राष्ट्रीय शिक्षा नीति – 2020 आधारित

Choice Based Credit System (C.B.C.S.)

[नियमावली: 2024–25]

3 YEARS UG PROGRAMME

3 YEARS UG (HONS.) PROGRAMME

4 YEARS UG (HONS.) PROGRAMME

4 YEARS UG (HONS. WITH RESEARCH) PROGRAMME

Geology (Minor)

3rd and 4th sem

[EFFECTIVE: 2024-25 ONWARDS]

महाराजा सुहेल देव विश्वविद्यालय, आजमगढ़

Maharaja Suhel Dev State University, Azamgarh

Syllabus

B.Sc. Geology (Minor)

For III and IV Sem

Year	Sem.	Course Code	Paper Title	Theory/Practical	Credits
2	III	B090301T	Minor: Palaeontology	Theory	6
2	IV	B090401T	Minor: Petrology	Theory	6

Year	Semester	Theory/ Practical	Compulsory / Elective	Course Title	Credits	Teaching Hours
2	Third	Theory	Minor	Minor: Palaeontology	06	90
2	Fourth	Theory	Minor	Minor: Petrology	06	90

B.Sc. Geology (Minor) Syllabus For III and IV Sem.

Programme/Class: **Minor**	Year: **Second**	Semester: **Third**
Subject: **Geology**		
Course Code: B090301T	Course Title: **PALAEONTOLOGY**	

Course outcomes:
After completing the course, student
will know the palaeo-life of earth
will know the reconstruction the earth based on fossils
will be able to determine the age of rock formation-based fossils
will be able to locate the resources based on fossils

Credits: 6	Core: **Minor**
Max. Marks: 100	Min. Passing Marks: as per rules

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 3-0-0

Unit	Topics	No. of Lectures
I	Introduction to palaeontology; Fossils and the processes of fossilization; Preliminary idea of the origin of life; Basic idea of trace fossils and their uses; Microfossils: Definition and significance; Geological Time Scale	12
II	Morphology and geological history of Bivalvia, Brachiopoda	11
III	Morphology and geological history of Gastropoda, Cephalopoda	10
IV	Morphology and geological history of Echinoidea and Anthozoa.	12
V	Morphology and geological history of Trilobita and Graptolithina	11
IV	Introduction to Palaeobotany; Important Lower and Upper Gondwana plant fossils	12
VII	Brief idea of concept of species; Classification of organisms; Principles of marine ecology, palaeoecology.	12
VIII	Principles of sequence stratigraphy; Microplaeontology and its use	10

Suggested Readings:

1. Cowen, R. (2000) History of Life, Blackwell Science.
2. E. N. K. Clarkson (2013) Invertebrate palaeontology and Evolution, Blackwell Science
3. Rhona M. Black, (1989) The Elements of Palaeontology, Cambridge University Press
4. Michael Benton, (2005) Vertebrate Palaeontology, Blackwell Publishing
5. Patrick Wyse Jackson, (2019) Introducing Palaeontology: A Guide to Ancient Life, Dunedin Academic Press Ltd.
6. Raymond Enay (2012) Palaeontology of Invertebrates, Springer-Verlag.
7. Peter Doyle, Understanding Fossils: An Introduction to Invertebrate Palaeontology.
8. Morley Davies (2008) An Introduction to Palaeontology, Read Books.
9. Sreepat Jain (2017) Fundamentals of Invertebrate Palaeontology: Macrofossils, Springer India
10. Roland Goldring, (2014) Field Palaeontology, Routledge

Programme/Class: **Minor**	Year: **Second**	Semester: **Fourth**
Subject: **Geology**		
Course Code: B090401T	Course Title: **PETROLOGY**	

Course outcomes:
After completing the course, student
will learn to identify rock types and their mineralogical composition.
will learn texture, structure found within the rock
will understand the role of temperature and pressure in formation of rocks
will understand the geo-thermoeter
Understand stratigraphy and sedimentation history of different sedimentary basins of India
will understand the process of sedimentation and rock formation

Credits: 6	Core: **Minor**
Max. Marks: 100	Min. Passing Marks: as per rules

Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 3-0-0

Unit	Topics	No. of Lectures
I	Rocks: types and origin. Phase Rule; Laws of thermodynamics; Phase equilibria studies in SiO_2, Diopside-Anorthite, Albite-Anorthite, Leucite-Silica and Diopside-Albite- Anorthite systems	12
II	Brief introduction to rocks; Magma: definition, composition and origin; Bowen's reaction series; Magmatic differentiation and assimilation	10
III	Textures of igneous rocks; IUGS classification of igneous rocks, Brief petrographic description of common igneous rocks	11
IV	Definition, agents, types and grades of metamorphism; Metamorphic rocks: texture, structure and classification; Concept of index minerals, concept of isograds and metamorphic facies.	12
V	Regional metamorphism of pelitic, calcareous and basic rocks; anatexis; Brief description of common metamorphic rocks.	10
VI	Origin and classification of sedimentary rocks; Introduction to sedimentary rocks and their origin; Flow dynamics; Froude number; Reynold number and Types of flow (Laminar and turbulent flow)	12
VII	Sediment characteristics; Diagenesis; Textures of sedimentary rocks; Important primary Sedimentary Structures- bedding, ripple marks, cross bedding, mud cracks and rain prints.	11
VIII	Classification of sedimentary rocks: clastic and non-clastic; Classification of sandstone and carbonates with special reference to Folk's classification; Sedimentary basins in different tectonic settings	12

Suggested Readings:

1. Cox, K. G., Bell, J. D. and Pankhurst, R. J. 1979. Interpretations of igneous rocks. George Allen and Unwin, London.
2. Wilson, M. 1989. Igneous Petrogenesis. London Unwin Hyman.
3. Anthony R. Philpotts and Ague, J. J. 2009. Principles of Igneous and Metamorphic Petrology. Cambridge.
4. Winter, J. D. 2001. Igneous and Metamorphic Petrology. Prentice Hall.
5. Gautam Sen, 2014. Petrology: Principles and Practice: Gautam Sen (Springer).
6. Best, M. G. 2013. Igneous and Metamorphic Petrology. Wiley Blackwell.