CE 528 Structural Design in Wood  
Spring 2007

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Office Hours: M-W 10-11:30 am and 1:30-3 pm. There may be occasions, however, when I cannot keep these office hours (meetings, graduate exams, etc.) I will try to keep you as informed as possible. You are welcome to drop by any time my office door is open. Please feel free to call or send email, especially if you think your question requires only a brief answer or explanation. If you call and I am not it, please leave a voice mail message.

Prerequisites: CE 325 and a 2.5 undergraduate major gpa. A first course in design such as CE 327 (reinforced concrete design) or CE 426 (structural steel design) is desirable.


2005 Wood Design Package, American Forest & Paper Association, American Wood Council, Madison, Wisconsin. To save you a bit on shipping, I will order enough books for the entire on-campus class. The student price is $43 which includes shipping. Please give me a check (payable to James M. Nau, or give me $43 cash by Thursday January 18.) Students enrolled in the online section must order the 2005 Wood Design Package directly from the American Wood Council (http://www.forestprod.org/awc/index.html).

References: International Building Code (IBC), 2006 edition, International Codes Council (ICC), Falls Church, VA, 2006. (Selected tables and figures from this building code appear in Appendix C of the textbook.)

Minimum Design Loads for Buildings and Other Structures, ASCE 7-05, American Society of Civil Engineers, New York, NY, 2005. (A portion of Chapter 6 will be made available for the determination of wind loads.)

Course Objectives:

The course covers the complete design of wood buildings, except for the foundations. The principles of member design and diaphragm design, however, have application to other wood structures, such as concrete formwork and falsework. By the end of the course, the student will be able to:

1. Determine gravity and lateral design loads (from ASCE 7-05 and IBC 2006),
2. Design structural elements and subassemblages for vertical loads (tension members, compression members, and beams),
3. Design structural elements and subassemblages for lateral forces (beam-columns, horizontal diaphragms, and shearwalls), and
4. Design connections.

**Course Outline:**

The book selected for the course was written either as a text or as a reference for systematic self-study of the subject. The course will cover essentially the first thirteen (13) chapters of the text, which are organized as they are encountered in design practice:

1. Wood Buildings and Design Criteria
2. Design Loads
3. Behavior of Structures under Loads
4. Properties of Wood and Lumber Grades
5. Structural Glued Laminated Timber
6. Beam Design
7. Axial Forces and Combined Bending and Axial Forces
8. Wood Structural Panels
9. Horizontal Diaphragms
10. Shearwalls
11. Wood Connections--Background
12. Nailed and Stapled Connections
13. Bolts, Lag Bolts, and Other Connectors

**Grading:**

- **Homework:** 35% (about 1 per week)
- **Tests:** 2@15% (Thursday February 22 and Thursday April 12)
- **Final Exam:** 35% (Thursday May 3, 8-11 am)

**Grading Scale:**

- 97-100 A+
- 93-96.9 A
- 90-92.9 A-
- 87-89.9 B+
- 83-86.9 B
- 80-82.9 B-
- 77-79.9 C+
- 73-76.9 C
- 70-72.9 C-
- 67-69.9 D+
- 63-66.9 D
- 60-62.9 D-
- <60 F

**Conduct of the Course:**

The course will move at a relatively rapid pace, especially the portions dealing with the properties of wood and wood products including sawn lumber, glued laminated timber, plywood, and oriented strand board. Much of this information is descriptive, and it is expected that students will do the required reading in the text ahead of the brief class discussions on these topics. Class time will focus on the calculation of loads and the solution of a variety of design examples according to the National Design Specification for Wood Construction (NDS). We will focus on ASD design pro-
visions since wood design in practice continues to be principally allowable stress design. We will likely only cover the first 10 chapters of the textbook; the textbook is an excellent resource for self-study on design of wood structures. Homework, with few exceptions, will be assigned from the text, so it is important that you have the new 6th edition, not the previous 5th edition.

Homework Policies:

1. Homework will normally be assigned on Thursday and, unless indicated otherwise, is due on Friday of the following week. Note that this allows for two class meetings to ask questions. **Late homework will not be accepted.**

2. Working on homework **in teams is optional.** Some assignments may be completed individually, and some may be completed in teams. Any number of students may work together as the assignment is completed; however, teams of **no more than two (2) members may submit a single group solution.** One team member is the “recorder” and the other is the “checker.” Each page must have title block at the upper right with the following information:

   ![Title Block]

   Page ___ of ___
   Recorder initials: ______
   Checker initials: ______

   Note that recording and checking duties must be shared approximately equally throughout the semester. If one team member is the recorder for an entire assignment, the other team member must be the recorder for the next assignment.

3. Each assignment must have a **cover page** with the following information: Course number and title, homework assignment number, and the typed names of team members. In addition, signatures of the team members must be under the following two statements:

   (a) “We, the undersigned, agree that we have each contributed equally to this assignment.”
   (Of course, this statement will not appear on an assignment completed individually.)

   (b) “We (or I if submitted individually), the undersigned, have neither given nor received unauthorized assistance on this assignment.”

Homework Standards:

1. Use high quality paper, preferably scaled engineering paper. **Paper with ragged edges, i.e., torn from a notebook, will not be accepted.**

2. Provide a brief problem statement and appropriate sketches. Copying the entire problem statement from the text or handout is not required. **All sketches, free body diagrams, etc. must be drawn neatly and clearly using a straight edge.**

3. Show all work in a neat and orderly fashion. **All final and intermediate numerical results**
must be accompanied by the proper units.

4. Clearly identify the final results by enclosing answers within boxes or by double underlining. Some problems may require one or more sketches or plots.

Attendance Policy:

On-campus students will be allowed access to the online lectures. However, regular class attendance is expected. Students are responsible for all material presented in class. See http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.3.php.

Academic Integrity Statement:

Students will adhere to the academic policy set forth by the University Code of Student Conduct (http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php). Plagiarism and cheating are attacks on the very foundation of academic life, and cannot be tolerated within universities. Section eight (8) of the Code defines academic dishonesty and provides information on potential sanctions for violators of academic integrity. You will be asked to sign the following statement on each test and the final: “I have neither given nor received any unauthorized assistance on this test.”

Students with Disabilities:

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653 (http://www.ncsu.edu/provost/offices/affirm_action/dss/). For more information on NC State’s policy on working with students with disabilities, please see http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php.
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Spring 2007 Section 601

Addendum to Syllabus for Online Students Only

This addendum applies only to those students registered for the online section 601. The following procedures DO NOT apply to on-campus students, namely those registered for section 001.

Homework

Please send all homework on or before the due date to Mike Myers in the NC State Engineering Online Office. Mike will accept homework as an email attachment, by fax, or by US mail. Mike will deliver these assignments to me and will return them to you after they have been graded. Mike’s contact information is as follows:

email: mike_myers@ncsu.edu
fax: (919) 515-8415
US mail: Engineering Online
256 Page Hall
21 Current Avenue
Raleigh, NC 27695-7547

Tests and Final Exam

The two 75-minute tests and the 3-hour final exam must be proctored. Engineering Online students must submit the name of an individual to serve as a proctor to the EOL office within the first two weeks of the semester. The Proctor Information Form will be sent to each registered online student during the first week of class. The form should be completed and returned via fax to Mike Myers at (919) 515-8415 within the first two weeks of class. Once the form has been received, you will be notified of the approval or disapproval status of the individual to serve as your proctor.

Proctors will receive and administer the tests and final exam according to the schedule in the syllabus. For additional detail, please see:
http://engineeringonline.ncsu.edu/onlinecourses/cour selogistics.htm