

**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: Biochemistry for Veterinary Science

Course Code: BMS2805

Course Duration: One Semester

Credit Units: 3 credits

Level: B2

Arts and Humanities

Proposed Area:
(for GE courses only)

Study of Societies, Social and Business Organisations

Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title)

Completion of Year 1 courses with C grade or above
VM2001 One Health; GE1401 University English;
GE1501 Chinese Civilisation – History and Philosophy;
BCH1100 Chemistry; AP1400 Introductory Physics for Biologists;
GE1351 Food Production in the Modern World;
GE1136 Animal Ethics, Welfare and Law – A Regulatory and Policy Review;
AP2400 Advanced Physics for Biologists;
BMS2802 Biology of Populations, Species and EcoSystems;
VM2002 Animal Welfare; VM2003 Extensive Livestock Farming Systems;
GE2401 English for Science; GE1228 Food Security and Sustainability;
GE1122 Animals and Animal Welfare: An Interdisciplinary Approach

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

(A 150-word description about the course)

This course aims to provide students:

1. an understanding of the chemical structure of biomolecules involved in vertebrate metabolism;
2. concepts in biochemical reactions involved in metabolism;
3. principles behind the free energy flow in several major metabolic pathways and their controls and integration;
4. up-to-date knowledge on the biochemical basis of some diseases;
5. experience with some biochemical techniques.

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.	Explain the thermodynamic principles behind the metabolic pathways			✓	
2.	Determine the bioenergetics and chemistry in metabolic reactions		✓	✓	
3.	Identify and explain the regulation of metabolism by hormones and deregulation of metabolism in diseases		✓		
4.	Create a concept map relating biochemistry to health and diseases			✓	
5.	Design and setup of experiments to illustrate certain principles in biochemistry; analyze and critically evaluate the data collected from experiments; summarize and report the observations in a concise and clear form		✓	✓	✓
* If weighting is assigned to CILOs, they should add up to 100%.		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	Teaching and learning will be based on lectures explaining the thermodynamic principles employed in metabolic pathways, the bioenergetics and chemistry of metabolic reactions, the importance of regulation of metabolism by hormones, and deregulation of metabolism in diseases.	✓	✓	✓			2 hours per week
Tutorials	Tutorials will explore the thermodynamic principles employed in metabolic pathways, the bioenergetics and chemistry of metabolic reactions, the importance of regulation of metabolism by hormones, and deregulation of metabolism in diseases using recent primary research articles on biochemistry related to health, diseases, and applications in biotechnology. During tutorials students (in small groups) will create a concept map relating biochemistry to health and disease based on case studies of applications of biochemistry in animal health and society.				✓		1 hour week
Laboratory classes	Students develop basic research skills required for biochemistry including skills in formulating a hypothesis, testing a hypothesis by designing and setting up experiments, data collection, analysis and critical evaluation of data, presentation in graphical and table forms and clear and concise written reports.					✓	2 hours every second week

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>50%</u>							
Tutorial quizzes and assignment	✓	✓	✓	✓		25%	
Laboratory quizzes and reports	✓	✓			✓	25%	
Examination: <u>50%</u> (duration: 3 hours)							
* 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. Tutorial assignment	Ability to explain the chemical and biological principles behind the metabolic pathways and integrate the metabolic pathways in various medical conditions and in cancers.	Excellent in understanding, explaining, exploring and integrating the knowledge in written format.	Good in understanding, explaining, exploring and integrating the knowledge in written format.	Basic ability in understanding, explaining, exploring and integrating the knowledge in written format.	Some deficiencies in understanding, explaining, exploring and integrating the knowledge in written format.	Lack of understanding and inadequate explaining, exploring and integrating the knowledge in written format.
2. Tutorial and laboratory quizzes	Ability to explain the chemical and biological principles behind the metabolic pathways and integrate the metabolic pathways in various medical conditions and in cancers; ability to understand the principle and rationale behind the experiment.	Excellent in understanding, explaining, exploring and integrating the knowledge.	Good in understanding, explaining, exploring and integrating the knowledge.	Basic ability in understanding, explaining, exploring and integrating the knowledge.	Some deficiencies in understanding, explaining, exploring and integrating the knowledge.	Lack of understanding and inadequate explaining, exploring and integrating the knowledge.
3. Laboratory report	Description of experimental design, scientific terms, facts, key concepts and theories, analysis of the data, and report presentation.	Complete and correct and provides an insightful and accurate analysis, excellent presentation.	Almost complete and correct, provides some insight, analysis and presentation generally quite good.	Largely complete and correct, provides limited insight but analysis largely accurate and adequate presentation.	Some deficiencies across the criteria of descriptions, underpinning facts, concepts, analysis, insight, and presentation.	Many deficiencies in descriptions, underpinning facts, concepts, analysis, and presentation; lack of insight.
4. Examination	Ability to explain the chemical and biological principles behind the metabolic pathways and integrate the metabolic pathways in various medical conditions and in cancers.	Excellent in understanding, explaining, exploring and integrating the knowledge in written format.	Good in understanding, explaining, exploring and integrating the knowledge in written format.	Basic ability in understanding, explaining, exploring and integrating the knowledge in written format.	Some deficiencies in understanding, explaining, exploring and integrating the knowledge in written format.	Lack of understanding and inadequate explaining, exploring and integrating the knowledge in written format.

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.)

Chemistry, biological functions, metabolic pathways
Thermodynamics, bioenergetics
Metabolism of carbohydrates and lipids
Lipid biosynthesis and fatty acid catabolism
Metabolic integration and cancer metabolism

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.	Engelking, L. (2014). <i>Textbook of Veterinary Physiological Chemistry, 3rd Edition</i> . Academic Press.
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2.2 Additional Readings

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

1.	Science Daily: http://www.sciencedaily.com/news/plants_animals/biochemistry/
2.	Nelson, D. and Cox, M. (2008). <i>Lehninger Principles of Biochemistry, 5th edition</i> . W.H. Freeman (QP514.2 .L425 2008).
3.	Bhagavan, N. and Ha, C-E (2011). <i>Essentials of medical biochemistry: with clinical cases</i> . Amsterdam ; Oxford : Academic (RB112.5 .B43 2011).