

DEPARTMENT OF PHYSICS

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech (CIVIL)		
Course Title	Physics I		
Course Code	PHIR11	No. of Credits	3 (2 credit for theory+1 credit for lab)
Course Code of Pre-requisite subject(s)	-	-	-
Session	July 2018	Section (if, applicable)	A
Name of Faculty	D.SASTIKUMAR	Department	PHYSICS
Email	sasti@nitt.edu	Telephone No.	9488600672
Name of Course Coordinator(s) (if, applicable)	Dr. S. Manivannan Dr. N.V.Giridharan		
E-mail	ksmani@nitt.edu giri@nitt.edu	Telephone No.	+91-431-503616 +91-431-2503613
Course Type	<input type="checkbox"/> Core course <input type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p>Kindly refer ‘Course Teaching and Learning activities’ in Part-II</p>			
COURSE OBJECTIVES			
<p>To introduce the notions of light matter interaction, fabrication of lasers, light propagation in waveguides, applications of lasers and optical fibers.</p> <p>To understand the fundamentals of acoustics, crystal physics and structure determination of crystals.</p> <p>To learn the fundamentals of magnetic, electrical and superconducting materials.</p> <p>To introduce the thoughts of special theory of relativity.</p>			

COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
1. Students will be able to know principle, construction of lasers, light propagation in optical fibers and their applications.	
2. Students will understand the acoustics of building, ultrasonics, crystal systems and structure determination.	
3. Students will also appreciate various materials properties like electrical, magnetic and superconducting	
4. Students will also establish mass-energy relationship through special theory of relativity.	

COURSE PLAN – PART II			
COURSE OVERVIEW			
The Physics- I course is offered to the First year B.Tech students. The subject has 2 credit for theory and 1 credit for lab weightage.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 - 3 weeks	Lasers Introduction to Laser- characteristics of Lasers- Spontaneous and stimulated emissions – Einstein’s coefficients – population inversion and lasing action – laser systems: Ruby laser, He-Ne Laser, semiconductor laser- applications- Holography.	Chalk and talk / power point presentation
2	4 - 6 weeks	Fiber Optics Fermat’s principle and Snell’s law-optical fiber – principle and construction – acceptance cone - numerical aperture – V-	Chalk and talk / power point presentation

		Number - types of fibers, Fabrication: Double Crucible Technique- fiber optic communication principle – fiber optic sensors.	
3.	7 - 9 weeks	Acoustics Introduction -reverberation – reverberation time – Sabine’s formula – acoustics of buildings – ultrasonics – production of ultrasonics using piezoelectric method –magnetostriction method- applications.	Chalk and talk / power point presentation
4.	10 - 12 weeks	Crystallography Seven crystal systems and Bravais lattices– Miller indices – interplanar distance- symmetry operation -Bragg’s law of X-ray diffraction –Laue Method- powder crystal method- structure determination for cubic system.	Chalk and talk / power point presentation
5.	13 - 15 weeks	Magnetic materials, conductors and superconductors <i>Magnetic materials:</i> Definition of terms – classification of magnetic materials and properties – domain theory of ferromagnetism- hard and soft magnetic materials – applications. <i>Conductors:</i> classical free electron theory (Lorentz –Drude theory) – electrical conductivity	Chalk and talk / power point presentation

COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assesment I (Test - Descriptive Questions)	First week of October	One Hour (Unit I & II)	10
2	Assesment II (Test - Descriptive Questions)	First week of November	One Hour (Unit III and IV)	10
3.	Assesment III (Assignment)	Nov./December	-	05
4.	Practicals (5 experiments)	During 1-15 weeks	150 mins (1 expt.per week) (5x7=35)	35
5.	Final Assessment IV*	As per Institute timetable	180 mins (Whole Theory Syllabus)	40
CPA	Compensation Assessment*		One Hour (Units I to IV)	10
*mandatory; refer to guidelines on page 4				
COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)				
By students through MIS				
COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)				
<u>MODE OF CORRESPONDENCE (email/ phone etc)</u>				
e-mail: sasti@nitt.edu Phone: <u>431-2503604</u>				
<u>COMPENSATION ASSESSMENT POLICY</u>				
For those who missed Cycle Test I or II, the Compensation Assessment will be conducted which covers the syllabus of Cycle Test I and Cycle Test II.				

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION

No separate semester exam for laboratory and each lab session carries equal weightage (5 x7 =35).

Total theory weightage: 2/3 (65%) and Practicals weightage : 1/3 (35%)

FOR APPROVAL

Course Faculty

CC-Chairperson

HOD

Guidelines:

- a) The number of assessments for a course shall range from 4 to 6.
- b) Every course shall have a final assessment on the entire syllabus with at least 30% weightage.**
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.**
- d) The passing minimum shall be as per the regulations.**

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or class average/2 whichever is greater.		Peak/3 or class average/2 whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.**
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.**
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.