Syllabus: EMA 3010 (Class No. 13540) – Materials – Fall 2017

COURSE DESCRIPTION: (3 Credit Hours)

- Conceptual perspective for origin of materials behavior, including structure, property, performance interrelationships.
- Materials selection and use of familiar materials, including metals, ceramics, polymers, electronic materials, and composites in electronics, structural and other engineering applications.

COURSE OBJECTIVES:

- To present the fundamental concepts in materials science and engineering.
- To describe the structure, properties, and applications of metallic, ceramic, polymeric and composite materials.
- To generalize structure-property-performance interrelationships in materials.

PREREQUISITES: CHM 2045 General Chemistry

Contribution of course to meeting the professional component: This course provides 3 credits towards engineering sciences.

INSTRUCTOR: Dr. Jon Dobson

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- Office hours: TBA or by appointment
- Teaching Assistants: Tanvi Ajantiwalay & Shangradhanva Eswara Vasisth
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Meeting Times and Location: M-W-F Period 4 (10:40 - 11:30 am) – Weimer Hall 1064

TEXTBOOK (required)

a. Title: *Fundamentals of Materials Science and Engineering: An Integrated Approach*
b. Author: William D. Callister, Jr. and D.G. Rethwisch
c. Year and edition: Fifth Edition (John Wiley & Sons, Inc.) / Electronic Version
d. ISBN: 9781119175483 or ON-LINE ONLY ISBN: 9781119127604

ON THE WEB: This course will use Canvas extensively as a *communication, **homework** and archival tool*. Students can access relevant course information via the entry link: https://lss.at.ufl.edu/.

Conduct, Attendance and Expectations: Proper behavior in class is always important and leads to a relaxed and productive educational environment. Thus, eating, drinking, texting, reading of newspapers, working on homework for this or other courses, or other activities that are not part of the class are not allowed. Students who do not comply with these requirements or who behave disorderly or disrespectfully may be asked to leave the classroom. Leaving your cell phone on, leaving early or arriving late can be VERY distracting. All electronic devices (PDAs, cell-phones, etc.) should be turned off or in silent mode. If your cell phone rings during class it will be confiscated for the remainder of the class period. Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at:

https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grading and Grading Scale: Your final grade will be allocated based on the following distribution:

Homework: 10% / Quizzes: 10% / Three In-Class Exams: 80%

A = 95% - 100%; **A-** = 90% - 94%; **B+** = 87% - 89%; **B** = 83% - 86%; **B-** = 80% - 82%; **C+** = 77% - 79%; **C** = 73% - 76%; **C-** = 70% - 72%; **D+** = 67% - 69%; **D** = 63% - 66%; **D-** = 60% - 62%; **E** < 60%

HOMEWORK: Homework exercises will be assigned throughout the course. Notification of homework assignments and due dates will be via classroom announcements and posting on Canvas. *Homework will be on Canvas. You will not need Wiley electronic access for homework.*

PROVISIONAL COURSE OUTLINE: Below is the tentative schedule of topics, activities, reading assignments and exams.

Week of…	TOPICS	Chapter
8/20	• Introduction • Material Properties	1
8/27	• Atomic structure & chemical bonding • Crystalline structure	2 & 3
9/3	• **No class 9/3: Labor Day** • Crystalline structure	3
9/10	• **Exam Review** • **EXAM 1: Sept. 12th** • Imperfections in solids	**1-3** 5
9/17	• Imperfections in solids • Diffusion	5 & 6
9/24	• Mechanical properties • Deformation and strengthening	7 & 8
10/1	• Deformation and strengthening • Failure • **Exam Review**	8 & 9 **5-9**
10/8	• **EXAM 2: Oct. 8th** • Phase diagrams • Phase transformations	10 & 11
10/15	• Types and applications of materials – Metals • Types and applications of materials – Ceramics • Types and applications of materials – Polymers	13, 4
10/22	• Processing of materials – Metals • Processing of materials – Ceramics • Processing of materials – Polymers	14
10/29	• Composites • **No class 11/2: Homecoming**	15
11/5	• Corrosion • **Exam Review** • **EXAM 3: Nov. 9th**	16 **4, 10-16**
11/12	• **No class 11/12: Veteran's Day** • Thermal properties • Optical properties	17,19
11/19	• Electrical properties • **No class 11/21 & 11/13: Thanksgiving**	12
11/26	• Electrical properties • Magnetic properties	12, 18
12/3	• **Exam Review** • **Exam 4: Dec. 5th**	**12, 17-19**

No Final Exam

HONESTY POLICY – All students admitted to the University of Florida have signed a statement of academic honesty committing them 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, http://www.counseling.ufl.edu/cwc/Default.aspx, counseling services and mental health services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.
- University Police Department 392-1111

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.

FEEDBACK – Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.