MINE 456 – MINING AND SUSTAINABLE DEVELOPMENT
Spring Semester 2015

Course Syllabus

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Office Hours: TBA

2015 Course Description:

Defining and applying the four critical elements of sustainable development: environment, economics, community and governance to the development, operations and design of mining projects.

What:

The course has three major themes:

- Mining and sustainable development
- Mine waste management
- Mine regulatory framework

How:

The format of the class will be lectures and discussions of the analysis of various facets of the subject matter. Lectures will be a combination of live lecture sessions (3 hours once per week) and prerecorded background lectures available on the YouTube channel: miningnotesbydirk.
Required texts, course materials:

Course materials will be provided in the form of handouts and reading assignments from the appropriate literature

Prerequisites:

Senior or graduate standing in an engineering or science major

Course Objectives:

1. Provide an understanding of Sustainable Development in terms of its history, development and importance in our modern global socio-economic environment.

2. Provide a basis for analysis of mined waste management option and how they relate to the environmental impacts of mining operations.

3. Understand the regulatory regime dictating compliance with the environmental requirements in the US.

Student Learning Outcomes:

At the conclusion of this course students will:

1. Understand how mining can contribute to sustainable development by integrating environmental, societal, economic and governance aspects.

2. Understand the construction options and methods for mine waste management facilities including tailings, mine rock piles and heap leach facilities.

3. Understand environmental considerations for these facilities, including containment design, acid drainage and cyanide management.

4. Appreciate water balance principles of tailings and heap leach facilities.

5. Appreciate mine closure and financial assurance principles and practices.

6. Appreciate the regulatory regime for developing and operating a mine in the US, and specifically Nevada.

7. Appreciate the importance of case studies.
Description of Assignments: exams, quizzes, projects, papers.

Assignments

1. Two written assignments on Mining and Sustainable Development (in groups of up to three)
2. One assignment on liner design
3. One assignment on water balance
4. One assignment on the NEPA process and Mine Permitting

Grading

Assignments 40 percent
Final Exam 60 percent

Grades will be based on total points with the following breakout:

A: 100-90%
B: 89-80%
C: 79-70%
D: 69-60%
F: >59%

Late work and make-up of missed exams will be at the discretion of the Instructor and decided on a case-by-case basis as to the cause of the late or missed assignments. Health and family issues would typically be considered acceptable excuses. Any excuse, other than unforeseen medical or family issues must be approved in advance.

Silver Core Learning Objectives:
One Silver Core Learning Objective is satisfied in this course:

CO9. Science, Technology, & Society. Students will be able to connect science and technology to real-world problems by analyzing scientific data related to a problem of societal concern, be able to discriminate between sound and unsound interpretation of data, employ cogent reasoning methods in their own examinations of problems and issues; and evaluate the applications of science and technology in societal contexts.

CO-9 is satisfied in the course through SLO-1. This outcome focuses on understanding the creation and development of the concept of Sustainable Development (SD) in a Global Environment. SD was originally created to provide a framework for the interaction of industrial activities with the environmental concerns of the world’s populations. An important part of this concerned the interaction of the industrial nations with the developing world and indigenous peoples. Therefore, by its very nature SD deals with the impact of Science and Technology on Society and the Human & Natural
Environment. Roughly one-third of this class is devoted to developing an understanding of this concept and how it impacts the modern mining industry on levels ranging from mine site to corporate standards.

The assessment of CO-9 will be through the two written assignments dealing specifically with Sustainable Development. The grading of these assignments will be an assessment of the student’s understanding in this area.

Class Topics and Schedule
2015

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<td>January 30</td>
<td>Mining and Sustainable Development</td>
<td>Mining Legacy and Historical Sustainable Development Initiatives</td>
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<td>February 6</td>
<td>Sustainable Development Concepts</td>
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<td>February 13</td>
<td>Social License to Operate and Sustainability Reporting</td>
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<td>February 20</td>
<td>Mine Waste Management</td>
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<td>Mine Rock Piles and Heap Leach Facilities</td>
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<td>March 6</td>
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<td>Liner Design and Mine Site Water Balance and Management</td>
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<td>Acid Drainage and Cyanide Management</td>
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<td>Mine Closure</td>
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<td>April 3</td>
<td>Mine Regulatory Framework</td>
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**YouTube lectures**

**YouTube Channel:** miningnotesbydirk

Lecture 1 – Sustainable Development Concepts -
http://www.youtube.com/watch?v=8v4sZSDz484

Lecture 2 – Mining Legacy and Historical Sustainable Development Initiatives
http://www.youtube.com/watch?v=35MSuBNG0iU

Lecture 3 – Tools for Incorporating Sustainable Development
http://www.youtube.com/watch?v=JgFflz0_L2U

Lecture 4 – Social License to Operate
http://www.youtube.com/watch?v=ytBn_ZKRzCY

Lecture 5 – Sustainability Reporting
http://www.youtube.com/watch?v=BdgOrDR47bI

**Academic Dishonesty:**
“Cheating, plagiarism or otherwise obtaining grades under false pretenses" constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course or for the assignment. For more details, see the University of Nevada, Reno General Catalog.

**Disability Services:**
Any student with a disability needing academic adjustments or accommodations is requested to speak with me or the Disability Resource Center (Thompson Building, Suite 101) as soon as possible to arrange for appropriate accommodations.

**Academic Success Services:**
Your student fees cover usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring-center), and University Writing Center (784-6030 or http://www.unr.edu/writing-center). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.

**Statement on Audio and Video Recording:**
Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.