

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Course Title	Nanoscience, Technology & Applications			
Course Code	PH684	No. of Credits	3	
Department	Physics	Faculty	Dr. J.Hemalatha	
Pre-requisites Course Code	-NIL-			
Course Coordinator(s) (if, applicable)				
Course Teacher(s)/Tutor(s) E-mail	hemalatha@nitt.edu	Telephone No.	04312503608	
Course Type	Core course	<input checked="" type="checkbox"/> Elective course		
COURSE OVERVIEW				
Fundamentals of Nanoscience and technology and also the potential applications in various fields				
COURSE OBJECTIVES				
To impart the basic knowledge on nanoscience and technology which includes the exotic properties of materials at nanoscale, various techniques available for the processing and characterization of nanostructured materials, applications in selected fields such as magnetic recording technology, electronics and biomedical field				
COURSE OUTCOMES (CO)				
Course Outcomes		Aligned Programme Outcomes (PO)		
On successful completion of this course, students would be able to 1. describe important experimental tools in the fields of nano-science 2. understand the quantum mechanical tunnelling of electrons, oscillatory coupling, GMR effect and related applications in devices and MEMs 3. familiarize with the applications of nanotechnology in magnetic recording, quantum computation, drug delivery, nanofluidics and biological devices.		Knowledge on current research topic would be helpful for the placements, as well as, to get into the Nationally and internationally reputed Institutes for post-doctoral research.		
COURSE TEACHING AND LEARNING ACTIVITIES				
S.No.	Week	Topic	Mode of Delivery	
1	1-3 4-6 7-9 10-12 13-15	Nanomaterials and Structures Characterization Tools Nanomagnetism Nanoelectronics and Integrated Systems Biomedical Applications of Nanotechnology	Conventional Conventional/video Ppt/video Conventional/ppt ppt/video	
COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage

1	Assignment-I	4 th week	1 week	5%
2	Cycle Test-I	6 th week	1 Hour	20%
3	Cycle Test-II	11 th week	1 Hour	20%
4	Assignment-II	13 th Week	1 week	5%
5	Final Exam	16 th Week	3 Hours	50%

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

Text Books & Reference Books::

1. Jan Korvink and Andreas Greiner, Semiconductors for Micro and Nanotechnology –an Introduction for Engineers, Weinheim Cambridge: Wiley-VCH (2001).
2. N John Dinardo and Weinheim Cambridge, Nanoscale Characterisation of Surfaces & Interfaces, 2nd edition, Wiley-VCH (2000).
3. Introduction to Nanotechnology, C.P. Poole and F.J. Ownes, Wiley_India (2007).
4. G Timp (ed), Nanotechnology, AIP Press, Springer (1999).
5. M. Wilson, K. Kannangara, G. Smith, M. Simmons and B. Raguse, Nanotechnology: Basic Sciences and Energy Technologies, Overseas Press (2005).
6. Nano: The Essentials, T. Pradeep, Mc-Graw Hill India (2007).

COURSE EXIT SURVEY

Feedback from the students will be collected after 15th week :on knowledge gained, subjects relevant to the course, methodology adopted, aspect of improvement ,whether the topics fulfil the course outcome and program outcome.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

Attendance : Mandatory

ADDITIONAL COURSE INFORMATION

The Course Coordinator is available for consultation in the evenings. Queries may also be emailed to the Course Coordinator directly at hemalatha@nitt.edu

FOR SENATE'S CONSIDERATION

Course Faculty _____

CC-Chairperson _____

HOD _____



