411-433 Reactor Engineering

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Total Time Commitment: Not available
Prerequisites:	610-141 Chemistry A and 610-142 Chemistry B
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Assoc Prof G Qiao
Subject Overview:	Basic concepts, ideal reactors, interpreting batch reactor data - no volume change, batch reactor data - complex reactions, batch reactor data - variable volume and differential method. Ideal reactor performance - batch reactor, ideal reactor performance - mixed flow reactor, ideal reactor - plug flow reactor, ideal reactor - performance comparison. Multiple reactors - mexed and plug flow reactors of identical size, multiple reactors - reactors of varying sizes, recycle plug flow reactor. Temperature effects - non-adiabatic operation, temperature effects - adiabatic operation, temperature instability. Non-ideal flow in reactors: residence time distributions, tracer tests, conversion in non-ideal reactors. Rate controlling mechanisms: film resistance control, chemical reaction control, surface and pore diffusion control, ash layer diffusion, shrinking core mechanisms, effectiveness factors and the Thiele modulus. Kinetic regimes for fluid-fluid and gas-fluid reactions.
Assessment:	One written 3-hour end-of-semestser examination (80%); a written 2-hour mid-semester test or a reactor design assignment (20%). An overall mark of 50% and a mark of 40% or more in the end of semester examination are needed to pass the subject.
Prescribed 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:	The subject will enhance the following generic skills: # The ability to undertake problem identification, formulation and solution # The capacity for independent thought # The ability and self confidence to comprehend complex concepts, to express them lucidly and to confront unfamiliar problems.
Related Course(s):	Bachelor of Engineering (Biomedical)Biocellular