

# BMS2202: DIVERSITY OF LIFE AND EVOLUTION

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**Effective Term**

Semester B 2023/24

## Part I Course Overview

**Course Title**

Diversity of Life and Evolution

**Subject Code**

BMS - Biomedical Sciences

**Course Number**

2202

**Academic Unit**

Biomedical Sciences (BMS)

**College/School**

Jockey Club College of Veterinary Medicine and Life Sciences (VM)

**Course Duration**

One Semester

**Credit Units**

3

**Level**

B1, B2, B3, B4 - Bachelor's Degree

**Medium of Instruction**

English

**Medium of Assessment**

English

**Prerequisites**

CHEM1200/BCH1200 Discovery in Biology (for normative 4-year students only, not applicable for advanced standing I/II students)

or

CHEM1300 Principles of General Chemistry

**Precursors**

Nil

**Equivalent Courses**

BCH2067 Diversity of Life and Evolution

**Exclusive Courses**

Nil

## Part II Course Details

### Abstract

In this course, students will:

- develop an understanding of the principles and importance of classification,
- develop an appreciation of Darwin's theory of evolution,
- examine the diversity of life in the Kingdoms Plantae and Animalia,
- explore the evolutionary relationships among various plant and animal groups as well as co-evolution of flowers and their pollinators,
- apply the knowledge of biological diversity to our daily life and culture.

This course will provide the basic knowledge on evolution and biodiversity of life, and prepare for elective courses e.g. Marine Biology, Animal Physiology, Plant Physiology.

### Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	Describe the general principles of classification and binomial nomenclature for species naming.			x	
2	Explain Darwin's evidence on evolution and hypothesis of natural selection that produced the diversity of life on earth.			x	
3	Compare the diversity and characteristics of major groups of plants and animals including identification of local animal/plant species.		x	x	
4	Apply the concepts of systematic zoology/botany to comprehend the evolutionary relationships among various plant and animal groups, and the co-evolution of flowers and their pollinators.		x	x	x
5	Discover the connection between our daily life, culture and biological diversity.				x

#### 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 real-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.

### Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures and tutorial exercises	Teaching and learning will be based on a combination of lectures and tutorial exercises to explain the principles on classification and species naming.	1	
2	Small group activities	Students will learn in small group activities, by examining Darwin's evidences on evolution and his hypothesis that natural selection produced the diversity of life on earth.	2	
3	Lectures and group presentations	Through lectures and group presentations students will learn to identify, describe and report basic morphological characteristics of major groups of plants (non-vascular plants to seed plants) and animals (invertebrates and vertebrates).	3	
4	Small group discussions, small projects and/or literature study	Concepts of adaptive radiation and convergent evolution in animals/plants as well as co-evolution of flowers and their pollinators will be examined through small group discussions, small projects and/or literature study.	4	
5	Small group activities and group project report	Through small group activities and a group project report, students will discover the connection between biological diversity on food plates to our daily life and culture.	5	

**Assessment Tasks / Activities (ATs)**

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Quizzes	1	5	
2	Oral presentation / report	2, 3, 5	20	

3	Class and online discussion / assignment	2, 4	15	
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**Continuous Assessment (%)**

40

**Examination (%)**

60

**Examination Duration (Hours)**

3

**Additional Information for ATs**

Minimum Passing Requirement : A minimum of 40% in both coursework and examination components.

**Assessment Rubrics (AR)****Assessment Task**

Quizzes

**Criterion**

Ability to explain biological concepts and their connection

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

**Assessment Task**

Oral presentation / report

**Criterion**

Capacity for self-directed learning to comprehend and explain in detail with accuracy the concepts of diversity and evolution

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

Class and online discussion / assignment

**Criterion**

Ability to apply the knowledge of diversity and evolution in daily life

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

Examination

**Criterion**

Ability to explain and apply the concepts and principles of diversity and evolution

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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## Part III Other Information

### Keyword Syllabus

#### Principles of classification and binomial nomenclature

The three-domain and six-kingdom classification system, taxonomic hierarchy and binomial nomenclature.

#### Darwin' s theory of evolution

Natural selection as the mechanism of evolution. Adaptive radiations of animals and plants.

#### Plant diversity and evolution

What is a plant? Green algae are the ancestors of land plants. Examine the diversity of life in the Kingdom Plantae, identify and describe basic morphological characteristics and reproductive strategies of various groups of non-vascular and vascular plants, identify common trees in Hong Kong. Examine the evidence of convergent evolution in plants. Explore the co-evolution of flowering plants and their animal pollinators.

#### Animal diversity and evolution

What is an animal? Examine the diversity of life in the Kingdom Animalia; identify and describe basic morphological characteristics of various groups of animals (invertebrates and vertebrates) and relate them to adaptations to the environment they are inhabiting (using local examples); examine adaptive radiations of animals and evolutionary relationships among various animal groups.

### Reading List

#### Compulsory Readings

Title	
1	Nil

#### Additional Readings

Title	
1	Raven P.H., Johnson G.B., Losos J.B. and Singer S.R. (2005) Biology. 7th edition. McGraw Hill, New York.
2	Campbell N.A. and Reece J.B. (2005) Biology. 7th edition. Pearson, Benjamin Cummings, San Francisco.
3	Raven P.H., Evert R.F. and Eichhorn S.E. (2005) Biology of Plants. 7th edition. Freeman, New York.
4	Online Resources: To be provided, as required, in lectures and tutorials.