PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

STRUCTURAL STEEL DESIGN
CET 2410

Class Hours: 3.0 Credit Hours: 3.0
Laboratory Hours: 0.0 Revised: Spring 2011

Catalog Course Description:

Design of structural steel members and their connections. Topics include tension and compression members, beams, girders, trusses, and columns subjected to concentric and eccentric loads.

Entry Level Standards:

Students entering this course should have some note-taking and study skills. They need some reading comprehension and written communication skills. Students may enroll in this course concurrently with DSPS, DSPW and DSPM courses.

Prerequisites:

MET 1040

Textbook(s) and Other Course Materials:

Text:
Steel Buildings: Analysis and Design; Dillon, Crawley; John Wiley and Sons, Inc.
Basic Steel Design; Johnston, Lin and Galambos; Prentice-Hall.

Other:
- A scientific calculator
- 8 1/2 x 11 Engineering Notepad
- Pencil

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Properties of Steel, Allowable Loads, and Safety Factors</td>
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<tr>
<td>2</td>
<td>Design of Tension Members</td>
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<tr>
<td>3</td>
<td>Beams in Bending</td>
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<tr>
<td>4</td>
<td>Beam Shear, Web Crippling, and Deflection</td>
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<tr>
<td>5</td>
<td>Cover Plate Beam Design</td>
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<tr>
<td>6</td>
<td>Plate Girder Design</td>
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<tr>
<td>7</td>
<td>Continuous Beam Design</td>
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</table>

EXAM 1
II. Course Goals*:

The course will:

A. Build the skills to determine the physical and material properties of steel frame members. I & II
B. Build the skills to determine the structural loads on steel frame members. I & II
C. Foster the ability to select the proper rolled structural steel shape to support applied building loads. I, II & IV
D. Foster the ability to use the appropriate design tables on the AISC manual. I & II
E. Build the skills to design statically determinant beams in accordance with AISC specifications. I, II, III & V
F. Build the skills to design steel columns. I, II, III & V
G. Build the skills to design steel connections. I, II, III & V

*Roman numerals after course objectives reference goals of the Engineering Technology program.

III. Expected Student Learning Outcomes*:

The student will be able to:

1. Describe typical steels used in steel frame buildings. A
2. Explain allowable yield and ultimate design stresses. A
3. Describe the physical properties of typical rolled structural steel shapes and their uses. A, C
4. Explain structural dead loads. B
5. Explain structural live loads. C
6. Explain net section area. B, C, D, E, F
1. Explain gross section area. B, C, D, E, F
2. Explain applied shear forces. B, C, D, E, F
3. Explain applied tensile forces. B, C, D, E, F
4. Explain applied compressive forces. B, C, D, E, F
5. Explain applied bending moments. B, C, D, E, F
6. Design steel tension members. D, E
7. Design steel beams in bending. D, E
8. Determine lateral support when required. D, E
10. Design cover plated beams. D, E
11. Design web stiffness when required. D, E
12. Design built-up plate girders. D, E
13. Design continuous beams. D, E
14. Design columns. D, F
15. Design column base plates. D
16. Design bolted connections. D, G
17. Design riveted connections. D, G
18. Design welded connections. D, G
19. Design beam to beam connections. D, E, G
20. Design beam to column connections. D, E, G
21. Design column to column connections. D, F, G
22. Design composite steel/concrete beams. E

* Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

**IV. Evaluation:**

A. Testing Procedures: 70 – 80% of grade

Four examinations are scheduled. They will be True/False, Multiple Choice, Matching, and Problem Solving. Students normally have 1 week to complete the exam. Examinations will normally be given as scheduled. Should a student have a planned vacation, operation, etc. occur during a scheduled exam, every effort should be made to take the exam prior to the scheduled absence. When a student misses an exam due to illness, he must contact the instructor immediately upon return and make-up the exam within one week.
B. Laboratory Expectations:

N/A

C. Field Work:

N/A

D. Other Evaluation Methods: 20 – 30% of grade

Quizzes:
Quizzes may be given by the instructor. Most quizzes will be unscheduled and randomly given. They cover the previous sessions material or the reading assignment for that day. There is no make-up or extra credit given for quizzes missed.

Written Assignments:
Students may be required to hand in answers to select questions at the end of each chapter or other appropriate homework at the instructor's discretion. All written assignments must be handed in on 8 x 11 engineering notepad, typing paper, lined paper with smooth edges or forms provided by your instructor. All written assignments will be assessed a 10% penalty for each school day it is late. All student work submitted for evaluation may be retained by the instructor.

A subjective evaluation based on attendance, classroom participation and attitude may be included (10%).

E. Grading Scale:

Grades are based on the following:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>91 - 100</td>
<td>A</td>
</tr>
<tr>
<td>86 - 90</td>
<td>B+</td>
</tr>
<tr>
<td>81 - 85</td>
<td>B</td>
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<tr>
<td>76 - 80</td>
<td>C+</td>
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<tr>
<td>71 - 75</td>
<td>C</td>
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<tr>
<td>66 - 70</td>
<td>D+</td>
</tr>
<tr>
<td>60 - 65</td>
<td>D</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
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V. Policies:

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of the Learning Division, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of the Learning Division.

B. Academic and Classroom Misconduct:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:
• Cheating, including but not limited to unauthorized assistance from material, people, or
devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.

- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one’s own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

C. Accommodations for disabilities:

Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at www.pstcc.edu/departments/swd/.