

Dept. of Geology

Govt. N.P.G. College of Science, Raipur (C.G.)

**Program specific out comes and course outcomes of Geology at
U.G. level**

Geology is a specific subject of Science with a Multidisciplinary approach.

Student doing graduation with B.Sc. in Geology should be able to: -

- Understand the basic geological concept, principles and theories of stratigraphy.
- Learn, design and perform experiments in the labs to demonstrate the concepts, principles and theories learned in the classroom.
- Expose the student to the vast scope of Geosciences in the field of disaster management, watershed management, water pollution, oil exploration, mining etc.
- Emphasize the importance of geology as the most important discipline for sustaining the existing industries and establishing new ones to create job opportunities at all levels of employment.

The UG Course program of Geology comprises of 3 year integrated degree course consisting of six papers encompassing various branches of Geology to achieve aim of study.

B.Sc. - I - Paper-I : Geodynamics and Geomorphology

Program Specific outcomes (PSOs)

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| PSO-1 | The study of this paper strengthens students' knowledge with respect to understanding the essentials of the dynamics of earth. |
| PSO-2 | The students will understand the origin and age of our Solar system and planets including earth. |
| PSO-3 | The students will able to learn the dynamic nature of the Earth processes. They will learn about the geodynamics of the lithosphere, concept of Isostacy, ocean floor spreading, continental drift, plate tectonics, volcanism, earth quakes etc. |
| PSO-4 | The course present concepts of geomorphology in relation with geological processes and evolution of land forms. |

PSO-5 The course presents an understanding of the endogenic and exogenic processes in action on the earth surface and creation of various land forms by various geological agents like river, glaciers, sea and oceans, wind etc.

Course Outcomes

- CO 1 Describe various hypothesis of origin of earth and solar system.
- CO 2 Describe internal structure and composition of the earth.
- CO 3 Describe volcanic activity, types of volcanoes, volcanic products.
- CO 4 Explain the relation of diastrophic movements with plate tectonics.
- CO 5 What are the various geological processes involving in creation of various land forms due to different geological agents.

B.Sc. - I - Paper-II : Crystallography and Mineralogy

Program Specific Outcomes

- PSO 1 The course is designed to understand the basics of Smineralogy and crystallography which helps to gain overall knowledge in Geology.
- PSO 2 The course deals with the study of crystals with respect to their morphology, symmetry, notations, normal crystal classes and various laws of crystallography.
- PSO 3 The course deals with the study of minerals, their physical, chemical and optical characteristics.
- PSO 4 The students will be able to identify common rock forming minerals in hand specimens and in thin section.
- PSO 5 The students will gain knowledge about various mineral groups.

Course Outcomes

- CO1 Identify face, form, Axis, symmetry and laws of crystallography.

- CO2 What is crystallography notation? Describe different symmetry class and morphological forms present in particular symmetry class.
- CO3 Define mineral and describe physical properties and optical properties of given mineral.
- CO4 Describe physical and optical properties of given mineral group.
- CO5 Explain polymorphism, pseudo morphism, isomorphism and solid solution.

B.Sc. - II - Paper-I : Petrology

Program Specific Outcomes (PSOs)

- PSO 1 The course of this paper designed to understand the processes involved in the formation of rocks i.e., building blocks of earth.
- PSO 2 The students will be able to understand the formation of igneous, metamorphic and sedimentary rocks. They acquaint about various processes responsible for the formation of different types of rocks.
- PSO 3 The students will understand the forms, structure, texture of igneous rocks interpreting crystallization history.
- PSO 4 The course presents an understanding of effects of high temperature and pressure transforming affected rocks in to metamorphic rocks.
- PSO 5 The students will know the processes of sedimentation, lithification, diagenesis which converting loose sediments into consolidated sedimentary rocks.

Course outcomes

- CO 1 Classify rocks on the basis of origin.
- CO 2 Describe forms of igneous rocks and gives the classification.
- CO 3 Describe crystallization of Magma, and explain how uni component, bicomponent and multi component magma gives rise to different types of rocks.

- CO 4 Explain how texture and structure help to determine origin of rock types.
- CO 5 Describe metamorphic facies, grade, agents and type of metamorphism.
- CO 6 Explain thermal metamorphism.
- CO 7 Explain the sedimentation processes.
- CO 8 Describe sedimentary structure, texture and sedimentary processes.

B.Sc. II : Paper-II : Structural Geology

Program Specific Outcomes (PSOs)

- PSO 1 The course designed for the students of understand geological structures developed in rocks by the action of force action on them.
- PSO 2 The students will be able to understand the geometry and mechanics of the various structures that result through rock deformation.
- PSO 3 To determine possible causes of formation of structures and forces responsible for its.
- PSO 4 This course also helps to know the relation of structure with tectonics.
- PSO 5 Learn how to read geologic maps and solve simple map problem using strike and dip and preparation of cross sections.
- PSO 6 Learn to use equipment and field tools to collect data for Laboratory analyses.

Course Outcomes (COs)

- CO 1 Describe rock deformation using stress strain analysis.
- CO 2 Describe various types of folds. Give classification.
- CO 3 Recognize folds in the fields and in the geological maps.
- CO 4 Describe faults, classify on the basis of Geometry and Genesis.
- CO 5 Recognize faults in the fields and in geological maps.

- CO 6 Out crop pattern, effect of structures in out crop of strata.
- CO 7 Describe morphometry of joints. Give geometric and genetic classification.
- CO 8 What is unconformity? Types and recognition of unconformity.
- CO 9 Give and account of foliation and lineation.

B.Sc. III : Paper-I : Economic Geology

Program Specific Outcomes (PSOs)

- PSO 1 Course topics include the conventional and non-conventional energy resources.
- PSO 2 This course introduces the students to various processes of mineral deposit formations.
- PSO 3 The Course deals with occurrence, origin, economic importance, distribution of selected ore minerals.
- PSO 4 The students will know origin and occurrence, distribution of coal, petroleum in India.

Course Outcomes (COs)

- CO 1 Give an account of non-conventional energy resources.
- CO 2 Describe magmatic concentration processes and resultant deposits.
- CO 3 Describe Hydrothermal processes and resultant deposits.
- CO 4 Give an account of mechanical and residual concentration processes and resultant deposits.
- CO 5 Describe Oxidation and supergene sulphide enrichment processes, resultant deposits.
- CO 6 Give an account of sedimentary and metamorphic processes of ore formation.
- CO 7 Describe the Occurrence of fossil fuels in India.

CO8 Give mode of occurrence, origin, compositions, distribution and economic importance of ore minerals given in the syllabus.

B.Sc. III : Paper-II : Natural environment, remote sensing, ground water mineral exploration.

Program Specific Outcomes (PSOs)

- PSO 1 The students will be able to know the basic earth science as applied to the interaction between human activity and natural environment.
- PSO 2 The students will gain knowledge about soil formation and types of soil.
- PSO 3 The course helps students to learn about environmental consideration in the site selection of construction of dam and tunnel.
- PSO 4 This course intends to introduce the fundamental principles and techniques of remote sensing and photogeology and application of these techniques.
- PSO 5 On completion of course, the student will have gained an understanding of occurrence and movement of ground water.
- PSO 6 Know the basic concept and various techniques of mineral exploration, drilling, sampling.
- PSO 7 Students will be able to know the national and state mineral policies and concession rules.

Course Outcomes (COs)

- CO 1 Give and account of impact of human environment over natural environment.
- CO 2 Describe the concept of Environmental Geology.
- CO 3 Describe soil forming factors and classification of soil.
- CO 4 Explain the environmental impact of construction of large dam and tunnels.
- CO 5 Describe Hydrostratigraphic units of India. Hydrological properties of rocks.
- CO 6 Explain the surface and sub surface methods of exploration.
- CO 7 Explain the national mineral policy.

CO 8 What are the marine mineral resources? Explain the rules related to this resource.

PROGRAMME OUTCOMES (POs) THREE YEAR DEGREE COURSE

For three-year degree programme in Higher Education, POs in context of Govt. NPG College of Science, Raipur will be as follows-

- PO1- Critical thinking – Syllabus for different subject in the under graduate programme is prepared by central board of studies duly approved by co-ordination committee headed by honorable Governor. The combination of different subjects in the graduation level is offered by the students in a way that apart from the knowledge gathering, they must develop critical thinking about the subject and also able to checking the assumption and ideas from different prospection.
- PO2- Effective communication – Apart from the science subjects, two language papers are also included in the graduation programme, must be aiming toward development of communication skills. Hence at the time of graduation students will be able to connect people, ideas, books media and technology.
- PO3- Social interaction – In graduation programme of science subjects apart from the practical practices most of the subjects carry field excursion and fields studies for better exposure and participation in discussion with industrialist, entrepreneurs, social activists etc., help them to reach conclusion in setting.
- PO4- Effective Citizenship – During the regular three-year degree programme, a student's actively participate in NCC, NSS, Red cross society activities. This participation will help them in developing effective citizenship, awareness of issues and concern about the national development.
- PO5- Ethics – College administration during the implementation of syllabus sees that the subjects of science field given to the students in theories and practical's, in such a way that they develop value system among the students and better approach regarding the moral dimensions.

- PO6- Environment and Sustainability – As per the Supreme Court guideline the graduation syllabus of this institute contains the studies related to environmental issues in which the students are given projects pertaining to the social concern. Apart from this, different subjects like Botany, Geology, Chemistry, Zoology are including localized environmental issues for studies. It will help students to understand the issues of environmental contexts and sustainable development.
- PO7- Self-directed and lifelong learning- with the changing time and as per need of an hour the syllabus is constructed and implemented in such a way that students even after completing their graduation may acquire their ability to lifelong learning process. For this applied aspect of syllabus are taken in to consideration.