

**Montana Tech  
Metallurgical and Materials Engineering Department**

**COURSE SYLLABUS**

**COURSE NUMBER AND TITLE:** EMET 235 Mineral Processing and Extractive Met. Lab

**DATE REVISED:** Fall, 2018

**SEMESTER CREDITS:** 1

**PREREQUISITE (COREQUISITE):** EMET 234

**INSTRUCTORS NAMES:** Avimanyu Das

**PHONE NUMBER:** 496-4794

**OFFICE LOCATION:** ELC 213

**OFFICE HOURS:** MTF 11.00-12.00 or by appointment.

**COURSE OBJECTIVE:**

Course is designed to provide students “hands-on” experience in the Mineral Processing lab environment that is essential to acquiring a working knowledge of the technology. The student will apply theory as well as make performance and efficiency calculations such as circulating load in a comminution circuit and grinding mill power requirements.

**COURSE OUTCOMES:**

Students passing this class will be able to:

- Understand proper laboratory operations and techniques.
- Understand and use separation processes and unit operations
- Obtain and analyze data from Mineral Processing operations.
- Write formal technical reports.
- Be prepared for success in subsequent process metallurgy courses.

**TOPICS COVERED:**

1. Safety
2. Advanced Flotation
3. Rod Mills
4. Coulter Counter
5. Bond Work Index
6. Hydrocyclone Operations
7. Thickeners
8. Electrostatic Separation
9. Column Leaching
10. Carbothermal Reduction
11. Pelletization

**STUDENT GRADING:**

Students work in lab groups and are graded on safety, participation and cooperation. Papers (Lab Reports) are prepared by the individual students and are due the week after the lab unless a date is

specifically assigned. They will typically be from 3-5 pages long. Required formats for the papers will be given to the students as will the grading matrix. Late papers are accepted for one week after the due date with a loss of 10 points per day.

Lab reports 70%

Lab 30%

### **LAB REPORTS**

The format of the report is outlined in each lab handout.

### **ATTENDANCE POLICY:**

Attendance is required. No make-up labs will be offered. Missing group members will not be allowed to hand in papers.

### **SAFETY POLICY:**

There are many ways to hurt yourself and/or others in the lab. Safety is to be considered at all times, and no safety rules can be compromised. Disregarding safety practices, endangering yourself or others in the lab or acting carelessly around the equipment will result in removal from the class and denial of lab access.

Eye protection is mandatory at all times in the lab area.

### **REQUIRED TEXT:**

None. Written lab assignments will be handed out.

### **SUGGESTED REFERENCE MATERIALS:**

B. A. Wills, Mineral Processing Technology, 7<sup>th</sup> Edition, Pergamon Press.

If you are found to be copying someone else's work from the past or the present, you will be reported to Administration and will flunk the class. There will be no exceptions to this policy. Lab reports are available from the instructor for review, so take advantage of this.

### **ABET Criteria Covered: 1, 4, 6, 7, 9, and 10**

1. identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
4. recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
6. develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. acquire and apply new knowledge as needed, using appropriate learning strategies
9. integrate the understanding of the scientific and engineering principles underlying the four major elements of the field: structure, properties, processing and performance related to metallurgical and materials systems appropriate to the field, and
10. apply and integrate knowledge from each of the above four elements of the field using experimental, computational and statistical methods to solve materials problems including selection and design consistent with the program educational objectives.

**Prepared by:** Avimanyu Das

**Date:** 12<sup>th</sup> November, 2018