

Course: **MinE 613 – Ground Control Failures**

Semester: Fall 2007

Course Format and Credit hours: 3 hr lecture
3 credit-hour

Prerequisites: MinE 611 Advanced Ground Control or Consent

Instructor: Dr. Syd S. Peng
Room 338 Mineral Resources Bldg.
293-7680 ext. 3301 syd.peng@mail.wvu.edu

Schedule: Monday, Wednesday, Friday 4:00 p.m. – 5:00 p.m.

Location: Room 152 Mineral Resources Bldg.

Office Hours: Monday, Wednesday, Friday, 2:00 p.m. – 3:00 p.m.

Course objectives: To examine 50 cases of coal mine ground control failures on coal pillar, roof fall, cutter, floor heave, multiple-seam mining and longwall mining such that students will be able to recognize, analyze the causes, and develop mitigation measures for prevention of these failures.

Expected Learning Outcomes: Upon successful completion of this course:

1. Students will be able to conduct investigation of various ground control failures in underground coal mines
2. Students will be able to identify the types of various ground control failures in underground coal mines
3. Students will be able to analyze the mechanisms of, and develop mitigation measures for, various ground control failures in underground coal mines

Required Text: Syd S. Peng, *Ground Control Failures – a pictorial view of case studies*, WVU Mining Engineering, June 2007

Grading: Seven project assignments on coal pillar, roof bolting, roof fall, cutter, multiple-seam mining, and longwall mining, each of which is evenly distributed for a total of 100%.

Grading Assignment: 80-100 A
70-80 B
60-70 C
< 60 F

Social Justice
Statement:

"West Virginia University committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration."

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangement with Disability Service (293-6700)".

Days of Special
Concern:

WVU recognizes the diversity of its students and the needs of those who wish to be absent from class to participate in Days of Special Concern, which are listed in the Schedule of Courses. Students should notify their instructors by the end of the second week of classes or prior to the first Day of Special Concern, whichever is earlier, regarding Day of Special Concern observances that will affect their attendance. Further, students must abide by the attendance policy of their instructors as stated on their syllabi. Faculty will make reasonable accommodation for tests or field trips that a student misses as a result of observing a Day of Special Concern.

Course Schedule:

1ST - 2ND WEEK - FAILURES OF PILLARS

- 1 Introduction
- 2 Massive Pillar Failures in the Lewiston-Stockton Seam (Case 1.1)
- 3 Massive Pillar Failures in the Coalburg Seam (Case 1.2)
- 4 Massive Pillar Failures in the Cedar Grove Seam (Case 1.3)
- 5 Massive Pillar Failures in a Phosphate Mine (Case 1.4)
- 6 Pillar Design Must Consider Interaction Among Roof, Coal and Floor (Case 1.5)
- 7 Small Pillars

3RD - 5TH WEEK - ROOF FALLS

- 1 Introduction
- 2 Anatomy of roof falls
- 3 Massive Roof Falls in the Lower Cedar Grove Seam (Case 2.1)
- 4 Massive Roof Falls in the Upper Alma Seam (Case 2.2)
- 5 Roof Falls in the Coalburg Seam (Case 2.3)
- 6 Massive Roof Falls in the Upper Elkhorn Seam (Case 2.4)
- 7 Roof Falls in the Amburgy Seam (Case 2.5)
- 8 Roof Falls in Longwall Gateroads in the Upper Freeport Seam (Case 2.6)
- 9 Massive Roof Falls in Longwall Face in the Phalen Seam (Case 2.7)
- 10 Massive Roof Falls in Longwall Gateroads in the Alma Seam (Case 2.8)
- 11 Roof Falls in Longwall Gateroads in the Blue Creek Seam (Case 2.9)
- 12 Roof Cracks do not Automatically Means Unstable Roof

5TH - 7TH WEEK - CUTTERS

- 1 Introduction
- 2 Cutters in the Eagle Seam (Case 3.1)
- 3 Cutters in the Lower Kittanning Seam (Case 3.2)
- 4 Cutters in the Herrin #6 Seam (Case 3.3)
- 5 Cutters in the Powellton Seam (Case 3.4)

8TH WEEK - ROOF BOLTING

- 1 Roof Bolting and Roof Falls
- 2 Glove Fingering

9TH - 11TH WEEK - MULTIPLE-SEAM MINING

- 1 Introduction
- 2 Upper Seam Room and Pillar Mining followed by Lower Seam Longwall Mining (Case 5.1)
- 3 Two-Seam Room and Pillar Mining in Ascending Order I (Case 5.2)
- 4 Upper Seam Room and Pillar and Longwall Minings followed by Lower seam Room and Pillar Mining (Case 5.3)
- 5 Three-Seam Room and Pillar Mining in Descending Order (Case 5.4)
- 6 Two-Seam Longwall Mining in Descending Order (Case 5.5)
- 7 Two-Seam Room and Pillar Mining in Ascending Order II (Case 5.6)

12TH WEEK - FLOOR HEAVE

- 1 Introduction
- 2 Massive Floor Heave in the Sewell Seam (Case 6.1)
- 3 Massive Floor Heave in the Fire Creek Seam (Case 6.2)

13TH – 14TH WEEK - LONGWALL

- 1 Introduction
- 2 Shield Collapse
- 3 Periodic Weighting
- 4 Gob Caving
- 5 Roof Fall (Headgate)
- 6 Roof Fall (Tailgate)
- 7 Roof Fall (Face)
- 8 Yield Pillar
- 9 Pre-Driven Recovery Room