

| Module Details |                                    |
|----------------|------------------------------------|
| Module Title   | Petroleum Engineering              |
| Module Code    | CPE6006-B                          |
| Academic Year  | 2021/2                             |
| Credits        | 20                                 |
| School         | Department of Chemical Engineering |
| FHEQ Level     | FHEQ Level 6                       |

| Contact Hours                  |       |
|--------------------------------|-------|
| Type                           | Hours |
| Lectures                       | 30    |
| Tutorials                      | 4     |
| Practical Classes or Workshops | 6     |
| Directed Study                 | 160   |

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

| Module Aims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <p>1) To provide students with a basic understanding of petroleum production processes.</p> <p>2) To describe the origin of fossil fuels, the location and capacity of known reserves of oil and natural gas, and calculation of the physical and chemical characteristics of crude oils and natural gas.</p> <p>3) To provide students with a background to the principles of petroleum production technology (focused on surface and upstream production) reservoir fluid and rock properties, relevant unit operations and design calculations.</p> |

| Outline Syllabus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <ul style="list-style-type: none"> <li>- Petroleum Production Engineering including surface production.</li> <li>- Analysis of performance of a production well (steady state, transient and pseudo-steady state).</li> <li>- Explain wellhead surface and sub-surface production facilities.</li> <li>- Calculation of rock and fluid properties (oil and gas).</li> <li>- Process design of two phase separators used in surface production operations.</li> <li>- Perform pressure drop calculations for multi-phase flow in horizontal and vertical wellhead production pipes.</li> </ul> |

| Learning Outcomes |                                                                                                                                                                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outcome Number    | Description                                                                                                                                                                      |
| 01                | Describe the stages and the function of upstream petroleum production such as vessels, valves and pipelines.                                                                     |
| 02                | Describe the stages and the function of upstream petroleum production such as vessels, valves and pipelines.                                                                     |
| 03                | Critically evaluate petroleum production systems and interpret data, use scientific method and solve problems systematically e.g. using Aspen Hysys process simulation software. |

| Learning, Teaching and Assessment Strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <p>Theory, implementation, application, and critical analysis is gained through lectures, tutorials, case studies and directed study. Engineering application and evaluation is gained from three Aspen Hysys computer workshop. Note that due to current COVID19 pandemic, the module uses a blended approach to support learning and achievement. Short video records that address key concepts, supplementary materials from website and e-books. Online tutorials will also be used to support learning and monitor progress as student move through the curriculum. Several online quizzes as a kind of formative assessment along the semester 2.</p> <p>This module satisfies the below Learning Outcomes as specified by the Accreditation of Higher Education Programmes: Third Edition (AHEP3) as published by The Engineering Council in-line with the UK Standard for Professional Engineering Competence (UK-SPEC). These outcomes specify six key areas of learning: Science and Mathematics (SM), Engineering Analysis (EA), Design (D), Economic, Legal, Social, Ethical and Environmental Context (EL), Engineering Practice (P) and Additional General Skills (G).<br/> SM1b, EA1b, EA3b, D3b, D4, D6, P2, P4, P8, G2, G3b, SM1m, SM5m, SM6m, EA1m, EA3m, D3m, P2m.<br/> Further details of these learning outcomes can be found at <a href="https://www.engc.org.uk/">https://www.engc.org.uk/</a>.<br/> Assessment is both formative and summative. Formative assessment mainly by online quizzes on understanding and application. Summative assessment on calculation, application and critical analysis by examination completed within a 24 hour period; online quizzes (formative), assessment of engineering application assessed by a process simulation coursework using Aspen Hysys software.</p> |

| Mode of Assessment |                           |                                                                                  |           |
|--------------------|---------------------------|----------------------------------------------------------------------------------|-----------|
| Type               | Method                    | Description                                                                      | Weighting |
| Summative          | Examination - Closed Book | Students required to answer questions within 2 hours with details of calculation | 70%       |
| Summative          | Coursework - Written      | One group report based on process simulation using Aspen Hysys.                  | 30%       |
| Formative          | Not assessed              | Online multiple choice quizzes (4x 15 minutes)                                   | N/A       |

| Reading List                                                                                                                                             |
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| To access the reading list for this module, please visit <a href="https://bradford.rl.talis.com/index.html">https://bradford.rl.talis.com/index.html</a> |

**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.*

