CGN 6905 Design of Temporary Structures Summer C 2005

"The capacity to design includes more than mere technical competence. It involves a willingness to attack a situation never seen or studied before and for which data are often incomplete; it also includes an acceptance of full responsibility for solving the problem on a professional basis."

Report of the Committee on Evaluation of Engineering Education, "The Grinter Committee", 1955.

INSTRUCTOR: Thomas Sputo, Ph.D., P.E.
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OBJECTIVE: Introduction to structural engineering principles in the design of temporary structures and operations used in the construction of permanent structures

PREREQUISITES: Working knowledge of statics, strength of materials, steel design. Proficiency using Excel and either Word or Word Perfect

TIME: M, W, F 2nd Period MAEB 229
Class will meet for 75 minutes each day (9:30 - 10:45)

TEXTS : Class Notes and Supplemental Material (Available for purchase through ASCE)

WEB PAGES: http://www.mindspring.com/~sputoeng/default.htm (Sputo's general web page)

GRADING CRITERIA: There will be no "tests" in this class. Your grade will be based on your performance on numerous assignments and several "projects". Assignments and projects may be individual or group. Each assignment and project will have a number of points assigned to it based on the scope of work required.

MAXIMUM GRADING SCALE: (May be relaxed at the option of the instructor)

93 - 100	A
90 - 92.99	B+
85 - 89.99	B
83 - 84.99	C+
77 - 82.99	C
75 - 76.99	D+
70 - 74.99	D
00 - 69.99	E

TENTATIVE LECTURE SCHEDULE
(Subject to modification)

Class #	Date	Topic	Notes
1	**09 May**	Introduction to Course	
2	11 May	Review of structural mechanics	
3	13 May	Steel columns and beams (ASD)	
4	**16 May**	Steel beam-columns (ASD)	
5	18 May	Steel tension members and connections (ASD)	
6	20 May	Timber beams and columns (ASD)	
7	**23 May**	Formwork for concrete: Loads	
8	25 May	Formwork for concrete: Wall forms	
	27 May	No Class - National Student Steel Bridge Competition - Orlando, FL - 27-28 May	**GO STEEL BRIDGE** !
	30 May	No Class - Memorial Day Holiday	
9	01 June	Formwork for concrete: Slab forms	
10	03 June	Formwork for concrete: Column forms	
11	**06 June**	Formwork for concrete: Joists, etc.	
12	08 June	Cables and rigging	
13	10 June	Lifting beams	
14	**13 June**	Crane statics	
15	15 June	Temporary foundations (wood and concrete)	
16	17 June	Construction safeguards: railings	
		Mid-Summer Break - 20-24 June	
	27 June	No Class - National Concrete Canoe Competition - Clemson SC - 24-27 June	**GO CONCRETE CANOE** !
17	29 June	Construction safeguards: tie-offs	
18	01 July	Wind pressure calculations	

Class #	Date	Topic	Notes
	04 July	No Class - Independence Day	
19	06 July	Wind pressure calculations	
20	08 July	Erection bracing: CMU walls	
21	**11 July**	Erection bracing: Wood trusses	
22	13 July	Erection bracing: Steel building frames	
23	15 July	Erection bracing: Metal building systems	
24	**18 July**	Shoring systems	
25	20 July	Scaffolding systems	
26	22 July	Jobsite signs and poles	
	25 July	No Class - Sputo at AISI Spec Committee	Work on Assigned Project
	27 July	No Class - Sputo at AISI Spec Committee	
	29 July	No Class - ASCE Florida Section Annual Meeting	
27	**01 Aug**	Steel sheet piles or TBD	
28	03 Aug	Steel sheet piles or TBD	
29	05 Aug	Steel sheet piles or TBD	

CLASS RULES:

1. Attendance at lecture is strongly encouraged and timeliness is important.

2. Homework will be assigned. Working with fellow students on homework will be allowed as "self-help", but the final homework which is turned in must represent the work of the individual student (or the group, for group assignments). Do not copy another student's (group's) work. Homework will be compared and violations will be dealt with. **Late homework may be turned in no later than the start of the next class meeting after the due date with a 25% penalty.** Homework not turned in by that date will not be accepted

    a. Homework will be submitted on engineering computation paper or as computer output **(DO NOT RE-USE PAPER!)** Number and label all pages. **Work neatly. All work will be graded on the basis of content and neatness. Use straightedges**, reasonable scales, use pencil (that means also using an eraser), and print and label clearly. Reference equations. List assumptions or rationale for your work. **Sloppy or difficult to follow work may be returned ungraded. No exceptions.**

3. No make-up work will be allowed, except in cases of emergencies or civic responsibilities (jury duty, etc.), provided that the instructor is notified by e-mail in advance. Provisions for make-up work will be determined on a case-by-case basis. The decision of the instructor is final.

4. Some class communication will be by means of e-mail. Check your e-mail regularly (at least daily). Keep the instructor informed of any changes to your e-mail address. Failure on the part of the student to keep-up with e-mail communications is not excusable.

5. Grade Appeals: Please carefully consider what you did wrong. If you still believe that an incorrect grade has been assigned, you must make your case in writing only. Verbal requests will not be considered. You must provide substantial information as to why your grade should be changed. Your request for re-grade must be received no later than 5 calendar days after the homework is returned. After that date, no requests will be considered. Turn in your request to the instructor.

General Grading Rules

It is not the responsibility of the course instructor to try to decipher your work. It should be clear what your intent is, and easy to follow in a logical sequence. Due to recurring problems each semester, the following criteria are set.

The following criteria will be used in grading:

Lines drawn freehand (i.e.: no straightedge)	Minus 10%
Work otherwise sloppy or difficult to follow	Minus 10 to 50%

These point deductions will be applied as the instructor sees fit. I like to assign partial credit for problems with incorrect answers, but if I cannot follow or otherwise decipher your work to find the incorrect step without expending excessive effort, I cannot assign partial credit.

IMPORTANT UNIVERSITY INFORMATION:

Academic Honesty:

All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others.

Accommodations for Students with Disabilities:

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

This short paper by Professor Yao from Texas Tech is a pretty good summery of my thoughts and philosophy on grades. I could not have said it better than this.

Sputo

ON GRADES AND GRADING

by James T. P. Yao for his students and interested colleagues

The grade in a given course is a measure of the student's performance in that endeavor. The overall grade point averages are indeed important considerations for all students. When I was a student at the University of Illinois in Urbana-Champaign, I did care about my grades at that time. However, I never complained about any of my grades though, at times, I felt that the grade I received in a particular course might not be fair. The fact is, on the average, the overall grade point average did reflect the knowledge gained and the effort that I put into my college education. There were courses for which I thought that I deserved a better grade than the one on my record. On the other hand, I also had grades that were better than what I expected and/or deserved. In the long run, they all averaged out at the end of my college career. Most importantly, I learned from each professor and from each course that I had.

A few years after I graduated, I forgot all my grades. No one has ever asked for my grades just a few years after I graduated from college. To date, however, I have kept all the basic knowledge that I gained from my college education. Especially, the method of learning new things on my own has been useful. If the students aim at learning as much as they can from each course and each professor, the good grades will come as a result of their diligent work, on the average. On the other hand, if the students waste their time arguing about their grades, they will lose time for studying new lessons and thus hurt their future grades.

As a teacher, I try very hard to be fair and consistent in grading student papers. The student will get a perfect score if he/she gives a correct answer. If the answer is not correct, the teacher is the one who judges how serious the error is and assigns a partial score accordingly. As a student, I had several professors who did not give partial scores. The reason was that, the engineering system could fail with the wrong answer, no matter how close the answer is to the correct one (e.g., exactly the same number but with a wrong sign). I do not agree with that policy but respect their judgement in those courses. In any event, partial scores are subjective depending on the experience and viewpoints of the individual teachers. It is counter-productive to argue about it.

Please be careful in doing your homework, tests, and other assignments. People's lives and properties will depend on your work someday in the near future. Try to learn as much as you can while you are in school. Communicate with your teachers and classmates frequently, and concentrate on the learning process. With knowledge, you will become a successful and proud engineer soon. **HAVE KNOWLEDGE, WILL SUCCEED!**

OCCAM'S RAZOR

by John H. Lienhard
The University of Houston

There is a wonderful old Shaker tune,

> 'Tis a gift to be simple, 'tis a gift to be free;
> 'Tis a gift to come down where you ought to be

Those lines should make up the first chapter in any book on engineering design. But how do we find the natural threads of simplicity that run through the world around us?

Simplicity in design was a lesson I fell into when the Army drafted me -- after I'd finished college. They assigned me to the Signal Corps Engineering Labs and put me to work designing research equipment. There I met a fine designer, Jules Soled, a person who could clearly teach me things. So I said to him, "Teach me, and I'll work for you." He taught me many things I hadn't learned in school, and his central lesson was always this:

> Do a first design. Then attack it. Your first design will be elegant and complicated, but it'll always work better when you get rid of complication. In a really good design you eventually make the very design itself unnecessary. And that is very hard to do because we like complication.

That idea is really quite old. The towering 14th-century philosopher William of Occam put it this way: "Multiplicity ought not to be posited without necessity." William was telling us **we should make no more assumptions than we really need to explain anything -- the simplest explanation is best.** We call that idea Occam's Razor because it helps slice away the junk in our thinking.

Look at the safety razor. For years designers fought with the problem of loading, mounting, and unloading a blade in a holder. If you're old enough, you'll remember Schick's "push-pull, click-click" advertisement for its mechanism. Keeping the action workable, and the blade solidly in place, was a big problem. Then some bright person applied Occam's razor to the razor-mounting problem. That designer realized you could simply mold the blade right into the plastic packaging. Now who buys replaceable razor blades? Instead, the blades are set, very solidly and with great precision, right into a cheap throwaway piece of plastic. We've designed blade-holding mechanisms out of existence. That's what Soled meant when he said that good design makes the design itself unnecessary.

But to take that last step -- to walk the plank from a clever design to no design at all -- takes nerve as well as imagination. **We're so tempted to look smart by mastering complication instead of simplicity.** If we go back to our Shaker tune,

> 'Tis a gift to be simple, 'tis a gift to be free;

the second line says:

> 'Tis a gift to come down where you ought to be

Good design exacts a price from our egos, but it really is a gift -- it really is freedom -- to find the simplicity in things and finally to reduce an engineering design down to where it ought to be.