

## 600-652 Tissue Engineering and Stem Cells

<b>Credit Points:</b>	12.50
<b>Level:</b>	9 (Graduate/Postgraduate)
<b>Dates &amp; Locations:</b>	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
<b>Time Commitment:</b>	Contact Hours: 48 hours comprising 3 one-hour lectures per week and 1 one-hour tutorial per week. Total Time Commitment: Not available
<b>Prerequisites:</b>	None
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	650-121 Biomolecules and Cells or equivalent 620-155 Calculus II or equivalent 610-150 Chemistry for Biomedicine or equivalent
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	<p>&lt;p&gt;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.&lt;/p&gt;         &lt;p&gt;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: &lt;a href="http://services.unimelb.edu.au/disability"&gt;http://services.unimelb.edu.au/disability&lt;/a&gt;&lt;/p&gt;</p>
<b>Coordinator:</b>	Assoc Prof Andrea O'Connor
<b>Subject Overview:</b>	This subject will detail the scope and potential of tissue engineering and the potential roles of different types of stem cells in tissue engineering. It will address the use of biomaterials in tissue engineering; major scaffold materials and fabrication methods, scaffold, strength and degradation; cell-surface interactions, surface recognition, biocompatibility and foreign body reactions; the role and delivery of growth factors for tissue engineering applications; in vitro and in vivo tissue engineering strategies, challenges, cell culture, scale-up issues and transport modelling; ethical and regulatory issues. In addition clinical applications of tissue engineering will be discussed, such as bone regeneration, vascular grafts, breast reconstruction, cardiac and corneal tissue engineering, and organogenesis (e.g. pancreas).
<b>Objectives:</b>	<p>On completion of this subject students should be able to:</p> <ul style="list-style-type: none"> <li>- discuss the motivation and current status of tissue engineering developments;</li> <li>- describe the sources, selection, potential manipulation and challenges of using stem cells for tissue engineering;</li> <li>- describe the design criteria, materials selection and fabrication methods for biomaterial scaffolds; and</li> <li>- discuss the challenges of in vivo implantation of biomaterials and scale up issues relating to human clinical applications of tissue engineering and stem cells.</li> </ul>
<b>Assessment:</b>	Two assignments each between 2,000 and 3,000 words, one due mid-semester and one due towards the end of semester, contributing 20% to the final mark; as well as an end of semester examination not exceeding three hours contributing 80% of the final mark. A mark of 40% or more in the end of semester examination is required to pass the subject.

<b>Prescribed Texts:</b>	None
<b>Recommended Texts:</b>	TBA
<b>Breadth Options:</b>	This subject is not available as a breadth subject.
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Generic Skills:</b>	<p>Upon completion of this subject, students should gain the ability to:</p> <ul style="list-style-type: none"> <li>- apply knowledge of basic science and engineering fundamentals;</li> <li>- undertake problem identification, formulation and solution;</li> <li>- utilise a systems approach to design and operational performance; and</li> <li>- function effectively as an individual and in multidisciplinary and multicultural teams, with the capacity to be a leader or manager as well as an effective team member.</li> </ul>
<b>Notes:</b>	This subject is co-taught with the undergraduate subject 411-394 Tissue Engineering and the postgraduate subject 411-651 Tissue Engineering.
<b>Related Majors/Minors/Specialisations:</b>	R05 PB Master of Science (Biotechnology)