NATIONAL EDUCATION POLICY-2020

Syllabus Minor Elective Subject

Geology

(*Not for the students having Geology Major Elective Subject*)

DEPARTMENT OF GEOLOGY

FACULTY OF SCIENCE

KUMAUN UNIVERSITY, NAINITAL

List of Semester-wise Titles of the Papers in Geology (Minor Elective Subject)					
Year	**Sem.**	**Course Code**	**Paper Title**	**Theory/ Practical**	**Credits**
CERTIFICATE COURSE IN SCIENCE					
FIRST YEAR	I		Introductory Geology	Theory	04
	II				
DIPLOMA COURSE IN SCIENCE					
SECOND YEAR	III		Geological Processes	Theory	04
	IV				

PROGRAMME OUTCOMES (POs)

The curricula of geology as a Minor Elective Subject are designed for the students who do not have geology as a Major Elective Subject. It has the following programme outcomes:

PO 1: Enabling the students to understand the origin of universe, solar system, and earth.

PO 2: Enabling the students to understand the internal structure, and physical characters of the earth.

PO 3: Enabling students to have knowledge about the common minerals and rocks, as well as deformation of rocks under stress.

PO 4: Enabling students to understand various internal and external processes of the earth, and the conditions under which they lead to disasters.

PO 5: Enabling students to have knowledge about the management of common geohazards.

Programme specific outcomes (PSOs):

UG I Year / ***Certificate Course in Science***

PSOs: The subject of geology in *Certificate Course in Science* programme pertains to broad physical aspects of the earth, including its internal structure. This programme will impart knowledge on diverse branches of the subject,as well as origin of the universe, solar system, and earth. The students will also know about deformation of rocks under stress. The knowledge gained through this programme will enhance the students understanding about the planet earth.

Programme specific outcomes (PSOs):

UG II Year/ ***Diploma Course in Science***

PSOs: The subject of geology in *Diploma Course in Science* programme provides broad understanding on various internal and external processes of the earth, that under certain conditions become disastrous to human societies. The programme will enable the students to have knowledge about the dynamism of the planet earth, energy sources of this dynamism, as well as about the strategies for managing different geohazards.

Semester I/II

Paper: Introductory Geology

Course outcome: After successful completion of this course students will understand the originof universe, solar system, and the earth. They will know about the internal structure of the earth. Common rocks and their mineral compositions, and deformation of rocks under stress. After completing this course they will have basic knowledge of the origin and physical characteristics of the earth.		
Course type, paper & Credits, paper & credit	**Content**	**Teaching hours**
Theory Introductory Geology (04)	Unit 1: Definition and branches of Geology. Age and Origin of the Universe: Big Bang Theory. Galaxies. Basic information about Milky way galaxy. Our Solar system: brief introduction to planets and their satellites, asteroid belt and kupier belt. Uniqueness of the earth in terms of its atmosphere and hydrosphere.	15
	Unit II: A brief account of various theories regarding the origin of the earth. Size, shape, mass, density and atmosphere of the earth; Internal structure and chemical composition of the earth and composition. Earth's gravity and magnetic fields, and thermal structure. Fossilization, fossils and their uses. The geological time scale.	15
	Unit III: Definition and characters of mineral Chemical composition and diagnostic physical properties of common rock forming minerals: quartz, feldspar, pyroxene, amphibole, garnet, olivine and mica families. Characters Igneous, metamorphic and sedimentary rocks	15
	Unit IV: Elementary idea of bed, dip and strike. Basic idea about stress and strain: deformation of rocks. Elementary idea of types of deformation. Nomenclature and types of folds, and faults. Joints and unconformities	15

Suggested Reading:

- Arthur Holmes (1992). Principles of Physical Geology. Chapman and Hall,London.
- Miller (1949). An Introduction to Physical Geology. East West PressLtd.
- Spencer, E.V. (1962). Basic concepts of Physical Geology. Oxford &IBH.
- Billings, M.P. (1972). Structural Geology. PrenticeHall.

- Davis, G.H. (1984). Structural Geology of Rocks and Region. JohnWiley
- Hills, E.S. (1963). Elements of Structural Geology. Farrold and Sons,London.
- R.J Park (1998) Foundation of Structural Geology, III Edition, Routledge
- Singh, R. P. (1995). Structural Geology, A Practical Approach. Ganga Kaveri Publ.,Varanasi.

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Suggested Online Link:

- https://www.futurelearn.com/courses/extinctions-past-present/19/steps/1312906.
- https://www.mooc-list.com/course/mountains-101-coursera
- https://www.mooc-list.com/course/origins-formation-universe-solar-system-earth-and- life coursera
- https://www.mooc-list.com/course/science-solar-system-coursera
- https://www.mooc-list.com/course/planet-earth-and-you-coursera
- https://www.mooc-list.com/course/dynamic-earth-course-educators-coursera
- https://www.classcentral.com/course/swayam-structural-geology-14312

Semester III/IV

Paper: Geological Processes

Course outcome: After successful completion of this course students will understand the formation of different landforms and the physical, chemical and biological processes operating upon the earth. They will also have knowledge of earthquake, volcanic and landslide disasters, along with basic ideas of their management. After completing this course they will able to recognize the future changes in the landscape of any region, in particular its hazard proneness.		
Course type, paper & Credits, paper & credit	**Content**	**Teaching hours**
	Unit 1: Laws of uniformitarianism. Energy sources of the earth. Internal and external processes of the earth. Elementary knowledge of plate tectonics. Continental drift and sea floor spreading.	15
Theory Physical & Structural Geology (04)	Unit II: Earthquakes: nature of seismic waves, their intensity and magnitude. Earthquake disasters: causes and strategy of mitigation. Volcanoes: types, products and causes of volcanism. Volcanic hazards: causes and strategy of strategy of mitigation	15
	Unit III: Weathering and its types; The rock cycle. Erosion, transportation and deposition by rivers, wind, glaciers, waves and underground water, and their related landforms	15
	Unit IV: Brief idea about mass wasting. Landslides: their types, and causative and triggering factors. Brief idea about various techniques of landslide management.	15

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- Arthur Holmes (1992). Principles of Physical Geology. Chapman and Hall,London.
- Miller (1949). An Introduction to Physical Geology. East West Press Ltd.
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- https://www.mooc-list.com/course/mountains-101-coursera
- https://www.mooc-list.com/course/origins-formation-universe-solar-system-earth-and- life coursera
- https://www.mooc-list.com/course/science-solar-system-coursera

- https://www.mooc-list.com/course/planet-earth-and-you-coursera
- https://www.mooc-list.com/course/dynamic-earth-course-educators-coursera
- https://www.classcentral.com/course/swayam-structural-geology-14312