	Major
3	23PHBS803	Statistical mechanics II	3	1	0	4	Major
4		MSC 8 *	2*	0	0	2 *	MSC *
5	23PHBS871	Minor Project *				4 *	Minor Research Project *
6	23PHBS872	Major Project / Major Dissertation #	-	-	-	6 #	Research Project/Dissertation for RP #
TOTAL			9# / 11 *	3	0	18	

L – Lectures, T- Tutorial, P- Practical, C- credits

* Students pursuing Honours will do 1 Course of 2 Credits and a Minor Project of 4 credits in lieu of Research Project in 8th Semester
Students pursuing Honours with Research will do Research Project/Dissertation of 6 Credits.

On Exit, students shall be awarded B.Sc. (Physics) (Honours with Research) or (Honours) or (Honours with Research in Discipline-1 (Major) with Discipline-2 (Minor) after securing the requisite 181 Credits on completion of VIII-Semester.

**List of Major Courses offered to
Four Year B.Sc. Physics programme in the Department of Physics
w.e.f. Academic Year 2023-24**

S No	Semester	Course Code	Course Title	L	T	P	Credits	Course Category
1	I	23PHBS101	Mathematical Physics I	3	1	0	4	Major Course
2		23PHBS102	Mechanics & General Properties Of Matter	3	0	0	3	Major Course
3		23PHBS152	Mechanics & General Properties Of Matter Lab	0	0	2	1	Major Course Lab
4	II	23PHBS201	Mathematical Physics II	3	1	0	4	Major Course
5		23PHBS202	Waves & Optics	3	0	0	3	Major Course
6		23PHBS252	Waves & Optics Lab	0	0	2	1	Major Course Lab
7	III	23PHBS301	Mathematical Physics III	3	0	0	3	Major Course
8		23PHBS351	Computational Physics lab I	0	0	2	1	Major Course Lab
9		23PHBS302	Electricity & Magnetism	3	0	0	3	Major Course
10		23PHBS352	Electricity & Magnetism lab	0	0	2	1	Major Course Lab
11		23PHBS303	Thermal Physics	3	0	0	3	Major Course
12		23PHBS353	Thermal Physics lab	0	0	2	1	Major Course Lab
13	IV	23PHBS401	Mathematical Physics IV	3	0	0	3	Major Course
14		23PHBS451	Computational Physics lab II	0	0	2	1	Major Course Lab
15		23PHBS402	Electronics - I	3	0	0	3	Major Course
16		23PHBS452	Electronics - I Lab	0	0	2	1	Major Course Lab
17		23PHBS403	Modern Physics	3	0	0	3	Major Course
18		23PHBS453	Modern Physics Lab	0	0	2	1	Major Course Lab
19	V	23PHBS501	Classical Mechanics	3	1	0	4	Major Course
20		23PHBS502	E. M. Theory	3	0	0	3	Major Course
21		23PHBS552	E. M. Theory Lab	0	0	2	1	Major Course Lab
22		23PHBS503	Quantum Mechanics I	3	1	0	4	Major Course
23		23PHBS504	Electronics - II	3	0	0	3	Major Course
24		23PHBS554	Electronics - II lab	0	0	2	1	Major Course Lab
25	VI	23PHBS601	Condensed Matter Physics I	3	0	0	3	Major Course
26		23PHBS651	Condensed Matter Physics I Lab	0	0	2	1	Major Course Lab
27		23PHBS602	Electrodynamics	3	1	0	4	Major Course
28		23PHBS603	Quantum Mechanics II	3	1	0	4	Major Course
29		23PHBS604	Laser and Non linear Optics	3	1	0	4	Major Course
30	VII	23PHBS701	Condensed Matter Physics II	3	1	0	4	Major Course
31		23PHBS702	Nuclear and Particle Physics	3	1	0	4	Major Course
32		23PHBS703	Statistical Mechanics I	3	1	0	4	Major Course
33	VIII	23PHBS801	Atomic and Molecular Physics	3	1	0	4	Major Course
34		23PHBS802	Semi Conductor Physics	3	1	0	4	Major Course
35		23PHBS803	Statistical mechanics II	3	1	0	4	Major Course

**List of Interdisciplinary Courses (IDC) / Minor Stream Courses (MSC) offered to
Four Year B.Sc. Physics programme in the Department of Physics
w.e.f. Academic Year 2023-24**

S. No	Cat.	Course code	Course title	Departme	L	T	P	C
1	IDC	23MABS00	Introduction to Algebra	Mathemati	3	1	0	4
2		23MABS00	Differential calculus	Mathemati	3	1	0	4
3		23MABS00	Differential Equations	Mathemati	3	1	0	4
4		23MABS00	Statistical Methods and Probability	Mathemati	3	1	0	4
5		23CYBS001	Physical Chemistry I	Chemistry	3	1	0	4
6		23CYBS002	Inorganic Chemistry	Chemistry	3	1	0	4
7		23CYBS003	Physical Chemistry II	Chemistry	3	1	0	4
8		23CYBS004	Analytical Chemistry	Chemistry	3	1	0	4
9	MSC	23PHBS001	Advanced Electronics	Physics	3	1	0	4
10		23PHBS002	Astronomy & Astrophysics	Physics	3	1	0	4
11		23PHBS003	Nanomaterials	Physics	3	1	0	4
12		23PHBS004	Biophysics	Physics	3	1	0	4
13		23PHBS005	Radiation Physics	Physics	3	1	0	4
14		23PHBS006	Medical Physics	Physics	3	1	0	4
15		23PHBS007	Atmospheric Physics	Physics	3	1	0	4
16		23PHBS008	Fiber Optics	Physics	3	1	0	4
17		23PHBS009	Soft Matter Physics	Physics	3	1	0	4
18		23PHBS010	Renewable Energy Physics	Physics	3	1	0	4
19		23PHBS011	Novel & Smart Materials	Physics	3	1	0	4
20		23PHBS012	Plasma Physics	Physics	3	1	0	4
21		23PHBS013	Nanophotonics	Physics	3	1	0	4
22		23PHBS014	Non-linear spectroscopy	Physics	3	1	0	4
23		23PHBS015	Optoelectronics	Physics	3	1	0	4
24		23PHBS016	Advanced Nuclear Physics	Physics	3	1	0	4
25		23PHBS017	Characterization techniques	Physics	3	1	0	4
26		23PHBS018	Nanomagnetism and Spintronics	Physics	3	1	0	4
27		23PHBS019	Quantum Field Theory	Physics	3	1	0	4
28		23PHBS020	Quantum Informatics & Quantum Computing I	Physics	2	0	0	2
29		23PHBS021	Quantum Informatics & Quantum Computing II	Physics	2	0	0	2
30		23PHBS022	Advanced Solid State Physics I	Physics	2	0	0	2
31		23PHBS023	Advanced Solid State Physics II	Physics	2	0	0	2
32		23RMBS710	Research Methodology	Physics	2	0	0	2

**List of Multidisciplinary Courses (MDC) offered to
Four Year B.Sc. Physics programme in the Department of Physics
w.e.f. Academic Year 2023-24**

Cat.	Code	Course Name	L	T	P	Credits
MDC I	23MDC201	Renewable Energy Sources	3	0	0	3
	23MDC202	Hybrid Electric Vehicle	3	0	0	3
	23MDC301	IPR in Business	3	0	0	3
	23MDC302	Library Information Sciences & Media Literacy	3	0	0	3
	23MDC401	Management Process & Organizational Behaviour	3	0	0	3
MDC II	23MDC203	Introduction to Bio-engineering	3	0	0	3
	23MDC204	Introduction to Robotics	3	0	0	3
	23MDC303	Psychology and Emotional Intelligence	3	0	0	3
	23MDC304	Indian Economy	3	0	0	3
	23MDC402	Creating an Entrepreneurial Mind	3	0	0	3
MDC III	23MDC301	Arduino based programming	3	0	0	3
	23MDC305	Electoral Literacy in India	3	0	0	3
	23MDC403	Personal Financial Planning	3	0	0	3
	23MDC404	Interior Design	3	0	0	3

**List of Ability Enhancement Courses (AEC) offered to
Four Year B.Sc. Physics programme in the Department of Physics
w.e.f. Academic Year 2023-24**

S. No.	Code	Course Name	L	T	P	Credits
1	23AEC101	Functional English I	2	0	0	2
2	23AEC201	Functional English II	2	0	0	2
3		Hindi / German / French	2	0	0	2
4		Hindi / German / French	2	0	0	2

**List of Value Added Courses (VAC) offered to
Four Year B.Sc. Physics programme in the Department of Physics
w.e.f. Academic Year 2023-24**

S. No.	Code	Course Name	L	T	P	Credits
1	23VAC102	Indian Constitution & Polity	2	0	0	2
2	23VAC101	Environment Protection & Sustainable Development	2	0	0	2
3	23VAC103	Sports, Yoga & Fitness	0	0	4	2

**List of Skill Enhancement Courses (SEC) offered to
Four Year B.Sc. Physics programme in the Department of Physics
w.e.f. Academic Year 2023-24**

Courses on Soft Skills

S. No.	Code	Course Name	L	T	P	Credits
1	23SS151	Effective Communication Skills	0	0	2	1
2	23SS252	Teamwork & Interpersonal Skills	0	0	2	1
3	23SS353	Presentation Skills	0	0	2	1
4	23SS454	Professional Skills	0	0	2	1
5	23SS555	Aptitude & Reasoning	0	0	2	1

Courses on Technical Skills

S. No.	Code	Course Name	L	T	P	Credits
1	23SS101	Digital Literacy & IT Skills	0	0	2	1
2	23SS202	Advanced Excel Skills	0	0	2	1
3	23SS303	Statistical Analysis with SPSS	0	0	2	1
4	23SS404	R language programming	0	0	2	1
5	23SS505	Programming with MATLAB	0	0	2	1