

Course Number	CE 321
Title	Civil Engineering Properties of Materials
Section	001
CRN(s)	10446
Credits	4
Prerequisite(s)	EAS 212 Mechanics of Materials
Days/Time	lectures: Tuesday & Thursday 12:00–13:50 labs: Wednesday 9:00-11:30 and W 14:00-16:30
Location	lectures: SB2 Rm. 155 labs: SB2 L32
Final Exam Day/Time	check schedule during week of December 5th - 9th, 2005
Course Website	N.A.
Instructor	Peter Dusicka, Ph.D., P.E.
Office	SB2 Rm. 462
Phone	503-725-9558
E-mail	dusicka@pdx.edu
Office Hours	T, Th 14:00-15:00 and W 8:00-9:00 (or by appointment)
Mailbox Location	CEE Office, Science Building 2, Room 128

Required Text or Other Materials:

Materials for Civil and Construction Engineers, M. S. Mamlouk and J. P. Zaniewski, Addison Wesley Longman Inc., 1998.

Recommended References/Optional Text/Supplemental Readings & Resources:

ASTM Standards, American Society of Testing Materials, 2004 (not recommended to buy).

Catalog Course Description:

Introduction to structure and properties of civil engineering materials such as steel, asphalt, cement, concrete, soil, wood, and polymers. Laboratory tests include evaluation of behavior of these materials under a wide range of conditions.

Laboratory:

Laboratory work and reporting is an essential component of the course. Laboratory work details will be announced during regular lectures and will be conducted under the guidance of Andrew Drexler in the structures laboratory on the lower level of SB2 in Rm. L42.

Course Objectives:

1. gain familiarity with different materials typically used in civil engineering
2. become knowledgeable of properties of civil engineering materials
3. develop laboratory skills, testing methods, interpretation and discussion of data
4. improve interaction and cooperation with colleagues

Assessment:

Final exam 30%*, Midterm 1 & 2 15% & 15%, Laboratory Reports 30%, Homework 10%

* must pass the Final exam to pass the course

Course Schedule (may be subject to change):

No	Week of	Topic
1	Sept. 26	<ul style="list-style-type: none"> • Introduction, course layout, importance of laboratory & review of important terms • Atomic structure, bonding, crystal structure, metals and alloys •
2	Oct. 3	<ul style="list-style-type: none"> • Reporting on laboratory procedures and results (reports, memos) • Phase diagrams, steel & mechanical testing of steels <p>Laboratory: introduction to measuring devices & test equipment</p>
3	Oct. 10	<ul style="list-style-type: none"> • Heat treatment of steel alloys, quenched & tempered steels • Strength, properties and use of constructional steel, shapes, strengths, corrosion effects <p>Laboratory: standard mechanical tests of steel</p>
4	Oct. 17	<ul style="list-style-type: none"> • Aggregates, gradation, portland cement composition, hydration of cement, effect of admixtures • Midterm 1 (date subject to change) <p>Laboratory: metal hysteretic behavior and fatigue</p>
5	Oct. 24	<ul style="list-style-type: none"> • Concrete, proportioning of mixes, wet concrete properties, curing • Basic properties of concrete, testing of hardened concrete, alternatives for improving concrete behavior <p>Laboratory: concrete mix design</p>
6	Oct. 31	<ul style="list-style-type: none"> • high performance concrete • Microstructure and defects in wood, shrinkage and creep <p>Laboratory: wood and its mechanical properties</p>
7	Nov. 7	<ul style="list-style-type: none"> • Engineered wood products • Composite materials - uses, types and fracture <p>Laboratory: concrete mechanical properties</p>
8	Nov. 14	<ul style="list-style-type: none"> • Asphalt uses, viscosity, mix and standard tests • Midterm 2 (date subject to change) <p>Laboratory: TBA</p>
9	Nov. 21	<ul style="list-style-type: none"> • particulate materials, soil types and composition, specific gravity, creep, expansion and contraction, confinement • <i>holiday – thanksgiving</i> <p>Laboratory: geosynthetics ASTM & geosynthetic soil interaction tests</p>
10	Nov. 28	<ul style="list-style-type: none"> • Innovative materials in civil engineering (shape memory alloys, high performance steel, light weight & high strength concrete) • Review •
	FINAL	check PSU schedule for final exam date and time

Computer and E-mail Accounts

All engineering students should activate their engineering computer account (go to the CadLab in SB2, 169) which will allow them to use engineering computer labs and e-mail. You should activate it *before* the day you need it. If you encounter problems with this account, see the lab attendant, or e-mail: support@cecs.pdx.edu. Please note: the CEE Department regularly sends course announcements, job information, etc. to students' CECS accounts, so if you do not check it regularly, we recommend forwarding your CECS e-mail to whatever e-mail address you use.

Ethics and Professionalism

As future professional engineers you should plan to take the FE Exam (see the Oregon State Board of Examiners for Engineering and Land Surveying at www.osbeels.org), and you should be familiar with the ASCE Code of Ethics (www.asce.org/inside/codeofethics.cfm), which includes the following:

Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the engineering profession.

The PSU Student Conduct Code prohibits all forms of academic cheating, fraud, and dishonesty. Further details can be found in the PSU Bulletin. Allegations of academic dishonesty may be addressed by the instructor, and/or may be referred to the Office of Student Affairs for action. Acts of academic dishonesty may result in a failing grade on the exam or assignment for which the dishonesty occurred, disciplinary probation, suspension or dismissal from the University. The students and the instructor will work together to establish optimal conditions for honorable academic work. Questions about academic honesty may be directed to the Office of Student Affairs (<http://www.ess.pdx.edu/osa/>).

Student Groups and Professional Organizations

Participation in student and professional groups can be a valuable part of your education experience. Membership gives students opportunities to get to know fellow students better, meet and network with professionals, collaborate in solving real engineering problems, learn about internship or job possibilities, socialize and have fun. Your fellow students can be a great source of help and guidance in your academic endeavors. Consider becoming active with a student organization, such as the following:

- American Society of Civil Engineers Student Group (ASCE): <http://www.asce.pdx.edu>
- Institute of Transportation Engineers Student Chapter (ITE): <http://www.its.pdx.edu/ite/>

Most professional organizations have monthly meetings and encourage student participation by providing discounts for lunch and dinner meetings. These meetings provide opportunities to network with potential future employers, learn about scholarships, and increasing your technical knowledge. Take a look at these organizations as a starting point:

- American Society of Civil Engineers (ASCE) Oregon Section: www.asceor.org
- Institute of Transportation Engineers (ITE) Oregon Section: www.oregonite.org
- Society of Women Engineers (SWE) Columbia River Section - <http://www.swe-columbia-river.org>
- Structural Engineers Association of Oregon (SEAO): www.seao.org

Resources

As a PSU student, you have numerous resources at your disposal. Please take advantage of them while you are here. A small sample is listed below:

- CE Website (includes program info, job listings, etc.): <http://www.cee.pdx.edu/>
- Career Center: <http://www.career.pdx.edu/>
- Center for Student Health & Counseling: <http://www.shac.pdx.edu/>
- The Writing Center: <http://www.writingcenter.pdx.edu/>
- PSU Disability Resource Center: 435 Smith Memorial Union

Note: The PSU Disability Resource Center is available to help students with academic accommodations. If you are a student who has need for test-taking, note-taking or other assistance, please visit the DRC and notify the instructor at the beginning of the term.

Introduction to Library and Literature Research

With the advent of the Internet it is very tempting to think that all necessary resources for a term project will be available in full text after typing in a few words at Google.com. This is not the case. You will often need to go to the library, use real library search tools and access real books and articles contained in refereed/archival journals.

Be sure to make use of the Vikat library catalog. Go to the PSU library home page at <http://www.lib.pdx.edu/>. Also available on the library home page are Full Text Electronic Journals: <http://www.lib.pdx.edu/~bvws/bytitle.html>, and a list of on-line Databases: <http://www.lib.pdx.edu/resources/databases/databases.html>. Try EI Compendex (<http://www.ei.org/ev2/ev2.home>) and Lexis-Nexis. Note that access to these databases is free for PSU students, but you must be using a computer on campus or via a dial-in service. See <http://www.lib.pdx.edu/services/distance/proxyserver.html> for instructions on how to gain off-campus access using a proxy server.

Campus Safety

The University considers student safety paramount. The Campus Public Safety Office is open 24 hours a day to assist with personal safety, crime prevention and security escort services. Call 503-725-4407 for more information. For Campus emergencies call 503-725-4404.