

SECOND SEMESTER

MGH 451: PETROLOGY

Skills, employability and entrepreneurship: Like the first subject, this one is a good opportunity for students especially about the formation of rocks which are useful to identify the better quality material in the field for the major constructions/civil engineering projects as well as dimensional and decorative stones. Students exit with course have skills to work in industries related to earth resources, agricultural and soil survey and public works. They will be exposed to start their own entrepreneurship.

IGNEOUS PETROLOGY

Unit 1	Magma and its properties: magma, its generation in the crust and mantle, physical and chemical properties. Bowen's reaction series. Magmatic Evolution: partial melting, magmatic differentiation fractional crystallization, liquid immiscibility, magma mixing and assimilation.	8 hrs
Unit 2	Forms and structures of igneous rocks. Classification of igneous rocks - IUGS and other standard classifications. Textures of igneous rocks.	6 hrs
Unit 3	Distribution and description of important igneous rocks: Granite, basalt, syenite, peridotite, carbonatite, dolerite, lamprophyre, kimberlite and their associated mineral deposits with special reference to India. Interactive sessions of teaching to enhance students-teacher interactions through hands-on demonstrations and exercises in the recent advancement of the subject related to the curriculum.	6 hrs

SEDIMENTARY PETROLOGY

Unit 4	Sources and formation of sediments. Textures and primary structures of sedimentary rocks.	6 hrs
Unit 5	Diagenesis. Classification of sediments and sedimentary rocks.	6 hrs
Unit 6	Distribution and description of important sedimentary rocks: Rudites – Breccia and conglomerate; Arenites - sandstones, greywacke; Argillites – shale, Carbonates - limestone and dolomite. Interactive sessions of teaching to enhance students-teacher interactions through hands-on demonstrations and exercises in the recent advancement of the subject related to the curriculum.	8 hrs

METAMORPHIC PETROLOGY

Unit 7	Metamorphism: Introduction, definition and types, ocean-floor metamorphism, diagenesis vs. metamorphism. Factors of metamorphism: temperature, pressure and fluids.	6 hrs
Unit 8	Textures and structures of metamorphic rocks: Lineation and Foliation, Grades of metamorphism. Gneisses, granulites, quartzites, schists, slates and marbles. Interactive sessions of teaching to enhance students-teacher interactions through hands-on demonstrations and exercises in the recent advancement of the subject related to the curriculum.	6 hrs

List of References:

1. Sedimentary Petrology F. J. Pettijohn (2004).
2. Petrology of sedimentary rocks – Greensmith (1989).
3. Depositional Sedimentary environments, Springer–H.E. Reineck and I.B. Singh
4. Principles of Petrology – G. W. Tyrell, Asia Pub. House, New Delhi (1980).
5. Petrology – Ehlers and Blatt, CBS Publ (2006).
6. Igneous and Metamorphic Petrology – Best Myron G., CBS Publications (1986).
7. Students Petrology – Allen and Nockolds (1978).
8. A Practical Approach to Sedimentology - CBS Pub. – R.C. Lindholm (1987).
9. Sedimentary Rocks, CBS Pub. – F. J. Pettijohn (1984).
10. Petrology- Igneous, Sedimentary and Metamorphic (3rd Edition): Harvey Blatt, Robert J. Tracy, Brent E. Owens - Allied Publishers.
11. Igneous rocks and Processes: Practical Guide by robin Gill - Willey Blackwell.
12. Petrology of Sedimentary Rocks: Boggs Sam- CUP.

MGH 452: STRATIGRAPHY AND PALAEOONTOLOGY

Skills, employability and entrepreneurship: This subject is a good opportunity for students to study evolution of life as well the history of the earth. Students exit from this course, especially from the biological discipline have scope to work on many unsolvable problems which are directly related t the evolution of human beings. Similarly they have chance to work in fossil fuel exploration (coal and petroleum).

STRATIGRAPHY

Unit 1	Introduction: Principles of stratigraphy, Concept of measurement of time, geological time scale and global stratigraphic chart. Stratigraphic classification: Litho, bio, chrono, seismic and magneto stratigraphic units and their inter-relationships. A brief review of global stratigraphy.	8 hrs
Unit 2	Physiographic and tectonic subdivisions of India; Evolution of the Indian subcontinent since the Archaean Eon.	4 hrs
Unit 3	Proterozoic basins of India with emphasis on lithological, geochemical, stratigraphic and geochronological aspects. Geological setting and important stratigraphic features of Phanerozoic formations in India such as Gondwana, Deccan Traps, Indo-Gangetic Plain and Himalaya.	8 hrs
Unit 4	Boundary problem and its significance in stratigraphy with emphasis on the Cretaceous - Tertiary boundary. Importance of Cenozoic Era with reference to evolution of climate and life. Quaternary period: Glacial and inter-glacial epochs. Sea-level fluctuations, causes and consequences. Interactive sessions of teaching to enhance students-teacher interactions through hands-on demonstrations and exercises in the recent advancement of the subject related to the curriculum. Interactive sessions of teaching to enhance students-teacher interactions through hands-on demonstrations and exercises in the recent advancement of the subject related to the curriculum.	6 hrs