ROCK CUTTING TECHNOLOGY

Code	Credit Hours
MinE-819	3-0

Course Description

Geotechnical considerations, Rock cutting, Environmental considerations, Human factors, Tunnel boring, Road headers, Soft rock cutting, Raise boring, and hard rock cutting.

Textbooks:

1. Drilling and excavation technologies for the future". ISBN: 978-0-309-05076-0

References Book:

1. Miedema. S. "The Delft Sand, Clay and Rock Cutting Model".978-1-61499-453-4Arla, Sweden, handbook

Pre-Requisites:

Nil

ASSESSMENT SYSTEM FOR THEORY

Quizzes	15%
Assignment	5%
Mid Terms	30%
ESE	50%

Teaching Plan

Week No	Topics	Learning Outcomes
1-2	Rock Cutting Technology	CourseOutline,objectives,teachingplan,assessmentmethod, conceptsreview. Basic rock properties control cutting and can be determined by site investigation and laboratory testing
3-4	Rock cutting	Rock cutting itself uses tools in various modes, within various types of rock cutting machine, depending on the specifics of the application
5-6	Environmental considerations	Rock cutting machines and their operators require ventilation and cooling. Dust and diesel particulate emissions from rock cutting are health hazards to be understood and controlled.

7-8	Human factors	Rock cutting still depends on people and organization. Systems thinking, the need for learning organizations and Lean thinking can all make the difference between success and failure in rock cutting
9	**MID TERM EXAM**	
10-12	Tunnel boring	Tunnel boring machines are routinely used to develop circular tunnels in civil applications
13-14	Road headers	Road headers offer a flexible means of cutting excavations with custom profiles. Their performance depends on their design and the design of excavation
15	Soft rock cutting	Rock cutting is routine in coal and soft rock such as salt, gypsum, or potash
16	Raise boring	Raise boring is the most common rock cutting technique seen in hard rock mines
17	Cutting machines for hard rock	Mobile Miner, Rapid Mine Development System, Reef Miner and other prototypes and ideas show the promise of the machines, and the challenges that they face
18	**END SEMESTER EXAM**	