

Module Details	
Module Title	Upstream Production and Refinery Operations
Module Code	CPE7007-B
Academic Year	2021/2
Credits	20
School	Department of Chemical Engineering
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Lectures	24
Tutorials	16
Directed Study	160

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims
The objective is to provide the students with expert level knowledge of upstream petroleum and refining processes synthesis, simulation and design.

Outline Syllabus
Onshore/offshore oil recovery, well-field processing, three-phase separation, crude oil stabilization, gas sweetening, gas dehydration, other gas processing processes, water treatment processes, environmental constraints of processes, crude oil desalting, distillation (atmospheric and vacuum), alkylation, catalytic reforming, cracking, coking, desulfurization, blending, heat exchanger network for energy recovery, FCC. Products discharge or exports to market. For the given coursework, the students will carry out detailed simulation using ASPEN and/or gPROMS.

Learning Outcomes	
Outcome Number	Description
01	Synthesise the right process configurations for any given well fluid and crude oil quality and design the entire upstream petroleum and refining processes with the given product quality constraints as well as HSE (health, safety and environment) concerns.
02	Critically evaluate current research and address solutions to complex problems of the upstream petroleum and refining operations emerging from current research.
03	Apply assumptions to complex problems in order to gain useful design information and models, individually and in a team and to present clear procedures for a given design problem.

Learning, Teaching and Assessment Strategy
The learning material is delivered through a series of online lectures (primarily on Zoom) so that the students participate and discuss during the sessions (LO1-3). Lectures discuss the engineering technologies, chemical processes and scientific parameters involved in the upstream production and refining operations met in the petroleum industry. Case studies sourced from current research in the chemical processing technologies of the upstream production and refining operations are based on the syllabus of the delivered lectures and modelled/simulated in the coursework. Case studies of coursework promote the critical ability of the students and knowledge dissemination. Courseworks are supported by tutorial sessions (LO2-3), which promote teamwork, development of ICT skills (simulation/ modeling) while students remotely access the required simulation/modelling software, e-learning, peer evaluation and feedback and self-learning. Computer laboratory-based tutorial sessions will be delivered each week. Students are given feedback on theoretical and practical aspects during the online lectures and tutorials respectively, in preparation for their course works. Announcements and discussions on the VLE will further support students' enquiries and feedback. Feedback after the submission deadline of each coursework will be provided on the VLE but also as discussions during the delivered sessions or by individual/ group requests. Learning outcomes are assessed by 2 pieces of course work released the first week for Coursework 1 and the fourth week for Coursework 2. Courseworks 1 and 2 are group works. The individual mark of the student is decided based on the peer review by the students. Coursework 1 is submitted as a 3,500-word report and Coursework 2 is submitted as a 5,500-word report along with their respective simulation/modelling file. All courseworks are simulations and/ or modelling of chemical processing technologies of the upstream production and refining operations. Students are assessed on their problem solving, analysing their results and their extended understanding of the engineering technologies, chemical processing and scientific parameters in the upstream processing and refining operations of the petroleum industry and identifying health, safety and environmental concerns. Simulation and optimisation of a process technology assess the students' problem formulation and solving ability.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	Detailed sim using ASPEN and/or gPROMS on entire petroleum and refining processes (3000 wds) exclud'g. figs/tables/sim	60%
Summative	Coursework - Written	Detailed sim using ASPEN and/or gPROMS on entire petroleum and refining processes (2000 wds) exclud'g. figs/tables/sim	40%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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