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

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

Text Books & Reference Books::

1. Jan Korvink andAndreas 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, 2ndedition, 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** _____