

# CHEM8017: RESEARCH METHODOLOGY AND ETHICS

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## Effective Term

Semester A 2025/26

## Part I Course Overview

### Course Title

Research Methodology and Ethics

### Subject Code

CHEM - Chemistry

### Course Number

8017

### Academic Unit

Chemistry (CHEM)

### College/School

College of Science (SI)

### Course Duration

One Semester

### Credit Units

2

### Level

R8 - Research Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

Nil

### Equivalent Courses

BCH8017 Research Methodology and Ethics

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

The overall goal of this course for research students is to develop a deeper view on the research methodology and corresponding ethics. The primary content will include research attitude, problem definition, literature search and review, quantitative and qualitative methods, presenting research materials, publication and research career. Special emphasis is given to research ethics and how to write applications for ethical approval. Students will also develop the subject of their research with critical thinking and individual judgement and obtain skills required in interpreting published results, writing research proposals, reports and dissertation in the area of chemical methods and technology.

### Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Demonstrate a good understanding of the fundamentals of research attitude, methodology and tools.	20	x	x	
2	Build up a framework for a selected research topic and be able to search and comment on relevant literatures.	20	x	x	
3	Apply the research methodology and tools to develop an original and practical research proposal.	20	x	x	x
4	Logically present their or other's research works to peers for effective communication.	20	x	x	x
5	Evaluate ethical concerns in scientific research and explore their implications for research design and methods.	20	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	Lecture	Students will learn skills for literature search, research process, written and oral communication, publication, and research ethics.	1, 2, 3, 4, 5 20 hours in total

2	Small group discussion/ written report	Students will participate in activities include presentation, group discussion and critique of the research design and methodology of selected scientific works.	2, 3, 4	6 hours in total
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**Assessment Tasks / Activities (ATs)**

	ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1	Class discuss/Quiz	1, 2, 3, 4, 5	30	-	Yes
2	Group/personal presentation	2, 3, 4	40	-	Yes
3	Short essay on research design	2, 3, 4, 5	30	-	Yes

**Continuous Assessment (%)**

100

**Examination (%)**

0

**Minimum Continuous Assessment Passing Requirement (%)**

40

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

Class quiz and discussion (for students admitted before Semester A 2022/23 and in Semester A 2024/25 &amp; thereafter)

**Criterion**

ABILITY to understand the fundamentals of research attitude, methodology and tools and participate in relevant discussion.

**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**

Group/personal presentation (for students admitted before Semester A 2022/23 and in Semester A 2024/25 &amp; thereafter)

**Criterion**

ABILITY to effectively and logically present their or other' s work to fellow peers.

**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**

Short essay on research design (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

**Criterion**

ABILITY to employ knowledge and skills obtained in class for critical review of literatures and proposal writing

**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 quiz and discussion (for students admitted from Semester A 2022/23 to Summer Term 2024)

**Criterion**

ABILITY to understand the fundamentals of research attitude, methodology and tools and participate in relevant discussion.

**Excellent**

(A+, A, A-) High

**Good**

(B+, B) Significant

**Marginal**

(B-, C+, C) Basic

**Failure**

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**Assessment Task**

Group/personal presentation (for students admitted from Semester A 2022/23 to Summer Term 2024)

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## Part III Other Information

**Keyword Syllabus**

Research attitude, Research process, Defining a topic, Improving creativity, Literature search, Research management, Presenting research material, Publication, Research ethic, Preparing for a research career

**Reading List**

**Compulsory Readings**

Title	
1	Nil

**Additional Readings**

Title	
1	R. Murray, How to Write a Thesis (4th edition), Open University Press, 2017.
2	T. Greenfield, Research Methods for Postgraduates (3rd edition), Wiley, 2016.
3	S. Tak, Research Methodology, DND Publications, 2015.