

PHY7112: PALEO- & ROCK-MAGNETISM

1. Course Name: Paleo- & Rock-Magnetism

2. Course Code: PHY7112

3. Credit Units: 3

4. Course Description:

This course discusses the plate tectonics and general features of the geomagnetic fields. Magnetic properties of solids are also discussed.

5. Course Objectives:

At the end of the course, the students should be able to:

- Discuss the general continental shift theories.
- Use geochronological methods in dating rocks.
- Use magnetic properties of rocks to determine their origins.

6. Course Outline:

| Content | Hours |
|---|-------|
| Paleo-tectonics; Plate tectonics and Continental Drift Theory; General features of geomagnetic field. | 7 |
| Magneto-hydro-dynamic theory (MHD); Magnetic mineralogy; Sampling procedure and measurements; Magnetic and thermal cleaning of natural remanence. | 7 |
| Statistical and mathematical analyses– Fisher’s statistics; Geochronological methods of dating rocks. | 5 |
| Applications: Archeological, Geomagnetic, Geological and geophysical, Paleo-environment and Environment, biological. | 5 |

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| Magnetic properties of solids- outline of ferromagnetism, magnetic domains and its structure, magnetic behaviour of fine ferromagnetic particles, susceptibility and coercive force, anti ferromagnetism. | 5 |
| Magnetic properties of minerals- ferrimagnetism of magnetite, properties of titanomagnetites, oxidized titanomagnetites, other iron bearing minerals. | 6 |
| Magnetic properties of rocks- magnetic minerals & their origin, anisotropy of magnetic susceptibility, magnetic hysteresis, thermomagnetic properties, classification of remanence, alternating field and thermal demagnetization, piezomagnetic effect; | 7 |
| Applications of rock magnetism. | 5 |
| Total | 45 |

7. Mode of Delivery:

This course will consist of lecture sessions and there will also be data analysis using theories learnt.

8. References:

1. C.M.R Fowler. The Solid Earth: Introduction to Global Geophysics. Cambridge Univ. Press (Textbook)
2. P.V. Sharma. Geophysical Methods in Geology. Elsevier Sci. Pub. Co.