ENGR90015 Mining Geotechnics and Mine Design

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: One 1 hour lecture + one 2 hour tutorial per week. Total 36 hours Total Time Commitment: 144 hours (including non-contact time).
Prerequisites:	400-686 (ENGR00012) Soil Rock and Tailings Mechanics. 400-688 (ENGR00014) Underground Mining and Planning Methods (can be taken concurrently).
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/
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Subject Overview:	The subject is an introduction to the application of geomechanics principles for the investigation of conditions, the design and the operation of a mine. Mining includes open pit, dredging and underground methods, for granular materials, coal and hard-rock geologic environments. Each of the range of components of the application of geomechanics are covered: **Geomechanical investigations of conditions:** • Logging and mapping of cores and exposures. • Geophysical surveys. • Field and laboratory measurements of the properties of materials. **For open pits:** • Pit-wall slope angles. • Excavatability of materials. • Support of pit-walls. • Monitoring and mapping of pit-walls. • Location and design of waste storages. • Assessment of risk. **For underground mining:** • dimensioning and sequencing of stopes.

	• support and stabilisation of stopes, including placement of backfill. • cavability and fragmentation of ore. • location, design and support of mine infrastructure. • monitoring and mapping of excavations and backfill. • assessment of risk. **Generally:** • management of the application of geomechanics advice. • codes of practice and regulation of mining.
Objectives:	# An understanding of the role and scope of geomechanics specialists in mining. # A sound basis for management of the incorporation of geomechanics specialist advice for mine planning and operations, be it from company or consultant sources. # Awareness of the circumstances in which geomechanics specialist advice ought to be sought and applied, and of how that can be engaged and applied. # Awareness of the complex nature of soil, rock, backfill and waste materials, and the risks that they pose for mining operations.
Assessment:	• Formally supervised written examination - 3 hours 30% (end of semester 2). • Project assignment (3,000 words limit) 30%(commencing at the start of semester).• 3 Homework assignments (1,500 words limit each) each of equal value, totalling 40%, commencing in Weeks 2, 5, and 8.
Prescribed Texts:	J. Jaeger, N. G. Cook and R. Zimmerman –"Fundamentals of Rock Mechanics", Blackwell, 2007.W. Pariseau – Design Analysis in Rock Mechanics, Taylor & Francis, 2006.B. Brady & E. Brown – Rock Mechanics for Underground Mining, Kluwer, 2004.C. Bise – Mining Engineering Analysis, SME 2003.
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 an understanding of underground mining principles necessary to develop a geological resource into a successful operating underground mine. # Analytical, critical and creative thinking, with an aptitude for continued self-directed learning. # Sense of intellectual curiosity. # Ability to interpret data and research results. # Sense of intellectual integrity and ethics of scholarship. # Writing, problem-solving and communication skills. # Ability to learn in a range of ways, including through information and communication technologies. # Capacity to confront unfamiliar problems. # Ability to evaluate and synthesise the research and professional literature. # Ability to develop models of practical applications and evaluate their performance by rigorous analytical means and by programming computer simulations. # Capacity to manage competing demands on time, including self-directed project work. # An understanding of underground mining principles necessary to develop a geological resource into a successful operating underground mine.
Notes:	Students will need access to PC/laptop.
Related Course(s):	Graduate Certificate in Engineering (Environmental Engineering) Master of Mining Engineering Postgraduate Certificate in Engineering