Course: Engineering Physics
PHY 1701

03-12-2019

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Division of Physics

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VIT®
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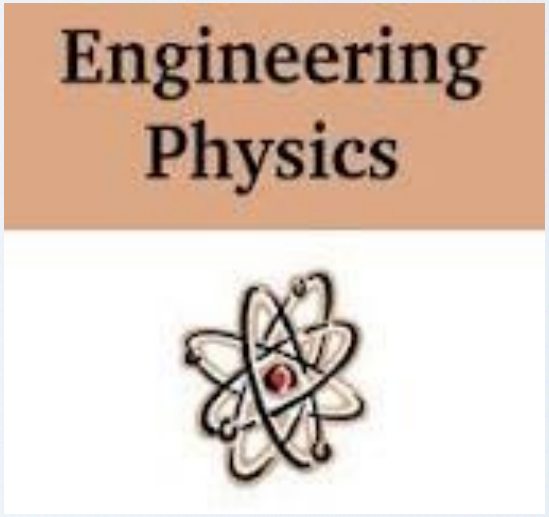
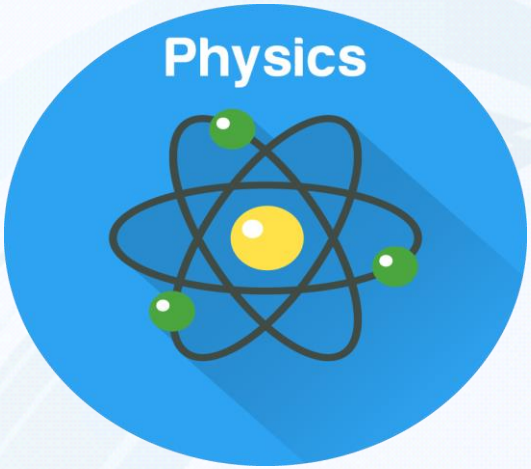
Outline

- About Engineering Physics
- Syllabus
- Text books & References
- Introduction





Syllabus

Modules	Topics
1	Introduction to Modern Physics: Particle properties of wave: Planck's concept (hypothesis), Compton Effect, Matter Waves, Davisson Germer Experiment, Heisenberg Uncertainty Principle, Wave function, and Schrodinger equation (time dependent & independent)
2	Applications of Quantum Physics: Particle in a 1-D box (Eigen Value and Eigen Function), 3-D Analysis (Qualitative), Tunneling Effect (Qualitative), Scanning Tunneling Microscope (STM).

Syllabus

3	Nanophysics: Introduction to Nano-materials, Moore's law, Properties of Nano-materials, Quantum confinement, Quantum well, wire & dot, Carbon Nano-tubes (CNT), Applications of nanotechnology in industry.
4	Laser Principles and Engineering Application: Laser Characteristics, Spatial and Temporal Coherence, Einstein Coefficient & its significance, Population inversion, Two, three & four level systems, Pumping schemes, Threshold gain coefficient, Components of laser, Nd-YAG, He-Ne, CO_2 and Dye laser and their engineering applications

Syllabus

5.	Electromagnetic Theory and its application: Physics of Divergence, Gradient and Curl, Qualitative understanding of surface and volume integral, Maxwell Equations (Qualitative), Wave Equation (Derivation), EM Waves, Phase velocity, Group velocity, Group index, Wave guide (Qualitative)
6.	Propagation of EM waves in Optical fibers: Light propagation through fibers, Acceptance angle, Numerical Aperture, Types of fibers - step index, graded index, single mode & multimode, Attenuation, Dispersion-intermodal and intramodal

Syllabus

7.	Optoelectronic Devices & Applications of Optical fibers: Sources-LED & Laser Diode, Detectors-Photodetectors-PN & PIN - Applications of fiber optics in communication-Endoscopy
8.	Special Theory of Relativity:, Frame of reference, Galilean relativity, Postulate of special theory of relativity, Simultaneity, length contraction and time dilation.

Text Books

1. Concepts of Modern Physics, Arthur Beiser et al., Tata McGraw Hill (2013)
2. Laser Fundamentals, William Silfvast, Cambridge University Press (2008)
3. Introduction to Electrodynamics, D. J. Griffith, 3rd Edition (2013)
4. Fiber Optic Communication Technology, Djafar K. Mynbaev and Lowell L.Scheiner, Pearson, 2011

Reference Books

1. Modern Physics, Raymond A. Serway, Clement J. Mosses, Curt A. Moyer, Cengage learning [3rd Indian Edition], 2010
2. Modern Physics for Scientists and Engineers, John R. Taylor, Chris D. Zafiratos and Michael A. Dubson, PHI Learning Private Ltd., 2011
3. Modern Physics, Kenneth Krane, Wiley Indian Edition, 2010
4. Modern Physics, Stephen T. Thornton and Andrew Rex, Cengage Learning, First Indian Reprint, 2008
5. The Essential Understandings of Nanoscience and Nanotechnology, J. Pradeep, Tata McGraw Hill, 2007

Reference Books

6. Laser Systems and Applications, Nityanand Choudhary and Richa Verma, PHI Learning Private Ltd., 2011
7. Lasers: Principles and Applications, J. Wilson and J.F.B. Hawkes, Prentice Hall (2003)
8. Lasers and Optical Instrumentation, S. Nagabhushana and B. Sathyanarayana, I.K. International Publishing House Pvt. Ltd., 2010
9. Electromagnetic Waves, R. Shevgaonkar, 1st Edition (2005)
10. Principles of Electromagnetics, Matthew N.O. Sadiku (Fourth Edition), Oxford (2010)

Grading System

Internal

1. Assignment – I → 10 Marks
2. Assignment – II → 10 Marks
3. Quiz → 10 Marks

Total = 30 Marks

30

External

1. CAT – I → 50 Marks → 15
2. CAT – II → 50 Marks → 15
3. FAT → 100 Marks → 40

Total = 70 Marks

70