



CLUSTER UNIVERSITY SRINAGAR

SYLLABUS (FYUP UNDER NEP 2020)

Offered By Department Of GEOLOGY

Semester 1st (Major Course)

Course Title: Dynamic Earth

Course Code: UGGLG22J101

Credits: 4 (Theory: 3, Practical: 1)

Contact Hrs: 75 (Theory: 45, Practical: 30)

Max. Marks 100

Theory External: 60; Min Marks: 24

Theory Internal (Continuous Assessment): 15 Marks, Min Marks: 06

Practical Experimental Basis= 15, Min. Marks: 06

Practical Experimental (Continuous assessment) = 10, Min. Marks: 04

Learning Objectives: To understand the dynamic earth, its origin, history and evolution, internal and external structures, and flow of energy.

Learning Outcomes: To have an overall comprehension of the earth and relate it to as a part of the earth's living system to understand the synergy between different processes operating within the planet.

UNIT 1:

15 Hrs

Understanding of Planet Earth

The importance of cosmology, geology, meteorology, and oceanography in understanding the earth. Geology and its sub-disciplines. Place of Earth in the solar system- origin, shape, size and age, rotational and revolution parameters of the Earth. Formation of core, mantle, and crust. Planets and Planetary Systems, meteoroids, asteroids, and comets.

UNIT 2:

15 Hrs

Internal Dynamics of Earth

Plate tectonics and earth's magnetic field. Plate tectonics vis-à-vis seafloor spreading and continental drift. Geodynamic elements of the earth- mountains, basins, rifts, trenches, oceanic ridges, island arcs and faults. Earth's magnetism and magnetic reversal through geologic ages.

UNIT 3:

15 Hrs

External Dynamics of Earth

Ocean bathymetry and overview of ocean circulation. The dynamics of the hydrosphere and atmosphere, atmospheric structure, and circulation. Land sea-air interaction. Weather and climatic changes. Heat budget of the earth.

UNIT 4: (PRACTICAL)

30 Hrs

Practical approach and hands-on investigation

Internal structure of the earth. Mapping convection currents, hotspots, and plate motion. Distribution of geodynamic elements of the earth. Geodynamics of the Indian plate. Mapping oceanic and atmospheric circulation patterns.

Suggested Readings:

1. Marshak, S. (2008). *Earth: Instructors Manual/Test Bank: Portrait of a Planet*. United States: W. W. Norton, Incorporated.
2. Lyell, C. (1854). *Principles of Geology: The Modern Changes of the Earth and Its Inhabitants Considered as Illustrative of Geology*. United States: D. Appleton & Company.
3. Holmes, A., Holmes, D. L. (1978). *Holmes Principles of Physical Geology*. India: Van Nostrand Reinhold.
4. Jain, S. (2013). *Fundamentals of Physical Geology*. India: Springer India.
5. Lowrie, W. (2007). *Fundamentals of Geophysics*. Cambridge University Press.
6. Roy, A. B. (2010). *Fundamentals of Geology*. United Kingdom: Alpha Science International, Limited.
7. Garrison, T. (2005). *Oceanography: An Invitation to Marine Science*. United States: Thomson Brooks/Cole.
8. Van der Pluijm, B. A., Marshak, S. (2010). *Earth Structure: An Introduction to Structural Geology and Tectonics*. United Kingdom: W.W. Norton, Incorporated.