CHEN30015 Process Engineering Case Studies

Credit Points:	12.5
Level:	3 (Undergraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 1 x two hour lecture + 1 x three hour workshop per week Total Time Commitment: Estimated 170 hours
Prerequisites:	Students must have completed the following subjects prior to enrolling in this subject:

Subject	Study Period Commencement:	Credit Points:
CHEN30005 Heat and Mass Transport Processes	Semester 1, Semester 2	12.50
CHEN30001 Reactor Engineering	Semester 1	12.50

(Prior to 2010 CHEN40003 Reactor Engineering)

CHEN30005 Heat and Mass Transport Processes may be taken concurrently

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	CHEN90017 Process Engineering Case Studies
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry.The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Dr Dalton Harvie
Contact:	Email: **daltonh@unimelb.edu.au (mailto:daltonh@unimelb.edu.au)**
Subject Overview:	**AIMS** This subject provides an introduction to process work in process engineering, focusing specifically on process safety and sustainability. Material taught in other chemical engineering subjects will be reinforced via a series of assignments in which ill-defined and open-ended process engineering problems will be tackled. This subject covers the following technical topics: # Development and application of selection criteria for making appropriate, context-specific engineering decisions # Process simulation techniques including heat and power integration # Process safety, including HAZOP and Quantitative Risk Assessment techniques # Sustainable engineering processes, including Life Cycle Analysis techniques and an understanding of waste management # Environmental Impact Assessment # Technical report writing.

	INDICATIVE CONTENT Several assessment tasks combine to form a capstone project. Within this project students, in teams of three or four, perform design tasks related to the development of a waste treatment facility. This capstone project culminates in an Environmental Effects Statement assignment. Several industry speakers, from the waste and environmental areas, talk and provide content to aid with this assignment.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject the student is expected to: 1 Approach and solve open-ended design problems in process engineering 2 Be congisant of the context in which engineering processes take place 3 Use pinch analysis and energy analysis techniques to minimise plantwide energy consumption 4 Perform HAZOP and QRA safety Analyses 5 Construct an Environmental Impact Assessment 6 Use sustainable engineering practices, such as Life Cycle Analysis 7 Write a professional engineering technical report.
Assessment:	Two Essays (20% total - 10% each); each consisting of no more than 700 words each (word limits do not include appendices, diagrams, tables, computations or computer output). Overall time commitment of approximately 20-25 hours (10-13 hours per assignment). All Intended Learning Outcomes (ILOs) are addressed in the essays. One essay due in the first-half of semester and the second due in the second-half of semester Seven in-class assignments (50%), each to be completed within a 3 hour workshop session. Preparation time of up to 6 hours for each workshop (including pre-reading tasks). All ILOs are addressed in the assignments. Delivered throughout the semester starting from week 2 Two major assignments (30% total - 15% each); each consisting of no more than 1000 words in length (word limits do not include appendices, diagrams, tables, computations or computer output). Overall time commitment of approximately 30-40 hours (15-20 hours per assignment) . All ILOs are addressed in the major assignments. One assignment due in the first-half of semester and the second due in the second-half of semester.
Prescribed Texts:	None
Recommended Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	# Ability to apply knowledge of basic science and engineering fundamentals # Ability to communicate effectively, not only with engineers but also with the community at large # Ability to undertake problem identification, formulation and solution # Ability to utilise a systems approach to design and operational performance # Ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams # Understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development.
Notes:	**LEARNING AND TEACHING METHODS** Within this subject there is a mix of learning and teaching methods employed: # Lectures where technical content is reviewed # Group-based time-limited workshops. Students are expected to complete reading tasks prior to these workshops. The pre-reading may or may not be based upon technical content previously delivered in lectures. Peer assessment techniques are employed within these workshops

	# One of the larger assignments (take home) uses industrially relevant computer simulation packages. Computer lab time/space is made available # When examining the wider context in which engineers operate, videos and other multimedia material are employed # Several (>10) external speakers also place the knowledge learnt/practiced in current engineering context. **INDICATIVE KEY LEARNING RESOURCES** Lecture notes and relevant multimedia material are provided throughout the course (available for download from LMS). Students are expected to use the library, internet and other resources to research some of the topics themselves. **CAREERS / INDUSTRY LINKS** Depending on year-to-year availability and relevance to the various chosen projects, typically more than 10 external (industry) speakers participate in this course. Alongside providing valuable context to the projects and detailing current practice, these external speakers also outline current employment opportunities within the profession and give overviews of their particular industrial area.
Related Majors/Minors/ Specialisations:	B-ENG Chemical Engineering stream B-ENG Chemical and Biomolecular Engineering stream Chemical Systems Master of Engineering (Biochemical) Master of Engineering (Chemical with Business) Master of Engineering (Chemical) Science-credited subjects - new generation B-SCI and B-ENG.