

BMS2202: DIVERSITY OF LIFE AND EVOLUTION

Effective Term

Semester A 2024/25

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 and Biology of Populations, Species and Ecosystems.

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.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	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	Lectures and 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	Lectures and tutorial exercises	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	10
2	Oral presentation	2, 3, 5	20

3	Report / Discussion / Assignment	2, 4, 5	10	
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Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

3

Minimum Continuous Assessment Passing Requirement (%)

40

Minimum Examination Passing Requirement (%)

40

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

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

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

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	Campbell N.A. (2020) Biology: A Global Approach. 12th edition. Pearson.

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	Raven P.H., Evert R.F. and Eichhorn S.E. (2005) Biology of Plants. 7th edition. Freeman, New York.
3	Online Resources: To be provided, as required, in lectures and tutorials.