EMAT 354 (MME 3540) Instructor: Dr Sudhakar K.V.
Materials & Physical Metallurgy Lab Office: ELC 218, x 4267
Lecture & Lab: M 14:00–17:00, ELC 106 & 101 Office Hours: M through F, 11:00 am–12:00 noon
or by appointment

2010-2011 Catalogue Description:
This is a continuation of Microstructural Interpretation but includes application to non-ferrous metals, ceramic and polymeric systems. Experiments are performed in heat treating, casting, working, and mechanical property evaluation of materials. Evaluation and interpretation of the materials are incorporated. Laboratory experiments are performed requiring engineering reports. Laboratory safety is emphasized.

Credits: 1.000 Credit (Lecture & Lab)

Designation: Required course (Metallurgical and Materials Engineering, General Engineering-Welding Option)

Prerequisites: METE 2520, M&ME 3510, M &ME 3530 or permission of the instructor.

Textbook: None, lab précis will be provided.

References: As per lab précis.

Relationship of Course to Metallurgical and Materials Engineering Program Outcomes:
This course provides practical experience in the fundamental themes of materials science and engineering.

Objectives: The objective of this course is to provide the student with:
1) practical experience with the processing, microstructure and performance of materials, and
2) practical experience with the relationships between them.

Outcomes: Graduates of the course will be experienced in technical report writing, in which the graduates will have related their familiarity with:
1) relate material behavior to mechanisms at an atomic/microstructure level,
2) performance measures in materials testing,
3) common microstructures encountered in non-ferrous alloys,
4) the effect of heat treatments on microstructures of non-ferrous alloys, and
5) fulfill ABET outcomes b and m (Consult the course catalogue and Department Guidelines)
MONTANA TECH  
Department of Metallurgical and Materials Engineering

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<tr>
<th>Date</th>
<th>Laboratory plan</th>
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<tbody>
<tr>
<td>Jan 17</td>
<td>Martin Luther King Day</td>
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<tr>
<td>Jan 24</td>
<td>Annealing of Cold Worked Brass</td>
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<td>Jan 31</td>
<td>Annealing of Cold Worked Brass</td>
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<td>Feb 7</td>
<td>Annealing of Cold Worked Brass</td>
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<td>Feb 14</td>
<td>Aluminum Casting</td>
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<td>Feb 21</td>
<td>President’s day</td>
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<td>Feb 28</td>
<td>NO Lab - TMS 2011/SME Conference</td>
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<td>Mar 7</td>
<td>Aluminum Casting</td>
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<td>Mar 14</td>
<td>Spring Break</td>
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<tr>
<td>Mar 21</td>
<td>Precipitation Hardening of Aluminum Alloys</td>
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<td>Mar 28</td>
<td>Precipitation Hardening of Aluminum Alloys</td>
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<td>Apr 4</td>
<td>Heat Treatment of Titanium Alloy</td>
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<td>Apr 11</td>
<td>Heat Treatment of Titanium Alloy</td>
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<td>Apr 18</td>
<td>Stainless Steel Welds</td>
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<td>Apr 25</td>
<td>Spare</td>
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Expectations:
1) Attend the lab, and let me know incase you need to be elsewhere prior to any class.
2) Note that all reports must be satisfactorily completed before a grade is assigned.

Assessment: The assessment will be an average of the lab reports submitted. The following aspects are important.
- preparation
- organization
- initiative, and
- effectiveness in accomplishing the lab

Contribution to Professional Component:
- Engineering Topics- Yes
- Engineering Design- No
- Computer Usage- Yes – spreadsheets, word processor
- Ethics- No
- Statistics- No
- Safety- Yes

ABET outcomes covered: b and m

Prepared by: Dr. Sudhakar K.V.  
Date: January 10th, 2011