This course will be recorded and will be available via the internet to all enrolled students. These recordings may contain images of you as you participate in the class. Please notify Dr. Linda Krute, Director of Distance Engineering Education Programs (ldkrute@ncsu.edu) if you do not want your image to be included in the recordings. If Dr. Krute does not hear from you by the end of the first week of class, it will be assumed that you are in agreement with this process.

Instructor: James M. Nau, Ph.D., P.E., Professor  
401C Mann Hall email: nau@ncsu.edu office phone: (919) 515-7737

Office Hours: MWF 10:00-11:30 am, but you are welcome to drop by any time my office door is open. There may be occasions, however, when I cannot keep my posted office hours. Please use the message board for the course so that others might benefit from your questions. I monitor the message board and email throughout the day and evening.

Prerequisite: CE 426, or equivalent first course in steel design. This prerequisite will be strictly enforced. CE 523 is not an introductory course, so you must revise your schedule if you have not had a first course in steel design. For your information, the textbook used in our undergraduate course in steel design is:


In the event that you need a copy of the steel manual, AISC offers an attractive student discount. See the payment instructions in a separate attachment. These payment instructions must be maintained securely to prevent unauthorized persons from purchasing a steel manual at the greatly reduced price.


Torsional Analysis of Steel Members, AISC, 1983. (out of print)
Website: Course materials including the video lectures, class notes, schedule, homework assignments, and other items are available online at:

http://engineeringonline.ncsu.edu/onlinecourses/coursehomepages/FALL-2014/CE523.html

The online grade book is available at http://courses.ncsu.edu/ce523/

Classwork: Regular class attendance and participation is expected. Please turn cell phones, pagers, and other electronic devices off. Sit in the same seat each class so I can learn who you are.

We will solve a number of analysis and design problems in class. Therefore, bring the AISC steel manual and calculator to each class.

Objectives: By the end of the course, you will be able to analyze and design:

1. bolted and welded connections subjected to eccentric shear and to combined bending (tension) and shear,
2. framed beam connections (simple shear connections),
3. continuous beam-to-column connections (moment connections),
4. beams subjected to combined bending and torsion,
5. compression members considering flexural, torsional, and flexural-torsional buckling,
6. laterally unsupported beams subject to lateral-torsional buckling, and
7. members subjected to combined bending and axial compression (beam-columns).

In most (but not all) design problems, emphasis will be placed on Load and Resistance Factor Design.

Course Outline:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Textbook reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment and review of important topics from first steel design course</td>
<td></td>
</tr>
<tr>
<td>Bolted connections subjected to eccentric shear; shear and tension from eccentric loading</td>
<td>Art. 4.12-4.15</td>
</tr>
<tr>
<td>Fillet welds subjected to eccentric shear; loads applied eccentric to the plane of the welds</td>
<td>Art. 5.17-5.19</td>
</tr>
<tr>
<td>Framed beam connections (simple shear connections)</td>
<td>Art. 13.1-13.2</td>
</tr>
<tr>
<td>Continuous beam-to-column connections (moment connections)</td>
<td>Art. 13.6</td>
</tr>
</tbody>
</table>
Grading: Homework assignments: 30%

Note that a homework assignment may be due the last week of class.

2 tests (Thurs. Oct. 2 and Thurs. Nov. 13): 30%

Final Exam (Tuesday Dec. 16, 1-4 pm): 40%

Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>97-100</td>
</tr>
<tr>
<td>A</td>
<td>93-96.9</td>
</tr>
<tr>
<td>A-</td>
<td>90-92.9</td>
</tr>
<tr>
<td>B+</td>
<td>87-89.9</td>
</tr>
<tr>
<td>B</td>
<td>83-86.9</td>
</tr>
<tr>
<td>B-</td>
<td>80-82.9</td>
</tr>
<tr>
<td>C+</td>
<td>77-79.9</td>
</tr>
<tr>
<td>C</td>
<td>73-76.9</td>
</tr>
<tr>
<td>C-</td>
<td>70-72.9</td>
</tr>
<tr>
<td>D+</td>
<td>67-69.9</td>
</tr>
<tr>
<td>D</td>
<td>63-66.9</td>
</tr>
<tr>
<td>D-</td>
<td>60-62.9</td>
</tr>
<tr>
<td>F</td>
<td>&lt;60</td>
</tr>
</tbody>
</table>

The two tests and comprehensive final exam are open book, open notes, and open steel manual. Make-up tests will be not be given for any reason. If one test is missed, the final exam counts 55%; if both tests are missed, the final exam counts 70%.

Homework Policies:

1. With some exceptions, homework will be assigned on Thursday and is due one week from the following Tuesday, i.e., twelve days after the assignment is made. This provides two weekends to complete each assignment. On-campus students will turn in their homework in class. Online students will scan and email their solutions to the EOL office.

2. Working on homework in teams is encouraged but 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) persons 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:

   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. Online students can work with teams via email, phone, or fax.

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.”

4. **Homework solutions will not be provided, but any questions you have will be answered.**

**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 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://policies.ncsu.edu/regulation/reg-02-20-03](http://policies.ncsu.edu/regulation/reg-02-20-03).

**Academic Integrity:**

Students will adhere to the academic policy set forth by the University Code of Student Conduct ([http://policies.ncsu.edu/policy/pol-11-35-01](http://policies.ncsu.edu/policy/pol-11-35-01)). 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 exam: “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://dso.dasa.ncsu.edu/). For more information on NC State’s policy on working with students with disabilities, please see http://policies.ncsu.edu/regulation/reg-02-20-01.

After registering with the DSS office, you must contact me to discuss the accommodations you require. This discussion must take place as soon as practicable, well in advance of the time at which the accommodations are required.

**Course Evaluation:**

Online class evaluations will be available for students to complete, usually during the last two weeks of the semester. Students will receive an email message directing them to a website where they can login using their unity ID and complete evaluations. All evaluations are confidential; instructors will not know how any student responded to any question, and students will not know the ratings for any particular instructor.
This addendum applies only to those students registered for the online section 601. The following procedures DO NOT apply to those registered for the on-campus section 001.

### Homework

Please send all homework to the NC State Engineering Online Homework Coordinator. Homework is accepted as a scanned .pdf file or by fax. Please use the cover page found here:

http://engineeringonline.ncsu.edu/online_courses/forms.html

Please make sure that your writing is bold so that the fax or printed scan is clear and legible. It is essential that you email or fax your homework no later than 4 pm on the due date to ensure that it has been received in good order. Homework assignments will be delivered to me and will be returned to you after they have been graded.

### 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 Identification Form may be found here:

http://engineeringonline.ncsu.edu/online_courses/forms.html

Complete the form and submit it. 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. Proctors will receive detailed instructions along with the tests and final exam.