

**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	Petroleum Refining/ CE.445
4. Programme(s) to which it contributes	Non
5. Modes of Attendance offered	Fall
6. Semester/Year	2 semester/ 4 year
7. Number of hours tuition (total)	3
8. Date of production/revision of this Specification	01/06/2016
9. Aims of the Course : <b>Summary of the main learning outcomes for students enrolled in the course.</b>	
1. Being familiar with composition of petroleum, origin and formation of petroleum, evaluation of petroleum ,thermal properties of petroleum, fractions , important product properties, and type of refineries.	
2. Understanding Introduction to Processing : Stabilization, Dehydration, heating of and Fractionation Of Petroleum, and design techniques of some equipments	
3. Understanding conversion processes: Thermal Cracking, Catalytic Cracking, Catalytic Reforming,and Alkylolation, Isomerization. Products Blending. and Sperting Processess , design techniques of some equipments	

## 10• Learning Outcomes, Teaching ,Learning and Assessment Method

### A- Knowledge and Understanding

- A1. To familiarize the students with the crude oil properties and fuel product quality.
- A2. To provide an overview of the type of petroleum refinery and the processes employed to convert crude oil and intermediate streams into finished products.
- A3. General principles of design techniques of some equipment used in refinery : heating of crude oil and distillation column.
- A4. Understanding the fundamentals of each refining process .
- A5. Provide a way to meet product demands and specification

### B. Subject-specific skills

- B1. The ability to evaluate the crude oil .
- B2. The ability to design some equipment used in petroleum refinery .
- B3. The ability to provides major insights the main processes used in petroleum refinery.

### 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 , or do not have a definite answer

### C. Thinking Skills : the students should be able to:

- C1. Perform complete mass and energy balances for some chemical engineering plants used in refinery .
- C2. Apply the principles of separation processes and process thermodynamics to systems
- C3. Characterization and analyses the crude oil to select the appropriate processes.
- C4. Combined the principles of chemical engineering including thermodynamics: mass and energy

### 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 , 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 the petroleum refinery

## 11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
<b>2<sup>nd</sup> semester</b>					
1	3	To provide an overview of the petroleum refinery	<b>Petroleum Processing Overview :</b> History of Petroleum Production, What is Petroleum, History of Petroleum Processing, Modern Petroleum Processing.	Lectures,	Midterm exams , final exam , partial test (oral questions :- multiple choice
2	3	To familiarize the students with Refinery Feed-stocks and Products.	<b>Refinery Feed-stocks and Products.</b>	Lectures,	Midterm exams , final exam , partial test (oral questions :- multiple choice ,alternative response ), open questions
3	3	Evaluate the crude oil, to familiarize the students with the crude oil properties and Characterization and analyses the crude oil	<b>Thermo-physical Properties of Petroleum Fractions and Crude Oils:</b> Specific Gravity, Boiling Point Curves	Lectures, tutorials , example classes , practical applications, home work, and team work	Midterm exams , final exam , partial test (oral questions :- multiple choice), open questions, and home work
4	3	Evaluate the crude oil, to familiarize the students with the crude oil properties and Characterization and analyses the crude oil	<b>Thermo-physical Properties of Petroleum Fractions and Crude Oils:</b> Breakup of TBP Curve into Pseudo-components, Thermo-physical Properties Calculation.	Lectures, tutorials , example classes , practical applications, home work, and team work	Midterm exams , final exam , partial test (oral questions :- multiple choice ,alternative response ), open questions and home work
5	3	Understanding the design techniques of this equipment and the ability to design its	<b>Heating of Crude Oil</b>	Lectures,	Midterm exams , final exam ,partial , and open questions
6	3	Understanding the fundamentals of the process and Combined the principles of chemical engineering	<b>Crude Distillation:</b> Desalting Crude Oils.	Lectures, practical applications	Midterm exams , final exam, partial test (oral questions), open questions
7	3	Understanding the fundamentals of the process and combined the principles of chemical	<b>Crude Distillation:</b> Atmospheric Distillation Unit { Material and Energy Balances, Reflux, Overflash,	Lectures, tutorials , example classes ,	Midterm exams , final exam , partial test (oral questions ,alternative response ), open questions

		engineering			
8	3	Perform complete mass and energy balances	<b>Crude Distillation</b> :Overhead Temperature, Side Draw Temperature, Bottom Temperature, Tower Diameter}, Vacuum Distillation Unit.	Lectures, tutorials , example classes , and home work	Midterm exams , final exam , partial test (oral questions), open questions and home work
9	3	Understanding the fundamentals of the process and ability to provides major insights the process , and the ability to design its	<b>Conversion Processes:</b> Visbreaking, Coking, Fluid Catalytic Cracking, Hydrotrating and Hydrocracking	Lectures, tutorials , example classes ,	Midterm exams , final exam , partial test (oral questions :- multiple choice ,alternative response ), open questions
10	3	Understanding the fundamentals of the process and evaluate scientific and engineering information and ability to provides major insights the process , and the ability to design its	<b>Upgrading Naphtha:</b> Catalytic Reforming, Isomerization	Lectures, tutorials , example classes , home work and team work	Midterm exams , final exam , partial test (oral questions :- multiple choice ), and home work
11	3	Allocate the available blending components in such a way to meet product demands and specification at the least cost	<b>Product blending :</b>	Lectures, tutorials , example classes , and home work	Midterm exams , final exam , partial test (oral questions, alternative response ), open questions and home work
12	3	Understanding the fundamentals of the process and evaluate scientific and engineering information and ability to provides major insights the process ,	<b>Supporting Processes:</b> Hydrogen Production, Gas Processing Unit, Acid Gas Removal, Sulfur Recovery Processes.	Lectures	

12. Infrastructure	
<p>Required reading:</p> <ul style="list-style-type: none"> <li>· CORE TEXTS</li> <li>· COURSE MATERIALS</li> <li>· OTHER</li> </ul>	<ul style="list-style-type: none"> <li>○ Lecturers</li> <li>1) Petroleum Refining, Technology and Economics, JAMES A. GARY &amp; GLENN E. HANDWERK" 4th Edition , Marcel Dekker ,Inc (2001)</li> <li>2) Petroleum Refinery Engineering, W. L. Nelson, 4th Edition (McGraw- Hill Book Company, New York, (1958)</li> <li>○ Other support books :-</li> <li>1) Modern Petroleum Refining Processes B.K. Bhaskara Rao , 3rd Edition, Oxford &amp; IBH Publishing Company Pvt. Ltd. New Delhi (1988).</li> <li>2) Petroleum and gas field processing"H. K. Abdel-Aal and Mohamed eggour" MARCELD DEKKER,Inc (2003)</li> </ul>
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: Chemistry, fuel technology.
Minimum number of students	Non
Maximum number of students	Non