



Government College (Autonomous), Rajamahendravaram.

(Affiliated to Adikavi Nannaya University)

SEMESTER- II - Syllabus

Course-II- Mineralogy & Optical Mineralogy (50 Marks)

Course outcomes

CO1-To Study minerals and mineral sections and infer them by their physical and optical properties.

CO2-To understand how Mineralogy and Optical Mineralogy are used to identify the mineralogical composition of geological materials in order to help reveal their origin and evolution

CO3- To study the minerals samples (hand samples & thin sections) in the laboratory with a petrographic microscope

CO4-To apply the knowledge in the field to identify the rocks

Unit - I

Definition of a mineral - classification of minerals into rock forming and ore forming minerals.

Physical properties of minerals - Colour, streak, transparency, lustre, form, hardness, tenacity, cleavage, fracture and, Specific gravity.

Silicate structures- isomorphism, solid solution, polymorphism, allotropy. Pseudomorphism and radioactivity

Study of physical properties, chemical properties and mode of occurrence of the following mineral groups: Olivine, Garnet and Aluminium silicates,

Unit-II

Study of physical properties, chemical properties and mode of occurrence of the following mineral groups: Pyroxenes, Amphibole and Mica

Unit-III

Study of physical properties, chemical properties and mode of occurrence of the following mineral groups: Quartz, Feldspars, and feldspathoids

Miscellaneous: Staurolite, Tourmaline, Zircon, Calcite, Corundum and Apatite.



Unit-IV

General Principles of optics, Refraction, Snell's law, Critical angle, total reflection,

Optical properties of minerals – isotropic and anisotropic

Polarised light, refractive index, Double refraction, uniaxial and biaxial minerals – Nicol prism and its construction – concept of crossed Nicols

Unit-V

Petrological microscope (Polarising) - its mechanical and optical parts – extinction, pleochroism and interference colours. Optical Properties of important minerals

Text books:

1. A textbook of mineralogy - E.S. Dana and W.E. Ford.
2. Rutleys elements of mineralogy - H.H. Reed
3. Essential of Crystallography - E. Flint.

References:

1. Manual of mineralogy - C.S. Hurlbut and C.Klein
2. Mineralogy for students - M.H. Batey.
3. An introduction to rock forming minerals - Deer, Howie, and zussman.
4. Elements of mineralogy - Mason and Bern.

LAB-II (Practicals)

50 Marks

At the end of Second semester

Practical-II- Mineralogy and Optical mineralogy

Study of physical properties and diagnostic features of the following mineral:

Quartz Jasper, Agate, Chalcedony, Amethyst, Orthoclase, Microcline, Albite, Anorthite, Labradorite, Enstatite, Hypersthene, Augite, Hornblende, Actinolite, Tremolite, Asbestos, Muscovite, Biotite, Phlogopite, Olivine, Epidote, garnet, Kyanite, Sillimanite, Andalusite, Beryl, Zircon, Apatite, Corundum, Talc, Gypsum, Calcite, Fluorspar and Serpentine.



Study of optical properties of the following minerals:

Quartz, Orthoclase, Microcline, Plagioclase, Hypersthene, Augite, Tremolite, Hornblende, Muscovite, Biotite, Olivine, Epidote, Garnet, Kyanite, Beryl, Calcite, Chlorite, sillimanite, Leucite.

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I B.Sc., GEOLOGY– (2019-20)

Internal assessment (w.e.f.2019-20)

As per the Examination Policy of the College, 50 marks are allocated for Continuous Internal Assessment, which is shown below.

CIA 1 (Direct Assessment)	--	20 m
CIA 2 (Online Test)	--	10 m
Assignment	--	05m
Pedagogical Strategies	--	05m
Attendance	--	05 m
Viva –Voice	--	05 m
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		50 m
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Model Question paper for CIA 1

Answer the following questions

Question No 1 (Essay question) }
Question No 2 (Essay question) } $2 \times 5m = 10 M$

Answer all the following questions $5 \times 2m = 10 M$

Question No 3
Question No 4
Question No 5
Question No 6
Question No 7

Model Question paper for CIA 2

20 multiple choice questions will be given for $\frac{1}{2}$ mark each. Student has to answer all the questions. $20 \times \frac{1}{2} = 10 M$