Department of Civil Engineering
Gary S. Prinz, PhD, PE

CVEG 3304 – Structural Analysis
Course Syllabus, Fall 2015

Classroom: 0501, Science Engineering Building (SCEN)
Mtg. Times: M,W,F: 8:35 – 9:25am
Lab (help session): F, 2-3pm, SCEN 0402

Website: www.ssrl-uark.com/teaching/

Instructor: Gary S. Prinz, PhD, PE
Office: Bell 4156
Office Hours: *M,W,F, 9:25-10:25am*
Email: prinz@uark.edu

Required Text:
R.C. Hibbeler, *Structural Analysis*, 8th or 9th Edition, Prentice Hall, 2011. ISBN: 978-0-13-257053-4.

Prerequisites: CVEG 2014; PHYS 2054; MATH 2554 & MATH 2564

Course Objectives:

The aim of this course is to give students the ability to analyze statically determinate and statically indeterminate structures. In this course students will learn to apply the various classical methods of structural analysis in determining deflections, internal forces, and external support reactions for beams, trusses and frames. After completion of the course students should be able to:

1. Define basic structural engineering terminology;
2. Apply Newton's laws of force equilibrium to determine axial forces, shear forces, and bending moments in statically determinate beams, trusses, frames, arches, and cables;
3. Apply calculus and the principle of virtual work to determine displacements in statically determinate beams, trusses, and frames;
4. Identify symmetry, antisymmetry, degrees of indeterminacy, and degrees of freedom in beams, trusses, and frames;
5. Analyze statically indeterminate beams, trusses, and frames by the flexibility method;
6. Analyze beams, trusses, and frames by the stiffness method;
7. Analyze beams and frames by moment distribution;

Grades: Grades are based on homework and exam performance. The final grade distribution is as follows:

Homework	25%
Intermediate Exams (x2)	25%
Final Exam	25%

Homework:

Homework assignments and corresponding due dates are listed in the attached course schedule. Please note that homework assignments will be collected at the BEGINNING of class on the day they are due. Late homework will not be accepted.

Beware of over-dependence on other people for help with homework. Proper use (full participation) of study groups is highly encouraged; however, improper use of study groups is a form of academic misconduct and will be dealt with seriously (see section on Academic Integrity below).

Standards for Presentation:

Similar to what is expected in engineering practice, complete, professional, and correct presentations are expected on homework and exams. The presentations will be subject to critical review. It is possible to have correct solutions on homework and exam problems but receive less than full credit due to lack of clarity or un-professional presentation. The work leading to the solutions must be presented appropriately and clearly.

Note: A sample of proper work presentation is provided in this packet.

Attendance:

All students enrolled in this course are required to attend all lectures. Unavoidable absences should be discussed with the instructor in advance.

Lab Section:

The lab section scheduled each Friday from 2-3pm will be used as a help session for those that wish to attend. This lab section is not mandatory. A teaching assistant or the instructor will be available during this lab time to help with concepts covered in previous lectures.

Academic Integrity:

In keeping with the University of Arkansas' academic integrity policy, academic misconduct in all forms is unacceptable and may result in a failing grade and further action by the Office of Academic Integrity and Student Conduct (OAISC). Academic misconduct includes, but is not limited to, plagiarism, fabrication or falsification, and cheating (including taking credit for work completed by others).

Five Keys to Success:

1. Read the assigned material before each class
2. Bring thoughtful questions to class or prepare for class as if you will be explaining the concepts to others
3. Take notes during class discussions and during reading assignments
4. Synthesize and summarize what you learn each week in a course journal
5. Begin your assignments the day they are assigned (rather than the day they are due) and turn in your work on time

Academic Accommodations:

If any member of the class has a documented disability and needs special accommodations, the instructor will work with the student to provide reasonable accommodation to ensure the student a fair opportunity to perform in this class.

Please advise the instructor of the disability and the desired accommodations within the first week of the semester.

Inclement Weather:

If the university is officially closed, class will not be held. When the university is open, you are expected to make a reasonable effort to attend class, but not if you do not feel that you can get to campus safely. Assignment due dates will be postponed in case of inclement weather.

Emergency Procedures:

Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found at emergency.uark.edu.

Severe Weather (Tornado Warning):

- Follow the directions of the instructor or emergency personnel.
- Seek shelter in the basement or interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside.
- If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building.
- Stay in the center of the room, away from exterior walls, windows, and doors.

Violence / Active Shooter:

- CALL - 9-1-1
- AVOID - If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
- DENY - Barricade the door with desk, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.
- DEFEND - Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others

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Tentative CVEG 3304 Course Schedule – Fall, 2015
(Subject to change by instructor)

Day	Date	Lecture	Topic / Discussion	Reading Assignment	HW Set
M	8/24	1	Course Introduction & Overview	--	
W	8/26	2	What is a Structure?	1.1-1.2, 2.1	
F	8/28	3	What are Loads?	1.3, 2.2	1
PART I: Forces in Statically Determinate Structures					
M	8/31	4	Forces in Statically Determinate Beams	Ch. 2	
W	9/2	5	Forces in Statically Determinate Beams (Cont.)		2
F	9/4	6	Forces in Statically Determinate Beams (Cont.)		
W	9/9	7	Forces in Statically Determinate Trusses	Ch. 3	
F	9/11	8	Forces in Statically Determinate Trusses (Cont.)		3
M	9/14	9	Forces in Statically Determinate Trusses (Cont.)		
W	9/16	10	Forces in Statically Determinate Frames	Handout	
F	9/18	11	Forces in Statically Determinate Frames (Cont.)		4
M	9/21	12	Forces in Statically Determinate Frames (Cont.)		
W	9/23	13	Forces in Statically Determinate Parabolic Arches and Cables	Ch. 5	
F	9/25	14	Forces in Statically Determinate Parabolic Arches and Cables (Cont.)		5
PART II: Displacements in Statically Determinate Structures					
M	9/28	15	Displacements in Statically Determinate Trusses	Handout, 9.2-9.4	
W	9/30	16	Displacements in Statically Determinate Trusses (Cont.)		
F	10/2	17	Displacements in Statically Determinate Beams	Ch. 8	6
M	10/5	18	Displacements in Statically Determinate Beams (Cont.)		
W	10/7	19	Displacements in Statically Determinate Plane Frames	Handouts	
F	10/9	20	Displacements in Statically Determinate Plane Frames (Cont.)		7
M	10/12	21	Displacements in Statically Determinate Space Frames		
W	10/14	22	Displacements in Statically Determinate Space Frames (Cont.)		
F	10/16	23	**Exam 1 (Held during lab, 2-hour time limit)**		
~ Fall Break ~					
PART III: The Flexibility or Force Method of Analysis					
W	10/21	24	Flexibility Analysis of Indeterminate Plane Trusses	Ch. 10 + Handout	
F	10/23	25	Flexibility Analysis of Indeterminate Plane Trusses (Cont.)		8
M	10/26	26	Flexibility Analysis of Indeterminate Plane Trusses (Cont.)		
W	10/28	27	Flexibility Analysis of Indeterminate Beams		
F	10/30	28	Flexibility Analysis of Indeterminate Beams (Cont.)		9
M	11/2	27	Flexibility Analysis of Indeterminate Beams (Cont.)		
W	11/4	28	Flexibility Analysis of Indeterminate Plane Frames		
PART IV: The Stiffness or Displacement Method of Analysis					
F	11/6	29	Stiffness Analysis of Indeterminate Beams	Ch. 11 + Handout	10
M	11/9	30	Stiffness Analysis of Indeterminate Beams (Cont.)		
W	11/11	31	Stiffness Analysis of Indeterminate Beams (Cont.)		
F	11/12	32	Stiffness Analysis of Indeterminate Rectangular Plane Frames		11
M	11/16	33	Stiffness Analysis of Indeterminate Rectangular Plane Frames (Cont.)		

W	11/18	34	Stiffness Analysis of Indeterminate Rectangular Plane Frames (Cont.)	Ch. 11	11 in
F	11/20	35	**Exam 2 (Held during lab, 2-hour time limit)**		
M	11/23	36	Stiffness Analysis of Non-Rectangular Plane Frames (Cont.)	Handout	
W	11/25	37	Stiffness Analysis of Non-Rectangular Plane Frames (Cont.)		
~ Thanksgiving Break ~					
PART V: The Moment Distribution Method of Analysis					
M	11/30	38	Moment Distribution for Indeterminate Beams and Plane Frames	Ch. 12	12
W	12/2	39	Moment Distribution for Indeterminate Beams and Plane Frames (Cont.)		
F	12/4	40	Moment Distribution for Indeterminate Beams and Plane Frames (Cont.)		
M	12/7	41	Moment Distribution for Indeterminate Beams and Plane Frames (Cont.)		
W	12/9	42	Final Exam Review Day		12 in
FINAL EXAM (Comprehensive)					