

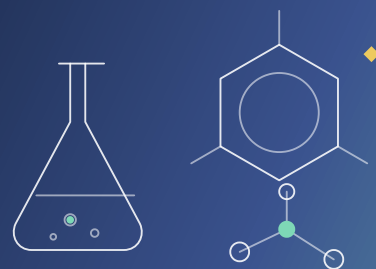
Module code

SPC-3408

Type of module

Undergraduate: Chemistry – Elective

Surface Reactions and Catalysis



Modular credits

2

Total student
engagement

28 hours

Prerequisite

SPC-1203
Fundamentals of
Physical and
Spectroscopic
Chemistry

Anti-requisite

None

Aims

To provide students with a foundational understanding of surface reactions and catalysis, and their applications in industrial, and technological, and environmental applications.

Module learning outcomes (MLO)

On successful completion of this module, a student will be expected to be able to:

MLO 1

Analyse the surface area and properties of small particles, and their role in surface reactions and catalysis.

MLO 2

Evaluate the mechanisms and efficiency of surface reactions in energy conversion, corrosion prevention, and contaminant removal.

MLO 3

Assess the feasibility and applications of surface reactions and catalysis, including photocatalysis, and understand the role of liquid-liquid phase diagrams in liquid-liquid separation.

Module contents

Introduction to surface and interface

The advanced particles in nanometer scales

The surface chemical phenomena and surface reactions

Solid-solid interface: Photovoltaic heterojunction

Liquid-solid interface: Corrosion, adsorption, and catalysis

Liquid-liquid interface: Phase transition

Liquid-liquid phase diagram
based on Flory-Huggins Theory

Surface chemistry in energy
conversion, corrosion prevention,
and contaminant removal

Assessment

60% **40%**

Examination

Coursework

Examination
60%

20%

20%

■ Examination — 60% ■ Assignment and quiz — 20% ■ Short answers question — 20%

Formative assessment

Weekly discussion
and feedback

Summative assessment

COMPONENT	WEIGHTING
Examination	60%
Coursework	40%
Individual	40%
Assignment and quiz	20%
Short answers question	20%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1 PLO 1 (Fundamental Knowledge in Chemistry)

6 PLO 6 (Digital Literacy and Lifelong Learning Skills)

3 PLO 3 (Critical Thinking and Problem-Solving Skills)

Sustainability concept addressed

4 SDG 4 Quality Education

9 SDG 9 Industry, Innovation and Infrastructure

Digital skills/software used (not limited to)

- Word processing software (e.g. Microsoft Word)
- Data processing software (e.g. Microsoft Excel)
- Learning management system (e.g. Canvas)

Micro-credentialling option

No

Stackable towards GenBESTARI Undergraduate Degree Programme or other relevant Lifelong Learning Programmes

No

Document details

Office **ODVCE** Document date **27 June 2026** Status **New** Approval **GBF (12/02/2026)**