CM 3830
Mineral Processing and Extraction Laboratory

Curricular Designation: Elective

Catalog Description:
Laboratory course covering the major mineral processing and extractive metallurgy operations, such as crushing, grinding, sampling, particulate separation processes, dewatering, and hydrometallurgical processing.

Credits: 1.0, Lec-Rec-Lab: (0-0-3), Semesters Offered: Spring

Prerequisites:
CM 2200 Intro Minerals and Materials, or CM 2110 Fund of Chem Engg 1

Textbooks(s) and/or Other Required Materials:
Laboratory manual provided

Course Objectives
1. Provide laboratory experience in all of the key minerals processing operations, particularly sampling, comminution, separations, dewatering, leaching, and precipitation
2. Practice preparation of laboratory reports

Topics Covered:
1. Sampling Theory and Methods – Bulk and Increment Sampling
2. Size Reduction for Sampling
3. Ball Mill Grindability Determination
4. Gravity Separation
5. Dry Magnetic and Electrostatic Separation
6. Wet Magnetic Separation, Low and High Intensity
7. Iron Ore Flotation with Fatty Acid - Kinetics
8. Spectrophotometric Determination of Iron
9. Phosphate Flotation
10. Mixed Sulfide Flotation
11. Flocculation, Dewatering, and Classification
12. Analysis and Instrumentation

Class/Laboratory Schedule:
Lab: 3 hours/week for 14 weeks

Contribution of Course to Curriculum:
Engineering Education
### Relationship of Course to Program Outcomes:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Contribution</th>
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<tbody>
<tr>
<td>a) An ability to apply knowledge of mathematics, basic science and engineering science</td>
<td>Moderate</td>
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<td>b) An ability to design and conduct experiments as well as to analyze and interpret data</td>
<td>Substantial</td>
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<td>c) An ability to design a system, component or process to meet needs within realistic constraints</td>
<td>Substantial</td>
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<td>d) An ability to function on multidisciplinary teams</td>
<td>Moderate</td>
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<td>e) An ability to identify, formulate, and solve engineering problems</td>
<td>Minimal</td>
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<td>f) An understanding of professional and ethical responsibility</td>
<td>Moderate</td>
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<td>g) An ability to communicate effectively</td>
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<td>h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social context.</td>
<td>Moderate</td>
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<td>i) A recognition of the need for, and the ability to engage in lifelong learning</td>
<td>Moderate</td>
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<td>j) A knowledge of contemporary issues</td>
<td>Moderate</td>
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<td>k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice</td>
<td>Substantial</td>
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**Prepared by:**

Associate Professor Timothy C. Eisele                                   January 4, 2016