

# CHEM4036: PROJECT

---

## Effective Term

Semester A 2022/23

## Part I Course Overview

### Course Title

Project

### Subject Code

CHEM - Chemistry

### Course Number

4036

### Academic Unit

Chemistry (CHEM)

### College/School

College of Science (SI)

### Course Duration

Two Semesters

### Credit Units

0-6

### Level

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

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

Nil

### Equivalent Courses

BCH4036 Project

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

In this course, students will:

- develop the ability to synthesize relevant background literature and demonstrate detailed knowledge of the context of their research project, and hypothesize scientific concepts and formulate methods to verify them
- learn to manage a substantial piece of individual laboratory-based research project, and a literature-based investigation
- develop skills in problem-solving and in scientific communication in the form of written and verbal presentation of information

### Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Develop, state and justify a testable hypothesis related to a practical scientific problem and recognises the limits of the hypotheses involved.		x		
2	Research, assemble, and critically evaluate literature relevant to the hypothesis being tested.		x		
3	Design experiments relevant to the hypothesis being tested, and utilise appropriate laboratory skills and instrumentation(s) to undertake the experiments.			x	
4	Analyse and interpret research data in a critical manner and present experimental results in a clear, concise and accurate scientific format.				x
5	Write a dissertation presenting the hypothesis being tested, a relevant literature review, findings and their interpretation, conclusions, and suggest further lines of investigation organised in the format of a scientific paper.			x	
6	Make a formal oral presentation of the research project, effectively summarising the project's background, the hypothesis being tested, the methods involved, the results achieved and the conclusions.			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	Discussions	Discussions with the student' s supervisor, and student' s reading of the current literature will lead to the development, and refinement, of a testable hypothesis.	1
2	Library and web-based searching and literature review	Library and web-based searching of the literature, reading and interpretation of relevant scientific literature, and assembly of a literature review relating to the testable hypothesis.	2
3	Undertaking of suitable experiments	Undertaking of suitable experiments under supervision, and maintaining a log book of data relevant to the experimental process.	3
4	Data analysis	Data analysis, including the use of appropriate statistical techniques and the presentation of data in summary graphs and tables where appropriate.	4
5	Writing a scientific report	Writing, under guidance, a formal scientific report summarising the experimental results in the context of knowledge related to the subject matter.	5
6	Oral presentation	Delivery of a formal oral presentation of the research project (10 min), followed by questions (5 min) from the audience.	6

**Assessment Tasks / Activities (ATs)**

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Benchwork	1, 2, 3, 4	25
2	Written Dissertation	5	65
3	Oral Presentation	6	10

**Continuous Assessment (%)**

100

**Examination (%)**

0

**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**

Benchmark

**Criterion**

Ability to design the experiment on his/her own and allow control of all variables selected, to appropriately use materials for all the procedure without any wastage, to set up apparatuses in the most effective way, to record raw data including units in a way that is clear and appropriate, to be actively and diligently engaged in the research, and to discuss the findings with the supervisor at regular frequencies.

**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**

Written Dissertation

**Criterion**

Ability to demonstrate thorough understanding of the project topic and excellent execution of a wide range of conventions relevant to science, to logically illustrate mastery of the subject, to use existing references to support the ideas, to present and analyse data in excellent ways, to discuss the assumptions, limitations, and weaknesses, to present logical and excellent explanations for the findings and accurately address the hypothesis, and to use scientific languages that skillfully communicate meaning to readers with clarity and fluency.

**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

**Criterion**

Ability to clearly organize a presentation with cohesive content, to deliver a compelling presentation with confidence using different techniques (posture, gesture, eye contact, and vocal expressiveness), to understand the questions completely, and to answer the questions as precisely as they can be.

**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**

- Management of a substantial piece of individual research and developmental research project
- Critical thinking and problem-solving skills
- Effective communication in the form of written and verbal presentation of scientific information

**Reading List**

**Compulsory Readings**

Title	
1	Nil

**Additional Readings**

Title	
1	Online Resources: To be provided, as required.