Instructor: Junkun Ma  
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Lecture Time: 9:30AM – 10:45AM Mo & We  
Lecture Location: Fayard Hall 213  
Office Hours: 9:30AM~12:00PM & 1:00PM~5:00PM Tu  
10:00AM~12:00PM Fr ONLINE office hour  
Other time by appointment

THE FOLLOWING IS A TENTATIVE PLAN. THE INSTRUCTOR RESERVES THE RIGHT TO MAKE CHANGES TO THIS SYLLABUS DURING THE SEMESTER BASED ON PROGRESS AND CHANGES OF OTHER CONDITIONS.

Course Description:  
This course introduces engineering materials, such as metals, plastics and ceramics, used in various industries. Mechanical, thermal, optical and electrical properties of these materials will be discussed. Physical and chemical structure of these materials will also be presented. Three credits will be awarded upon successful completion of this course.

Course Objectives:
1. To understand concepts and parameters used to describe physical properties of various engineering materials.  
2. To develop basic understanding of the structure-properties relationship of various engineering materials.  
3. To introduce general applications of various engineering materials.  
4. To provide students with an understanding of the physical laws and principles that governs the behaviors of materials.  
5. To develop within each student a measurable degree of competence in testing and evaluating materials.

Course Materials:
- Notes and materials provided as the semester proceeds.  
Grades:
1. Grades will be assigned according to the following scale.
   90-100 = A, Superior
   80-89 = B, Very Good
   70-79 = C, Average
   60-69 = D, Below Average
   59 or lower = F, Failure

Note: Students MUST score a “C” or above in all courses within their major. Otherwise, they must retake the course.

2. Basis for assigning grades:
   a.) Three exams (two mid-terms and one final): 300 Points
       Note: All students are to take the exams on the scheduled date and time.
   b.) Assignments: 100 points

If you have any problem with this grading system, please make an appointment to talk with the instructor immediately! NO LATE HOMEWORK WILL BE ACCEPTED. Students with unexcused absences will NOT be able to make-up exams or homework! A grade of ZERO (0) will be assigned to missing exams or homework! Students are required to provide documentations for legal absence before any make-ups.

Important Dates and Notes:
1. Wednesday, January 13, 2016 ~ Thursday, January 14, 2016 is the Drop/Add period. Students can make schedule adjustment without receiving a ‘W’ grade for each class dropped. Students may make final schedule adjustments by 5:00PM on Thursday, January 14, 2016.

2. Monday, February 15, 2016 is the last day to apply for Spring 2016 graduation, and Summer/Fall 2016 graduation without late fee.

3. Students will NOT automatically be dropped from classes. Students who choose to drop from this class must do so via LEONET by the university deadline of Friday, March 11, 2016 before 12:30PM. It is also the deadline to resign from the university.

4. The time and location of the final exam for this class will be announced during the last week of lecture.

5. Friday, May 6, 2016 is the last day of classes.

6. Friday, May 20, 2016 is the deadline to return rental textbook without fine. Student accounts will be charged for any rental books not returned by 12:30PM on Friday May 20, 2016.

7. If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Office of Disability Services, War Memorial Student Union 1304. No accommodations will be granted without documentation from the Office of Disability Services.

8. Student behavior/Classroom decorum: "Free discussion, inquiry, and expression are
encouraged in this class. Classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of students to benefit from the instruction is not acceptable. Examples may include routinely entering class late or departing early; use of beepers, cellular telephones’ or other electronic devices; repeatedly talking in class without being recognized; talking while others are speaking; or arguing in a way that is crossing the civility line.” In the event of a situation where a student legitimately needs to carry a beeper/cellular telephone to class, prior notice and approval by the instructor is required.” Otherwise, **ALL PAGERS, BEEPERS, CELLULAR TELEPHONES AND OTHER ELECTRONIC DEVICES ARE TO BE TURNED OFF OR TURNED TO SILENT MODE BEFORE YOU ENTER THE CLASSROOM.**

**TEXT MESSAGING DURING THE LECTURE IS NOT ALLOWED.**

Classroom behavior that is deemed inappropriate and cannot be resolved by the student and the faculty member may be referred to the Office of Judicial Affairs for administrative or disciplinary review as per the Code of Student Conduct which may be found at http://www.selu.edu/admin/stu_affairs/handbook/.

9. **Academic Integrity:** Students should note that repercussions of academic integrity are discussed in the university catalogue. “Cheating on examinations, plagiarism, improper acknowledgment of sources in essays and the use of a single essay or paper in more than one course without permission are considered very serious offenses and shall be grounds for disciplinary action”.

10. The students Southeastern Louisiana University e-mail address MUST be used for all e-mail communication between students and faculty/administration/staff. Students are encouraged to check their Southeastern e-mail frequently for important communications from the university.

11. University policy states that the lab is not a place for children. Students are not to bring their children to the lab.

**Course Requirements:**

1. Adherence to departmental policies and procedures, which you were provided.

2. Regular and punctual class attendance. Students who have unexcused absences will receive the grade of zero (0) for all tests, quizzes, and/or lab experiments missed. When any student receives unexcused absences (e.g., ten percent of the total classes) in any class prior to the published withdrawal date, the instructor may withdraw the student with a grade of W.
Course Outline:

1. Introduction
   A. Course overview
   B. Syllabus
   C. Course outline
   D. Term Project

2. Basics and Concepts
   A. Definition of materials and material sciences
   B. History of materials
   C. Materials selection
   D. Standard and specifications

3. Structure of Materials
   A. Atomic structure of materials
   B. Chemical bonding
   C. Unit cell of materials
   D. Classification of materials

4. Mechanical Properties of Materials
   A. Materials in product designs
   B. Stresses and Strain
   C. Elasticity in Cartesian coordinates system
   D. Mechanical properties of materials
   E. Common properties measured

5. Thermal Properties of Materials
   A. Basic concepts
   B. Heat transfer
   C. Thermal stresses

6. Physical and Chemical Properties of Materials
   A. Physical properties
   B. Electrical Properties
   C. Magnetic Properties
   D. Optical Properties
   E. Chemical Properties

7. Iron and Ferrous Alloys
   A. Basic concepts
   B. Irons, steels, alloys
   C. Phase diagram
   D. Heat treatment
   E. Cast irons

8. Nonferrous Metals and Alloys
A. Basic concepts
B. Copper and copper alloys
C. Aluminum and aluminum alloys
D. Zinc and Magnesium alloys
E. Precious metals

9. Plastics
   A. Polymers
   B. Thermoplastics
   C. Thermosetting plastics
   D. Applications of plastics
   E. Recycling of plastics

10. Ceramics
    A. Introduction
    B. Composition and classification
    C. Structure of ceramics
    D. Properties of ceramics
    E. Fabrication of ceramics

11. Composites
    A. Introduction
    B. Components in composites
    C. Advantage of composites
    D. Properties of composites
    E. Testing of composites
    F. Fabrication of composites

BIBLIOGRAPHY