

City University of Hong Kong
Course Syllabus

offered by Department of Biomedical Sciences
with effect from Semester A 2017/18

Part I Course Overview

Course Title:	Molecules and Cells
Course Code:	BMS2801
Course Duration:	One Semester
Credit Units:	3 credits
Level:	B2
Proposed Area: <i>(for GE courses only)</i>	<input type="checkbox"/> Arts and Humanities <input type="checkbox"/> Study of Societies, Social and Business Organisations <input type="checkbox"/> Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: <i>(Course Code and Title)</i>	
Precursors: <i>(Course Code and Title)</i>	BCH1200 Discovery in Biology
Equivalent Courses: <i>(Course Code and Title)</i>	BCH2804 Molecules and Cells (for students who took BCH2804 during academic year from 2011/2012 to 2014/2015)
Exclusive Courses: <i>(Course Code and Title)</i>	BCH 2003 Biochemistry, BCH 2071 Biological Chemistry

Part II Course Details

1. Abstract

(A 150-word description about the course)

Biomolecular structures allow us to understand the molecular nature of healthy cells and treat the underlying molecular causes of disease. Our cells contain thousands of molecules that must all work in concert to keep us healthy. This course will introduce the students to the molecules and the biochemical processes which support life. This course aims to: **(1)** develop in students an understanding of the structures of biomolecules such as carbohydrates, lipids, nucleic acids and proteins; **(2)** students will learn about their functions and biochemical reaction and to acquire a comprehensive view of energy metabolism, basic metabolic pathways and their controls; **(3)** they will develop an appreciation of biomolecules in relation to health, diseases and biotechnology. This course will also introduces the basics of cell biology; **(4)** they will learn about structures and functions of cellular components such as the cell membrane, and nuclei; **(5)** students will learn the intimate relationship between “structure” and “function” in a cell: how specialized cellular structures are evolved to accommodate and facilitate particular biochemical reactions of the biomolecules and how the defects in cellular structures can lead to diseases; **(6)** they will also learn that cells possess genetic information and the means to use it; **(7)** students will learn about the biochemical and mechanical activities taking place inside cells. This course serves as an introduction to biochemistry and cell biology.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe the structure, bonding and property of major biomolecules in life	25%	✓		
2.	Discover the variety of biochemical reactions occurring inside cells	25%	✓	✓	
3.	Relate structures of the cellular components to their functions in cellular transport, replication and differentiation	20%		✓	✓
4.	Describe the mechanical principles of cytoskeleton on intracellular transport, cell locomotion and cellular maintenance	20%		✓	✓
5.	Integrate biochemical knowledge and cell biology concepts to human health and society	10%		✓	✓
		100%			

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

[#] 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)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lectures & Tutorials	Students will be taught in lectures on various molecular structures and functions, understand biochemical reactions, to investigate the mechanisms of cell transport and replication, comprehend how the mechanical properties of intracellular molecules facilitate intracellular transport and cell movement, and examine how diseases are developed due to the structural alterations in molecule	✓	✓	✓	✓	✓	
Group discussions	Students will be divided into groups and have group discussions to examine how diseases are developed due to the structural alterations in molecule					✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: <u>30</u> %							
Coursework (home assignments, quizzes and presentation)	✓	✓	✓	✓	✓		
Examination: <u>70</u> % (duration: 3hrs, if applicable)							
* The weightings should add up to 100%.						100%	

"Minimum Passing Requirement" for BMS courses:

A minimum of 30% in coursework as well as in examination, in addition to a minimum of 40% in coursework and examination taken together.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Assignment	The number of correct answers and the quality of the answer.	Accurately answered all the questions. Well organised text and coherent logic.	Correctly answered >80% of the questions.	Correctly answered 60% to 80% of the questions.	Correctly answered 40% to 60% of the questions.	Did not hand in the assignment on time. Or correctly answered < 40% of the questions.
2 .Group presentation	The content and the style of the presentation. Handling of questions.	Correct questions > 90%.	Correct questions between 75% and 90%.	Correct questions between 60% and 75%.	Correct questions between 50% and 60%.	Correct questions < 50%.
3. Quizzes	The number of correct answers.	Accurately answered all the questions. Well organised text and coherent logic.	Correctly answered >80% of the questions.	Correctly answered 60% to 80% of the questions.	Correctly answered 40% to 60% of the questions.	Correctly answered < 40% of the questions.

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

1. Keyword Syllabus

(An indication of the key topics of the course.)

- Biomolecules, structure, bonding
- Thermodynamics, bioenergetics
- Metabolic pathways
- Cellular structure and activities
- Cell proliferation and maintenance
- Diseases associated with alterations in biomolecules and cellular organelles

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Essential Cell Biology, 4 th Ed. (2014), by Bruce Alberts et al, Garland Science (ISBN:978-0-815344551)
2.	Molecular Biology of the Cell, 5 th Ed. (2008), by Bruce Alberts, Alexander Johnson et al, Garland Science. ISBN-13: 978-0815341055, ISBN-10: 0815341059
3.	Molecular Biology of the Cell, 5 th Ed. (2008) : the Problems Book, by John Wilson & Tim Hung, Garland Science. ISBN-10: 0815341105. ISBN-13: 978-0815341109
4.	Appropriate Selected Research Papers

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

NIL