

MSE 401: Thermodynamics of Materials

Fall 2008

Lecture hours: Mon, Wed, Fri: 9:00–9:50am, 253 Mechanical Engineering Building.
Recitation section: Monday, 2:00-2:50pm (114 Transportation Building).

Instructor: Prof. Erik Luijten, 202 MSEB, 244-5622, luijten@uiuc.edu

Teaching assistants: Will Chemelewski (wchemel2@illinois.edu) and Clarabelle DeVries (cdevries@illinois.edu)

Web site

Relevant materials will be posted on <http://simu.mse.uiuc.edu/401/>

This webpage also contains a link to a detailed schedule with topics treated on each date, corresponding book sections, homework assignments, etc. Please check this frequently.

Grades are accessible via Illinois Compass, <http://compass.uiuc.edu/>

Office hours: I have tried, together with the TA's, to put together an extensive framework of ways to help you beyond the regularly scheduled class hours.

1. Office hour: **Wednesday**, 1:00-1:50pm, 202 MSEB
2. In addition, I will always try to make time to help you outside of the office hours: please call me or send an e-mail to schedule an appointment. Also useful if you have lengthy (or many!) questions.
3. Clarabelle holds an office hour in the **Ceramics Lounge**, immediately after the recitation section on **Monday afternoon** (i.e., 3:00-4:00pm).
4. Will holds an office hour on **Tuesday**, 1:00-2:00pm, also in the Ceramics Lounge.

Textbook: *Thermodynamics in Materials Science* by Robert T. DeHoff (publisher: McGraw-Hill). Second edition.

Several other books have been put on reserve in Grainger Library (ask at the reserve desk for MSE 401).

Course objectives

The purpose of this course is to introduce the application of thermodynamics to a variety of materials problems. You will learn the laws of thermodynamics and fundamental thermodynamic principles and concepts. These principles will be applied to understand phase equilibria in a broad range of systems, ranging from one-component systems to mixtures, oxidation reactions and electrochemical systems. The statistical interpretation of thermodynamics will be discussed at an introductory level. This course aims to provide a basis for a variety of subsequent courses in Materials Science and Engineering.

[please turn over for more information]

Grade calculation

There will be two hourly exams (midterms) and one final exam. In addition, there will be homework at least at the end of every chapter; it is my intention to give a significant number of homework problems, in order to give you the opportunity to practice and to detect misunderstandings in an early stage. In general, the homework is due one week after it was handed out (late homework will *not* be accepted, unless this has been discussed with me in advance); **put it in the special mailbox (marked “401”) in the administrative office on the second floor of MSEB.** As you can see from the table below, homework does not count very much to your final grade (although it’s not negligible either); nevertheless I *strongly recommend* to take it seriously. Solving problems is essential for truly mastering the material. An additional motivation may be that homework problems may (and in the past often did) reappear later as exam questions. Past experience has shown that there is a strong correlation between doing the homework and being able to finish exams within the allotted time.

Final grade calculation:

10%	Homework
25%	First midterm
25%	Second midterm
40%	Final exam