School of Mining and Petroleum Engineering

Min E 324: Drilling, blasting & explosives

Tuesday, Thursday 9:30 — 10:50 AM
Course Instructor: Dr. Derek Apel, Ph.D., P.Eng.

Course TA: Alicja Szmigiel: szmigiel@ualberta.ca
Department of Civil & Environmental Engineering

School of Mining and Petroleum Engineering
Donadeo Innovation Centre for Engineering
9211 116th Street,
Room 6-233

Email: derek.apel@ualberta.ca
If you want to contact me, before you come send me an e-mail.

Catalog Description:

Drilling methods, breakage mechanics, performance, and equipment. Explosive characteristics, initiation systems, selection, handling, and loading. Blasting, rock dynamics, design of surface and underground blasts, fragmentation prediction, vibrations, damage control and monitoring.

Prerequisite:
MIN E 295 or consent of Instructor.

Course Topics:

1. Black powder, dynamite, TNT, ANFO and emulsion explosive.
2. Explosive Properties.
3. Blasting Theory
4. Principles of Priming
5. Initiation Systems
6. Surface Blast Design
7. Underground Metal and Nonmetal Mining
8. Blasting Economics
9. Blasting Safety
10. Rock Dynamics and Blasting
11. Wave Transmission in Rock

12. Blast design using ShotPlus software

13. Project blast

14. Percussion Drilling

15. Rotary Drilling

16. Evaluating Drill Performance

17. Tunnel Boring Machines, Continues Miners and Raiseborers.

Textbook:

Relevant technical publications and handouts will be distributed before each lecture.

Suggested Literature:

1. *Drilling and Blasting of Rocks* by C. L. Jimeno, E. L. Jimeno and F.J. A. Carcedo.

2. *Explosives and Rock Blasting* by Atlas Powder Company, 1987
2. *Principles of Rock Drilling* by Rao Karanam, B. Mistra, 1998

Important Dates

The MidTerm Exam will be held online on February 11 from 9:30 till 10:50 am.

The Final Exam will also be held online on 20-Apr-2021 (Tuesday) from 2:00 p.m. till 4:00 pm

Marking:

Home assignments - 20%
Midterm Exam - 30%
Field project- 15%
Final Exam - 35%
There will be a penalty for late submissions of assignments of 2% per day (14% per week)