

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

**STRUCTURAL STEEL DESIGN
CET 2410**

Class Hours: 3.0

Credit Hours: 3.0

Laboratory Hours: 0.0

**Date Revised: Spring
02**

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 Reference Materials Basic to the Course:

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:

Week	Topic
1	Properties of Steel, Allowable Loads, and Safety Factors
2	Design of Tension Members
3	Beams in Bending
4	Beam Shear, Web Crippling, and Deflection
5	Cover Plate Beam Design
6	Plate Girder Design
7	Continuous Beam Design

	EXAM 1
8	Column Stresses; Buckling; Effective Length
9	Column Design EXAM 2
10	Simple Bolted Connections
11	Welded Connections
12	Standard Beam Connections EXAM 3
13	Composite Beam Design
14	Composite Beam Design
15	Plastic Design of Steel; Miscellaneous
16	FINAL EXAM

II. Course Objectives*:

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

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

III. Instructional Processes*:

Students will:

1. Actively listen to class lectures and participate in class activities that develop and reinforce comprehension of the theories, concepts, principles and applications of distance measurement using surveying instruments. *Communication Outcome, Problem Solving & Decision Making Outcome, Active Learning Strategies*
2. Work individually and in teams to complete class assignments. *Communication Outcome, Problem Solving & Decision Making Outcome, Information Literacy Outcome, Active Learning Strategies*
3. Use WordPerfect/Word or other appropriate software to generate written home work assignments. *Communication Outcome, Problem Solving & Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy*

Outcome, Active Learning Strategies

4. Use and interpret steel design manuals. *Communication Outcome, Problem Solving & Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Active Learning Strategies*

*Strategies and outcomes listed after instructional processes reference Pellissippi State's goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should 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
7. Explain gross section area. B, C, D, E, F
8. Explain applied shear forces. B, C, D, E, F
9. Explain applied tensile forces. B, C, D, E, F
10. Explain applied compressive forces. B, C, D, E, F
11. Explain applied bending moments. B, C, D, E, F
12. Design steel tension members. D, E
13. Design steel beams in bending. D, E
14. Determine lateral support when required. D, E
15. Design steel beams for shear. D, E
16. Design cover plated beams. D, E
17. Design web stiffness when required. D, E
18. Design built-up plate girders. D, E
19. Design continuous beams. D, E
20. Design columns. D, F
21. Design column base plates. D
22. Design bolted connections. D, G

23. Design riveted connections. D, G
24. Design welded connections. D, G
25. Design beam to beam connections. D, E, G
26. Design beam to column connections. D, E, G
27. Design column to column connections. D, F, G
28. Design composite steel/concrete beams. E

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures:

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:

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.

C. Field Work:

N/A

D. Other Evaluation Methods:

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

E. Grading Scale:

Final grades will be computed from the grades obtained on homework, quizzes and examinations as follows:

Quizzes & Homework = 20% - 30%

Examinations = 70% - 80%

Grades are based on the following:

91 - 100	A
86 - 90	B+
81 - 85	B
76 - 80	C+
71 - 75	C
66 - 70	D+
60 - 65	D
Below 60	F

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course (Pellissippi State Catalog). Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

It is the student's responsibility to attend every scheduled class activity on time.

Students are responsible to get assignments missed and to make-up any work missed during an absence.

B. Academic Dishonesty:

To use any form of unauthorized aid (notes, text, etc.) during a quiz or obtain any form of help from another student during testing is considered a form of cheating. Any time any form of cheating is observed the student will receive a 0 on that quiz or test.