NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI

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Course Title	Physics - I	Branch	Product	ion Engineering	
		Section		A	
Course Code	PHIR 11	No. of Credits	3 (2 theory	3 (2 theory + 1 lab)	
Department	Physics	Faculty	Dr. K. Balaı	nurugan	
Pre-requisites			Nil		
Course Code	de commencia de la	and the last	INII	Courton de la	
Course Coordinator(s)	Dr. S. Manivan	nan			
(if, applicable)	Dr. N.V. Giridl	idharan			
Other Course	Details available		Telephone	(0431) 250 3616	
Teacher(s)/Tutor(s) E-mail	year coordinator	office	No.	(0431) 250 3613	
Course Type	☑Core	course	Elective course		
	COURSI	E OVERVI	IFW.		
The Physics-I (PHIR11)				ches of engineering	
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	COURSE	OBJECT	IVES		
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journals etc. (by the assignment work)
5. Solving problems that are related to various topics of the course that are customized for the Production Engineering

branch.

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influences of physics on parameters for custom-designed equipment / tools / products.

	COURSE TEACHING AND LEARNING ACTIVITIES				
S.No.	Week	Mode of Delivery			
1. 1-3 (August)		Lasers → Introduction to laser & its characteristics → Spontaneous & stimulated emissions → Einstein's theory on population inversion and lasing action → Laser systems: Ruby, He-Ne and Semiconductor lasers → Applications of lasers → Summary / Sample problems	Chalk & Talk / ppt presentation.		
2.	4-6 (September)	Fiber Optics → Introduction & Physics of / for / in optical fibers → Types of optical fibers → Fabrication of optical fibers → Fiber optic communications → Fiber optic sensors & other applications → Summary / Sample problems	Chalk & Talk / ppt presentation.		
(O4)	7 – 8 (September & October)	Acoustics → Characteristics and measure of intensity of sound / music & absorption coefficient → Reverberation, Sabine's formula and acoustics of buildings → Ultrasonic waves, its production & applications → Summary / Sample problems	Chalk & Talk / ppt presentation.		
4.	9 – 10 (October)	Crystallography → Classifications of solids and crystal structure & symmetry → Miller indices and packing fraction of SC, BCC & FCC unit cells → Bragg's law & X-ray diffraction methods → Summary / Sample problems	Chalk & Talk / ppt presentation.		
5.	11 – 13 (November & December)	Magnetic materials, Conductors and superconductors → Introduction to magnetism and magnetic materials classification → Ferromagnetism, materials' classifications	Chalk & Talk / ppt		

	& applications	presentation.
to Character Tours and	Classical free electron theory and electrical conductivity	All students will without any con
ich depends on the time	Discovery and definition and classification of super-conductors	F. Snotenis can op availability tour
+	BCS theory & High T_c superconductors	
+	Josephson's effect, SQUID devices and	
mili nimaso es sare	applications Summary / Sample problems.	at visitabnamai il. si

S.No.	Assessment by	Week / Date	Duration	Weightage
1.	Quiz I	End of 3 rd week (<i>Topic</i> : Lasers)	30 min	10 %
2.	Mid-term exam.	End of 8 th week (<i>Topics</i> : Fiber Optics and Acoustics)	60 min	20 %
3.	Quiz II	End of 10 th week (<i>Topic</i> : Crystallography)	30 min	10 %
4.	Assignment	gnment End of 13 th week (Topics: Ssuperconductors and its engineering / industrial applications)		10 %
5.	Semester exam.	In the time window od 11 to 22 Dec. 2017 (As per NITT schedule)	180 min	50 %
Total (theory)				
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1. Torsional pedulum				
2. Numerical apertaure of an optical fiber			20 %	
3. Conversion of galvanometer into ammeter and voltmeter			20 %	
4. Dispersive power of a prism			20 %	
5. Rad	ius of curvature of	a lens – Newton rings	eals in that o	20 %
		Tota	l (practical)	100 %

ESSENTIAL READINGS

Text Books

A lo F sup?

- 1. A text book of Engineering Physics, M.N. Avadhanulu and P.G. Kshirsagar, S. Chand and Company, New Delhi (2009).
- 2. Engineering Physics, R.K. Gaur and S.L. Gupta, Dhanpat Rai Publications (P) Ltd., 8th edn., New Delhi (2001).

Reference Books

- 1. Laser Fundamentals, William T. Silfvast, 2nd edn., Cambridge University press, New York (2004).
- 2. Fundamentals of Physics, 6th Edition, D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, New York (2001).
- 3. Introduction to solid state physics, 7th Edn, Charles Kittel, Wiley, Delhi (2007).

COURSE EXIT SURVEY

> All students will be given a feedback form and get chance to give a written feedback, yet without any compulsion.

> Students can optionally give their feedbacks orally as well (which depends on the time availability towards the end of the course time.)

COURSE POLICY

Attendance:

- It is mandatory to have a min. of 75% attendance to appear in the semester examination.
- Already, 25% of attendance has been relaxed for any sickness, family ceremony / festivals and academic / sport activities or any industrial visits etc.
- > Student(s) having less than 75% attendance will not be allowed in semester examination.

Minimum mark to pass the course:

- From the total marks obtained in the theory component of the course, 3/4 will be taken for final grading.
- From the total marks obtained in the laboratory practical component of the course, 1/3 will be taken for final grading.
- To pass in the course each student should score a minimum total (sum of ²/₃ from theory and ½ from practical) of either Class average or 35%, but whichever is higher.

Plagiarism, academic honesty & indiscipline activities etc.:

- > Those who indulge in malpractice such as copying, plagiarism will get punishment which may lead to REDO the course (depending on the actual intensity of the activity).
- > Those who are absent for any of the assessment tests on genuine grounds will be given an opportunity for a retest only.
- > For retest, the student(s) should get prior permission from concerned faculty member (course teacher), Course coordinators and Head of the Department of Physics. The retest will be covering the topics of Lasers, Fiber Optics, Acoustics and Crystallography.
- > The marks for laboratory sessions shall be awarded based on independent experiments, observation, accuracy, skill, punctuality, neatness, etc.
- > Those who fail in the course can appear for the supplementary exam. The laboratory and internal marks shall be considered till his/her B.Tech. programme duration.
- Any misbehavior, indiscipline in the classroom / laboratory / examination hall will be dealt with seriously. In the worst case, the institute's disciplinary committee is empowered to debar the student from the course.

ADDITIONAL COURSE INFORMATION

The lecture materials such as ppt presentation / notes, problems and video lectures shall be displayed by the faculty members. The individual faculty members can be contacted through phone or in person for further discussions and clarifications on a mutually convenient time.

FOR SENATE'S CONSIDERATION

Course Faculty Balanonungan

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CC: Chairman