

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology				Branch/Spec.	Computer Science and Business Systems			
Semester	II				Version	1.0.0.0			
Effective from Academic Year	2026-27				Effective from the batch admitted in	July 2026			
Course Code	2BSC1115				Course Name	Physics for Computing Science			
Course Category	Basic Science Courses (BSC)								
Teaching Scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	50	50	100
Hours	3	0	2	0	5	Practical	25	25	50
Pre-requisites:									
High school physics & math, 10+2 physics									
Course Outcomes									
COs	Description								
CO1	Analyse and explain the behaviour of a damped harmonic oscillator, phenomenon of interference, diffraction and polarisation and utilise it for engineering applications.								
CO2	Describe and make use of Maxwell's equation of electromagnetism.								
CO3	Explain the principles, types, and applications of lasers, optical fibers, and basic semiconductor concepts								
CO4	Demonstrate different laws of thermodynamics, their significance and calculate entropy for a given process.								
Theory Syllabus									
Unit	Content								Hours
1	Oscillation: Periodic motion-simple harmonic motion-characteristics of simple harmonic motion-vibration of simple spring mass system. Resonance-definition., damped harmonic oscillator – heavy, critical and light damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators.								6
2	Interference-principle of superposition-young's experiment: Theory of interference fringes-types of interference-Fresnel's prism-Newton's rings, Diffraction-Two kinds of diffraction-Difference between interference and diffraction-Fresnel's half period zone and zone plate-Fraunhofer diffraction at single slit-plane diffraction grating. Temporal and Spatial Coherence.								5
3	Polarization of light: Polarization - Concept of production of polarized beam of light from two SHM acting at right angle; plane, elliptical and circularly polarized light, Brewster's law, double refraction.								4
4	Basic Idea of Electromagnetisms: Continuity equation for current densities, Maxwell's equation in vacuum and non-conducting medium.								4
5	Semiconductor Physics: Conductor, Semiconductor and Insulator; Basic concept of Band theory								4

6	Laser and Fiber optics: Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: Ruby Laser, CO ₂ and Neodymium lasers; Properties of laser beams: mono-chromaticity, coherence, directionality and brightness, laser speckles, applications of lasers in engineering. Fiber optics and Applications, Types of optical fibers.	12
7	Thermodynamics: Zeroth law of thermodynamics, first law of thermodynamics, brief discussion on application of 1st law, second law of thermodynamics and concept of Engine, entropy, change in entropy in reversible and irreversible processes.	10

Practical and Self Learning Content

Practical, assignments, quiz, industrial visit, field survey and tutorials are based on the above syllabus.

Text Books

1	Concepts of Modern Physics, (Fifth Edition) A Beiser, McGraw Hill International
2	Fundamentals of Physics, David Halliday, Robert Resnick and Jearl Walker, Wileyplus.

Reference Books

1	Optics, (Fifth Edition) Ajoy Ghatak, Tata McGraw Hill.
2	Sears & Zemansky University Physics, Addison-Wesley.
	Fundamentals of Optics, (Third Edition) Jenkins and White, McGraw-Hill.

ICT/MOOCs Reference

1	https://nptel.ac.in/courses/122103011
2	https://nptel.ac.in/courses/122107035

Mapping of COs, POs, and PSOs														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	1	0	0	1	0	1	3	2	2
CO2	3	2	2	2	2	1	0	0	1	0	2	3	3	1
CO3	3	3	3	1	2	1	0	0	1	0	2	3	3	2
CO4	3	3	2	2	1	2	0	0	1	0	3	2	1	3

Bloom's Taxonomy Level				
Unit	Unit Title	Aligned COs	Learning Hours	BTL Level
1	Oscillation	CO1	6	U, A
2	Interference-principle of superposition-young's experiment	CO1	5	U, A
3	Polarization of light	CO1	4	U, A
4	Basic Idea of Electromagnetisms	CO2	4	U, E
5	Semiconductor Physics	CO3	4	N,A
6	Laser and Fiber optics	CO3	12	N,A
7	Thermodynamics	CO4	10	U, E

Note:

- Version 1.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)
- 1 Hour Lecture = 1 Credit, 1 Hour Tutorial = 1 Credit, 2 Hours Practical = 1 Credit, 2 Hours Internship/Project/Seminar = 1 Credit

- Bloom's Taxonomy Level (BTL): R: Remember, U: Understand, A: Apply, N: Analyze, E: Evaluate, and C: Create