BIEN20002 Metabolic Engineering

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 32 hours of lectures, 8 hours of tutorials and 8 hours of practical work Total Time Commitment: Estimated 120 hours
Prerequisites:	411-254 Biomolecular Process Principles or 411-694 Biology for Engineers
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 Sally Louise Gras
Contact:	Melbourne School of Engineering Office Building 173, Grattan Street The University of Melbourne VIC 3010 Australia General telephone enquiries: + 61 3 8344 6703 + 61 3 8344 6507 Facsimiles: + 61 3 9349 2182 + 61 3 8344 7707 Email: **eng-info@unimelb.edu.au (../../../)**
Subject Overview:	Students will learn about metabolism and metabolic pathways including catabolism and anabolism and variations on these pathways for prokaryotic and anaerobic cells. The role of enzymes in metabolic pathways will be explored including enzyme kinetics and enzyme inhibition along with the application of immobilised enzymes to industrial processing. The control of metabolism will form a central theme, including enzymatic and genetic control. Case studies in Metabolic Engineering will also be developed that concern the bioprocess industries. Metabolic Engineering techniques and Genetic manipulation will also be explored as methods to enable improved cellular and metabolic properties. Practical work (enzyme kinetics)
Objectives:	On completion of this subject students should be able to # Describe cell metabolism and the control of cell metabolism for aerobic and anaerobic organisms. # Apply systems approaches to describe and model cell metabolism. # Develop creative strategies to decouple and remove metabolic regulatory controls in order to increase product yield or develop new products.

	# Discuss the role of metabolic engineering in product development, the regulatory standards that apply to such products and the business drivers for product development. # Discuss the synergies between biochemistry and chemical engineering # Work in teams to process primary scientific information, perform laboratory assignments # Communicate their knowledge and findings to their peers and to broader audiences.
Assessment:	One written 3-hour end-of-semester examination (80%)An assignment not exceeding 2000 words (10%) Practical work assignments not exceeding a combined total of 2000 words (10%).
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: # Capacity for independent thought # The ability to comprehend complex concepts and communicate lucidly this understanding # Awareness of advanced technologies in the discipline # Ability to work in a team, including with professionals from different discipline areas
Notes:	This subject will be offered from 2010 onwards.