

## BTCH90008 Tissue Engineering and Stem Cells

<b>Credit Points:</b>	12.50						
<b>Level:</b>	9 (Graduate/Postgraduate)						
<b>Dates &amp; Locations:</b>	2012, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.						
<b>Time Commitment:</b>	Contact Hours: 1 x two hour lecture + 1 x one hour lecture + 1 x one hour tutorial per week Total Time Commitment: Estimated 120 hours						
<b>Prerequisites:</b>	None						
<b>Corequisites:</b>	None						
<b>Recommended Background Knowledge:</b>	It is recommended that students have completed ANY ONE of: <b><u>BIOL10004 Biology of Cells and Organisms</u></b> ( <a href="#">../view/2012/BIOL10004</a> ) <b><u>BIOL10002 Biomolecules and Cells</u></b> ( <a href="#">../view/2012/BIOL10002</a> ) <b><u>CHEN90008 Biology for Engineers</u></b> ( <a href="#">../view/2012/CHEN90008</a> ) <b><u>BTCH90006 Bioprocess Engineering/CHEN30014 Bioprocess Engineering</u></b> ( <a href="#">../view/2012/BTCH90006</a> ) As well as ONE OF: <b><u>CHEM10006 Chemistry for Biomedicine</u></b> ( <a href="#">../view/2012/CHEM10006</a> ) <b><u>CHEM10003 Chemistry 1</u></b> ( <a href="#">../view/2012/CHEM10003</a> ) And: <b><u>MAST10006 Calculus 2</u></b> ( <a href="#">../view/2012/MAST10006</a> )						
<b>Non Allowed Subjects:</b>	<table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>BMEN90011 Tissue Engineering &amp; Stem Cells</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	BMEN90011 Tissue Engineering & Stem Cells	Semester 2	12.50
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BMEN90011 Tissue Engineering & Stem Cells	Semester 2	12.50					
<b>Core Participation Requirements:</b>	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: <a href="http://www.services.unimelb.edu.au/disability/">http://www.services.unimelb.edu.au/disability/</a>						
<b>Coordinator:</b>	Assoc Prof Andrea O'Connor						
<b>Contact:</b>	Email: <a href="mailto:a.oconnor@unimelb.edu.au">a.oconnor@unimelb.edu.au</a> ( <a href="mailto:a.oconnor@unimelb.edu.au">mailto:a.oconnor@unimelb.edu.au</a> )						
<b>Subject Overview:</b>	Students studying Tissue Engineering and Stem Cells will become familiar with the history, scope and potential of tissue engineering, and the potential role of stem cells in this field. This subject will address the use of biomaterials in tissue engineering; major scaffold materials and fabrication methods, scaffold strength and degradation; cell sources, selection, challenges and potential manipulation; cell-surface interactions, biocompatibility and the foreign body reaction; 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; clinical applications of tissue engineering, such as bone regeneration, breast reconstruction, cardiac and corneal tissue engineering, and organogenesis (e.g. pancreas).						
<b>Objectives:</b>	On completion of this subject/ course students should be able to: # Explain the significance, current status and future potential of tissue engineering						

	<ul style="list-style-type: none"> <li># Identify key challenges in tissue engineering of different human tissue</li> <li># Describe the design, fabrication and biomaterials selection criteria for tissue engineering scaffolds</li> <li># Describe the sources, selection, potential manipulations and challenges of using stem cells for tissue engineering</li> <li># Use simple models to quantify aspects of bioreactor design explain the ethical and regulatory issues of significance in tissue engineering</li> <li># Discuss the challenges of in vivo implantation of biomaterials and scale-up issues relating to human clinical applications</li> </ul>
<b>Assessment:</b>	One 3-hour examination contributing 70% of the final assessment Two assignments each of up to the equivalent of 4000 words contributing 30% of the assessment
<b>Prescribed Texts:</b>	None
<b>Recommended Texts:</b>	None
<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>On successful completion of this subject, students should be able 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</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>Related Course(s):</b>	Master of Biotechnology