# CHEN40003 Reactor Engineering

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| **Credit Points:** | 12.50 |
| **Level:** | 4 (Undergraduate) |
| **Dates & Locations:** | 2010, Parkville<br>This subject commences in the following study period/s:<br>Semester 1, Parkville - Taught on campus. |
| **Time Commitment:** | Contact Hours: Forty Eight Hours Total Time Commitment: Estimated 120 hours |
| **Prerequisites:** | # 411-257 Chemical Process Analysis 2 or 411-102 Chemical Process Analysis,<br># 610-283 Reactions and Synthesis or 610-211 Light Matter and Chemical Change<br># 620-155 Calculus 2. |
| **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 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:** | Prof Greg Qiao |
| **Contact:** | Melbourne School of Engineering Office<br>Building 173, Grattan Street<br>The University of Melbourne<br>VIC 3010 Australia<br>General telephone enquiries:<br>+ 61 3 8344 6703<br>+ 61 3 8344 6507<br>Facsimiles:<br>+ 61 3 9349 2182<br>+ 61 3 8344 7707<br>Email: **eng-info@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:<br># Interpret data from both ideal and non-ideal batch, plug flow and mixed flow reactors<br># Model more complex flowing reactor systems using combinations of idealized plug flow and continuously stirred tank ranks<br># Design simple reactor systems<br># Predict simple temperature profiles in reacting systems |

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| **Assessment:** | One written three hour end-of-semester examination (70%)a written 2-hour mid-semester test and assignments later in 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<br># H.S.Fogler, **Elements of chemical reaction engineering**, 3rd Ed., Prentice Hall PTR, New Jersey, 1999 |
| **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:** | On completion of this subject students should have developed team work skills and enhance the following generic skills:<br># Ability to undertake problem identification, formulation and solution;<br># Capacity for independent thought;<br># Ability and self-confidence to comprehend complex concepts, to express them lucidly and to confront unfamiliar problem. |
| **Related Course(s):** | Bachelor of Engineering (Biomedical)Biocellular |