

411-432 Particle Mechanics and Processing

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:	Contact Hours: Forty-eight hours Total Time Commitment: Not available
Prerequisites:	411-203 Fluid Mechanics and 431-202 Engineering Analysis B (prior to 2001, 421-205 Engineering Analysis) or equivalent
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	<p><p>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.</p> <p>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</p></p>
Coordinator:	Prof P J Scales
Subject Overview:	<p>Upon completion of this unit, students will have 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.</p> <p>Content: 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 and density, composition and magnetic susceptibility. 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.</p>
Assessment:	One written 3-hour end-of-semester examination (80%); a written 1-hour mid-semester test (20%).
Prescribed Texts:	None
Recommended Texts:	Information Not Available
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 # 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 Bachelor of Engineering(Biochemical Engineering)and Bachelor of Science