GENERAL INFORMATION
Class Hours: MWF 1500-1615
Class Location: UH120
Instructor: Dr. Cameron Coates
Office: UH251
Phone: 912-344-2693
Email: cameron.coates@armstrong.edu
URL: http://engineering.armstrong.edu/cameron
Office Hours: MW 1245-1345, T 1300-1600 or by appointment
Course URL: http://engineering.armstrong.edu/cameron/courses_fall2017.html

PREREQUISITES
CHEM 1211 and PHYS 2211

CATALOG DESCRIPTION
The structure, property, processing, and performance relationships of engineering materials. Materials selection is treated as part of engineering design.

COURSE OBJECTIVE
The main objective of this course is to study the fundamentals of structure-property-processing relationships of engineering materials; to relate these fundamentals to the performance of these materials; to discuss the mechanical, electrical, thermal and other properties of materials and to introduce selection of materials and processes as part of engineering design.

TOPICS COVERED
• Introduction to engineering materials;
• Atomic structure and bonding; Crystalline structures;
• Point defects and diffusion; Linear, planar and volume defects;
• Non crystalline and semi crystalline structures
• Phase Equilibrium and phase diagrams; Structural transformations;
• Mechanical properties; Electrical properties;
• Optical and dielectric properties; Magnetic properties and Thermal properties;
• Composite materials;
• Materials-environment interactions;
• Materials processing;
• Materials and engineering design
Note that the above topics are tentative and the instructor may change them if and when needed.
Course Outcomes
Upon successful completion of this course, students should be able to:
1. Analyze and predict material structure at the atomic, molecular and macroscopic levels
2. Understand the relationship between material structure and material properties
3. Analyze and predict material performance based on material properties
4. Perform design, safety and failure analysis for specific materials
5. Analyze and predict material properties for materials selection and design applications

Grading policy
The grading policy will be based on:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>2 Projects @ 10% each</td>
<td>20%</td>
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<tr>
<td>3 Exams @ 10% each</td>
<td>30%</td>
</tr>
<tr>
<td>4 quizzes @ 4% each</td>
<td>16%</td>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>24%</td>
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Final grades will be assessed as:

- A (90-100)
- B (80-89)
- C (70-79)
- D (60-69)
- F (< 60)

The instructor reserves the right to adjust the grading percentages and scale if he/she deems it necessary.

Homework Assignments
Homework assignments will be assigned once every 1-2 weeks. Homework assignments are for practice only and may or may not be collected. However, the quiz material will primarily come from the homework assignments.

Projects
Projects will be based on the material covered in class and the homework assignments with an emphasis on problem solving, design and case studies. Projects will usually be due 2-3 weeks from the date they are assigned. All projects are to be submitted in the required format. Late work is accepted, however the following grade reductions will be enforced: submitted < 1 day: -20%, 1 day < submitted < 2 days: -30%, 2 < submitted < 3 days: -40%. Projects are due at the BEGINNING of class held on the due date specified on the assignment.

Exams
Exams will be closed book and closed notes (unless specified otherwise) and are to be individual effort. Exams will cover all course material (lectures, handouts, reading assignments, etc.) up to the class period before the exam unless designated otherwise on the syllabus. No makeup exams will be given unless written documentation is provided that verifies a medical emergency or family crisis.

Campus Carry
It is the responsibility of every individual who would like to carry a concealed weapon to first verify that the area where they are carrying it meets the requirements of HB 280. If you intend to carry a conceal weapon, it is essential that you visit [http://www.usg.edu/hb280](http://www.usg.edu/hb280) and follow ALL USG rules for this activity.

Computer Labs and tutoring
The ES program has free tutoring specifically for engineering students, located in University Hall room 240, Monday through Thursday 9 a.m. - 5 p.m. The CST tutoring center also provides free tutoring for most lower level mathematics and science courses. [https://www.armstrong.edu/science-technology/cst-tutorial-center](https://www.armstrong.edu/science-technology/cst-tutorial-center) The College of Science and Technology Lab (SC 129) has Microsoft Office, MATLAB, AUTOCAD, SolidWorks, Adobe Acrobat Reader and other engineering software. SC129 is available to all students for general use.
Class Attendance
Students are expected to attend class, bring their textbooks, writing material or tablets, external storage media, etc., and are responsible for all topics covered in class. Disruption of class (use of cell phones, playing on the computer, talking, sleeping, etc.) will not be tolerated. A warning will be given the first time and you will be asked to leave the class on further instances.

Class Tardiness
Students are expected to come to class on time. A tardiness of five minutes after class start time will be allowed. After that there is a possibility you may not be allowed to enter the class. Emergency situations (with the instructor’s approval; written documentation required) will be taken on a case by case basis.

Academic Integrity Policy:
Violations of the Armstrong State University Academic Integrity Policy (including cheating and plagiarism) are taken very seriously. Any violation of this policy will become part of the student’s permanent educational record. More information on the Academic Integrity policy and procedure can be found at www.armstrong.edu/studentintegrity.

Title IX Clause:
Armstrong is dedicated to providing a safe and equitable learning environment for all students. Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Title IX Office in Victor Hall Room 245 or by email: diversity@armstrong.edu. This is important for the safety of the whole Armstrong community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The University Counseling Center provides 24/7 confidential support, and the http://www.armstrong.edu/counseling_center describes reporting options and other resources.

Disability Related Accommodations
Armstrong State University is committed to providing reasonable accommodations to students with documented disabilities, as required under federal law. Disabilities may include learning disabilities, ADD, psychological disorders, brain injury, Autism Spectrum Disorders, serious chronic medical illnesses, mobility impairment, communication disorders, vision or hearing loss or temporary injuries. The purpose of disability accommodation is to provide equal access to the academic material and equal access to demonstrate mastery of the material. Students with disabilities must meet all the academic requirements and standards of the class, including the attendance policy. If you have a disability and need accommodations, please contact the Office of Disability Services, located on the second floor of Memorial College Center, room 208. You will need to meet with Disability Services Staff, who can help you gather documentation of your disability or refer you to an appropriate resource for assessment. Once documentation of the disability is gathered and approved, Disability Staff will provide you with an Accommodation Letter, detailing the appropriate, approved accommodations, which you should present to me so we can discuss and implement your accommodations. Disability accommodations work best starting at the beginning of the semester, but can be approved and started at any point in the semester. Accommodations start at the time the Accommodation Letter is presented to faculty, within reasonable timelines. Accommodations are not given retroactively. Accommodations are not part of your academic transcript.
IMPORTANT DATES
Exams, Quizzes, Projects (see course schedule)
Last day to withdraw without automatic grade of WF (Mid-term): Oct 4
Last day of classes: Dec 7
No class: Monday, September 4th, Labor Day
No class: November 20 – 24, Thanksgiving Break
FINAL EXAM: Dec 4 & 6, 3:00-4:15pm, UH121