UNIVERSITY of BRADFORD

Module Details	
Module Title	Upstream Production and Refinery Operations
Module Code	CPE7007-B
Academic Year	2023/4
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 simulations using ASPEN and/or gPROMS as appropriate.

Learning Outcomes

Outcome Number	Description
O1	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.
O2	Critically evaluate current research and address solutions to complex problems of the upstream petroleum and refining operations emerging from current research.
O3	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 lectures 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 IT skills (simulation/modelling) while students access the required software either on campus or through remote provision, 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 coursework 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 2000-word report and Coursework 2 is submitted as a 3000-word report along with their respective simulation/modelling files.

All pieces of coursework simulate and/or model 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/gPROMS on entire petroleum and refining processes (3000 word report plus figs,tables,sim files)	40%
Summative	Coursework - Written	Detailed sim using ASPEN/gPROMS on entire petroleum and refining processes (3000 word report plus figs,tables,sim files)	60%

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