

411-449 Minerals, Materials and Recycling

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Thirty-two hours of lectures, sixteen hours of tutorials and computer laboratory Total Time Commitment: Not available
Prerequisites:	411-432 Particle Mechanics and Processing (prior to 2005 411-332), 411-303 Reactor Engineering (prior to 2005 411-433), 411-204 Chemical Engineering Thermodynamics
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><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> </p>
Coordinator:	Assoc Prof G Franks
Subject Overview:	<p>Students successfully completing this unit should understand the complex interaction of processes within the material cycle ie. starting with consumer products, primary material production, material properties and ending with recycled material, waste and environmental issues. This will be based on material science principles, thermodynamics, kinetics (etc.) as well as system engineering and optimization. The students will understand the relationships between materials composition, processing, microstructure and properties.</p> <p>Content: Industrial Ecology, materials in consumer products, survey of the relationship between metals and non-metals production and the industrial cycle of materials and recycling. Application of fundamental principles to simulate material systems. Advanced aspects of physico-chemical principles of oxide and sulphide processing, to produce metals and ceramic products from ores as well as a recycled materials and consumer products. The systems approach to recycling of products, process sustainability and environmental considerations. The relationship between product sophistication, material properties, separation efficiency and recycling. Case studies, such as the optimization of a material flow system by the use of optimization procedures, thermodynamics, physical separation principles, will be part of the course. Also included are a review of interatomic bonding, material atomic structure, phase diagrams and equilibria, and material mechanical, electrical and magnetic properties. Finally the process of developing material selection criteria and selecting materials for particular applications will be presented.</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:	<p>The subject will enhance the following generic skills:</p> <ul style="list-style-type: none"> # capacity for independent thought # awareness of advanced technologies in the discipline # ability to apply knowledge of basic science and engineering fundamentals # ability to undertake problem identification, formulation and solution # ability to utilise a systems approach to design and operational performance
Related Course(s):	<p>Bachelor of Engineering (Chemical Engineering) Bachelor of Engineering (Chemical) and Bachelor of Science</p>