CHEN90013 Process Engineering

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 1 x one hour lecture per week + 1 x three hour workshop per week Total Time Commitment: Estimated 200 hours
Prerequisites:	Students must have taken ALL of 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
CHEN90032 Process Dynamics And Control	Semester 2	12.50
CHEN30015 Process Engineering Case Studies	Semester 2	12.50

AND ONE OF the following subjects (may be taken concurrently):

Subject	Study Period Commencement:	Credit Points:
CHEN90020 Chemical Engineering Management	Semester 1	12.50
ENGM90011 Economic Analysis for Engineers	Semester 1	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	CHEN40007 Process Engineering
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
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Subject Overview:	**AIMS** This subject aims to develop critical thinking skills essential for work in the chemical process and other industries. Students will learn by tackling ill-defined engineering tasks, learn to

	organise and prioritise tasks to meet deadlines and improve their analytical and written communication skills. They will gain an appreciation of the tools and resources used in the design of process plants. Their understanding of issues relating to project management and plant safety will also be deepened. This subject provides grounding in chemical engineering process design and feasibility studies prior to the final design subject CHEN90022. **INDICATIVE CONTENT** Students will conduct chemical plant feasibility and design studies through a series of assignments that analyse process plant feasibility, the sensitivity of process economics to external influences and consider the technological, market, environmental and other effects on project viability. Students will learn how to design chemical plants, including the necessary documentation, and consider control strategies for safe operation. Student teams will discuss tools and resources available for the design of chemical processes and the critical analysis of information sources. Issues relating to project and safety management will be discussed and professional-quality technical reports and oral presentations delivered throughout the semester.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILOs)** On completion of this subject the student is expected to: 1 Understand the steps involved in designing a chemical processing facility. 2 Competently undertake many aspects of the design process. 3 Understand the technical and non-technical aspects of design, in particular the need for such a facility to operate safely and economically. 4 Demonstrated an ability to communicate technical information orally or in written reports.
Assessment:	One written literature review performed in week 1. Expected to take 7-9 hours outside of class and 1 week to complete (6%). Intended Learning Outcomes (ILO) 3, 5 and 6 will be addressed in the literature review One large material and energy balance conducted in class during a 3 hourr workshop (6%). Assessed in Week 2. ILOs 4 -6 will be addressed in this project One individually prepared written assignment on sustainability (8%). Expected to take 9-12 hours to complete outside of class and 4 weeks to complete. Due week 2 -6. ILOs 2, 5 and 6 will be addressed in this assignment One individually prepared written assessment interfacing with research (6%). Expected to take 7-9 hours each outside of class and 1 week to complete. Due week 3. ILOs 5 and 6 will be addressed in this assessment One written process flow diagram performed in week 4 (6%). Expected to take 7-9 hours outside of class and 1 week to complete. Due in week 4. ILOs 1, 5 and 6 will be addressed in this assessment Two written group assignments designing a major piece of equipment conducted in week 5-7 and week 7-9 (16.5%). Assessed in week 5-7 and week 7-9. Each expected to take 21-25 hours to complete within 3 weeks. ILOs 2, 5 and 6 will be addressed this assignment. One short 5 minute individual oral presentation conducted in weeks 5 and 6 (6%), expected to require 7-9 hours of preparation One individual written report on reducing greenhouse gas emissions (8%). Expected to take 9-12 hours to complete outside of class and 4 weeks to complete. Assessed week 6- 10. ILOs 5 and 6 will be addressed in this assessment One written report developing a Process and Instrumentation Diagram (15%). Expected to take 20 -25 hours to complete within 2 weeks. Due in week 10-11. ILOs 1, 5 and 6 will be addressed in this assessment One written Hazop developed within a 3 hour workshop class (22.5%). Due in week 12. ILO 2, 5 and 6 will be addressed in the Hazop.
Prescribed Texts:	None
Recommended Texts:	Albright, L., (Ed.), , 2008, *Albright's Chemical Engineering Handbook*, CRC Press (note: this is available as an e-book through the library) Seider, W.D., Seader, J.D., Lewin, D.R., Widagdo, S., 2009, *Product and Process Design Principles: Synthesis, Analysis, and Evaluation*, Third Edition, John Wiley
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 analyse and utilise a variety of information sources

	# Ability to communicate effectively, not only with engineers but also with the community at large # Ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member # Understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development.
Notes:	**LEARNING AND TEACHING METHODS** The subject will be delivered through a combination of lectures and workshops. Students will work independently and in small teams. Discussion boards are also used for problem solving outside of the workshops. **INDICATIVE KEY LEARNING RESOURCES** Students will have access to lecture notes and lecture slides. Books, journals, and web-based sources will also be used to develop solutions in workshops and key engineering software programs used to present key documents. **CAREERS / INDUSTRY LINKS** A number of industrial processes will be used to illustrate case studies with the industry varying from year to year.
Related Majors/Minors/ Specialisations:	B-ENG Chemical Engineering stream B-ENG Chemical and Biomolecular Engineering stream Master of Engineering (Biochemical) Master of Engineering (Chemical with Business) Master of Engineering (Chemical)