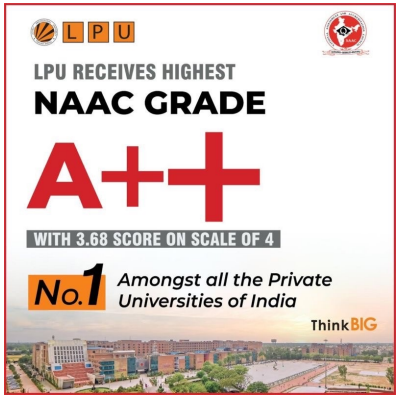
LOVELY PROFESSIONAL UNIVERSITY

PHY110
ENGINEERING PHYSICS



Zero Lecture

Zero lecture is the lecture which acquaint the students about the structure of the course. It enables the learners to understand the vision of the course and provides a clear mental checklist of various course objectives to accomplish.

University Vision and Mission

To be a premier academic institution, recognized internationally for its contribution to industry and society through excellence in teaching, learning, research, internationalization, entrepreneurship and leadership.

- To transform education through academic rigor, practical orientation, and outcome-based teaching.
- To develop and implement a relationship of cooperation between industry and academia.
- To undertake impactful research addressing local, national, and global challenges.
- To prepare graduates to be lifelong learners with strong analytical and leadership skills.
- To develop global professionals and entrepreneurs with an innovative spirit, tolerance, and desire to make a difference in society.

School Vision & Mission

Vision

To be a globally recognized school through excellence in teaching, learning and research for creating Computer Science professionals, leaders and entrepreneurs of the future contributing to society and industry for sustainable growth.

Mission

M1: To build computational skills through hands-on and practice based learning with measurable outcomes.

M2: To establish a strong connect with industry for in-demand technology driven curriculum.

M3: To build the infrastructure for meaningful research around societal problems.

M4: To nurture future leaders through research-infused education and lifelong learning.

M5: To create smart and ethical professionals and entrepreneurs who are recognized globally.

Program Educational Objectives

PEO1: Graduates will be able to apply technical knowledge to solve industrial problems in the field of mechanical engineering.

PEO2: Graduates with exposure to interdisciplinary skills will have the potential to become successful innovators or entrepreneurs engaged in technology development and deployment.

PEO3: Graduates with their lifelong learning skills and research capabilities will be able to pursue higher studies and research careers at national/international levels.

PEO4: Graduates will demonstrate sensitivity to environmental and sustainability issues while contributing to society.

B.

Program Outcomes

. No.	Outcomes	Headings	Description
1	PO1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	PO2	Problem analysis	Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	PO3	Design/development of solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	PO4	Conduct investigations of complex problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	PO5	Modern tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6	PO6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	PO7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8.	PO8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9.	PO9	Individual and team work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10.	PO10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	PO11	Project management and finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	PO12	Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

C. Program Specific Options

Sr. No.	Outcomes	Description
1.	PSO1	Apply basic knowledge in the areas such as Software Engineering, Networking and Security, Database Management Systems, Intelligent Systems, Operating Systems, Programming Skills and System Architecture for building Software products along with the integration of futuristic technologies.
2.	PSO2	Provide effective and efficient real time solutions using attained knowledge in inter-disciplinary domains for societal benefits through hands-on projects or hackathons or technical challenges or global competitions.

A. PSO mapping with core courses

Course code	Course title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
PHY110	Engineering Physics	Yes	Yes	Yes	Yes								Yes	Yes	

Program Information

Program Code: P132 **Program Name: B. Tech. Computer Science and Engineering**

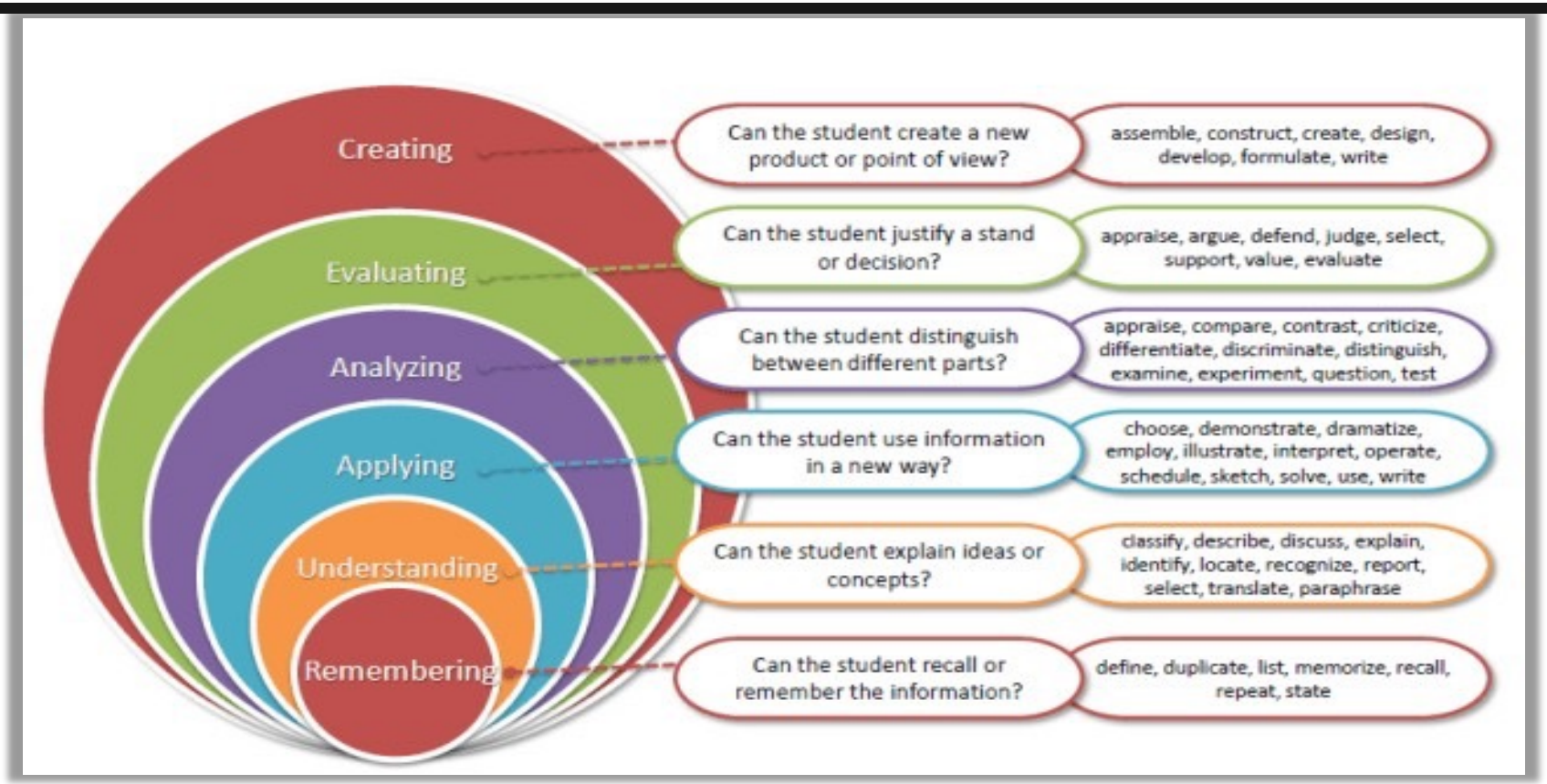
This Bachelor of Technology program offered by Lovely Professional University has a minimum duration of 4 years and is offered under the Semester system through Regular mode. It is a Standalone program based on the Credit system.

#The medium of Instruction in this program is English.

A. Program Educational Objectives

Sr.No.	Objective
1	Become a successful professional demonstrating amalagamation of science and information technology.
2	Those employed in industry will demonstrate professional advancement, based on scientific learnings and experimental aptitude.
3	Those who continue their formal education will achieve a higher degree or other advanced certification.

Revised Bloom's Taxonomy



Course Outcomes:

Through this course you will be able to

CO 1 : understand the basic principles of physics to lay the foundation for various engineering courses

CO 2: explain the principle and working of lasers and optical fiber for their wide applications.

CO 3: employ the principle of quantum mechanics to solve Schrodinger equations for standard systems.

CO 4: articulate the physics of solids to understand their properties.

CO 5: determine the properties of engineering materials.

What you will study here in this course?

But how to find the syllabus in UMS ?

- UMS log in >> UMS navigation
  >> Learning Management System
  >> Academic course syllabus
  >> syllabus files
  >> select the session
  >> PHY110

Course Assessment Model

L: 3.0 T: 0.0 P: 0.0 Cr: 3.0

Attendance:	**5**
Continuous Assessment (CA):	**25**
Mid Term:	**20**
End Term:	**50**
Total	**100 Marks**

MTE : 100% MCQ

ETE : 100% MCQ

Continuous Assessment (CA)

CA category *C010102*

- **Two Class Tests** (One best out of two)
  - One pre-MTE (30 Marks)
  - one post-MTE (30 Marks)
- **One assignment** (Term paper, Compulsory task) Lab@Home 30 marks

Rubric for Assignment (Lab @ home)

(a)	Lab @ Home review submission (students will produce the layout and content outline of the given topic).	[5 Marks]
(b)	Presenting accurate information, highlighting key principles, supporting facts and details in the report.	[5 marks]
(c)	Observation, conclusion, and references	[5Marks]
(d)	Completeness of the Problem/Task and References cited.	[5Marks]

- **Viva** **[10 Marks]**

Text book and Reference Books

Text Books: Engineering Physics By B K Pandey And S Chaturvedi, Cengage Learning

References:

1. Fundamental Of Physics By Halliday D., Resnick R., Walker J., Wiley
2. Concept Of Modern Physics. By Besier Arthur., Mcgraw Hill Education
3. Engineering Physics By Hitendra K Malik, A K Singh, Tata Mcgraw Hill, India

Need of Engineering Physics ?

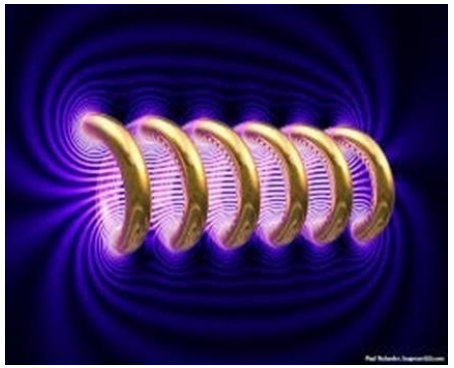
- Engineering physicists combine advanced physics concepts and engineering expertise to bring ideas to the marketplace. They are primed to find the connection between a new physical phenomenon and its applications.
- An iconic example of engineering physics at work is the leap forward that transistors brought to computing. Five years after the invention of the transistor, researchers at the University of Manchester, UK, realized that these electrical on-off switches could replace the hotter, slower vacuum tubes of early 1950s computers. Now, millions of transistors are packed into each modern microprocessor.

Syllabus

Unit I

Electromagnetic Theory

- Scalar and vectors fields
- Concept of gradient, divergence and curl
- Gauss theorem and Stokes theorem (qualitative)
- Poisson and Laplace equations, continuity equation
- Maxwell electromagnetic equations (differential and integral forms)
- Physical significance of Maxwell equations, Ampere Circuital Law
- Maxwell displacement current and correction in Ampere Circuital Law.



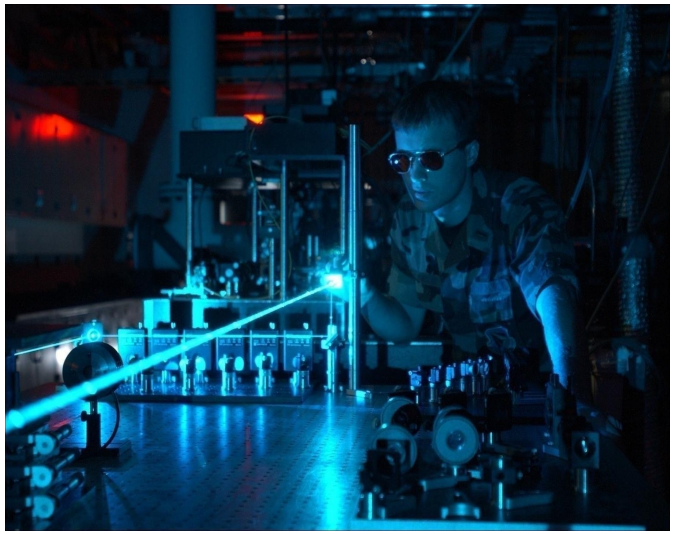
Michael Faraday

James Clerck Maxwell

Unit II

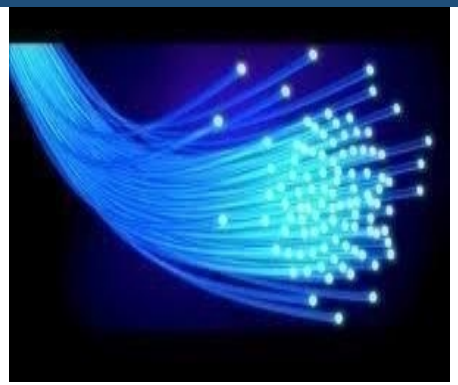
Laser and Applications

- Fundamentals of laser- energy levels in atoms
- Radiation matter interaction, Absorption of light
- Spontaneous emission of light, stimulated emission of light
- Population of energy levels, Einstein A and B coefficients
- Metastable state, population inversion, lasing action
- Properties of laser, resonant cavity, excitation mechanisms
- Nd - YAG, He-Ne Laser, Semiconductor Laser
- Applications of laser in holography.

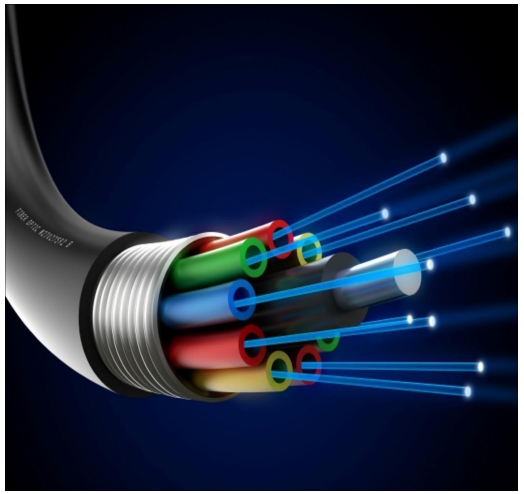


Unit III

Fiber Optics



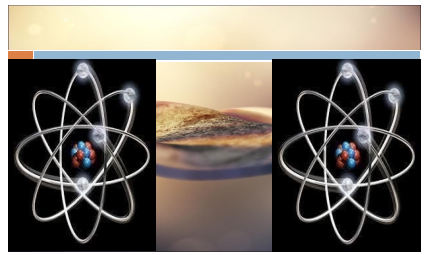
- Fiber optics introduction
- Optical fiber as a dielectric wave guide
- Total internal reflection, acceptance angle
- Numerical aperture, relative refractive index
- V-number
- Step index and graded index fibers
- Losses associated with optical fibers



Unit IV

Quantum Mechanics

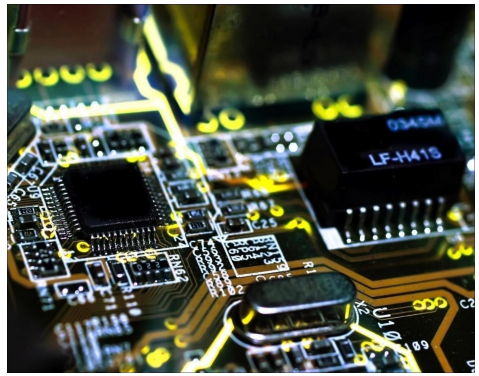
- Need of quantum mechanics
- Photoelectric effect, Concept of de Broglie matter waves
- Wavelength of matter waves in different forms
- Heisenberg uncertainty principle
- Concept of phase velocity and group velocity (qualitative)
- Wave function and its significance
- Schrodinger time dependent and time independent equation
- Particle in a box



Unit V

Solid State Physics

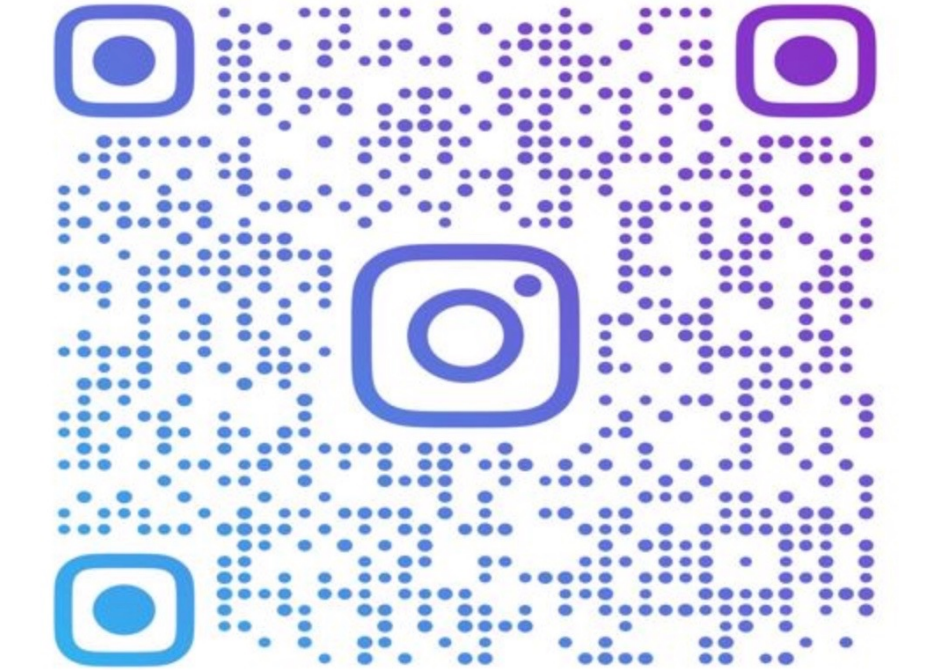
- Free electron theory, diffusion and drift current
- Fermi energy, Fermi-Dirac distribution function
- Band theory of solids - formation of allowed and Forbidden energy bands
- Concept of effective mass - electrons and holes
- Hall effect (with derivation)
- Semiconductors and insulators
- Fermi level for intrinsic and extrinsic semiconductors
- Direct and indirect band gap semiconductors



Unit VI

Introduction to Engineering materials

- Introduction to dielectric material
- Magnetic materials: Dia, Para, Ferromagnetic
- Piezoelectric materials
- Direct and inverse Piezoelectric methods
- Superconducting materials: properties, applications
- Meissner Effect
- Type 1 & Type – 2 superconductors



Scanning the QR code, students can easily follow the page and ensure they don’t miss out on any important updates.


Good
Luck!