MSE 440/540(001/601): Processing of Metallic Materials

Time: 1:30 PM – 2:45 PM | Days: Tu, Th | Room: 3003 EB1
Fall 2017

Instructors: Dr. Yuntian T. Zhu (ytzhu@ncsu.edu), 308 RBII, (919) 513-0559
Office Hour: Dr. Zhu: by appointment


Course Description (from Catalog): Fundamental concepts of solidification and their application to foundry and welding practices; metal forming concepts applied to forging, rolling, extrusion, drawing, and sheet forming operations; machining mechanisms and methods; powder metallurgy; advanced processing methods including rapid solidification and mechanical alloying.

Course Objectives: By the end of the course, you should be able to do the following things:

1. Understand the physical principles related to the processing of metallic materials such as solidification theory, metal forming theory, theory of chip formation in machining, etc.
2. Be familiar with the common metal processing technologies both from classroom study and from field trips.
3. Be able to optimize the design of processing variables to obtain sound material free from defects.

POLICIES AND PROCEDURES

• Test grading. If you believe an error has been made in grading on a problem set, bring it to the instructor. If you believe that you should have gotten more points than you got for any reason other than a simple addition error, write a statement making your case and take it to me for decision.

• Missed tests. If you miss a test without either a certified medical excuse or prior instructor approval, you will take a makeup test at a designated time during the last week (dead week) of the semester. The makeup exam will be fair but comprehensive (covering all the course material) and challenging. Tests missed with certified medical excuses or prior instructor approval will be dealt with individually. Only one missed test can be made up.

• Cheating on tests. Any student caught cheating in a test will automatically get 0 for that test, and be reported to the university.

• Attendance. You are expected to attend the classes. 0.2% will be deducted if you are not present in the class to answer a quiz (question);

• Homework. Homework will not be collected. However, the assigned homework might be in the test. Therefore, it is advised that students should do the homework although it is not collected.

• Field Trips. Three field trips are planned, depending on arrangements with metal processing companies. Field trips typically occur on Fridays and are required for on-campus students. Each field
trip will result in 0.5% credit for participants. See the class website for the dress code for field trips.

**• Calculation of course grade.**

<table>
<thead>
<tr>
<th>Weighted average</th>
<th>&gt;98</th>
<th>97.9 - 94</th>
<th>93.9 – 90</th>
<th>89.9 - 86</th>
<th>85.9 - 82</th>
<th>81.9 - 78</th>
<th>77.9 - 73</th>
<th>72.9 - 68</th>
<th>67.9 - 63</th>
<th>62.9 - 53</th>
<th>&lt;53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter grade</td>
<td>A+</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

No grade markup no matter how close.
Targeted grade distribution: A: 15-25%, B: 30-40%

**Teaching Style and Quiz:** Active student participation

**For in-class students:** A dice will be rolled to determine who participate. 0.2% will be deducted if you are not present in the class to answer a quiz; 0.2% extra credit will be given if you give the right answer; 0.2% extra credit will be given to a volunteer who gives the right answer. No credit will be given or deducted if you give a wrong answer.

**For Online students:** Quizzes may be given. Students should submit the answers to me by email at ytzhu@ncsu.edu within 5 days. Correct answers will be given credits. Online students will be graded separately from in-class students.

**Supporting Fellow Students in Distress:**
As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom and the campus as a whole remains a safe environment for learning. Occasionally, you may come across a fellow classmate whose personal behavior concerns or worries you. When this is the case, I would encourage you to report this behavior to the NC State Students of Concern website: http://studentsofconcern.ncsu.edu/. Although you can report anonymously, it is preferred that you share your contact information so they can follow-up with you personally.