Course Code: Title	NET350: MINING PRACTICES AND THE ENVIRONMENT
Program Number: Name	5221: NAT ENVIRONMENT TY
Department:	NATURAL RESOURCES PRG
Semesters/Terms:	21W
Course Description:	This course will give students an overview of geological processes and the formation of mineral and petroleum resources. Surface and sub-surface mining techniques to extract non-renewable resources will be discussed generally as well as their effect on the environment. The focus of the course will be on environmental considerations of mineral extraction to mitigate environmental impact.
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**5221 - NAT ENVIRONMENT TY** VLO 3 Apply the basic concepts of science to natural resource conservation and management. VLO 4 Plan, design, implement and participate in the maintenance of natural environment assessments. VLO 5 Apply eco-site conservation and management principles VLO 6 Practice principles and ethics associated with natural resource conservation and management issues. VLO 10 Communicate technical information accurately and effectively in oral, written, visual and electronic forms. VLO 11 Develop and present strategies for ongoing personal and professional development to enhance performance as an environmental technologist.
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 4 Apply a systematic approach to solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.

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	EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.
	EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
	EES 10 Manage the use of time and other resources to complete projects.
	EES 11 Take responsibility for ones own actions, decisions, and consequences.

General Education Themes: Civic Life

Science and Technology

Course Evaluation: Passing Grade: 50%, D

A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

Other Course Evaluation & Assessment Requirements:

Academic success is directly linked to attendance. Missing more than 1/3 of the course hours in a semester shall result in a F Grade for this Course

Absences during field labs, tests, quizzes, and other assessments will not be excused without documented personal or health reasons.

Late assignments will only be accepted within 24 hours past the due date and will be penalized 20% except under extenuating circumstances with appropriate documentation.

Changes to the Course Evaluation scheme may be considered during the semester if approved by the majority of the class (majority = approval by 75% of students present at time of vote).

The instructor cannot guarantee responses to questions in the 24-hour period prior to assignment deadlines and tests via phone message or email.

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Identify and describe various geological processes responsible for the formation of mineral and petroleum resources.	1.1 Describe the difference between igneous, sedimentary and metamorphic rocks and their formation. 1.2 Explain the importance of various rock formations to mineral formation and exploration. 1.3 List mineral groups and describe their properties and differences. 1.4 Classify geological features for their mineral potentials.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Identify surface and sub-surface mining techniques.	2.1 List and describe the various classes of surface mining techniques. 2.2 List and describe the various classes of sub-surface mining techniques. 2.3 Describe the steps in mining techniques. 2.4 Explain the uses and purpose for each technique. 2.5 Describe environmental considerations in the use of each mining technique.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Identify and describe a	3.1 List a variety of impacts from mining that could adversely

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	variety of environmental effects each mining technique has the potential to generate.	affect the environment.t 3.2 Identify specific environmental impacts from various mining techniques. 3.3 Describe the mechanisms and processes that result in the environmental impact. 3.4 Identify their cause(s). 3.5 Describe methods to mitigate the environmental impact.
	Course Outcome 4	**Learning Objectives for Course Outcome 4**
	4. Identify potential environmental impacts from various stages of mining.	4.1 List the stages of mine development from exploration through decommissioning. 4.2 Identify environmental concerns from each stage. 4.3 Identify best practices to mitigate their adverse impacts.
	Course Outcome 5	**Learning Objectives for Course Outcome 5**
	5. Identify mitigation strategies and best practices to minimize environmental impacts from mining activities.	5.1 Identify benefits and drawbacks of different mitigation strategies for each class of environmental impacts. 5.2 Discuss their advantages and disadvantages. 5.3 List factors that affect the costs (direct, life cycle, full cost and externalities) of various mitigation strategies and considerations and best practices. 5.4 Describe the full cost accounting approach for a cost benefit assessment of mitigation strategies
	Course Outcome 6	**Learning Objectives for Course Outcome 6**
	6. Identify and discuss case study examples of good and poor environmental mining practices.	6.1 Describe the environmental impacts from several different mineral resource mining techniques. 6.2 Explain how these have been mitigated. 6.3 Identify differences between and costs/benefits of various mitigation techniques.
	Course Outcome 7	**Learning Objectives for Course Outcome 7**
	7. Describe and discuss relationships between the environmental impacts of mining and sustainable development.	7.1 Describe how environmental impacts of mining affect people and societies (beneficial and adverse). 7.2 Describe the life cycle of a mine. 7.3 Explain the significant environmental challenges of mining. 7.4 Describe driving factors for mineral extraction and mining and their relationships to sustainable development. 7.5 Differentiate and describe the roles mining performs in sustainable development. 7.6 Explain the life cycles of consumer artifacts from a mining perspective.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	70%
Tests and Quizzes	30%

Date: June 17, 2020

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.

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