

# EMA 6316 – Materials Thermodynamics

## Course Syllabus – Fall 2015

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	Office	E-Mail
Prof: Richard G. Hennig	154 Rhines Hall	<a href="mailto:rhennig@ufl.edu">rhennig@ufl.edu</a>
TAs: Will Brewer		<a href="mailto:wmbrewer@ufl.edu">wmbrewer@ufl.edu</a>
Josh Gabriel		<a href="mailto:joshgabriel92@gmail.com">joshgabriel92@gmail.com</a>

### Course Description (3 credit hours)

Thermodynamics of materials systems, surfaces in solids, irreversible processes.

### Prerequisites:

EMA 4314: Energetics and Kinetics in Materials Science or any equivalent Thermodynamics course.

### Course Objectives

This is a graduate level course. It reviews the four laws of thermodynamics as the fundamental basis for thermal and chemical equilibrium and introduces a statistical mechanical viewpoint for fundamental thermodynamic variables and the relationships between them. The students will apply these principles to understanding phase equilibria, phase diagrams, heterogeneous reactions, solutions, surfaces, and defects. The use of thermodynamics for practical scientific and technical applications will be emphasized in the course.

### Class Time

Monday, Wednesday, Friday      Period 3    9:35-10:25      NEB 201

### Text book: (required)

Title:            Thermodynamics in Materials Science, 2nd Edition

Author:        Robert DeHoff

ISBN:          0-8493-4065-9

Supplementary reading and links to various other resources/websites are provided and updated throughout the semester.

### Course Website

The course website is on the Canvas system <http://lss.at.ufl.edu>, where you can find the syllabus, lecture notes, homework problems, announcements, and your grades. Please check it frequently.

### Lectures

Lectures are critical to success in this MS&E course. However, I will not require attendance. Questions are highly encouraged. It will make the class more interesting, wake up your fellow students and give me a chance to explain things better. If you do not understand something, chances are that most of the class missed that point too. If you as students do not ask enough questions, I will start asking you.

### Homework, due Wednesdays at midnight

Weekly homework exercises will be assigned. These homework questions are essential to your study and some exam questions will be adapted from them. There are about 10 home-

work assignments planned. The homeworks will be graded on an Satisfactory/Unsatisfactory scale. For each satisfactory homework, I will add one point to the lowest exam score. Please see me or the TAs during their office hours to discuss homework problems. **No late homework assignments will be accepted.**

### Exams

You will be given 3 in-class exams throughout the semester, tentative exam dates are:

Exam 1: September 18, 2015

Exam 2: October 30, 2015

Exam 3: December 9, 2015

There will be NO Final Exam. Each exam is weighted equally and each exam will be worth 1/3 of your final grade. Review sessions will be given prior to each exam. You have two weeks after the test results are posted to resolve any questions about scores and grades. No changes to your exam grade will be made after that time.

### Exam Conflicts with other course exams

The official UF policy on exam conflict resolution states that when two exams conflict, the course with the higher number will take priority. There will be no exceptions to this rule.

### Make-up exams

Make up exams will be provided only with the *prior approval of the instructor in accordance with university policies*. (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) In general, acceptable reasons for excused absence from an exam include illness, serious family emergencies, special curricular requirements, military obligation, court-imposed legal obligations, and religious holidays. In all cases, you will be required to provide written documentation, and obtain prior instructor approval. You will not be excused from any exam without following the policy above, with no exceptions. Students not in attendance for the scheduled exam will receive a score of zero. **You must notify the instructor no less than 1 week of the scheduled exam of your intent and justification for missing the exam.** Make-up exams for excused absences as well as exam conflicts must occur within 1 week of the missed exam, and may occur before the missed exam.

### Grading

Grades will be based on your understanding and mastery of the material as demonstrated by quantitative scores on homework (25%) and the three exams (25% each).

### Grading Scale

Percentage	≥92	≥88	≥84	≥80	≥76	≥72	≥68	≥65	≥62	≥59	≥56	<56
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Grade Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0

### Office Hours

If I am in my office with the door open, you are welcome to come in and ask questions. A closed door means I am either not there or on a conference call, or writing an exam/proposal. Official office hours are Tuesday afternoons 4:00-6:00 p.m. TA office hours will be on Wednesday and Thursday afternoons 4:00-6:00 pm.

I will try to respond to e-mail questions as fast as possible. Important e-mail questions (minus identifying information) and answers will be posted to the class either by e-mail or on the course website for the benefit of other students.

### **Honesty Policy**

All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

See <http://www.dso.ufl.edu/sccr/procedures/honorcode.php>.

### **Accommodation for Students with Disabilities**

Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

### **UF Counseling Services**

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.

### **Software Use**

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.