

DEPARTMENT OF PHYSICS

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech. and CSE		
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)	Nil		
Session	July 2018	Section (if, applicable)	A
Name of Faculty	Dr. A. Chandra Bose	Department	Physics
Email	acbose@nitt.edu	Telephone No.	0431-2503605
Name of Course Coordinator(s) (if, applicable)	Dr. S. Manivannan Dr. N.V.Giridharan		
E-mail		Telephone No.	
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
Kindly refer 'Course Teaching and Learning activities' in Part-II			
COURSE OBJECTIVES			
<ul style="list-style-type: none">• To bridge the School Physics and Engineering Physics.• To introduce the fundamental and application concepts in the thrust areas like Laser, Fiber optics, Acoustics, Superconductors, Magnetic materials, relativity and etc.			

COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
<p>The student will be able to</p> <ol style="list-style-type: none"> 1. Understand many modern devices and technologies based on lasers and optical fibers. 2. Appreciate various material properties which are used in engineering applications and devices. 3. Identify the cause of reverberations in buildings 4. Analyze the crystal structure of materials 5. Decide on suitable materials for engineering applications 	<ul style="list-style-type: none"> ➤ Obtain in depth knowledge on important Physics concepts. ➤ Carry out independent research work in interdisciplinary areas. ➤ Interact with professionals in related areas. ➤ Communicate ideas and learn new technologies.

COURSE PLAN – PART II

COURSE OVERVIEW

The Physics- I course is offered to the First year B.Tech students. The subject has 2 credit theory and 1 credit lab weightage.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic (Syllabus)	Mode of Delivery
1	1 - 3 weeks (Unit-I)	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 Week (Unit-II)	Fermat’s principle and Snell’s law-optical fiber – principle and construction – acceptance cone - numerical aperture – V-Number - types of fibers, Fabrication: Double Crucible Technique- fiber optic communication principle – fiber optic sensors.	Chalk and talk / power point presentation
3	7- 9 week (Unit-III)	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 week (Unit-IV)	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 (Unit-V)	<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 <i>Superconductors:</i> definition – Meissner effect – type I & II superconductors – BCS theory (qualitative) – high temperature superconductors – Josephson effects applications. <i>Special theory of relativity:</i> Lorentz transformation -Time dilation – length contraction- mass-energy relation..	Chalk and talk / power point presentation/ Seminar

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	I Cycle Test (MCQ and/or Descriptive Questions)	First week of October 2018	60 mins (Unit I & II)	20
2	II Cycle Test (MCQ and/or Descriptive Questions)	First week of November 2018	60 mins (Unit III and IV)	20
3	ASSIGNMENT/SEMINAR	Before cycle tests	-	5+5
4	End Semester	As per Institute timetable	180 mins (Whole Theory Syllabus)	50
	Theory 2/3 will be taken		Total	100
5	Practicals (5 experiments)	During 1-15 weeks	150 mins (1 expt.per week) (5x20=100)	100
	Practical 1/3 will be taken		Total	100
CPA	Compensation Assessment*	First week of December	60 mins (Units I to IV)	20

6	Final Assessment *			
*mandatory; refer to guidelines on page End				
ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc				
<ol style="list-style-type: none"> 1. <i>Laser Fundamentals, William T. Silfvast, 2nd edn, Cambridge University press, New York (2004).</i> 2. <i>Fundamentals of Physics, 6th Edition, D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, New York (2001).</i> 3. <i>Introduction to solid state physics, 7th Edn, Charls Kittel, Wiley, Delhi (2007).</i> 4. <i>Concepts of Modern Physics. Arthur Beiser, Tata McGraw-Hill, New Delhi (2010).</i> 5. <i>Fundamentals of Physics, R. Shankar, Yale University Press, New Haven and London (2014).</i> 				
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)				
MODE OF CORRESPONDENCE (email/ phone etc) E.mail: acbose@nitt.edu Phone: 0431-2503605				
COMPENSATION ASSESSMENT POLICY For those who missed Cycle Test I or II, Compensation Assessment will be conducted which cover the syllabus of Cycle Test I and Cycle test II.				
ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed) <ul style="list-style-type: none"> ➤ 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 <ul style="list-style-type: none"> ➤ 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.

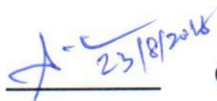
ADDITIONAL INFORMATION

Demonstration and Practice will be given to the students before the regular laboratory. No separate semester exam for laboratory and Each lab session carries equal weightage (5 x20 =35).

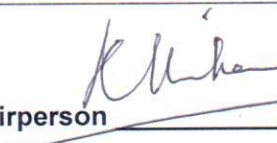
Total theory weightage: 2/3 and Practicals weightage : 1/3

FOR APPROVAL

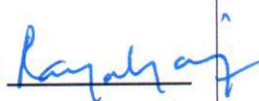
Course Faculty

 23/8/2016

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. Details of compensation assessment to be specified by faculty.
- d) The passing minimum shall be as per the regulations.
- 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.