CHEM1200: DISCOVERY IN BIOLOGY

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Discovery in Biology

Subject Code
CHEM - Chemistry
Course Number
1200

Academic Unit
Chemistry (CHEM)

College/School
College of Science (SI)

Course Duration
One Semester

Credit Units
3

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

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
BCH1200 Discovery in Biology

Exclusive Courses
Nil

Part II Course Details

Abstract
After a century in which physical sciences and engineering have dominated public attention, many of the most challenging issues in the 21st century are likely to be related to biology: dealing with emergent diseases, feeding the increasing world

population, generating energy from biological sources, creating a better environment for sustainable growth. Biology is on the verge of answering some of the most fundamental questions of our existence: How do organisms grow and develop? To what extent can and should we manipulate biology for our purposes?

This course aims to equip students with little or no biological background with basic biological concepts needed to navigate in a world where biological knowledge is becoming increasingly essential for a global citizen. In this course, students will be guided to explore the intricacy and complexity of organisms and integrate this knowledge into the world around them.

The course will begin with an examination of the chemical basis of life, then move on to systems of increasing complexity, from genes to cells to ecosystems. At all times, the course will connect students to issues of human interest, examining social, ethical and environmental issues relevant to biology in the 21st century. The central theme is to apply biological concepts to familiar experiences and to help students share the excitement of science and its importance to their daily lives.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain basic concepts of biology governing the diversity and complexity of life.		x		
2	Apply basic biological concepts to discover and analyze the reasons behind local / regional / global issues in relation to daily life.		x	x	
3	Examine and discover the roles of biology in society both today and in the future.		x	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	Student will learn basic concepts of biology by a series of lectures on different topics.	1, 2, 3	
2	Tutorials	Students will learn how to approach and solve biological questions.	1, 2, 3	
3	Laboratory session	Students working in small groups to discover how standard procedures can explain lecture-related concepts and problems.	2, 3	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Lab exercise and lab-related quiz	2, 3	10	
2	Assignment	1, 2, 3	30	

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

1.5

Additional Information for ATs

Starting from Semester A, 2015-16, students must satisfy the following minimum passing requirement for courses offered by CHEM: "A minimum of 40% in both coursework and examination components."

Assessment Rubrics (AR)

Assessment Task

Lab exercises

Excellent (A+, A, A-)

Lab exercises are completed with exceptional accuracy and thoroughness, submitted on time, and presented in a well-organized and clear manner.

Good (B+, B, B-)

Lab exercises are mostly accurate and thorough, submitted on time, and presented in an organized and clear manner with minor issues.

Fair (C+, C, C-)

Lab exercises show basic understanding with several errors, may be slightly late, and are somewhat organized but lack clarity.

Marginal (D)

Lab exercises have significant errors, are often late, and are poorly organized and unclear.

Failure (F)

Lab exercises are mostly incorrect or missing, submitted extremely late or not at all, and are very disorganized and unclear.

Assessment Task

Assignment

Excellent (A+, A, A-)

The assignment demonstrates deep understanding and insight, extensive and relevant research, thorough analysis, and is exceptionally well-written with no errors.

Good (B+, B, B-)

The assignment demonstrates good understanding, relevant research, good analysis, and is well-written with minor errors.

Fair (C+, C, C-)

The assignment demonstrates basic understanding, adequate research, basic analysis, and is adequately written with some errors.

Marginal (D)

The assignment demonstrates limited understanding, minimal research, superficial analysis, and is poorly written with many errors.

Failure (F)

The assignment demonstrates little to no understanding, little to no research, little to no analysis, and is very poorly written with numerous errors.

Assessment Task

Final examination

Excellent (A+, A, A-)

The final exam demonstrates comprehensive knowledge, accurate and efficient problem-solving, effective application of concepts, and answers are clear and well-structured.

Good (B+, B, B-)

The final exam demonstrates good knowledge, mostly accurate problem-solving, minor errors in application of concepts, and answers are clear with minor issues.

Fair (C+, C, C-)

The final exam demonstrates basic knowledge, some errors in problem-solving, struggles with application of concepts, and answers are somewhat clear but lack structure.

Marginal (D)

The final exam demonstrates limited knowledge, significant errors in problem-solving, struggles to apply concepts, and answers are unclear and poorly structured.

Failure (F)

The final exam demonstrates little to no knowledge, unable to solve problems, unable to apply concepts, and answers are very unclear and disorganized.

Part III Other Information

Keyword Syllabus

Microbiology
Biology of Cells
Chemistry of Life
Metabolism
Biodiversity
Ecology
Evolution
Genetics
RNA World

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	“Biology The Dynamic Science”, Cengage Learning, 5th edition, 2020