

## MGH 402: 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 |                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |
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| Unit 1            | Magma and its properties: magma, its <b>generation in the crust and mantle</b> , 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 <b>igneous rocks</b> - IUGS and other standard classifications. Textures of igneous rocks.                                                                                                                                                                                                                                                                             | 6 hrs |
| Unit 3            | Distribution and description of <b>important igneous rocks</b> : Granite, basalt, syenite, peridotite, carbonatite, dolerite, lamprophyre, kimberlite and their associated mineral deposits with special reference to India.<br><br>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

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| Unit 4 | Sources and formation of <b>sediments</b> . Textures and primary structures of sedimentary rocks.                                                                                                                                                                                                                                                                                                      | 6 hrs |
| Unit 5 | Diagenesis. Classification of sediments and <b>sedimentary rocks</b> .                                                                                                                                                                                                                                                                                                                                 | 6 hrs |
| Unit 6 | Distribution and description of <b>important sedimentary rocks</b> : Rudites – Breccia and conglomerate; Arenites - sandstones, greywacke; Argillites – shale, Carbonates - limestone and dolomite.<br><br>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

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| Unit 7 | <b>Metamorphism</b> : Introduction, definition and types, ocean-floor metamorphism, diagenesis vs. metamorphism. Factors of metamorphism: temperature, pressure and fluids. | 6 hrs |
| Unit 8 | <b>Textures and structures of metamorphic rocks</b> : Lineation and Foliation, Grades of metamorphism. Gneisses, granulites, quartzites, schists, slates and marbles.       | 6 hrs |

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|  | 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. |  |
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### 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 (3<sup>rd</sup> 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.

