

Course Syllabus
EMA 6316, Materials Thermodynamics
Fall 2013

1. Catalog Description - Credits: 3
Thermodynamics of Materials systems, surfaces in solids.
2. Pre-requisites and Co-requisites - EMA 4314
3. Course Objectives –
This course deals with the basic problems of Materials Thermodynamics including the laws, conditions for equilibrium and treatment of heterogeneous equilibrium. The relation between thermodynamics and the various types of phase diagrams is discussed and applied to multi component materials.
Thermodynamics is introduced as a tool applicable to understand the phase stabilities and phase reactions in metal alloys, ceramics, polymers and composites. The way to put thermodynamics to practical use for scientific and technical problems is emphasized.
4. Contribution of course to meeting the professional component – This course provides 3 credits towards engineering sciences.
5. Instructor - Dr. Rajiv K. Singh
 - a. 178 Rhines Hall
 - b. Telephone: 392-1032)
 - c. E-mail address: rsing@mse.ufl.edu
 - d. Web: <http://mse.ufl.edu>
 - e. Office hours: T and TR period 2 pm to 3 pm
6. Meeting Times and Location – T 5&6 TR 6 NEB 100
7. Textbooks and Software Required – (i) D. R. Gaskell, Introduction to the Thermodynamics of Materials, 5th Ed., Taylor and Francis, NY, 2008.
13-digit ISBN: 978-1-5916-9043-6

Course web site: Go to the UF Academic Technology website at: <https://iss.at.ufl.edu/>
8. Recommended Reading
 - R. T. DeHoff, Thermodynamics in Materials Science, McGraw Hill, Inc., NY, 1993
 - Y. A. Cengel and M. A. Boles, Thermodynamics: An Engineering Approach, McGraw Hill, NY, 2002.

- D. V. Ragone, Thermodynamics of Materials, Vols. 1 and 2, John Wiley and Sons, NY, 1995.
 - C. H. P. Lupis, Chemical Thermodynamics of Materials, Prentice Hall, Englewood Cliffs, NJ, 1983.
 - O. Kubaschewski, C. B. Alcock, and P. J. Spencer, Materials Thermochemistry, Pergamon Press, NY, 1993.

The following databases will be essential:

JANAF Thermochemical Tables check FREED software in the CD that accompanies Gaskell's text

11. Course Outline

- Introduction to Thermodynamics
- The Laws of Thermodynamics
- Thermodynamic Variables, Definitions, and Relations
- Thermodynamics Data Sources/Programs
- Equilibrium
- Statistical Thermodynamics
- Unary Systems
- Solutions
- Reactions Involving Gases
- Gibbs Phase Rule and Phase Diagrams
- Electrochemistry

12. Grading:

Home work	20%
Take Home	15%
Attendance	5%
Midterm 1	20%
Midterm 2	20%
Third Examination	20%

Attendance above 60% will receive 100% of grade

Attendance between 40 to 60% will receive 50% of grade

Attendance below 40% will receive 0% of the grade

EDGE students do not have attendance requirements.

HW submission after 1 week of deadline will receive no credit (within 1 week of deadline 80% of credit)

ALL HOMEWORK AND ASSIGNMENTS MUST BE COMPLETED IN ORDER TO PASS THE COURSE.

Information on current UF grading policies for assigning grade points can be found at <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html> .

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

Assignment	Assigned problems	Dead line	Remarks
HW# 1	2.2, 2.5, 2.7	TBA	
HW# 2	3.2, 3.5, 4.1	TBA	
HW# 3	6.1, 6.3, 6.8	TBA	
Exam # 1	Chapters 1-4	TBA	EDGE students TBA
HW# 4	7.1, 7.5, 7.9	TBA	
HW# 5	8.2, 8.3, 8.6	TBA	
HW# 6	9.2, 9.3, 9.8, 9.11	TBA	
Exam # 2	Chapters 5-8	TBA	EDGE students TBA
HW# 7	Will be posted on the web	TBA	
HW# 8	Will be posted on the web	TBA	
Third Exam	9-last chapter covered in class	TBA	TBA

13. 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.
14. 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.
15. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.
16. 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.

