

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Chemical Engineering Department
3. Course title/code	Particles and nanotechnology/343
4. Programme(s) to which it contributes	Non
5. Modes of Attendance offered	fall
6. Semester/Year	1 semester/year
7. Number of hours tuition (total)	2
8. Date of production/revision of this Specification	11/6/2016
9. Aims of the Course	
1. To introduce and develop an understanding of particles and nonoparticles this understanding aim to know the production methods ,specification , application ,and safe dealing with fine particles .	

10• Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

- A1.Develop a deep understanding of purification ,sizing and investigation of particles
- A2.Master the ability to make appropriate choices regarding the method of production.
- A3.understanding the main application and method of specification of nanoparticles.

B. Subject-specific skills

- B1. Apply specific method for production .
- B2. Apply the suitable method for specification.
- B3. Understanding the application of nanomaterials in different fields.

Teaching and Learning Methods

Lectures, Tutorials , Example Classes , Informal and formal teamwork , Weekly homework problems

Assessment methods

Midterm exams , Final exam , Quizzes, Weekly homework, Team and homework problems , partial test (Oral questions :- multiple choice ,alternative response), Open questions that have a definite answer

C. Thinking Skills

- C1. An ability to apply effective, creative and innovative solutions, both independently and cooperatively, to current and future problems.
- C2. Solve reaction engineering problems through logic.
- C4. Characterization, analyses and evaluate scientific and engineering information and identify knowledge gaps and opportunities to fine and nanoparticles technology.

Teaching and Learning Methods

Lectures, Tutorials , Example Classes , Informal and formal teamwork , Weekly homework problems , Analysis of cases linked to the work environment , Practical Applications

Assessment methods

Midterm exams , Final exam , Quizzes, Weekly homework, Team and homework problems , partial test (Oral questions :- multiple choice ,alternative response), Open questions that have a definite answer , or do not have a definite answer

D. General and Transferable Skills (other skills relevant to employability and personal development).

D1. Work together in same-discipline teams to solve problems.

D2. To review state-of-the-art concepts for process intensification and design approaches used for fine particles and nanoparticles.

D3. Speed intuitive, predictability and evaluate information and ideas in the handling of nanotechnology issues

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 st semester					
1	2	Understanding the powder and nanotechnology and their application in many field, Particle size analysis	Introduction to particle and nanotechnology, Particle size analysis	Lectures, Tutorials , Example Classes , Practical	partial test (Oral questions :- multiple choice ,alternative response), Open questions that have a definite answer , or do not have a definite answer
2		Understanding The size,shape and sampling	Definition of size,shape and sampling	Lectures, Tutorials , Example Classes , Practical	
3		Knowing the of measurements	Methods of measurements		
4		Knowing the characterization methods	Characterization of powders	Lectures, Tutorials , Example Classes ,	
5		Understanding the mixing method and techniques	Powder mixing and segregation	Lectures, Tutorials , Example Classes , Practical	
6		Understanding methods of processing	Particle processing	Lectures, Tutorials , Example Classes , Practical	
7		Understanding methods of milling and grinding	Size reduction – comminution / milling	Lectures, Tutorials , Example Classes , Practical	

8			Mid course Examination	Lectures, Tutorials , Example Classes , Practical	
9		Understanding the concept of nanotechnology	Nano-particle technology	Lectures, Tutorials , Example Classes , Practical	
10		Knowing the different chemical and physical processing methods	Production, properties and behavior of nanomaterial	Lectures, Tutorials , Example Classes , Practical	
11		Knowing different technique for characterization	Characteristic methods of nanoparticles (SEM,TEM,XRD,XRF, AFM..)	Lectures, Tutorials , Example Classes , Practical	
12		Knowing the field of application	Application of nanomaterials: In filtration, Energy, environment, catalyst	Lectures, Tutorials , Example Classes , Practical	
13		Assessment hazard and control	Fire and explosion hazards of powders	Lectures, Tutorials , Example Classes , Practical	
14		Knowing health safety and safe dealing with nanomaterials	Industrial dust control and health risks	Lectures, Tutorials , Example Classes , Practical	
15			Final examination		

12. Infrastructure

Required reading:

- CORE TEXTS
- COURSE MATERIALS
- OTHER

Lecturers

1. Handbook of analytical methods for material ,INC.2001
2. Introduction to nanotechnology by Henrik Bruus(2004)

Special requirements (include for example workshops, periodicals, IT software, websites)	websites
Community-based facilities (include for example, guest Lectures , internship , field studies)	field trips

13. Admissions	
Pre-requisites	Before undertaking this module the student should have undertaken the following: Material science and engineering CE.232
Minimum number of students	Non
Maximum number of students	Non