CHEN30001 Reactor Engineering

Credit Points: 12.50

Level: 3 (Undergraduate)

Dates & Locations:

2012, Parkville

This subject commences in the following study period/s:
Semester 1, Parkville - Taught on campus.

Time Commitment: Contact Hours: 2 x one hour lecture and 1 x two hour lecture per week, 1 x one hour tutorial per week and 2 x three hour laboratory sessions per semester Total Time Commitment: Estimated 120 hours

Prerequisites:

Students must have completed ALL of the following:

Subject	Study Period Commencement:	Credit Points:
MAST10009 Accelerated Mathematics 2	Semester 2	12.50

OR:

Subject	Study Period Commencement:	Credit Points:
MAST10006 Calculus 2	Semester 1, Semester 2	12.50

AND:

Subject	Study Period Commencement:	Credit Points:
CHEN20008 Chemical Process Analysis 2	Semester 2	12.50
CHEM20018 Reactions and Synthesis	Semester 1	12.50

CHEM20018 Reactions and Synthesis may also be taken concurrently

OR

Admission to the Master of Engineering (MC-ENG), plus both of the following:

Subject	Study Period Commencement:	Credit Points:
CHEN20008 Chemical Process Analysis 2	Semester 2	12.50
CHEM20018 Reactions and Synthesis	Semester 1	12.50

CHEM20018 Reactions and Synthesis may also be taken concurrently

Corequisites: None

Recommended Background Knowledge: None

Non Allowed Subjects: CHEN40003 Reactor Engineering

Core Participation Requirements: For the purposes of considering applications for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005) and Students Experiencing Academic Disadvantage Policy, this subject requires all students to actively and safely participate in laboratory activities. Students who feel their disability may impact upon their participation are encouraged to discuss this with the Subject Co-ordinator and the Disability Liaison Unit http://www.services.unimelb.edu.au/disability

Coordinator:	Prof Greg Qiao
Contact:	Email: **gregghq@unimelb.edu.au (mailto:gregghq@unimelb.edu.au)**
Subject Overview:	This subject introduces students to aspects of reactor system design. Topics covered include ideal batch and flow reactors, the approximation of reaction systems using combinations of plug flow reactors and continuously stirred tank reactors. Also covered are the use of multiple reactors of identical and differing sizes, temperature effects on both non-adiabatic and adiabatic operation and issues associated with temperature instability. Non-ideal flow in reactors is also covered including residence time distributions, tracer tests, conversion in non-ideal reactors, micromixing and macromixing.
Objectives:	On completion of this subject students should be able to: # Interpret data from both ideal and non-ideal batch, plug flow and mixed flow reactors # Model more complex flowing reactor systems using combinations of idealized plug flow and continuously stirred tank ranks # Design simple reactor systems # Predict simple temperature profiles in reacting systems
Assessment:	One written three hour end-of-semester examination (70%) A written 2-hour mid-semester test and two lab reports during the semester (30% in total) A mark of 40% or more in the end-of-semester examination is required to pass the subject
Prescribed Texts:	O. Levenspiel, Chemical Reaction Engineering, 3rd Ed, John Wiley & Sons, Inc., New York,1999
Recommended Texts:	R. W. Missen, C. A. Mims and B. A. Saville, Introduction to chemical reaction engineering and kinetics, John Wiley & Sons, Inc, New York,1999 H.S.Fogler, Elements of chemical reaction engineering, 3rd Ed., Prentice Hall PTR, New Jersey, 1999
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2012/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2012/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2012/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2012/B-MUS)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	On completion of this subject students should have developed team work skills and enhance the following generic skills: # Ability to undertake problem identification, formulation and solution # Capacity for independent thought # Ability and self-confidence to comprehend complex concepts, to express them lucidly and to confront unfamiliar problem
Related Course(s):	Bachelor of Engineering Bachelor of Engineering (Biomedical)Biocellular
Related Majors/Minors/ Specialisations:	B-ENG Chemical Engineering stream B-ENG Chemical and Biomolecular Engineering stream Chemical Systems Master of Engineering (Biomolecular) Master of Engineering (Chemical)

	Science-credited subjects - new generation B-SCI and B-ENG. Core selective subjects for B-BMED.