



Faculty of Earth Sciences



**Department of Mineral Resources & Rocks
3rd & 4th Years Program**



The Geological Society
Accredited degree courses

IGNEOUS PETROLOGY

Course Name	Course ID	Prerequisite
<i>IGNEOUS PETROLOGY</i>	<i>EMR 421</i>	<i>EMR 304</i>

Time Table for Course Lectures

Igneous Petrology (EMR 421)

Week	Topic
1	Introduction to the course, list of references and plane of study of the course
2	2A-Types and sources of magmas in different tectonic settings 2B-Petrographic textures and their significances in plutonic rocks
3	Geochemical characteristics of igneous rocks
4	Calculating CIPW norm and chemical classification of Ign. Rock
5	Behavior of major, trace and REE during magmatic processes Short Exam.(Quiz)
6	Determination of paleotectonic settings of igneous rocks
7	Magmatic processes- Fractional crystallization and partial melting Magmatic processes-Magma mixing and crustal contamination
8	Geochemical modeling of magmatic processes- FC & PM.
9	Midterm Exam Study of silicate melts- phase rule, lever rule
10	Study of silicate melts- one component system, Silica and diopside systems Study of silicate melt- Binary system, with eutectic and Incongruent melting
11	Study of silicate melt- Binary system, with complete solid solution Binary system, shows solid solution with minimum temperature of cryst.
12	Study of silicate melt- Ternary system, Nepheline-Kalsilite-Silica Study of silicate melt- Ternary system, Diopside-Forsterite- Silica
13	Study rock association, 1- Ophiolite and ophiolitic mélange Study rock association, 2-Granites: types and recent classification and genesis
14	Study rock association, 3-Basalt-andesite-dacite Series

15	Study rock association, 4-Gabbro layered intrusions
16	General discussion, revision and questions

References:

The Interpretation of Igneous Rocks, by Cox, K.G. & Bell, J.D, 1979. Allen & [1]
Unwin, London
[2] *Igneous Petrology*, by Hughes, C.J., 1982. Elsevier, 551p.

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IGNEOUS PETROLOGY (EMR 421)

Time Table for Practical Course

Week	Test Name
1	General revision on the rock-forming minerals
2	General revision on the rock-textures besides new textures
3	Train the students on how to write a petrographic report
4	Petrographic study of granites, granodiorite, and syenites
5	Petrographic study of Gabbro-diorite-tonalite
6	Petrographic study of ultramafic rocks (peridotites+dunite)
7	Petrographic study basalt-andesite
8	Mid term practical examination of geological exploration
9	Petrographic study of Rhyolite and dacite
10	General petrographic revisions and preparing reports
11	Calculating CIPW norm for saturated rocks + problems
12	Calculating CIPW norm for unsaturated rocks +problems
13	Geochemical modeling -calculating mineral vectors
14	Geochemical modeling using trace elements (FC + PM)
15	General Revision
16	Final practical examination of geochemical exploration

References:

Atlas of the Textural Pattern of Granites, Gneisses and Associated [1]

Rock Types, by Augustithis, S.S., 1973. Elsevier Sci.

The Interpretation of Igneous Rocks, by Cox, K.G., Bell, J.D., & [2]

Pankhurst, R.J., 1979. London: George Allen & Unwin, 450 pp.

Petrography to petrogenesis, by Hibbard, M.J., 1995. Prentice-Hall [3]