

<b>STRUTTURA</b>	Scuola Politecnica - DICGIM
<b>ANNO ACCADEMICO</b>	2014-15
<b>CORSO DI LAUREA MAGISTRALE</b>	Ingegneria Chimica
<b>INSEGNAMENTO</b>	MATERIALS AND PROCESSES FOR TISSUE ENGINEERING
<b>TIPO DI ATTIVITÀ</b>	Caratterizzante
<b>AMBITO DISCIPLINARE</b>	Ingegneria Chimica
<b>CODICE INSEGNAMENTO</b>	17581
<b>ARTICOLAZIONE IN MODULI</b>	NO
<b>NUMERO MODULI</b>	
<b>SETTORI SCIENTIFICO DISCIPLINARI</b>	Ing-Ind/22
<b>DOCENTE RESPONSABILE</b>	Vincenzo La Carrubba Professore Associato Università di Palermo
<b>CFU</b>	6
<b>NUMERO DI ORE RISERVATE ALLO STUDIO PERSONALE</b>	96
<b>NUMERO DI ORE RISERVATE ALLE ATTIVITÀ DIDATTICHE ASSISTITE</b>	54
<b>PROPEDEUTICITÀ</b>	
<b>ANNO DI CORSO</b>	2
<b>SEDE DI SVOLGIMENTO DELLE LEZIONI</b>	Consultare il sito <a href="http://politecnica.unipa.it">politecnica.unipa.it</a>
<b>ORGANIZZAZIONE DELLA DIDATTICA</b>	Lezioni frontali, Esercitazioni in aula, Esercitazioni in laboratorio
<b>MODALITÀ DI FREQUENZA</b>	Facoltativa
<b>METODI DI VALUTAZIONE</b>	Prova Scritta + Prova Orale
<b>TIPO DI VALUTAZIONE</b>	Voto in trentesimi
<b>PERIODO DELLE LEZIONI</b>	Consultare il sito <a href="http://politecnica.unipa.it">politecnica.unipa.it</a>
<b>CALENDARIO DELLE ATTIVITÀ DIDATTICHE</b>	Consultare il sito <a href="http://politecnica.unipa.it">politecnica.unipa.it</a>
<b>ORARIO DI RICEVIMENTO DEGLI STUDENTI</b>	Martedì e giovedì, ore 15-17

<p><b>LEARNING OUTCOMES</b></p> <p><b>Knowledge and understanding</b>  Introducing the tissue engineering and regenerative medicine concept.  Define the key concepts of cell biology, bioengineering, histology and anatomy useful for understanding the tissue engineering and regenerative medicine paradigm.  Define properties and features of materials and processes used in tissue engineering.</p> <p><b>Applying knowledge and understanding</b>  Choosing the most appropriate processes and materials for a given tissue engineering application</p> <p><b>Making judgements</b>  Identifying the most important processes and materials for tissue engineering applications, highlighting differences, analogies, advantages and disadvantages in a comparative way</p> <p><b>Communication skills</b></p>
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Studente should be able to communicate with competence and language skills about materials and processes for tissue engineering applications, including mechanical properties, biodegradation, surface properties, porosity requirements.

### Learning skills

Students should be able to assess with autonomy a basic tissue engineering problem, with the aim of define the solution strategies

### LEARNING OBJECTIVES

1. Introduce the fundamentals of prosthetic systems and regenerative medicine
2. Define the main structural and functional properties of the materials used for regenerative medicine and tissue engineering
3. Scrutinize the main production processes of tissue engineering scaffolds and regenerative medicine devices
4. Selecting the most appropriate production process with respect to a well defined target

ORE FRONTALI	LEZIONI FRONTALI
2	The History of prosthetic devices, Tissue Engineering and Regenerative Medicine.
5	Introduction to cell biology and celle cultures: culture media, growth and differentiation, tissue formation. Cell-biomaterial interaction. Inflammatory and immunitary response.
4	Tissue Engineering and Regenerative Medicine paradigm: Goals and methods.
4	Scaffolds for tissue engineering. Strategies for the design.
5	Introduction to istology and anatomy: skin, cartilage, cardiovascular system (blood vessels) and respiratory system (bronchial tube)
5	Materials used in tissue engineering applications: natural and synthetic polymers
5	Methods used in tissue engineering (scaffold production)
6	Methods for scaffold production based on phase separation: thermodynamics and kinetic implications
4	Biodegradation issues in tissue engineering: hydrolitic and enzymatic degradation
	<b>ESERCITAZIONI</b>
12	Case studies of in-vitro tissue engineering: skin, blood vessels, bronchiole tube
<b>TESTI CONSIGLIATI</b>	Articoli scientifici, Review e dispense fornite dal docente