



# **D.B.F. Dayanand College of Arts and Science, Solapur**

**Department of Geology**

**Year 2018-2019**

**Program Outcomes, Program Specific Outcomes and Course Outcomes**

# DEPARTMENT OF GEOLOGY

## PROGRAM OUTCOME: B.Sc. GEOLOGY

<b>Department of Geology</b>	After successful completion of three-year degree program in Geology a student should be able to;
<b>Program outcome</b>	<p><b>PO-1.:</b> Acquire a solid base of knowledge in the science of geology as a whole as well as earth materials, earth history, sedimentation and stratigraphy, deformational processes and structural features, and geomorphic processes and landforms.</p> <p><b>PO-2.:</b> Know the geologic time scale and place important geologic events in a temporal framework</p> <p><b>PO-3.:</b> Use compasses, survey instruments, and images in geological investigations</p> <p><b>PO-4.:</b> Understand the pathways, fluxes, and influence of water and other fluids at Earth's surface and in the subsurface</p> <p><b>PO-5.:</b> Interpret topographic maps and terrain models and create profiles</p> <p><b>PO-6.:</b> Interpret geologic maps and construct cross sections from them</p> <p><b>PO-7.:</b> Interpret geophysical measurements of subsurface properties</p> <p><b>PO-8.:</b> Distinguish between various structural features and determine the types of stress responsible for their formation</p> <p><b>PO-9.:</b> Describe and interpret types of surficial deposits and landforms</p> <p><b>PO-10.:</b> Apply principles of mathematics, chemistry, and physics to geologic problems</p> <p><b>PO-11.:</b> Develop proficiency in conveying complex geologic concepts in clear, technically correct writing.</p> <p><b>PO-12.:</b> Develop proficiency in oral communication of complex geologic concepts.</p> <p><b>PO-13.:</b> Develop the aptitudes and dispositions necessary to help democratize society by obtaining and maintaining employment as a professional geologist.</p>

**B.Sc. – I, Semester – I, Paper – I Physical Geology**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This paper strengthens the knowledge about the universe, galaxies and solar system and relation of the earth with other planets.</p> <p><b>PSO-2.:</b> The students get acquainted with the dynamic nature of the earth and interaction of various spheres of the earth.</p> <p><b>PSO-3.:</b> The students get acquainted with the agents and processes of weathering, erosion and deposition.</p> <p><b>PSO-4.:</b> Students will able to understand the earthquakes, their causes, distribution, effects and classification</p> <p><b>PSO-5.:</b> Student will understand the interior of the earth and use of seismic waves to interpret interior of the earth.</p> <p><b>PSO-6.:</b> Students understand the process of sedimentation, and diagenesis of sedimentary rocks.</p> <p><b>PO-7.:</b> Students will know the processes of volcanic activity its classification, products and distribution.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Describes various hypothesis about origin of the earth and solar system.</p> <p><b>CO-2.:</b>Describe various spheres of the earth and their interaction.</p> <p><b>CO-3.:</b> Explains the effect of weathering, erosion and deposition for the formation of various features on the earth surface</p> <p><b>CO-4.:</b> Explain effects, distribution, causes and process of earthquake.</p> <p><b>CO-5.:</b> Explains interior of the earth.</p> <p><b>CO-6.:</b> Describe types and distribution of volcanic activities.</p>

**B.Sc. – I, Semester – I, Paper – II Structural Geology**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course deals with the geological structures developed in the rocks due to deformation.</p> <p><b>PSO-2.:</b> Gains the knowledge of geometry and mechanism of deformative forces acting on the rocks.</p> <p><b>PSO-3.:</b> Students will learn various geometrical characters of outcrops.</p> <p><b>PSO-4.:</b> Understand the types and geometry of structures developed in the rocks such as folds, faults, joints and unconformities.</p> <p><b>PSO-5.:</b> Learn to identify foliation and lineation within the rocks.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Describe various mechanisms of deformations and resulting structures.</p> <p><b>CO-2.:</b> Apply theoretical knowledge of geometrical characters of outcrops in the field such as dip, strike, dip angle etc.</p> <p><b>CO-3.:</b>Identify and classify the structures developed in the rocks.</p> <p><b>CO-4.:</b> Acquire structural data in the field.</p>

**B.Sc. – I, Semester – II, Paper – III Crystallography**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>The course deals with the study of crystals with respect to their morphology, symmetry, notations, normal crystal classes and various laws of crystallography</p> <p><b>PSO-2.:</b> The students will acquire skill to measure interfacial angle of crystallographic models with the help of goniometer.</p> <p><b>PSO-3.:</b> Students will able to identify class and elements of symmetry of given crystal models</p> <p><b>PSO-4.:</b> Student will understand various parts such as faces, edges, solid angles and forms of the crystal model.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Identify and classify the crystal model by applying laws of crystallography.</p> <p><b>CO-2.:</b> Able to measure interfacial angles of various models.</p> <p><b>CO-3.:</b>Shows various parts of the crystals.</p> <p><b>CO-4.:</b>Uses crystallographic knowledge for identification of minerals / crystals in hand specimen.</p>

**B.Sc. – I, Semester – II, Paper – IV Mineralogy**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>The course is designed to understand the basics of mineralogy and optical mineralogy.</p> <p><b>PSO-2.:</b> The course deals with the physical and chemical characteristics of minerals and their classification.</p> <p><b>PSO-3.:</b> Students will able to identify the minerals in hand specimens as well as under the petrological microscope.</p> <p><b>PSO-4.:</b> Student will understand the process of formation of minerals and their composition.</p> <p><b>PSO-5.:</b> The students get acquainted with the parts and properties of petrological microscope.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Define mineral and describe physical and optical properties, chemical composition and group / family of given mineral.</p> <p><b>CO-2.:</b> Explain the association and occurrences of minerals in the rocks.</p> <p><b>CO-3.:</b> explain working of parts of petrological microscope</p> <p><b>CO-4.:</b> explain behaviour of light through the microscope and causes of properties</p>

### B.Sc. – II, Semester – III, Paper – VIigneous Petrology

<b>Program Specific Outcome</b>	<b>PSO-1.:</b> This course deals with advanced igneous processes and classification. <b>PSO-2.:</b> Gains the knowledge about textures and structures and reaction relationship. <b>PSO-3.:</b> Students will learn to classify igneous rocks considering various aspects. <b>PSO-4.:</b> Know complex chemical and physical processes during igneous rock formation.
<b>Course Outcome</b>	<b>CO-1.:</b> Describe various crystallization processes. <b>CO-2.:</b> Apply knowledge to microscopic and megascopic characters of rocks to understand genesis and sequence of formation. <b>CO-3.:</b> Identify and classify the igneous rocks. <b>CO-4.:</b> Describe the magmatic processes during crystallization.

### B.Sc. – II, Semester – III, Paper – VISedimentary and Metamorphic Petrology

<b>Program Specific Outcome</b>	<b>PSO-1.:</b> This course deals with advanced sedimentary and metamorphic processes and classification. <b>PSO-2.:</b> Describes the physical and optical properties of rocks of different groups. <b>PSO-3.:</b> Students will learn to classify sedimentary rocks on various aspects and understand environment of deposition. <b>PSO-4.:</b> Know classification of metamorphic rocks based on different aspects. <b>PSO-5.:</b> Understand the facies and complex metamorphic processes.
<b>Course Outcome</b>	<b>CO-1.:</b> Describe varieties of sedimentary and metamorphic rocks. <b>CO-2.:</b> Apply knowledge to microscopic and megascopic characters of rocks to understand genesis and sequence of formation. <b>CO-3.:</b> Identify and classify the sedimentary and metamorphic rocks. <b>CO-4.:</b> Describe the conditions during the formation of sedimentary and metamorphic rocks.

### B.Sc. – II, Semester – IV, Paper – VIIStratigraphy

<b>Program Specific Outcome</b>	<b>PSO-1.:</b> This course enables the students to understand geological concepts, principles and theories of stratigraphy and stratigraphy of India. <b>PSO-2.:</b> The students understand the Principles of stratigraphy and various methods of correlations. <b>PSO-3.:</b> Students will learn about physiographic and tectonic divisions of India. <b>PSO-4.:</b> Students will learn and understand cratons and mobile belts of India. <b>PSO-5.:</b> Students will learn Precambrian stratigraphy of India. <b>PSO-6.:</b> Students will learn Phanerozoic stratigraphy of India.
<b>Course</b>	<b>CO-1.:</b> Describe and explain principles of stratigraphy and methods of

<b>Outcome</b>	<p>correlations</p> <p><b>CO-2.:</b>Explains tectonic framework of India.</p> <p><b>CO-3.:</b>Describe and classify Dharwar, Cuddapah, Vindhyan and Delhi Supergroups.</p> <p><b>CO-4.:</b>Describe and classify Palaeozoic, Mesozoic, Cretaceous, Palaeogene and Neogene successions in India</p> <p><b>CO-5.:</b> Describe and explain origin, distribution, tectonics, economics and structure of Deccan traps in Maharashtra.</p>
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#### **B.Sc. – II, Semester – IV, Paper – VIII Palaeontology**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course encompasses the aspects of the age of the earth, chronological arrangement of rocks and appearance and evolution of life through the geologic time.</p> <p><b>PSO-2.:</b> The student will enable to understand the changes that occurred in the history of the earth and relate them to their field observations.</p> <p><b>PSO-3.:</b> The students will learn meaning of fossils, their classification, age and the modes of their formations.</p> <p><b>PSO-4.:</b> Students will able to identify and describe the morphology of fossil.</p> <p><b>PSO-5.:</b>Students will know various hard parts of fossils of various phylum and classes.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b>Interpret paleo-climate and paleo-environment.</p> <p><b>CO-2.:</b>Define fossils and their modes of preservations.</p> <p><b>CO-3.:</b>Identify and classify the fossils and describes its morphology hard parts.</p>

#### **B.Sc. – III, Semester – V, Paper – IX Earth's Physics and Dynamics**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course enables the students to appreciate the dynamic nature of the Earth processes.</p> <p><b>PSO-2.:</b> The course develops the concepts of plate tectonics on a global scale and analyses the physical processes responsible for the formation and destruction of the plates.</p> <p><b>PSO-3.:</b> Students will learn various modern concepts of orogenic and Epeirogenic movements.</p> <p><b>PSO-4.:</b> Students will learn geodynamics of the lithosphere and concept of isostasy, ocean floor spreading, continental drift, plate tectonics.</p> <p><b>PSO-5.:</b>Students will learn tectonic evolution of India</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Describe orogenic and Epeirogenic movements.</p> <p><b>CO-2.:</b> Understand the processes of isostasy, ocean floor spreading, continental drift, plate tectonics.</p> <p><b>CO-3.:</b>Describe mountain building processes.</p> <p><b>CO-4.:</b> Apply the earth's dynamic processes to know the tectonic evolution of India.</p>

#### **B.Sc. – III, Semester – V, Paper – X Geomorphology**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course enables the students to appreciate the evolution and development of various landscapes under various environments.</p> <p><b>PSO-2.:</b> The students understand the fundamental concepts of geomorphology.</p> <p><b>PSO-3.:</b> Students will apply concepts in geomorphology in various landscape evolution models.</p> <p><b>PSO-4.:</b> Students will learn cycle of erosion formed due to activities of agents</p> <p><b>PSO-5.:</b>Students will learn importance of slope in evolution of landscape and its elements</p> <p><b>PSO-6.:</b> Students will get knowledge of mass movements, its classification, factors, prevention and monitoring.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Describe and explain ten fundamental concepts of geomorphology.</p> <p><b>CO-2.:</b> Apply knowledge of concepts in the cycle of erosion.</p> <p><b>CO-3.:</b>Describe and classify slopes and its application in the evolution of landscape.</p> <p><b>CO-4.:</b> explains the effects of mass movements and suggests various innovative preventive measures and monitoring methods.</p>

#### **B.Sc. – III, Semester – V, Paper – XI Stratigraphy of India Part – I**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course enables the students to understand geological concepts, principles and theories of stratigraphy and Precambrian geology of India.</p> <p><b>PSO-2.:</b> The students understand the Principles of stratigraphy and various methods of correlations.</p> <p><b>PSO-3.:</b> Students will learn about physiographic and tectonic divisions of India.</p> <p><b>PSO-4.:</b> Students will learn and understand cratons and mobile belts of India.</p> <p><b>PSO-5.:</b>Students will learn Precambrian stratigraphy of extra-peninsular India.</p> <p><b>PSO-6.:</b> Students will get knowledge about Proterozoic basins of India.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Describe and explain principles of stratigraphy and methods of correlations.</p> <p><b>CO-2.:</b> Explains tectonic and physiographic framework of India.</p> <p><b>CO-3.:</b>Describe and classify cratons, Proterozoic basins and mobile belts in India.</p> <p><b>CO-4.:</b> explains and classify Precambrian successions in extra-peninsular India.</p>

#### **B.Sc. – III, Semester – V, Paper – XII Applied Geology Part – I**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course is designed to learn applications of geology in fields such as civil engineering projects and groundwater.</p> <p><b>PSO-2.:</b> The students understand applications of geological knowledge to large civil engineering projects.</p> <p><b>PSO-3.:</b> Students will apply engineering properties of rocks and suggest</p>
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	<p>suitable sites for constructions.</p> <p><b>PSO-4.:</b> Students will learn and understand definition, types, movement and operating laws of groundwater.</p> <p><b>PSO-5.:</b>Students will apply the knowledge for conservation of groundwater by recharging it.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Suggest suitable site for civil constructions using geological considerations and knowledge.</p> <p><b>CO-2.:</b> Explains engineering properties of rocks.</p> <p><b>CO-3.:</b>Describe and classify aquifers and movements of groundwater.</p> <p><b>CO-4.:</b> Suggest various methods for groundwater conservations.</p>

### **B.Sc. – III, Semester – VI, Paper – XIII Economic Geology and Prospecting**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course is designed to learn economic aspect of geology.</p> <p><b>PSO-2.:</b> The students understand processes of formation of ore minerals.</p> <p><b>PSO-3.:</b> Students will learn rules and regulations of the national mineral policy laid by the Government of India.</p> <p><b>PSO-4.:</b> Students will learn sustainable development and conservation of the geogenic natural resources.</p> <p><b>PSO-5.:</b>Students will learn geophysical, geological and geomorphological methods of prospecting for economic minerals</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Explain economic aspects of geology.</p> <p><b>CO-2.:</b> Explains formation processes of ore minerals.</p> <p><b>CO-3.:</b>Describe and suggest various conservation methods for geogenic natural resources.</p> <p><b>CO-4.:</b> Apply geologic, geophysical and geomorphological methods for prospecting.</p>

### **B.Sc. – III, Semester – VI, Paper – XIV Environmental Geology**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course is designed to learn applications of fundamental knowledge of geology to the interaction between anthropogenic activities and natural environment.</p> <p><b>PSO-2.:</b> The students understand concept and fundamentals of environmental geology.</p> <p><b>PSO-3.:</b> Students will understand and learn the processes of geogenic hazards and anthropogenic hazards.</p> <p><b>PSO-4.:</b> Students will learn geological aspects of environmental health.</p> <p><b>PSO-5.:</b>Students will acquire skills of disaster management.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Explain concept and fundamentals of environmental geology.</p> <p><b>CO-2.:</b> Classify and Explains various geogenic and anthropogenic hazards.</p> <p><b>CO-3.:</b>Describe and suggest various precautionary and preventive measures.</p> <p><b>CO-4.:</b> Apply geologic knowledge to conserve environmental health.</p>

### **B.Sc. – III, Semester – VI, Paper – XV Stratigraphy of India Part – II**

<b>Program</b>	<p><b>PSO-1.:</b>This course enables the students to understand Phanerozoic stratigraphy of India.</p>
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<b>Specific Outcome</b>	<p><b>PSO-2.:</b> The students understand the concept of Precambrian – Cambrian boundary;</p> <p><b>PSO-3.:</b> Students will learn the Paleozoic and Mesozoic Formations of Peninsular India with reference to their, Geographical distribution, Stratigraphic classification, Lithology, Age, Flora, Fauna, and Economic importance</p> <p><b>PSO-4.:</b> Students will learn the Cenozoic Formations of India with reference to their, Geographical distribution, Stratigraphic classification, Lithology, Age, Flora, Fauna, and Economic importance.</p> <p><b>PSO-5.:</b>Students will learn geology of Maharashtra.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Describe and explain importance of Precambrian and Cambrian boundary</p> <p><b>CO-2.:</b> Explain and describe Paleozoic and Mesozoic Formations of Peninsular India</p> <p><b>CO-3.:</b>Explain and describe Cenozoic Formations of India</p> <p><b>CO-4.:</b> Explains, classify and describe Geology of Maharashtra.</p>

#### **B.Sc. – III, Semester – VI, Paper – XVI Applied Geology Part – II**

<b>Program Specific Outcome</b>	<p><b>PSO-1.:</b>This course is designed to learn remote sensing, Geographic Information System and Field Geology.</p> <p><b>PSO-2.:</b> The students will learn fundamental techniques used for remote sensing with their applications in geology.</p> <p><b>PSO-3.:</b> Students will acquire skill to interpret aerial and satellite images related to geosciences.</p> <p><b>PSO-4.:</b> Students will learn theoretical and practical, hands-on approach to spatial database design and spatial data analysis with Geographical Information Systems as applied to the various fields of geosciences.</p> <p><b>PSO-5.:</b>Students will acquire skills and basic knowledge of geological mapping and surveying techniques.</p>
<b>Course Outcome</b>	<p><b>CO-1.:</b> Uses fundamental techniques of remote sensing to interpret geological aspects from analog and digital images.</p> <p><b>CO-2.:</b> Use GIS software to analyse, design model, interpret and generate map to solve geoscientific problems.</p> <p><b>CO-3.:</b>Work independently in the field for geological mapping and sampling.</p> <p><b>CO-4.:</b> Successfully use Brunton compass and GPS in the field.</p>

