

**DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI
(Even Semester for the Academic Year 2022 – 2023)**

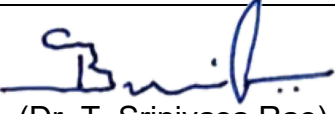


COURSE PLAN – PART I			
Course Title	Nanomaterials and Technology		
Course Code	MT 668	No. of Credits	3
Course Code of Pre-requisite subject(s)	At least one 600 level course related to materials		
Session	January	Section (if, applicable)	-
Name of Faculty	Prof.T. Srinivasa Rao	Department	Metallurgical and Materials Engineering
Email	tsrao@nitt.edu	Telephone No.	7893150786
Name of Course Coordinator(s) (if, applicable)	Dr.S. Muthukumaran		
E-mail	smuthu@nitt.edu	Telephone No.	9442069381
Course Type	<input type="checkbox"/> Core course <input checked="" type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
<p>Concept of nano materials – scale / dimensional aspects, Top-down and bottom-up approaches for preparing nano materials</p> <p>Advantages and limitations at the nano level – thermodynamic aspects at the nano level, health and environmental issues.</p> <p>Characterization of nano materials and nano structures, important characterization techniques for nano size measurement.</p> <p>Overview of properties of nano materials, Introduction to nano composites, processing of nanocomposites.</p> <p>Applications in different areas such as semi-conductors, sensors, nano structured bioceramics and nanomaterials for drug delivery applications.</p>			
COURSE OBJECTIVES			
<p>To know the fundamental concepts of nanomaterials, synthesizing methods, their properties at nanoscale and possible technological applications in various fields of science and engineering.</p>			

[Type here]

COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
At the end of this course, the students would be able to:	
1. Understand the concepts of nanomaterials and their properties	[1,2]
2. Learn different routes of synthesizing methods of nanomaterials	[1,2]
3. Know the change in properties at the nanoscale level and their applications	[1,3]
4. Understanding the risks on producing nanomaterials and safety precautions.	[1,5,6,8,10]

COURSE PLAN – PART II				
COURSE OVERVIEW				
Concept of nano materials – scale / dimensional aspects, Top-down and bottom-up approaches for preparing nano materials. Advantages and limitations at the nano level – thermodynamic aspects at the nano level, health and environmental issues. Characterization of nano materials and nano structures, important characterization techniques for nano size measurement. Overview of properties of nano materials, Introduction to nano composites, processing of nanocomposites. Applications in different areas such as semi-conductors, sensors, nano structured bioceramics and nanomaterials for drug delivery applications.				
COURSE TEACHING AND LEARNING ACTIVITIES				
S.No.	Week/Contact Hours	Topic	Mode of Delivery	
1	January 3 rd , 4 th weeks & February 1 st week	Introduction to materials in general and nanomaterials, synthesis of nanomaterials.	Chalk and Board, PPT	
2	February 2 nd , 3 rd & 4 th weeks	Advantages, limitations, thermodynamic aspects, health and environmental issues.	Chalk and Board, PPT	
3	March 1 & 2 March 3 & 4	Characterization of nanomaterials, using tools like SEM, TEM, STM, FM, etc.	Chalk and Board, PPT	
4	March 4 th , April 1 st & 2 nd weeks	Properties of nano materials, Introduction to nano composites, processing of nanocomposites.	Chalk and Board, PPT	
5	April 3 rd , 4 th weeks & May 1 st week	Applications – semiconductors, sensors, drug delivery, etc.	Chalk and Board, PPT	
COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignment -1	February/March		10
2	Cycle test	March	1 hr	30
CPA	Compensation Assessment*			

[Type here]

3	Assignment - 2	April		10
4	Final Assessment *	April/May	3 hrs	50
*mandatory; refer to guidelines on page 4				
COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)				
Students feedback				
COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, academic honesty and plagiarism etc.)				
<u>MODE OF CORRESPONDENCE (email/ phone, etc.)</u>				
Email/phone				
<u>ATTENDANCE</u>				
Attendance should be more than 75%.				
<u>COMPENSATION ASSESSMENT</u>				
With genuine reason, CPA will be conducted.				
<u>ACADEMIC HONESTY & PLAGIARISM</u>				
Should have moral ethics while preparing the assignments and writing the examinations.				
ADDITIONAL INFORMATION				
FOR APPROVAL				
 (Dr. T. Srinivasa Rao) 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. This is not applicable for project work/industrial lectures/internship.

[Type here]

- d) The policy for attendance for the course should be clearly specified.
- e) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.

[Type here]