DEPARTMENT OF GEOLOGY

BSC (Hons.) Geology
Category-I

DISCIPLINE SPECIFIC CORE COURSE – 1 (DSC-1) Earth System Science

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Earth System Science	**4**	**3**	**0**	**1**	**B.Sc. Hons. Geology students only**	**NIL**

Learning Objectives

Introduction to the subject Geology. Holistic understanding of Earth as a planet in the Solar System and its relationships with other terrestrial planets. Understanding of the processes occurring in lithosphere, hydrosphere, biosphere, and atmosphere

Learning outcomes

After completion of this course, students will be able to understand and comprehend the connectivity and dynamics of the atmosphere, lithosphere, and hydrosphere of the Earth. A thorough understanding of Geology, its various branches and the overall scope of Earth Science will be possible through this course.

SYLLABUS OF DSC-1

Unit 1: **(12 Hours)**

Holistic understanding of dynamic planet 'Earth' and its orbital parameters. Introduction to various branches of Earth Sciences. General characteristics and theories about the origin of the Universe including our Solar System and its planets. The terrestrial and Jovian planets. Interior of the Earth. Meteorites and Asteroids. Earth's origin, size, shape, mass, density, rotational and revolution parameters. Methods to determine age of the Earth. Earth's Magnetic Field and Palaeomagnetism. Applications of paleomagnetism.

Unit 2: **(9 Hours)**

Plate Tectonics: Concept of plate tectonics, sea-floor spreading and continental drift.
Earthquake and earthquake belts; Volcanoes- types, products and distribution of volcanic belts.

Unit 3: **(9 Hours)**

Hydrosphere and Atmosphere: Layers of the Atmosphere. Various cells of the atmospheric circulation. World surface oceanic currents and their distribution. Earth's heat budget. Orogeny and epeirogeny. Major mountain belts of the world.

Unit 4: (15 Hours)

Understanding the past from geologic records; Nature of geologic records; Standard Geological time scale and introduction to the concept of time in geological studies; Introduction to geochronological methods and their application in geological studies. History of development in concepts of uniformitarianism, catastrophism, and Neptunism, Physiographic divisions of India.

Practical (30 Hours)

1. Study of major geomorphic features and their relationships with outcrops through physiographic models.
2. Detailed study of topographic sheets and preparation of physiographic description of an area
3. Study of distribution of major dams on map of India and their impact on river systems
4. Study of major ocean currents of the World
5. Study of different rock types
6. Study of fossils and their application
7. Study of physiographic map of earth during different Geological ages

Essential readings

- Cesare Emiliani,1992; Planet Earth: Cosmology, Geology, and the Evolution of Life and Environment
- Arthur Holmes, 197; Holmes Principles Of Physical Geology, by John Wiley & Sons

Suggestive readings (if any)

- Physical Geology, 15th Edition, Charles C. Plummer, Diane H. Carlson, Lisa Hammersley McGraw-Hill Education- 2016
- Essentials of Geology, 13th Edition Frederick K. Lutgens, Edward J. Tarbuck, Dennis G. Tasa- Pearson Publications 2016
- Emiliani, C. (1992). Planet earth: cosmology, geology, and the evolution of life and environment. Cambridge University Press.
- Gross, M. G. (1977). Oceanography: A view of the earth.
- Duff, P. M. D. & Duff, D. (Eds.). (1993). Holmes' principles of physical geology. Taylor & Francis.