

**City University of Hong Kong**  
**Course Syllabus**

**offered by Department of Biomedical Sciences**  
**with effect from Semester B 2017/2018**

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**Part I Course Overview**

**Course Title:** Stem Cell and Regenerative Medicine

**Course Code:** BMS8106

**Course Duration:** One semester

**Credit Units:** 3

**Level:** R8

**Proposed Area:**  
*(for GE courses only)*

Arts and Humanities  
 Study of Societies, Social and Business Organisations  
 Science and Technology

**Medium of Instruction:** English

**Medium of Assessment:** English

**Prerequisites:**  
*(Course Code and Title)* Nil

**Precursors:**  
*(Course Code and Title)* Nil

**Equivalent Courses:**  
*(Course Code and Title)* Nil

**Exclusive Courses:**  
*(Course Code and Title)* Nil

## Part II Course Details

### 1. Abstract

Stem cells are undifferentiated biological cells that can have the potential to differentiate into cells that are found throughout the body. This fundamental property of stem cells suggests that they can potentially be used to replace degenerative cells within the body, and regenerate the functional capacity of organ systems that have deteriorated because of disease or aging. Thus this course provides an overview of the latest advances in the field of stem cell biology and regenerative medicine including but not limited to fundamental scientific knowledge and technological concepts of stem cells and stem cell based tissue regeneration. The student will examine the underlying principles of the normal processes of repair and regeneration in humans. Various processes on the tissue, organ and organism levels will be used as examples to highlight conserved principles governing tissue repair and regeneration. The student will integrate their prior knowledge of cell and molecular biology, tissue engineering and genetics, to analyse the regulation of processes leading to tissue repair and regeneration.

### 2. Course Intended Learning Outcomes (CILOs)

No.	CILOs <sup>#</sup>	Weighting * (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Distinguish the different patterns of tissue repair and organ regeneration in humans		✓		
2.	Discover key molecular players and modulating factors in the biology of repair, regeneration and replacement			✓	
3.	Compare and contrast the operational principles of molecular therapy, stem cell therapy, biologically-inspired materials and novel biomaterials			✓	
4.	Comprehend and evaluate current literature on biological functionality and compatibility, and applications of microand nanotechnology of these emerging technologies			✓	
5.	Appraise the various approaches in manipulating the regeneration process in humans		✓		
		100%			

\* If weighting is assigned to CILOs, they should add up to 100%.

<sup>#</sup> Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1: Attitude

*Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.*

A2: Ability

*Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.*

A3: Accomplishments

*Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.*

### 3. Teaching and Learning Activities (TLAs)

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lecture, tutorial	To learn through teaching.	✓	✓	✓	✓	✓	39 hours in total
Quiz, test, assignment, presentation, case studies, etc.	To understand basic concepts and theories of curves and surfaces.	✓	✓	✓	✓	✓	

### 4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: 40%							
Quiz, test, assignment, presentation, case studies, etc.	✓	✓	✓	✓	✓	40%	
Examination: 60% (duration: 2 hours)							
* The weightings should add up to 100%.						100%	

## 5. Assessment Rubrics

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
Quiz, test, assignment, presentation, case studies, etc.	Ability to show the learning progress, analyse and express the synthesis of ideas and knowledge	Outstanding performance on all CILOs. Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.	Substantial performance on all CILOs. Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.	Satisfactory performance on the majority of CILOs possibly with a few weaknesses. Being able to profit from the course experience; understanding of the subject; ability to develop solutions to simple problems in the material.	Barely satisfactory performance on a number of CILOs. Sufficient familiarity with the subject matter to enable the student to progress without repeating the course.	Unsatisfactory performance on a number of CILOs. Failure to meet specified assessment requirements, little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature
Examination	Ability to synthesize, state and apply the principles and subject matter learnt in the course					

**Part III Other Information** (more details can be provided separately in the teaching plan)

**1. Keyword Syllabus**

- Biology and technology of tissue repair and organ regeneration
- Key molecules and cells in regeneration: techniques and analysis
- Emerging technologies of molecular and stem cell therapies, tissue engineering and novel biomaterials
- Regeneration and aging society
- Medical and ethical implications of regenerative medicine

**2. Reading List**

**2.1 Compulsory Readings**

Nil

**2.2 Additional Readings**

1.	Engineering Biomaterials for Regenerative Medicine: Novel technologies for Clinical Applications, editor: Sujata Bhatia, to be published by Springer in Nov 2011, ISBN-10:1461410797
2.	Principles of Regenerative Medicine, Bruce Carlson, published by Elsevier