

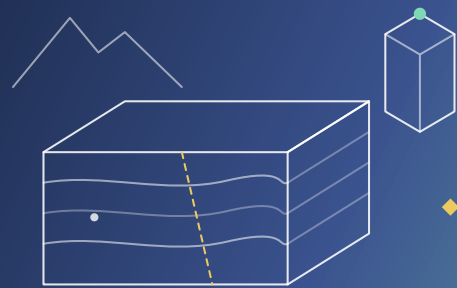
Module code

SPG-1201

Type of module

Undergraduate: Geosciences – Major Core

Introduction to Crystallography and Mineralogy



Modular credits

4

Total student
engagement

56 hours

Prerequisite

None

Anti-requisite

None

Aims

To introduce students to the principles of crystallography and mineralogy, focusing on crystal structures, symmetry, and mineral properties. Students gain skills in optical mineralogy and systematic identification, applying modern analytical tools to interpret data for Earth sciences and resource management.

Module learning outcomes (MLO)

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

MLO 1

Classify minerals into crystal systems and crystal classes based on their internal symmetry.

MLO 2

Use optical mineralogy techniques to identify minerals under a microscope.

MLO 3

Interpret the results of mineralogical analyses and compile detailed reports.

MLO 4

Determine mineral applications using their properties.

MLO 5

Examine the relationship between mineral properties and their interaction with light.

MLO 6

Assess how crystal structures influence mineral formation processes.

MLO 7

Critique microscopic textures of minerals to infer their geological history.

MLO 8

Develop collaborative or independent research projects that combine crystallographic data with mineralogical interpretations.

Module contents

Mineral environments, fundamental chemistry for Mineralogy

Crystal, crystal Lattice, elements of symmetry, laws of Crystallography, crystal systems

Miller and Miller-Bravais indices, crystal zones, crystal forms

Stereographic projections

Mineral chemistry

Physical properties of minerals

Polarised light, optical indicatrices, optical properties of minerals

Systematic mineralogy and mineral classification

Nesosilicates, cyclosilicates, single chain inosilicates, double chain inosilicates, phyllosilicates, tectosilicates, non-silicate minerals

Assessment

60%

Examination

40%

Coursework

Examination
60%

20%

10%

Examination — 60%

Weekly practical reports — 5%

Class test — 20%

Assignments — 10%

Industry trip report — 5%

Formative assessment

Weekly quizzes, discussion and feedback

Summative assessment

COMPONENT	WEIGHTING
Examination	60%
Coursework	40%
Individual	25%
Weekly practical reports	5%
Class test	20%
Group	15%
Assignments	10%
Industry trip report	5%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1	PLO 1 (Fundamental Theoretical Knowledge in Geosciences)	2	PLO 2 (Application of Scientific Methods and Data Analysis)
3	PLO 3 (Integrated Laboratory, Field, and Technical Skills)	4	PLO 4 (Critical Thinking and Problem-Solving Skills)
5	PLO 5 (Sustainability and Responsible Practice)	6	PLO 6 (Communication and Collaboration Skills)
7	PLO 7 (Independent Learning and Professional Development)		

Sustainability concept addressed

4	SDG 4 Quality Education
7	SDG 7 Affordable and Clean Energy
12	SDG 12 Responsible Consumption and Production

Digital skills/software used (not limited to)

- Application software (e.g. Microsoft Word, KrystalShaper, Mineral Classification Apps)
- Organisational tools (e.g. Notion, Canvas)
- File sharing and collaboration platforms (e.g. Google Docs, Spreadsheets, OneDrive)
- Advanced digital tools (e.g. AI-assisted analysis and writing tools)

Micro-credentialling option

Yes, 4 MCs

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

No

Document details

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