CHEN90010 Minerals, Materials and Recycling

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2011.
Time Commitment:	Contact Hours: 4 x one hour lectures per week Total Time Commitment: Total Time Commitment: Estimated 120 hours
Prerequisites:	Students must have taken the following subject prior to enrolling in this subject

Subject	Study Period Commencement:	Credit Points:
CHEN90018 Particle Mechanics and Processing	Semester 1	12.50
CHEN30001 Reactor Engineering	Semester 1	12.50
ENGR30001 Fluid Mechanics & Thermodynamics	Semester 1, Semester 2	12.50

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/
Contact:	Email: **gvfranks@unimelb.edu.au (mailto:gvfranks@unimelb.edu.au)**
Subject Overview:	The importance of the minerals industry to the Australian economy. Liberation, size reduction, size separation and concentration separations in minerals processing. Extractive metallurgy, including hydrometallurgy and pyrometallurgy. Aspects of physico-chemical principles of mineral separation processes to produce metals and ceramic products from ores as well as recycled materials and consumer products. The influence of interatomic bonding and material atomic structure on material behaviour. Phase diagrams and equilibria as well as material mechanical, electrical and magnetic properties will be covered. The process of developing material selection criteria and selecting materials for particular applications will be presented. The systems approach to recycling of products, process sustainability and environmental considerations.
Objectives:	On completion of this subject students should be able to: # Understand the complex interaction of processes within the material cycle i.e. starting with primary material production from minerals, material production and properties, consumer products and ending with recycled material, waste and environmental issues. This will be based on material science principles, thermodynamics, system engineering and optimization. # The students will understand the relationships between materials composition, processing, microstructure and properties. # The students will be able to select materials for particular engineering design applications.
Assessment:	One written 3-hour end-of-semester examination (70%)Continuous assessment comprising regular assignments (30%)
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: # Capacity for independent thought # Awareness of advanced technologies in the discipline # Ability to apply knowleddge 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):	Bachelor of Engineering (Chemical Engineering)
Related Majors/Minors/ Specialisations:	Master of Engineering (Biomolecular) Master of Engineering (Chemical)