

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	Combustion Eng /CE.348
4. Programme(s) to which it contributes	ME.374
5. Modes of Attendance offered	Fall
6. Semester/Year	1 semester/year
7. Number of hours tuition (total)	3
8. Date of production/revision of this Specification	
9. Aims of the Course	
1. Study the nature of combustion ,scope of internal combustion engine	
2. Types of flame ,study the effect of temp and pressure	
3. study the types of solid fuels and the drying of solid fuels	
4. Furnaces and furnaces efficiency	

10• Learning Outcomes, Teaching ,Learning and Assessment Method
A- Knowledge and Understanding A1.Develop a deep understanding of issues related to the combustion reaction A2.Master the ability to make appropriate choices regarding the reaction step(s) of a combustion. A3.Explain and derive heat balance equations for gas fired furnace combustion.
B. Subject-specific skills B1. Compare combustion types B2. Analyze combustion chemistry for solid and liquid fuels. B3. Analyze the type of flame and explain the effect of reactant pressure and temperature on laminar burning velocity.
Teaching and Learning Methods Lectures, Tutorials, Weekly homework problems
Assessment methods Midterm exams , Final exam , Quizzes, Weekly homework, Oral questions
C. Thinking Skills C1- Solve reaction engineering problems through logic. C2-Characterization, analyses and evaluate scientific and engineering information for combustion engineering
Teaching and Learning Methods Lectures, Tutorials , Example Classes, 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 , 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 engineering problems.

D2. Speed intuitive, predictability and evaluate information and ideas in the handling of combustion chemistry.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 st semester					
1	3	Fundamentals	1. History of combustion	Lectures,	Oral questions :-
2		Uses	Gaseous and vapour fuel	Lectures,	test
3		Types	Furnaces	Lectures,	tutorials
4		The useful heat output and efficiency	Furnaces energy balance	Example	tutorials
5		types	Flames	Lectures,	Oral questions
6		In gases and solid fuels	Adiabatic flame and diffusion	Lectures,	Quizzes
7		Introduction and effect of stoichiometry	Laminar premixed flame	Example	Oral questions
8		Effect of pressure and temperature	Laminar premixed flame	Example	Oral questions
9		Higher and lower heating value	Heat of formation and absolute enthalpy	Lectures	Weekly homework

10		Model formulation	Gas and droplet velocities	Lectures	Quizzes
11		Analysis of liquid spray formation	- Fuel injectors	Lectures	Oral questions
12	2	The mechanism of breakup of liquid	Spray dynamics	Lectures	Oral questions
13		For fuel contain (C,H ₂ O ₂)	Stoichiometry calculations	Example	WEEKLY HOMEWORK
14		Heat of reaction and latent heat of vaporization	Chemical energy	Lectures	Quizzes
15		The most important of solid fuels	Solid fuels	Example	Oral questions
2nd semester					
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12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	<ul style="list-style-type: none"> ○ Lecturers ○ STEPHEN.R.TURNS.”An introduction to combustion”MC Grw HILL 2012 ○ GARY,L.BORMAN ”Combustion Engineering” MC Grw HILL 1998
Special requirements (include for example workshops, periodicals, , 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: Basic Principles of chemical engineering I and II , chemistry , mathematics I and II ,Physical chemistry , as well simultaneous courses:- Thermodynamics , and applied mathematics
Minimum number of students	
Maximum number of students	