IIPM SCHOOL OF ENGINEERING & TECHNOLOGY

LESSON PLAN: 2022-23

Sub: Th.1- Mine Geology-I (MG-I)

Branch : **Mining** **Semester** : **3RD**

Faculty name : **Soumya Ranjan Dash**

Duration : **60 hours**

SYLLABUS:

UNIT-I	***1. Physical Geology*** ➢ **Define weathering and erosion.** ➢ **Explain with suitable sketches the erosional and depositional land forms produced by wind.** ➢ **Explain with neat sketches the erosional and depositional land forms produced by river.** ➢ **Differentiate between glacier and iceberg** ➢ **Describe the erosional and depositional features produced by glacier.** ➢ **Define moraine. Describe the different type of moraine with sketches.**
UNIT-II	***2. Petrology*** ➢ **Define a Rock. Distinguish between a rock and a mineral.** ➢ **Define Igneous, Sedimentary and Metamorphic rocks.** ➢ **Describe the various textures and structures found in Igneous rocks.** ➢ **Describe some important structures of sedimentary rocks along with neat sketches.** ➢ **Describe various structure found in metamorphic rocks.**
UNIT-III	***3. Structural Geology*** ➢ **Define Dip. Distinguish between true dip and apparent dip.** ➢ **Define strike.** ➢ **Define folds. Classify folds and describe them.** ➢ **Define faults. Describe the various types of fault.** ➢ **Define unconformity. Describe the various type of unconformity with neat sketches.** ➢ **Define joints. Describe various joints.**
UNIT-IV	***4. Element of Crystallography*** ➢ **Define a crystal.** ➢ **Explain Miller's indices.** ➢ **Describe the Symmetry elements and forms present in the normal class of isometric system.**
UNIT-V	***5. Elements of Mineralogy*** ➢ **Define a mineral.** ➢ **Enumerate and describe the physical properties of minerals.** ➢ **Describe various optical properties of minerals.** ➢ **Explain briefly the silicate structures along with diagrams.** ➢ **Classify minerals.** ➢ **Describe mineralogy and physical properties of Olivine, Quartz, Feldspar and Pyroxene group of minerals.**

Books Suggested:

- Textbook of Geology P.K Mukharjee
- Textbook of Geology G.B. Mohapatra
- Engineering Geology K M Banger

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.

Sl. No	Chapter	Proposed Week for Teaching	Lecture No.	Sub. Topic	Important Teaching Points	Content Source
01	I	1ST	01	Physical Geology	Introduction to Geology	
02			02	Physical Geology	Description of weathering and erosion of rocks and minerals in nature	K.M. Banger, P27-30 Savindra Singh, P247-256
03			03	Physical Geology	Erosional landforms produced by wind activities	K.M. Banger, P33-34 G.B. Mahapatra, P58-60
04			04	Physical Geology	Depositional landforms produced by wind activities	K.M. Banger, P34-35 G.B. Mahapatra, P60-62
05		2ND	01	Physical Geology	Erosional landforms produced by river and	K.M. Banger, P36-39

					stream.	G.B. Mahapatra, P52-56
06			02	Physical Geology	Depositional landforms produced by river and stream	K.M. Banger, P39-42 G.B. Mahapatra, P56-57
07			03	Physical Geology	Differentiate between glacier and iceberg	Savindra Singh, P478
08			04	Physical Geology	Erosional landforms produced by glacier	K.M. Banger, P50-52 G.B. Mahapatra, P65-66
09		3RD	01	Physical Geology	Depositional landforms produced by glacier	K.M. Banger, P53-54 G.B. Mahapatra, P66-67
10			02	Physical Geology	Definition of moraine.	K.M. Banger, P53 Savindra Singh, P485-486
11			03	Physical Geology	Description of different type of moraine	K.M. Banger, P53 Savindra Singh, P485-486
12			04	Physical Geology	Revision of Physical Geology	---
13		4TH	01	Physical Geology	Discussion and class presentation of Chapter 1 by students	---
14			02	Physical Geology	Unit Test (Chapter 1)	---
15			03	Physical Geology	Doubt Clearing Class (Chapter 1)	---
16	II		04	Petrology	Meaning of Petrology and definition of Rock	P.K. Mukerjee, P74-75 G.B. Mahapatra, P183
17		5TH	01	Petrology	Distinguish between Rock and minerals	P.K. Mukerjee, P74-75 G.B. Mahapatra, P183
18			02	Petrology	Rock formation and Rock cycle	K.M. Banger, P163
19			03	Petrology	Study about Igneous, Sedimentary and Metamorphic Rocks	K.M. Banger, P163 Savindra Singh, P140-141
20			04	Petrology	Texture of Igneous Rock	K.M. Banger, P165-169 P.K. Mukerjee, P89-96
21		6TH	01	Petrology	Structure of Igneous Rock	K.M. Banger, P165-169

22			02	Petrology	Structures of Sedimentary Rocks	K.M. Banger
23			03	Petrology	Structures of Sedimentary Rocks	K.M. Banger
24			04	Petrology	Various structure in Metamorphic Rock	K.M. Banger
25			01	Petrology	Revision of Petrology	K.M. Banger
26			02	Petrology	Doubt Clearing and class presentation of Chapter 2 by students	----------
27		7TH	03	Petrology	Unit Test (Chapter 2)	----------
28			04	Structural Geology	Defination of Dip & Strike. Difference between true dip and apparent dip.	K.M. Banger, G.B. Mahapatra
29			01	Structural Geology	Classification of folds and their description	K.M. Banger G.B. Mahapatra
30			02	Structural Geology	Description of various types of fault.	K.M. Banger G.B. Mahapatra
31	**III**	8TH	03	Structural Geology	Description of various type of unconformity. Description of various joints.	K.M. Banger G.B. Mahapatra
32			04	Structural Geology	Doubt Clearing and class presentation of Chapter 3 by students	----------
33			01	Structural Geology	Unit Test (Chapter 3)	----------
34			02	Element of Crystallography	Introduction to crystallography	K.M. Banger G.B. Mahapatra
35		9TH	03	Element of Crystallography	Definition of crystal and nomenclature of different elements present in a crystal	K.M. Banger G.B. Mahapatra
36			04	Element of Crystallography	Symmetry elements	K.M. Banger G.B. Mahapatra
37	**IV**		01	Element of Crystallography	Parameter and Indices	K.M. Banger G.B. Mahapatra
38			02	Element of Crystallography	Miller's Indices	K.M. Banger G.B. Mahapatra
39		10TH	03	Element of Crystallography	Different types of crystal system	K.M. Banger G.B. Mahapatra
40			04	Element of Crystallography	Symmetry Elements of Isometric system	K.M. Banger G.B. Mahapatra

41		11TH	01	Element of Crystallography	Forms present in Isometric system	K.M. Banger G.B. Mahapatra
42			02	Element of Crystallography	Revision of Crystallography	----------
43			03	Element of Crystallography	Discussion and class presentation of Chapter 4 by students	----------
44			04	Element of Crystallography	Unit Test (Chapter 4)	----------
45		12TH	01	Element of Crystallography	Doubt Clearing Class (Chapter 4)	----------
46	V		02	Elements of Mineralogy	Introduction to Mineralogy and definition of Mineral	K.M. Banger G.B. Mahapatra
47			03	Elements of Mineralogy	Description of physical properties of minerals.	K.M. Banger G.B. Mahapatra
48			04	Elements of Mineralogy	Description of physical properties of minerals.	K.M. Banger G.B. Mahapatra
49		13TH	01	Elements of Mineralogy	Optical properties of minerals.	K.M. Banger G.B. Mahapatra
50			02	Elements of Mineralogy	Silicate structures (Neso, soro, Cyclo)	K.M. Banger G.B. Mahapatra
51			03	Elements of Mineralogy	Silicate structures (Ino, Phylo, Tekto)	K.M. Banger G.B. Mahapatra
52			04	Elements of Mineralogy	Classification of Minerals into different groups	K.M. Banger G.B. Mahapatra
53		14TH	01	Elements of Mineralogy	Olivine	K.M. Banger G.B. Mahapatra
54			02	Elements of Mineralogy	Quartz	K.M. Banger G.B. Mahapatra
55			03	Elements of Mineralogy	Feldspar	K.M. Banger G.B. Mahapatra
56			04	Elements of Mineralogy	Pyroxene	K.M. Banger G.B. Mahapatra
57		15TH	01	Elements of Mineralogy	Revision of Mineralogy	----------
58			02	Elements of Mineralogy	Discussion and class presentation of Chapter 5 by students	----------
59			03	Elements of Mineralogy	Unit Test (Chapter 5)	----------
60			04	Elements of Mineralogy	Doubt Clearing Class (Chapter 5)	----------

Signature of

Faculty Member **HOD** **Principal/ Director**