

MINING 324 SYLLABUS

FS11

Underground Mining Methods and Equipment.

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I. COURSE DESCRIPTION

Principles utilized to develop metallic, coal and industrial mineral deposits into productive entities using underground mining methods. For underground mining, includes selection of mining methods, mine planning, economics, safety and overall operational considerations. Review of selected case histories.

II. TEXT (You must have access to read the assignment and study the pictures in the text.)

Underground Mining Methods-Engineering Fundamentals and International Case Studies, Edited by William A. Hustrulid and Richard L. Bullock (There will be a considerable amount of reading assignments in this text, thus you will need the book for this course.)

Society of Mining Engineers Handbook, Third Edition, Ed. Peter Darling, Vol. 1 and Vol 2, SME 1840 pp, or the CD for these Volumes. (Or CD of the Text)

There is a lot of reading assignments for this course. Some of the reading is what I consider "Study Reading" and some is what I consider "Speed Reading" and I will designate which of the two you should do.

III. GRADES

Grades (A=90-100, B=80-**89.9**, C=70-**79.9**, D=60-**69.9** & F=<**60**) .

Grades: How determined:

There will be **nine exams covering the 32 lessons**. The exams may cover not only what is in the lecture notes, but also what is **in the reading material**. The reading material and the pictures (in the lesson plans and the reading material) are very important for your understanding of the mining methods and the equipment that is used. **Eight of the exams are closed book, closed note exam; two are open book, open note exams.**

There is a Discussion Board on Blackboard that I expect each student to use for questions of comments on the course. Class participation is strongly encouraged. I will respond to questions by direct email, but will probably post it (without your name) on Blackboard for the education of others.

IV. UNDERGROUND TOPICS

INTRODUCTION LESSON

- Introduction to Underground Mine Terminology;
- Introduction to Subsurface Mine Development,
- Introduction to Underground Mining Methods;
- Design Considerations and Underground Method Overview;
- Minimum Support Mining Methods: Room and Pillar. Sublevel Stoping. VCR;
- Additional Support: Shrinkage Stoping Methods, Cut and Fill, Undercut and Fill, (Timber Supported Systems will not be covered as they are no longer usually economical);
- Caving Methods: Sublevel Caving. Panel Caving and Longwall Mining(non-coal);
- Equipment Overview; and
- Equipment Production Estimating.

MINE PLANNING LESSON

- General Mine Planning;
- Mine Planning for the various types of mining methods;

MINING METHODS LESSONS

- Four Lessons on Room and Pillar Stoping (R&P);
- Review of the four R&P lessons
- Two Lessons on Sublevel Open Stoping (SLOS);
- One Lesson on Vertical Crater Retreat (VCR);
- One Lesson on Shrinkage Stoping;
- Review Lesson on the Last Four Lessons
- Four Lessons on Cut and Fill Stoping (C&F)
- Two Lesson on Sublevel Caving Systems;
- Two Lesson Block Caving;
- Review of Caving Systems;
- Three Lessons on Coal Mining Systems (includes hard rock Longwall methods).
- Review on Coal Mining Systems.

MINE AUXILIARY TASK and EQUIPMENT

- One Introduction Lesson to Drills, Drilling, and Drill Rounds
- Introduction Lesson to Blasting Applicable to Underground (Will not replace Min 307);
- Auxiliary Operations & Equipment:
 - One Lesson-Ground Support & New Australian Tunneling Method (NATM);
 - One Lesson- Shotcrete;
 - Two Lessons -Grouting;
 - Review Lesson on the Previous Six Lessons;
- One Lesson on Mechanical Methods: Roadheaders, Continuous Miners, & TBMs,
- One Lesson on Shaft Sinking & Raise Boring Equipment;
- One Lesson on Sampling, Dilution, and Recovery
- One Lesson on Underground Backfill Systems
- One Lesson on Environmental Issues Related to Mine Planning and Development
- One Lesson on In Situ Solution Mining Methods;
- Review of Last Six Lessons.

CASE HISTORIES (Covered with reading assignment in text.)

See attached next page.

Important Information for Course Syllabi, 2010-2011 Academic Year

All faculty are encouraged to provide students with a course syllabus to emphasize the expectations that students must meet in order to be successful in the courses they are taking. In addition to the important information that is typically included in a course syllabus, all faculty are encouraged to include information about the following:

- **Academic Alert System:** <http://academicalert.mst.edu>
All faculty are encouraged to utilize the online Academic Alert System. The purpose of the Academic Alert System is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses.
- **Disability Support Services:** <http://dss.mst.edu>
Any student inquiring about academic accommodations because of a disability should be referred to Disability Support Services so that appropriate and reasonable accommodative services can be determined and recommended. Disability Support Services is located in 204 Norwood Hall. Their phone number is 341-4211 and their email is dss@mst.edu. Instructors may consider including the following statement on their course syllabus as a means of informing students about the services offered:

"If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation."
- **Academic Dishonesty:** <http://registrar.mst.edu/academicregs/index.html>
Page 30 of the Student Academic Regulations handbook describes the student standard of conduct relative to the System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage. Additional guidance for faculty, including a description of the process for dealing with issues related to academic dishonesty, is available on-line at <http://ugs.mst.edu> .