

Course Number and Name									
BPH101 - ENGINEERING PHYSICS I									
Credits and Contact Hours									
3 & 45									
Course Coordinator's Name									
Dr.Srilatha									
Text Books and References									
<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> Jayaraman D Engineering Physics I. Global Publishing House, 2014. Arumugam M. Engineering Physics. Anuradha publishers, 2010. Gaur R.K. and Gupta S.L. Engineering Physics. Dhanpat Rai Publishers, 2009. Mani Naidu S. Engineering Physics, Second Edition, PEARSON Publishing, 2011. <p>REFERENCES:</p> <ol style="list-style-type: none"> Searls and Zemansky. University Physics, 2009 Marikani A. Engineering Physics. PHI Learning Pvt., India, 2009. Palanisamy P.K. Engineering Physics. SCITECH Publications, 2011. http://ocw.mit.edu/courses/find-by-topic http://nptel.ac.in/course.php?disciplineId=122 https://en.wikipedia.org/wiki/Engineering_physics 									
Course Description									
To enhance the fundamental knowledge in Physics and its applications relevant to various streams of Engineering and Technology									
<table border="1"> <thead> <tr> <th>Prerequisites</th> <th>Co-requisites</th> </tr> </thead> <tbody> <tr> <td>+ 2 Level Physics</td> <td>Nil</td> </tr> <tr> <td colspan="2" style="text-align: center;">required, elective, or selected elective (as per Table 5-1)</td> </tr> <tr> <td colspan="2">Required</td> </tr> </tbody> </table>		Prerequisites	Co-requisites	+ 2 Level Physics	Nil	required, elective, or selected elective (as per Table 5-1)		Required	
Prerequisites	Co-requisites								
+ 2 Level Physics	Nil								
required, elective, or selected elective (as per Table 5-1)									
Required									
Course Outcomes (COs)									
CO1	Understand the Principles and Laws of Physics								
CO2	To understand the impact of Crystal Physics								
CO3	Learn the Properties of Elasticity and Heat transfer.								
CO4	Acquire Knowledge on Quantum Physics.								
CO5	Understand the concepts on Laser & Ultrasonic's and its Applications								
CO6	Understand the Principle of Laser and its Applications in Engineering Medicine.								

Student Outcomes (SOs) from Criterion 3 covered by this Course												
COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	H						M			H		
CO2		L	H		M				M		L	H
CO3												
CO4	H		M	L						L		M
CO5		L	L								L	L
CO6												
List of Topics Covered												
UNIT I CRYSTAL PHYSICS											9	
Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – d spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – Diamond and graphite structures (qualitative treatment)- Crystal growth techniques –solution, melt (Bridgman and Czochralski) and vapour growth techniques (qualitative)												
UNIT II PROPERTIES OF MATTER AND THERMAL PHYSICS											9	
Elasticity-Hooke's law - Relationship between three moduli of elasticity (qualitative) – stress -strain diagram – Poisson's ratio –Factors affecting elasticity –Bending moment – Depression of a cantilever – Young's modulus by uniform bending- I-shaped girders Modes of heat transfer- thermal conductivity- Newton's law of cooling - Linear heat flow – Lee's disc method – Radial heat flow – Rubber tube method – conduction through compound media (series and parallel).												
UNIT III QUANTUM PHYSICS											9	
Black body radiation – Planck's theory (derivation) – Deduction of Wien's displacement law and Rayleigh – Jeans' Law from Planck's theory – Compton effect. Theory and experimental verification – Properties of Matter waves – G.P Thomson experiment-Schrödinger's wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one dimensional box - Electron microscope - Scanning electron microscope - Transmission electron microscope.												
UNIT IV ACOUSTICS AND ULTRASONICS											9	
Classification of Sound- decibel- Weber–Fechner law – Sabine's formula- derivation using growth and decay method – Absorption Coefficient and its determination –factors affecting acoustics of buildings and their remedies. Production of ultrasonics by magnetostriction and piezoelectric methods - acoustic grating -Non Destructive Testing – pulse echo system through transmission and reflection modes - A,B and C – scan displays, Medical applications – Sonogram.												
UNIT V PHOTONICS AND FIBRE OPTICS											9	
Spontaneous and stimulated emission- Population inversion –Einstein's A and B coefficients - derivation.												

Types of lasers – Nd:YAG, CO₂, Semiconductor lasers (homo junction & hetero junction)- Industrial and Medical Applications. Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, mode) – attenuation, dispersion, bending - Fibre Optical Communication system (Block diagram) - Active and passive fibre sensors- Endoscope. .