 IIPM SCHOOL OF ENGINEERING & TECHNOLOGY

**LESSON PLAN: 2022-23**

**Sub: Th.2- Mine Geology II (MG-II)**

**Branch : Mining Semester : 6th**

**Faculty name : Soumya Ranjan Dash**

**Duration : 60 hours**

**Syllabus :**

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| **UNIT 01** | **Stratigraphy**  ** Describe the principles of stratigraphy.**  ** Describe the geological time Scale.**  ** Describe the stratigraphic sequence, lithology, distribution & economic mineral deposits of Iron Ore series, Cuddpah Supergroup, Vindhyan super group & gondwana super group.** |
| **UNIT 02** | **Fossil fuels**  **o Coal**  ** Describe the different ranks of coal.**  ** Describe different grades of coal like A,B,C,D.**  ** Describe the various theories accounting for the origin of coal.**  ** Describe various important lower gondwana Coalfields of India.**  **o Petroleum**  ** Describe the organic & inorganic theories accounting for the origin of petroleum.**  ** Define oil pool & oil trap.**  ** Describe process of accumulation of oil.**  ** Describe favorable conditions for accumulation of oil.**  ** Describe different important oil fields in India.** |
| **UNIT 03** | **Prospecting & exploration.**  ** Define prospecting.**  ** Differentiate between prospecting & exploration.**  ** Use of multi shot camera for borehole direction test.**  ** Enumerate & describe various criteria for geological exploration.**  ** Describe various methods of Geophysical prospecting.**  ** Explain Geochemical prospecting.**  ** Differentiate between biogeochemical & geo botanical prospecting** |
| **UNIT 04** | **Economic Geology**  ** Define ore & gangue.**  ** Define tenor & grade.**  ** Describe the mineralogy, mode of occurrence, distribution & use of iron ore deposits in India.**  ** Describe the mineralogy, mode of occurrence, & description of Chromites deposits in India & its uses.**  ** Describe the mineralogy, mode of occurrence & distribution of copper deposits in India & uses of this metal.**  ** Describe the mineralogy, mode of occurrence, distribution of lead & zinc deposits in India & the uses of these metals.**  ** UNFC (United Nation Framework of Classification) code of classification of reserves.** |
| **UNIT 05** | **Sampling**  ** Define sampling, outline the method of preparation of samples for assay.**  ** Explain sampling**  ** Describe the different methods of sampling as outlined by Bureau of Indian Standards. (BIS)** |

**Books Suggested:**

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| * Geology of India | M S Krishnan |
| * Geology of Petroleum | A I Levorson |
| * Mineral Economics | R K Sinha |
| * Economic Geology | Umeshwar Prasad |

**Objective :**

* Outline the importance of Stratigraphy & Geological time Scale in the study of geology.
* The major Groups & economic minerals associated with them that form the basis for the study of stratigraphy.
* Describe the use, origin mode of occurrence & distribution of fossil fuels & where to look for them.
* Explain the fundamental principles that underline the search for economic minerals. He will achieve a certain amount of clarity in using geological, geophysical & geochemical methods for looking for important mineral deposits.
* Develop a comprehensive idea regarding mineralogy mode of occurrence, uses & distribution of ores.
* Undertake sampling work according to BIS specification.

**Learning Outcome:** In majority of the cases, materials that need to be explored comprise rocks & minerals. It is therefore, essential for an engineer to have basic knowledge of mining geology.

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| **Sl. No** | **Chapter** | **Proposed Week for Teaching** | **Lecture No.** | **Sub. Topic** | **Important Teaching Points** | **Content Source** |
| 01 | **I** | 1 | 1 | Stratigraphy | Principles of Stratigraphy | M.S Krishnan  GM Banger |
| 02 | 2 | Stratigraphy | Geological Timescale | M.S Krishnan  GM Banger |
| 03 | 3 | Stratigraphy | Iron Ore Group | M.S Krishnan  GM Banger |
| 04 | 4 | Stratigraphy | Iron Ore Group | M.S Krishnan  GM Banger |
| 05 | 2 | 5 | Stratigraphy | Cuddpah Supergroup | M.S Krishnan  GM Banger |
| 06 | 6 | Stratigraphy | Cuddpah Supergroup | M.S Krishnan  GM Banger |
| 07 | 7 | Stratigraphy | Vindhyan Supergroup | M.S Krishnan  GM Banger |
| 08 | 8 | Stratigraphy | Vindhyan Supergroup | M.S Krishnan  GM Banger |
| 09 | 3 | 9 | Stratigraphy | Gondwana Supergroup | M.S Krishnan  GM Banger |
| 10 | 10 | Stratigraphy | Gondwana Supergroup | M.S Krishnan  GM Banger |
| 11 | 11 | Stratigraphy | Unit Test- I |  |
| 12 | 12 | Stratigraphy | Revision |  |
| 13 | **II** | 4 | 1 | Fossil Fuels | Ranks of Coal | U Prasad  K M Banger |
| 14 | 2 | Fossil Fuels | Grades of Coal | U Prasad  K M Banger |
| 15 | 3 | Fossil Fuels | Origin of Coal | U Prasad  K M Banger |
| 16 | 4 | Fossil Fuels | Lower Gondwana Coalfields of India | U Prasad  K M Banger |
| 17 | 5 | 5 | Fossil Fuels | Origin of Petroleum | A I Levorsen  K M Banger |
| 18 | 6 | Fossil Fuels | Oil Pool & Oil Trap | A I Levorsen  K M Banger |
| 19 | 7 | Fossil Fuels | Process of accumulation of Oil | A I Levorsen  K M Banger |
| 20 | 8 | Fossil Fuels | Conditions for accumulation of Oil | A I Levorsen  K M Banger |
| 21 | 6 | 9 | Fossil Fuels | Important Oilfields in India | A I Levorsen  K M Banger |
| 22 | 10 | Fossil Fuels | Important Oilfields in India | A I Levorsen  K M Banger |
| 23 | 11 | Fossil Fuels | Unit Test- II |  |
| 24 | 12 | Fossil Fuels | Revision |  |
| 25 | **III** | 7 | 1 | Prospecting & Exploration | Introduction Prospecting | P K Guha  K M Banger |
| 26 | 2 | Prospecting & Exploration | Differentiate between prospecting & Exploration | P K Guha  K M Banger |
| 27 | 3 | Prospecting & Exploration | Use of multi sbhot camera for borehole direction test | P K Guha  K M Banger |
| 28 | 4 | Prospecting & Exploration | Geological Exploration | P K Guha  K M Banger |
| 29 | 8 | 5 | Prospecting & Exploration | Geological Exploration | P K Guha  K M Banger |
| 30 | 6 | Prospecting & Exploration | Geophysical Exploration | P K Guha  K M Banger |
| 31 | 7 | Prospecting & Exploration | Geophysical Exploration | P K Guha  K M Banger |
| 32 | 8 | Prospecting & Exploration | Geochemical Exploration | P K Guha  K M Banger |
| 33 | 9 | 9 | Prospecting & Exploration | Geochemical Exploration | P K Guha  K M Banger |
| 34 | 10 | Prospecting & Exploration | Difference between biogeochemical geobotanical prospecting | P K Guha  K M Banger |
| 35 | 11 | Prospecting & Exploration | Unit Test- III |  |
| 36 | 12 | Prospecting & Exploration | Revision |  |
| 37 | **IV** | 10 | 1 | Economic Geology | Ore, Gangue | U Prasad  K M Banger |
| 38 | 2 | Economic Geology | Tenor & Grade | U Prasad  K M Banger |
| 39 | 3 | Economic Geology | Iron Deposits in India | U Prasad  K M Banger |
| 40 | 4 | Economic Geology | Iron Deposits in India | U Prasad  K M Banger |
| 41 | 11 | 5 | Economic Geology | Chromite Deposits in India | U Prasad  K M Banger |
| 42 | 6 | Economic Geology | Chromite Deposits in India | U Prasad  K M Banger |
| 43 | 7 | Economic Geology | Copper Deposits in India | U Prasad  K M Banger |
| 44 | 8 | Economic Geology | Copper Deposits in India | U Prasad  K M Banger |
| 45 | 12 | 9 | Economic Geology | Lead & Zinc Deposits in India | U Prasad  K M Banger |
| 46 | 10 | Economic Geology | UNFC code of classification of reserves | U Prasad  K M Banger |
| 47 | 11 | Economic Geology | Unit Test- IV |  |
| 48 | 12 | Economic Geology | Revision |  |
| 49 | **V** | 13 | 1 |  | Introduction to Sampling | R K Sinha  K M Banger |
| 50 | 2 |  | Methods of preparation of samples for assay | R K Sinha  K M Banger |
| 51 | 3 |  | Methods of preparation of samples for assay | R K Sinha  K M Banger |
| 52 | 4 |  | Explanation of Sampling | R K Sinha  K M Banger |
| 53 | 14 | 5 |  | Explanation of Sampling | R K Sinha  K M Banger |
| 54 | 6 |  | Explanation of Sampling | R K Sinha  K M Banger |
| 55 | 7 |  | Types of sampling | R K Sinha  K M Banger |
| 56 | 8 |  | Types of sampling | R K Sinha  K M Banger |
| 57 | 15 | 9 |  | Methods of Sampling by BIS | R K Sinha  K M Banger |
| 58 | 10 |  | Methods of Sampling by BIS | R K Sinha  K M Banger |
| 59 | 11 |  | Unit Test- V |  |
| 60 | 12 |  | Revision |  |

**Books Suggested:**

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| * Geology of India | M S Krishnan |
| * Geology of Petroleum | A I Levorson |
| * Mineral Economics | R K Sinha |
| * Economic Geology | Umeshwar Prasad |

Signature of

**Faculty Member HOD Principal/ Director**