

CHEN90018 Particle Mechanics and Processing

Credit Points:	12.50															
Level:	9 (Graduate/Postgraduate)															
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.															
Time Commitment:	Contact Hours: 4 x one hour lectures + 1 x one hour tutorial per week Total Time Commitment: Estimated 120 hours															
Prerequisites:	<p>Students must have completed the following subject prior to enrolling in this subject:</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>ENGR30001 Fluid Mechanics & Thermodynamics</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>As well as ONE OF the following subjects (or an equivalent):</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST20029 Engineering Mathematics</td> <td>Summer Term, Semester 1, Semester 2</td> <td>12.50</td> </tr> <tr> <td>MAST20009 Vector Calculus</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	ENGR30001 Fluid Mechanics & Thermodynamics	Semester 1, Semester 2	12.50	Subject	Study Period Commencement:	Credit Points:	MAST20029 Engineering Mathematics	Summer Term, Semester 1, Semester 2	12.50	MAST20009 Vector Calculus	Semester 1, Semester 2	12.50
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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:	Dr Anthony Stickland															
Contact:	Email: peterjs@unimelb.edu.au (mailto:peterjs@unimelb.edu.au)															
Subject Overview:	Particle size and measurement of particle size, shape factors, differential and cumulative distributions, mean size, median size and surface area. Generalised description of separation and classification efficiency based on particle size, density and composition. Hydrocyclones, screens and data reconciliation for particulate separators, including the two product formula. Comminution, Bond work index, matrix description of size reduction and milling circuit simulation, comminution circuits and liberation of particles from composite particles. Flow properties of solids, design of bins and hoppers, mass and channel flow. Solid-liquid separation including flocculation processes, gravity sedimentation, clarification, thickening and pressure filtration. Motion of particles in fluids, fluidisation, minimum fluidisation velocity and bed expansion, flow of fluids through granular beds.															
Objectives:	<p>Upon completion of this unit, students will have</p> <ul style="list-style-type: none"> # An appreciation of the flow behaviour of particulate materials and the design of unit operations associated with particulate slurries in a range of unit operations common to the materials, food, water, pharmaceuticals and minerals processing industries # They will be familiar with the unit operations in comminution and particle liberation, particle separation, hopper flow, solid-liquid separation and fluidisation and flow through packed beds 															

Assessment:	One written 3-hour end-of-semester examination (80%) A written 1-hour mid-semester test or assignment not exceeding 2000 words (20%)A mark of 40% or more in the end of semester examination is required to pass the subject
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:	The subject will enhance the following generic skills <ul style="list-style-type: none"> # Ability to undertake problem identification and solution # Capacity for independent thought # Awareness of advanced technologies in the discipline # Ability and self confidence to comprehend complex concepts, to express them lucidly and to confront unfamiliar problems
Related Course(s):	Bachelor of Engineering (Chemical Engineering) Bachelor of Engineering (Chemical and Biomolecular Engineering) Bachelor of Engineering (Chemical) and Bachelor of Arts Bachelor of Engineering (Chemical) and Bachelor of Commerce Bachelor of Engineering (Chemical) and Bachelor of Laws Bachelor of Engineering (Chemical) and Bachelor of Science Bachelor of Engineering (EngineeringManagement) Chemical
Related Majors/Minors/ Specialisations:	B-ENG Chemical Engineering stream B-ENG Chemical and Biomolecular Engineering stream Master of Engineering (Biomolecular) Master of Engineering (Chemical)