

CHEM4039: ENVIRONMENTAL CONSERVATION AND RESOURCES MANAGEMENT

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Environmental Conservation and Resources Management

Subject Code

CHEM - Chemistry

Course Number

4039

Academic Unit

Chemistry (CHEM)

College/School

College of Science (SI)

Course Duration

One Semester

Credit Units

4

Level

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

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

BCH4039 Environmental Conservation and Resources Management

Exclusive Courses

Nil

Part II Course Details

Abstract

In this course, students will:

- explore the concepts of conservation and sustainable development;
- develop an appreciation of the need for conservation and management of physical and biological resources;
- apply ecological principles in conservation and exploitation of natural resources;
- critically evaluate present knowledge and techniques in environmental conservation and resources management.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the concepts of conservation and sustainable development and justify the need for conservation to a variety of audiences.	x		
2	Justify the selection of targets for the management of physical and biological resources.	x		
3	Apply relevant ecological principles and management techniques to solve real-life environmental conservation and resource problems through formulation of innovative approaches.		x	x
4	Critically evaluate the merits, limitations and future trends, and apply techniques in environmental conservation and resources management.	x	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	Group activities	Students will learn in large and small group activities by examining the concepts of conservation and sustainable development, and justifying reasons for the need of conservation locally and globally.	1

2	Group sessions and guest presentations	In large and small group sessions students will identify the targets for the management of physical and biological resources, examine how these targets are selected and justify their choice. Complementary guest presentations will engage students in discussion of real-life situations.	2	
3	Case studies, student discussions / presentations, and field visits	Students will discover approaches in environmental conservation and resources management, primarily through case studies, student discussions/presentations based on individual and/or group work, and field visits.	3	
4	Group critical evaluation tasks	Through large and small group critical evaluation tasks students will analyse the merits, limitations and future trends and apply the techniques of environmental conservation and resources management.	4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- for nil entry)	Allow Use of GenAI?
1	Short Quizzes	1	10	-	Yes
2	Tutorial Assignments	2, 4	10	-	Yes
3	Web-based Discussion / Presentation	2, 3	10	-	Yes
4	Field Visits / Report	3	10	-	Yes

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

Short Quizzes

Criterion

ABILITY to master the concepts, principles, needs and applications of environmental conservation and sustainable development of natural resources.

Excellent (A+, A, A-)

Demonstrates a comprehensive mastery of the concepts, principles, needs, and applications of environmental conservation and sustainable development of natural resources.

Good (B+, B, B-)

Shows a significant mastery of the concepts, principles, needs, and applications of environmental conservation and sustainable development of natural resources.

Fair (C+, C, C-)

Displays a moderate mastery of the concepts, principles, needs, and applications of environmental conservation and sustainable development of natural resources.

Marginal (D)

Exhibits a basic mastery of the concepts, principles, needs, and applications of environmental conservation and sustainable development of natural resources.

Failure (F)

Does not demonstrate even a marginal mastery of the concepts, principles, needs, and applications of environmental conservation and sustainable development of natural resources.

Assessment Task

Tutorial Assignments

Criterion

ABILITY to analyse and apply relevant ecological principles and management techniques to solve real-life environmental conservation and resource problems through formulation of innovative approaches.

Excellent (A+, A, A-)

Demonstrates a comprehensive ability to analyze and apply relevant ecological principles and management techniques to solve real-life environmental conservation and resource problems through innovative approaches.

Good (B+, B, B-)

Shows a significant ability to analyze and apply relevant ecological principles and management techniques to solve real-life environmental conservation and resource problems through innovative approaches.

Fair (C+, C, C-)

Displays a moderate ability to analyze and apply relevant ecological principles and management techniques to solve real-life environmental conservation and resource problems through innovative approaches.

Marginal (D)

Exhibits a basic ability to analyze and apply relevant ecological principles and management techniques to solve real-life environmental conservation and resource problems through innovative approaches.

Failure (F)

Does not demonstrate even a marginal ability to analyze and apply relevant ecological principles and management techniques to solve real-life environmental conservation and resource problems through innovative approaches.

Assessment Task

Web-based Discussion / Presentation

Criterion

ABILITY to critically evaluate the merits, limitations and future trends in dealing with imminent environmental conservation and resources management problems.

Excellent (A+, A, A-)

Demonstrates a comprehensive ability to critically evaluate the merits, limitations, and future trends in dealing with imminent environmental conservation and resources management problems.

Good (B+, B, B-)

Shows a significant ability to critically evaluate the merits, limitations, and future trends in dealing with imminent environmental conservation and resources management problems.

Fair (C+, C, C-)

Displays a moderate ability to critically evaluate the merits, limitations, and future trends in dealing with imminent environmental conservation and resources management problems.

Marginal (D)

Exhibits a basic ability to critically evaluate the merits, limitations, and future trends in dealing with imminent environmental conservation and resources management problems.

Failure (F)

Does not demonstrate even a marginal ability to critically evaluate the merits, limitations, and future trends in dealing with imminent environmental conservation and resources management problems.

Assessment Task

Field Visits / Report

Criterion

CAPACITY for self-observations, analysis and reporting of conservation and/or resource management issues

Excellent (A+, A, A-)

Demonstrates a comprehensive capacity for self-observations, analysis, and reporting of conservation and/or resource management issues.

Good (B+, B, B-)

Shows a significant capacity for self-observations, analysis, and reporting of conservation and/or resource management issues.

Fair (C+, C, C-)

Displays a moderate capacity for self-observations, analysis, and reporting of conservation and/or resource management issues.

Marginal (D)

Exhibits a basic capacity for self-observations, analysis, and reporting of conservation and/or resource management issues.

Failure (F)

Does not demonstrate even a marginal capacity for self-observations, analysis, and reporting of conservation and/or resource management issues.

Assessment Task

Examination

Criterion

ABILITY to explain, analyse, synthesize and/or discuss the principles, theories, applications and/or cases related to environmental conservation and resources management.

Excellent (A+, A, A-)

Demonstrates a comprehensive ability to explain, analyze, synthesize, and/or discuss the principles, theories, applications, and/or cases related to environmental conservation and resources management.

Good (B+, B, B-)

Shows a significant ability to explain, analyze, synthesize, and/or discuss the principles, theories, applications, and/or cases related to environmental conservation and resources management.

Fair (C+, C, C-)

Displays a moderate ability to explain, analyze, synthesize, and/or discuss the principles, theories, applications, and/or cases related to environmental conservation and resources management.

Marginal (D)

Exhibits a basic ability to explain, analyze, synthesize, and/or discuss the principles, theories, applications, and/or cases related to environmental conservation and resources management.

Failure (F)

Does not demonstrate even a marginal ability to explain, analyze, synthesize, and/or discuss the principles, theories, applications, and/or cases related to environmental conservation and resources management.

Part III Other Information

Keyword Syllabus

- Principles of conservation and management of renewable and non-renewable resources.
- Conservation and management of agriculture/forestry.
- Conservation and management of wildlife/natural resources.
- Conservation and management of coastal/fisheries resources
- Conservation and protection of endangered species.
- The use of GIS and remote sensing techniques in the conservation and management of natural resources.
- Environmental economics in conservation and management of natural resources/habitats.
- Case studies.

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	Gottfried Konecny, 2014. Geoinformation: Remote Sensing, Photogrammetry and Geographic Information Systems, Second Edition. CRC Press.
2	James R. Mihelcic, Julie B. Zimmerman, 2014. Environmental Engineering: Fundamentals, Sustainability, Design, 2nd Edition. Wiley.
3	Tom Tietenberg, Lynne Lewis, 2016. Environmental and Natural Resource Economics, 10th Edition. Routledge.
4	David A. Anderson, 2013. Environmental Economics and Natural Resource Management, 4th Edition. Routledge.
5	Bruce Mitchell, 2014. Resource & Environmental Management 2nd Edition. Routledge.
6	Guy R. Larocque, 2015. Ecological Forest Management Handbook. CRC Press.
7	Alexander Lane, Michael Norton, Sandra Ryan, 2017. Water Resources: A New Water Architecture. Wiley.
8	Ray Hilborn, Ulrike Hilborn, 2012. Overfishing: what everyone needs to know. Oxford University Press.
9	Serge M. Garcia, Jake Rice, Anthony Charles, 2014. Governance of Marine Fisheries and Biodiversity Conservation: Interaction and Co-evolution. Wiley Blackwell.
10	Kevern L. Cochrane, 2005. A Fishery Manager's Guidebook: Management Measures and Their Application. Food and Agriculture Organization of the United Nations.
11	Craig R. Groves , Edward T. Game, 2015. Conservation Planning: Informed Decisions for a Healthier Planet. Roberts and Company Publishers.
12	Peter Kareiva, Michelle Marvier, 2014. Conservation Science: Balancing the Needs of People and Nature, 2nd Edition. Roberts and Company Publishers.
13	Lee, H., 2015. Climate change biology. Academic Press, London.
14	Thipse, S.S., 2014. Energy conservation and management. Oxford: Alpha Science International Ltd.