

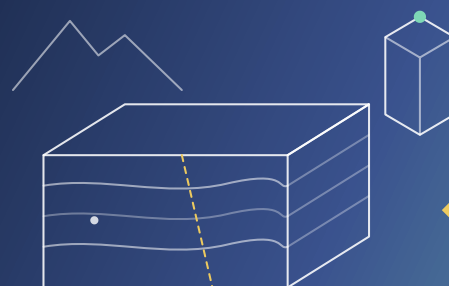
Module code

SPG-2206

Type of module

Undergraduate: Geosciences – Major Core

Petrography of Igneous and Metamorphic Rocks



Modular credits

4

Total student
engagement

56 hours

Prerequisite

SPG-1201 Introduction
to Crystallography and
Mineralogy

Anti-requisite

None

Aims

To provide students with knowledge and skills in petrographic analysis of igneous and metamorphic rocks. Students learn to identify, classify, and interpret textures, mineral assemblages, and geochemical signatures. Using advanced techniques, they integrate data with tectonic frameworks for geological and resource applications.

Module learning outcomes (MLO)

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

MLO 1

Use a polarising microscope to identify minerals, textures, and microstructures in thin sections of rocks.

MLO 2

Classify rocks based on their mineralogical composition, texture, and formation processes.

MLO 3

Interpret petrographic data to deduce the pressure-temperature history of igneous and metamorphic rocks.

MLO 4

Analyse the relationship between rock textures and their geological environments.

MLO 5

Assess the tectonic significance of mineral assemblages and microstructures in igneous and metamorphic rocks.

MLO 6

Critique petrographic methodologies and propose improvements for studying complex rock systems.

MLO 7

Develop comprehensive reports integrating petrographic observations with geochemical and tectonic data to reconstruct rock formation histories.

MLO 8

Identify rocks and evaluate their relationships and structures in the field.

MLO 9

Justify the genesis of rocks based on mineralogical and textural criteria.

MLO 10

Appraise quality of rocks for industrial and environmental applications.

Module contents

Formation of the solar system and rocks, Earth's structure, geothermal and geobarometric gradients

Rock types, meteorites, classification of igneous rocks

Properties of magma, field relationships of igneous rocks, structures of igneous rocks

Generation and evolution of magma

Study of ultramafic, mafic, intermediate and acidic rocks

Metamorphism, definitions, characteristics of metamorphic rocks, metamorphic agents

Types of metamorphism, classification of metamorphic rocks, metamorphic zones and metamorphic facies

Metamorphism of mafic, ultramafic, calcareous and pelitic rocks, migmatites

Assessment

60%

Examination

40%

Coursework

Examination
60%

20%

10%

Examination — 60%

Weekly practical reports — 5%

Class test — 20%

Field-trip report — 10%

Assignments and activities — 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%
Field-trip report	10%
Assignments and activities	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 |
| 12 | SDG 12 Responsible Consumption and Production |
| 13 | SDG 13 Climate Action |

Digital skills/software used (not limited to)

- Data processing and spreadsheet software (e.g. Microsoft Excel)
- Rock classification apps
- Artificial intelligence (e.g. ChatGPT)
- Learning management systems (e.g. Canvas)
- Note-taking, knowledge management, and organisation software (e.g. Notion)

Micro-credentialling option

Yes, 4 MCs

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

No

Document details

Office **ODVCE** Document date **27 August 2026** Status **New** Approval **GBF (12/02/2006)**