

Program Structure

Bachelor of Technology (Engineering Physics)

Minor Computer Science & Engineering

Duration: 04 Years

Batch: 2026-2030

School Engineering and Applied Sciences

Department of Physics

Vision of the University:

To be a global leader in education, research, and innovation, empowering higher learning ecosystem

Mission of the University:

- Empower all the members of the Bennett ecosystem and provide thought leadership, focus on nation-building, and prepare our graduates to move with the Times.
- Cultivate international partnerships and collaborations with academic institutions, industry, and government organizations and provide a rigorous and innovative education that equips students with the knowledge, skills, and ethical values required to excel in their careers.
- Foster a culture of lifelong learning, adaptability, and critical thinking, ensuring graduates are prepared to tackle emerging challenges in all academic fields.
- Drive interdisciplinary research and innovation, pushing the boundaries of human knowledge, addressing pressing global issues, and solving real-world problems.
- Enhance a collaborative environment that encourages faculty and students to engage in research, innovation, and entrepreneurship, creating a lasting impact on society.
- Promote diversity, equity, and inclusion, ensuring that all individuals, regardless of background, feel welcomed, respected, and empowered.
- Prepare students to become global citizens, capable of addressing global challenges and contributing to the well-being of communities worldwide.
- Provide a globally connected career service networking with graduate employers and alumni.
- Foster a strong sense of ethical responsibility in our graduates, emphasizing the importance of ethical conduct, sustainability, and social impact in professional practice.
- Commit to ongoing assessment and improvement of our programs and invest in modern infrastructure and advanced technology to support teaching, research, and innovation adapting to the evolving needs of students, industries, and society.

Vision of the School: To be a leading center of excellence in engineering education, research and innovation, fostering the development of skilled engineers who will shape the future of science and technology and contribute to the betterment of society.

Mission of the School:

- I Provide high-quality science & engineering education: The school is dedicated to delivering rigorous, comprehensive, and contemporary education that equips students with the necessary knowledge, skills, and ethical values to excel in the field of science & engineering.
- I Foster research and innovation: Encourage and support cutting-edge research and innovation in various scientific & engineering disciplines, promoting interdisciplinary collaboration, entrepreneurship skills to address real-world challenges. The school aims to be at the forefront of technological advancements and contribute to the body of knowledge in science & engineering.
- I Promote experiential learning: Create an environment that generate new knowledge with emphasis on hands-on learning experiences, practical applications of scientific & engineering principles, and collaboration with industry partners. The school strives to develop graduates who are ready to tackle real-world problems , promote entrepreneur and adapt to a rapidly evolving engineering landscape.
- I Cultivate professional ethics and social responsibility: Instill in students a strong sense of professional ethics, integrity, and social responsibility. The school aims to produce engineers who are committed to sustainable development, ethical practices, and actively contribute to society's well-being.

Vision of the Department: To provide high-quality physics education relevant to engineering and technology's professional requirements and to execute cutting-edge research in theoretical, experimental, and applied physics.

Mission of the Department:

- To impart interdisciplinary knowledge through undergraduate and PhD program.
- To produce the best and sought-after graduates in engineering physics by enabling them to face future challenges in science, technology, and society.

Program Educational Objectives (PEO):

1. **Advanced Problem-Solving Skills:** Graduates will be equipped with advanced problem-solving skills, including mathematical modeling, experimental design, and analytical techniques, to address complex interdisciplinary challenges in science and engineering.

2. **Application of Physics Principles:** Graduates will demonstrate a strong understanding of fundamental physics principles and their applications to solve real-world engineering problems, innovate new technologies, and contribute to scientific advancements.
3. **Integration of Multidisciplinary Knowledge:** Graduates will be able to integrate knowledge from multiple disciplines, including physics, mathematics, engineering, and computer science, to develop innovative solutions to complex engineering problems.
4. **Preparation for Diverse Career Paths:** Graduates will have the knowledge, skills, and adaptability to pursue diverse career paths in fields such as engineering, research, technology development, entrepreneurship, and academia.
5. **Contribution to Society and Global Impact:** Graduates will understand the societal and global implications of their work and demonstrate a commitment to ethical practice, sustainability, and social responsibility in their professional endeavors, contributing positively to the advancement of society and the betterment of the world.

PEO to Mission Statement Mapping:

Mission Statements		
	M1	M2
PEO Statements		
PEO1	3	
PEO2	3	
PEO3	3	
PEO4		3
PEO5		3

1: Low

2: Medium

3: High

Program Outcomes (POs) and Program Specific Outcomes (PSOs):

PO1: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Identify, formulate, review research literature and analyze complex engineering problems in order to solve using basic principles of mathematics and natural sciences.

PO3: Analyse solutions for complex engineering problems and design materials and develop algorithms for applications in different sectors of environment, society, public health etc.

PO4: Use research based knowledge and methods of experiments, analyses of models, interpretation of data to provide relevant and valid conclusions.

PO5: Create and apply advance techniques and modern engineering tools for modelling engineering problems.

PO6: Analyse societal issues and consequent responsibilities of engineering practice.

PO7: Understanding the impact of engineering solutions in environmental and societal contexts and need of sustainable development

PO8: Apply professional ethics and norms of engineering

PO9: Ability to function effectively as an individual and as a team member un multidisciplinary environment.

PO10: Communicate effectively in science and engineering community, being able to effectively present and document.

PO11: Ability to pursue projects as team member and leader using engineering and management skills.

PO12: Recognize and accept the importance of life-long learning, demonstrated through career growth and impact.

PSO1: Develop computer-based algorithms and analytical models to analyze complex physical, technological, biological and social worlds.

PSO2: Apply professional communication skills, team building, academic and technological ethics through internship opportunities to attain entrepreneurial success.

PSO3: Experiment and prepare new materials and provide innovative ideas towards research and societal issues.

Mapping of POs/PSOs to PEOs:

PEO Statements	PEO1	PEO2	PEO3	PEO4	PEO5
Program Outcomes					
PO1	3	3	2	2	1
PO2	3	3	2	2	1
PO3	3	3	2	2	1
PO4	3	3	2	2	1
PO5	3	3	3	2	1
PO6	1	2	2	1	3
PO7	1	2	2	1	3
PO8	1	1	2	3	2
PO9	1	1	3	2	2
PO10	1	1	2	3	2
PO11	1	1	3	2	2
PO12	1	1	2	2	3
PSO1	3	2	2	1	1
PSO2	2	2	3	2	1
PSO3	2	2	2	1	3

1: Low

2: Medium

3: High

List of Courses:

B. Tech Engineering Physics							
Minor Computer Science & Engineering							
Batch 2026-30							
Semester: I							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Engineering Calculus	2026MATH101	4	3	1	0	0
2	Electromagnetism	2026PHYS101	4	2	1	2	0
3	Newtonian Mechanics	2026PHYS102	4	2	1	2	0
4	Fundamentals of Electrical and Electronics Engineering (ECE) / Computational Thinking and Programing (CSE)	2026EECE100/ 2026CSET10X	4	2	1	2	0
5	Introduction to Electrical and Electronics Engineering	2026EECE10X	3	2	0	2	0
6	Introduction to Engineering	2026ENGG101	2	1	0	2	0
7	TREP-I	2026TREP101	2	1	0	0	3
Total Credits in Semester - I			23				
Semester: II							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	TREP-II	2026TREP151	2	1	0	0	3
2	Linear Algebra and Ordinary Differential Equations	2026MATH151	4	3	1	0	0
3	Classical Mechanics and STR	2026PHYS151	4	3	1	0	0
4	Thermal and Statistical Physics	2026PHYS152	4	3	1	0	0
5	Signals and Systems (ECE) / Object Oriented Programming using Java (CSE)	2026EECE152/ 2026CSET15X	4	3	0	2	0
6	Chemistry & Biology	2026BIOT160	3	2	0	2	0
7	Environmental Studies-I	2026ENVS151	2	2	0	0	0
Total Credits in Semester – II			23				
Semester: III							
S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Data Structures using C++ (CSE)	2026CSET20X	4	2	0	4	0

2	Electrodynamics	2026PHYS201	4	3	1	0	0
3	Mathematical Physics	2026PHYS202	4	2	1	2	0
4	Complex Analysis and Partial Differential Equation (SEAS)/ Probability and Statistics (CSE)	2026MATH202/ 2026MATH201	3	2	1	0	0
5	Workshop and Product Realization (MEC)	2026MECH100	3	1	0	4	0
6	TREP-III	2026TREP201	2	1	0	0	3
7	AI for All	2026AINT20X	2	1	0	2	0
	Total Credits		22				

Semester: IV

S.No.	Course Name	Course Code	Credit	L	T	P	E
2	Statistical Mechanics	2026PHYS251	3	2	1	0	0
3	Computational Physics	2026PHYS255	3	2	0	2	0
4	Quantum Mechanics	2026PHYS252	3	3	0	0	0
5	Optics and Lasers	2026PHYS253	3	3	0	0	0
6	Advance Physics Lab-I	2026PHYS256	2	0	0	4	0
7	Vacuum Technology	2026PHYS254	2	2	0	0	0
8	Specialization Elective – I	2026CSETXXX	3	2	0	2	0
10	TREP-IV	2026TREP251	2	2	0	0	3
		Total Credits in Semester IV	21				

Semester: V

S.No.	Course Name	Course Code	Credit	L	T	P	E
1	TREP-V	2026TREP301	2	1	0	0	3
2	Condensed Matter Physics	2026PHYS301	4	3	1	0	0
3	Advanced Quantum Mechanics	2026PHYS302	3	3	0	0	0
4	Photonics Science and Technology	2026PHYS303	3	2	0	2	0
5	Advanced Physics Lab-II	2026PHYS304	2	0	0	4	0
6	Specialization Elective – II	2026CSETXXX	3	3	0	0	0
7	SUMMER INTERNSHIP - I		2	0	0	0	6
		Total Credits in Semester V	19				

Semester: VI

S.No.	Course Name	Course Code	Credit	L	T	P	E
1	TREP-VI	2026TREP351	2	1	0	0	3
2	Atomic and Molecular Physics	2026PHYS351	3	3	0	0	0
3	Semiconductor Physics	2026PHYS352	3	3	0	0	0
4	Nano Science and Technology	2026PHYS353	3	2	0	2	0
5	Departmental Elective-I	2026PHYSXXX	3	3	0	0	0

6	Specialization Elective – III	2026CSETXXX	3	3	0	0	0
7	Specialization Elective - IV	2026CSETXXX	3	3	0	0	0
		Total Credits in Semester VI	20				

Semester: VII

S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Foreign Language	2026FOLA401	2	2	0	0	0
2	Departmental Elective-II	2026PHYSXXX	2	2	0	0	0
3	Departmental Elective-III	2026PHYSXXX	2	2	0	0	0
4	Specialization Elective – V		3	3	0	0	0
5	Specialization Elective – VI		3	3	0	0	0
6	AI/ML applications in Mechanical Engineering / Sustainable Manufacturing / Green Energy	2026AINT44X*	2	2	0	0	0
7	Experimental Design and Analysis	2026PHYS401	2	0	0	4	0
8	Summer Internship-II	2026PHYS400	2	0	0	0	6
9	Environmental Studies-II	2026ENVS401*	2	2	0	0	0
		Total Credits in Semester VII	18				

Semester: VIII

S.No.	Course Name	Course Code	Credit	L	T	P	E
1	Yoga and Postive Psychology / Mental Health and Well Being (NPTEL)	2026HRESXXX*	2	2	0	0	0
2	Research Project/ Dissertation	2026PHYS451	12	0	0	0	36
3	Specialization Elective - VII	2026CSETXXX	3	3	0	0	0
4	Management related courses like leadership skills, Project Management / Digital Marketing/ E-Business (NPTEL)	2026MKTGXXX *	2	2	0	0	0
5	Design of Experiments course, data handling and analysis techniques/IPR/Application of AI (NPTEL)	2026ILAWXXX*	2	2	0	0	0
Total Credits in Semester VIII			17				