411-652 Bionano Engineering

Credit Points:	12.500
Level:	Graduate/Postgraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Thirty-six hours; Non contact time commitment 84 hours. Total Time Commitment: Not available
Prerequisites:	None
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 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. 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
Coordinator:	Assoc Prof Dave Dunstan
Subject Overview:	Nanotechnology, and biotechnology, history and definition, nano-particles and surface forces, emulsions, surfactant self assembly, polymers and proteins. the role of surfaces in processing and materials manufacture related to nanotechnology. Characterisation methods in nanotechnology; electrokinetics, nano-particle dispersions and stability criterion. Inter-particle forces and parameters that influence flow and gelation properties. Nano-particle characterisation using light scattering electron microscopy and fluorescence methods. Solution properties of polymers, macromolecules, self assembly surfactants, lipids, proteins and polysaccharides. The role of self assembly in the formation of structured nano and biomaterials. Cell assembly and molecular components. Biochemical functions of proteins. Nano-particle formation through precipitation. Surface layer structure, fictionalisation and biocompatibility of nano-particles for pharmaceutical, drug delivery biossay, biosensor and immunology applications.
Assessment:	One 3-hour examination contributing 60% of the final assessment and two assignments each of up to the equivalent of 4000 words contributing 40% of the assessment.
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. # The ability to analyse and solve open-ended problems. # The ability to comprehend complex concepts and communicate lucidly this understanding. # Awareness of advanced technologies in the discipline.

	# The ability to work in a team (practical work component).
Related Course(s):	Master of Biomedical Engineering