# IIPM SCHOOL OF ENGINEERING & TECHNOLOGY

**LESSON PLAN: 2020-21**

# Sub: Surface Mining Tech(SMT)

## Branch : Mining Engineering Semester : 3rd

**Faculty name** **:** **Sanjay Kumar Majhi**

## Duration : 60 hours

**Objective** **:**

* Explain the dynamic natural agencies that are constantly moulding the landscape of earth. He will be able to visualize the erosional and depositional landforms created by natural agencies.
* Distinguish between Igneous, Sedimentary and Metamorphic rocks and their texture and structures.
* Distinguish and identify the various structures that one may encounter in the field.
* Underline the importance of crystal structures in the identification and study of minerals.
* Identify minerals based on their physical properties. They will possess a sound knowledge of silicate structures.

**Learning Outcome:** In majority of the cases, materials that need to be mined in order to reach the hidden treasure are rocks and minerals. It is therefore, essential for a mining engineer to have the basic knowledge of geology.

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| **Sl. No** | **Chapter** | **Proposed Week for Teaching** | **Lecture No.** | **Sub. Topic** | **Important Teaching Points** | **Content Source** |
| 01 | **I** | 1ST | 01 | Choice of open cast mining | Introduction and types mines | Surface Mining Technology |
| 02 | 02 | Choice of open cast mining | Factors affecting onchoice of open cast mining | Surface Mining Technology |
| 03 | 03 | Choice of open cast mining | Condition favouring adoption of mechanizedo/c mines | Surface Mining Technology |
| 04 | 04 | Choice of open cast mining | Stripping ratio,Break even ratio, Factors affecting stripping ratio | Surface Mining Technology |
| 05 | 2ND | 01 | Choice of open cast mining | Quarriable limit | Surface Mining Technology |
| 06 | 02 | Choice of open cast mining | Limitation on large open pit mines | Surface Mining Technology |

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| 07 |  |  | 03 | Choice of open cast mining | Doubt Clearing Class |  |
| 08 | 04 | Choice of open cast mining | Box cut,Location ,layout | Surface Mining Technology |
| 09 | 3RD | 01 | Choice of open cast mining | Determination of overburden,ore ratio |  |
| 10 | 02 | Choice of open cast mining | Calculation of ore reserve and OB | Surface Mining Technology |
| 11 | 03 | Choice of open cast mining | Doubt Clearing Class on 1st chapter |  |
| 12 | 04 | Bench Parameters | Bench terminology in open cast mines with figure | Surface Mining Technology |
| 13 | 4TH | 01 | Bench Parameters | Bench,Bench height,,face,width,crest,toe,bench face angle,pit slope angle | Surface Mining Technology |
| 14 | 02 | Bench Parameters | Cut,safety catch,berm,descriptionof berm | Surface Mining Technology |
| 15 | 03 | Bench Parameters | Determination of benchParameters…Height,Wi dth and slope | Surface Mining Technology |
| 16 | **II** | 04 | Bench Parameters | Length of ore bench andOB bench and Doubt Clearing Class | Surface Mining Technology |
| 17 | 5TH | 01 | Class test | Chapter 01 and 02 |  |
| 18 | 02 | Slope stability | Intro,slope stability | Surface Mining Technology |
| 19 | 03 | Slope stability | Types of slope stability | Surface Mining Technology |
| 20 | 04 | Slope stability | Factors affecting slope stability | Surface Mining Technology |
| 21 | 6TH | 01 | Slope stability | Cause of slope stability | Surface Mining Technology |
| 22 | 02 | Slope stability | Prevention of slope stability on orebench,OB bench and OB dump yard | Surface Mining Technology |
| 23 | 03 | Slope stability | Doubt Clearing Class |  |
| 24 | 04 | Explosive and Blasting accessories | Blasting,explosive,comp osition of explosive,diff. properties and charactristic ofexplosive | Explosive & Blasting Practices in Mines |

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| 25 |  | 7TH | 01 | Explosive and Blasting accessories | Classificationof explosive and use of explosive | Explosive & Blasting Practices inMines |
| 26 | 02 | Explosive and Blasting accessories | Explain PMS and SMS | Explosive & Blasting Practices inMines |
| 27 | 03 | Explosive and Blastingaccessories | Permitted explosive & classification | EMT vol. 1 |
| 28 | **III** | 04 | Explosive and Blasting accessories | Sheathed explosive,Equivalentsheathed explosive, &ultra safe explosive | EMT vol. 1 |
| 29 | 8TH | 01 | Explosive and Blastingaccessories | Properties of Permitted explosive | EMT vol. 1 |
| 30 | 02 | Explosive and Blasting accessories | Composition & constructional feautures of safety fuse,detonatingfuse,relay,ignitor,nonel,r aydet | Explosive & Blasting Practices in Mines |
| 31 | 03 | Explosive and Blasting accessories | Types of detonator,its uses,advantages of delay detonator | Explosive & Blasting Practices inMines |
| 32 | 04 | Explosive and Blastingaccessories | Types of exploder,its construction,safety feauture &circuit tester | EMT vol. 1 |
| 33 | 9TH | 01 | Explosive and Blastingaccessories | Stemming rod,crack detector,knife,crimper | EMT vol. 1 |
| 34 | **IV** | 02 | Explosive andBlasting accessories | Class test & doubt class |  |
| 35 | 03 | DRILLING | Intro. & application ofDrilling/Boring | EMT vol. 1 |
| 36 | 04 | Drilling | Principles & method ofexporatory drilling in o/c mines | EMT vol. 1 |
| 37 | 10TH | 01 | Drilling | Types of drill used in o/c mines | EMT vol. 1 |
| 38 | 02 | Drilling | Construction feautures of churn drill & rope drill | EMT vol. 1 |
| 39 | 03 | Drilling | Drill master,wagon drill, & jack hammer | EMT vol. 1 |
| 40 | 04 | Drilling | Explanation of D.T.H& T.L.D | Explosive & BlastingPractices in Mines |

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| 41 |  | 11TH | 01 | Drilling | Diff. types of drill bits in drilling | EMT vol. 1 |
| 42 | 02 | Drilling | Doubt Clearing Class |  |
| 43 | 03 | BLASTINGPractices in o/c mines | Intro & Description | Explosive & Blasting Practices inMines |
| 44 | 04 | Blasting Practices in o/cmines | Preparation of loading & charge | EMT vol. 1 |
| 45 | 12TH | 01 | Blasting Practices in o/cmines | Procedure of blasting or firing | EMT vol. 1 |
| 46 | **V** | 02 | Blasting Practices in o/c mines | Pattern of blasting | Explosive & Blasting Practices inMines |
| 47 | 03 | Blasting Practices in o/c mines | Diff. system of Blasting initiation | Explosive & Blasting Practices inMines |
| 48 | 04 | BlastingPractices in o/c mines | Procedure of stemming | Surface Mining Technology |
| 49 | 13TH | 01 | Blasting Practices in o/c mines | Water ampoules,cushion blasting | Explosive & Blasting Practices inMines |
| 50 | 02 | Blasting Practices in o/cmines | Blasting efficiency | Surface Mining Technology |
| 51 | 03 | Blasting Practices in o/c mines | Diff. types of secondary blasting | Explosive & Blasting Practices inMines |
| 52 | 04 | Blasting Practices in o/cmines | Class test on chapter 5 & 6 |  |
| 53 | 14TH | 01 | Controlled Blasting techniques usein o/c mines | Pre-spliting,Cushion blasting | Explosive & Blasting Practices in Mines |
| 54 | 02 | Controlled Blasting techniques usein o/c mines | Muffled blasting,coyote hole blasting | Explosive & Blasting Practices in Mines |
| 55 | 03 | Controlled Blasting techniques usein o/c mines | Chambered hole blasting,Elctronic blasting system | Explosive & Blasting Practices in Mines |
| 56 | 04 | Controlled Blasting | Diff. directional blasting | Explosive & Blasting |

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|  |  |  |  | techniques use in o/c mines |  | Practices in Mines |
| 57 | 15TH | 01 | Controlled Blasting techniques usein o/c mines | Revision ,Discussion and Doubt clearing class |  |
| 58 | 02 | MAGAZINE | Intro. , layout of magazine & types of magazine | Explosive & Blasting Practices inMines |
| 59 | 03 | Magazine | Safety features of magazine | Explosive & BlastingPractices in Mines |
| 60 | 04 | Magazine | Unit test on chapter 7 & 8 |  |

**Books Suggested:**

* Surface Mining Technology
* EMT vol. 1
* Explosive & Blasting Practices in Mines

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Signature of

## Faculty Member HOD Principal/ Director