CE 336 Materials Science for Civil Engineers

Instructor: Prof. Tong Qiu, Ph.D., P.E.
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Office Hours: M Tu W 1:30 – 3:30 PM

Lectures: M W F 10:10 – 11:00 AM      158 Willard


Prerequisite: E MCH 213 (Strength of Materials), STAT 401 (Experimental Methods)

Objectives and Goals:
The main objective of this course is to enable students to relate (1) manufacturing and processing of construction materials to (2) their microstructure and (3) macroscopic properties. By understanding the interconnection between these three elements, students will be able to predict the short- and long-term performance of various construction materials. In addition, students will be able to design material processing and production that results in optimal mechanical and durability related properties suited for different construction applications. This course provides a bridge between engineering mechanics and engineering design.

By the end of semester, students will be able to understand, explain, characterize, and predict the behavior of aggregates, portland cement and concrete, asphalt, steel, structural alloys, wood, and polymer composites used in civil infrastructure and building construction. The measure of this knowledge is both a basic competence in understanding the material and proficiency in applying the knowledge in civil engineering applications.

Grading:
Homework Assignments 25%
In-class Exams (4) 75%
(First three exams: 15% for lowest score, 20%, 25% for highest score;
Last exam: 15%)

Bonus Points: Up to three points added to final grade for in-class participation

Grade Distribution: A(10%) A-(15%) B+(15%) B(15%) B-(15%) C+(10%) C(10%)
Discretionary (10%, A – F*)
* The final grade will be an F automatically if the final score (i.e., combined homework assignment, exams, and bonus points) is less than 60.
Feedback on where you stand on grade will be provided after the 2nd and 3rd exams.
**Academic Integrity:**
Students are expected to uphold the highest academic integrity. Any deviation will result in disciplinary measures consistent with University policies, including a grade of zero points for that assignment/exam/quiz and potentially a failing grade in the class. Please consult the policies at [http://www.engr.psu.edu/CurrentStudents/acadinteg.aspx](http://www.engr.psu.edu/CurrentStudents/acadinteg.aspx)

**Course Materials:**
All course materials, emails, and web postings will be made using the ANGEL course management software. Please regularly login ([https://cms.psu.edu](https://cms.psu.edu)) to check course announcements and access posted homework and solutions.

Many lectures will be conducted with PowerPoint. Copies of the PowerPoint slides, with space for notes, will be posted on ANGEL by 12 PM the day before each class. You may print these out to facilitate note-taking, and allow you to focus your attention on participation and understanding of the material.

**Notes:**
- Homework is due at the start of the class period before the lecture begins. **No late homework will be accepted** except in unusual circumstances (“forgot to bring it to class” is NOT considered as an unusual circumstance). Homework will be graded based on the accuracy of solutions, as well as your presentation. Please present your solutions neatly, clearly, and logically.

  - Homework solutions will be made available on the ANGEL Course Management system.

  - Questions, comments, etc. regarding the grading of exams or homework must be submitted to the instructor in writing (ANGEL e-mail is fine) within 48 hours (excluding weekends and holidays) of their return, after which time the discussion is closed.

  - Instead of mid-term and final exams, there will be four exams (50 minutes each) **tentatively** scheduled every four weeks on the following dates: *February 7th (Monday), March 4th (Friday), April 8th (Friday), and Final Exam Week (date to be determined).* The exams will be given at the beginning of class and will be closed book and closed notes. You may bring a basic calculator to the exams. The exams are non-accumulative and will cover lectures, textbook, homework assignments, and assigned reading. Three days before the scheduled exam, an equation sheet and study guide will be provided to aid your preparation for the exam. However, you are encouraged to start your preparation early.

  - **There are NO plans for make-up exams. Prior consent must be given for any missed exam, and will only be granted in extreme cases. The score will then be the average of the other exams in the course. Any student who misses an exam without prior consent will receive a grade of zero for the exam.**

  - Lecture attendance will **NOT** be taken; however, it is expected that you attend every lecture. The lecture is intended to present and clarify the course content; additional material may also be covered in lecture which cannot be found in the internet notes or textbook.
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<td>Microstructure of solids, Metals</td>
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