CIVL 4136/6136
Intermediate Reinforced Concrete Design

THE UNIVERSITY OF MEMPHIS

Instructor's Name:	Dr. Shahram Pezeshk; Office EN108C, Phone: (901) 678-4727
Semester:	Spring 2006
Hours Credit:	3 Semester Hours
Office Hour:	"open door policy"
Course Meetings:	TBD
Prerequisites:	CIVL 4135 and CIVL 4122
Textbook:	"Design of Concrete Structures" by A.H. Nilson, 13th Ed., McGraw-Hill.
Code:	ACI building Code and Commentary, (Instructor will order at a discount price)
Recommended Textbooks:	"Reinforced Concrete Slabs" by R. Park and W.L. Gamble, Second Edition, *Wiley–Interscience*
	"Reinforced Concrete a Fundamental Approach", E.G. Nawy, Fifth Edition, Prentice Hall.
	"Practical Design of Reinforced Concrete" by Russell S. Fling, John Wiley & Sons.
	"Design of Reinforced Concrete." by Jack McCormac, Fifth Edition, Wiley.

COURSE DESCRIPTION

Design of two–way slab systems; column design including length effects; integrated building design using current code provisions.

GRADING

The final grades for the course will be based on the following percentages:

Homework/Programs	30%
Exams	40%
Final Exam	30%

	100%

All students taking CIVL6136 are required to submit a term paper regarding a topic discussed in class. Students are to discuss their term paper topic with the professor and get an approval.

ATTENDANCE

Regular attendance is necessary to maintain pace with the lectures and the progress of the class. If you must be absent, please make sure you know the assignment for the following class meeting and turn in any work due that day.

MAKE-UP WORK

Generally, if a student misses an exam, a computer program, or a homework assignment a score of zero will be awarded. However, the student may be allowed to make-up an exam or turn in their homework late if a valid reason for the absence is presented to the instructor at the next class meeting. If the student must miss an exam because of a conflict in his/her schedule the student must notify the instructor in writing at least two days prior to the absence. Late homework problems will receive only a maximum of 50% of the grade.

EXAM GRADE CHANGES

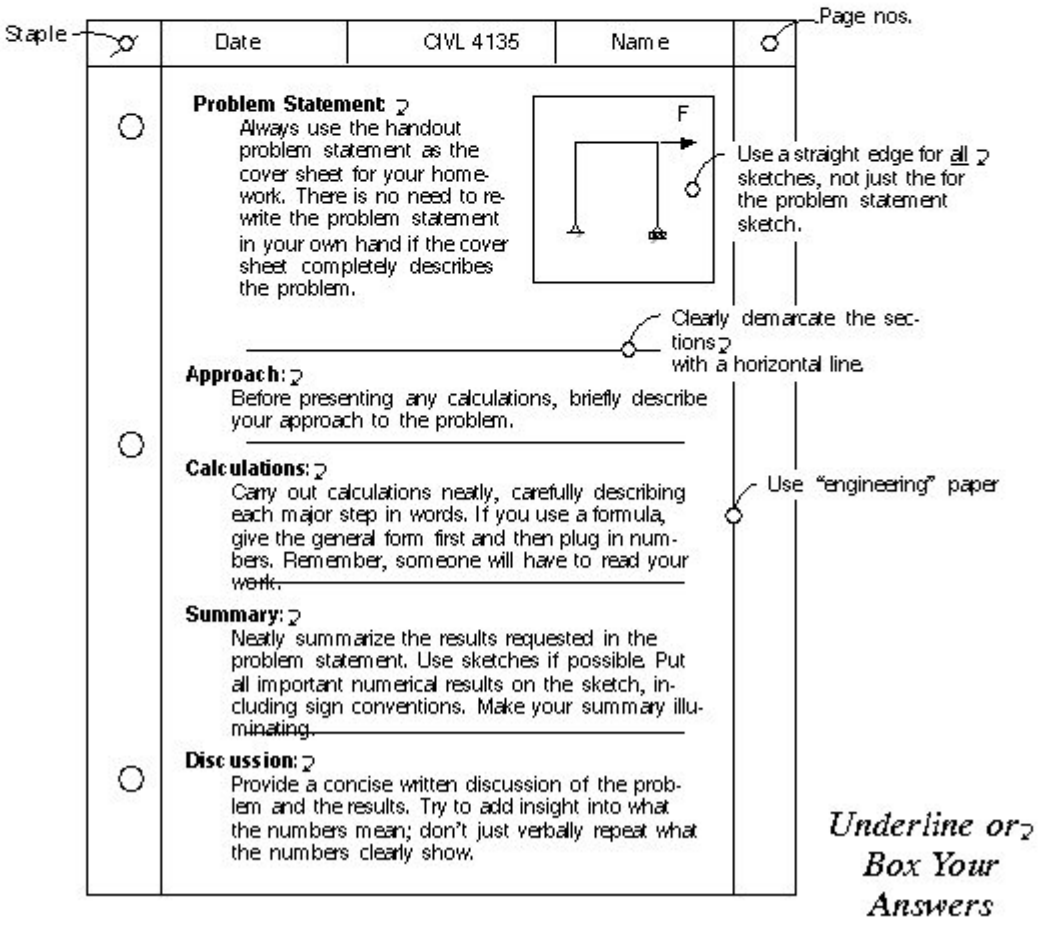
After you receive a grade on your exam you will have one week to argue about your grade by writing a dated and signed memo to me explaining the reasons on why you think your grade needs to be changed. After one week I will not consider any arguments about grade changes.

Homework Format

All assignments are to be submitted on engineering paper. You may use any type of engineering paper as long as it has a background grid. The example page below is for the paper available in the bookstore. If an alternate form of paper is used, the headings at the top of the page should be modified to match the printed partitions, however, the remainder of the instructions apply equally to either form.

Work should be done in pencil, and a lead hardness used which produces good contrast to the paper. Figures should be drawn with a straight edge and if appropriate, a circle template or compass. The layout and appearance of your work should be of professional quality. Work no more than one problem per page. Do not use the back of a page for any reason. All pages should be ordered by page number and stapled. A good guide for this standard is to prepare each assignment as if it were to be kept on file and sent to prospective employers as an example of your work at the University of Memphis.

Answers to problems should be accurate to three significant figures. In general, use four significant figures in calculations, and round the final results to three significant figures. Round numbers properly, do not simply truncate. Homework is due at the beginning of class on the due date. **Late homework will not be accepted.**



COURSE OUTLINE

Date	Subject	Chapter
January	Introduction and review	
	Members in compression and bending	
	”	
	”	
February	”	
	Length effects on columns	
	”	
	”	
	Edge supported slabs	
	Exam	
	Edge Supported Slabs	
	”	
March	”	
	Two–way column supported slabs	
5-11	**Spring Break**	
	”	
	”	
	Two–way column supported slabs	
	”	
April	”	
	Exam	
	Two–way column supported slabs	
	”	
	Deflection and Crack Control in Two–Way–Action Slabs	
	”	
	Yield line theory	
	”	
26	**Study Day - No Class**	
May		
1	**FINAL EXAM (8:00 a.m. – 10:00 a.m.)**	

References on Deflections

1. ACI Committee 435, "Variability of Deflections of Simply Supported Reinforced Concrete Beams," American Concrete Institute Journal, January 1972, pp. 29-35.

2. K.M. Kripanarayanan and D.E. Branson, "Short Term Deflections of Flat Slabs, and Two–Way Slabs," American Concrete Institute Journal, December 1976, pp. 686-690.

3. A.H. Nilson and D.B. Walters, Jr., "Deflections of Two–Way Floor Systems by the Equivalent Frame Method," American Concrete Institute Journal, December 1975, pp. 210-218.

4. B. Bijaya Rangan, "Prediction of Long–Term Deflections of Flat Plates and Slabs," American Concrete Institute Journal, April 1976, pp.223-226.

5. B. Bijaya Rangan and A.E. McMullen, "A Rational Approach to Control of Slab Deflections," American Concrete Institute Journal, June 1978, pp.256-262.

6. N.A. Scalan and D.W. Murry, "Practical Calculation of Two–Way Slab Deflections," American Concrete Institute Journal, Concrete International Journal, November 1982, pp. 43-50.

7. J.P. Taylor and J.L Heiman, "Long Term Deflection of Reinforced Concrete Flat Slabs and Plates," American Concrete Institute Journal, November 1977, pp. 556-561.

8. M.D. Vanderbilt, M.A. Sozen and C.P. Siess, "Deflections of Multiple–Panel Reinforced Concrete Floor Slabs," American Society of Civil Engineering and Engineers, Proceedings, Vol. 91, No. ST4, August 1965, pp. 77-101.

LECTURE I

Topics Studied in CIVL 4135:

- Flexure analysis ad design of beams
- Shear and diagonal tension in beams
- Bond, anchorage, and development length
- Serviceability
- Introduction to column design

CIVL 4136/6136 Topics

- Columns
    - Short columns
    - Slender columns
- Slabs
    - Elastic analysis of plates - flexure
        * Classical solutions
        * Approximate solutions
            . Finite difference
            . Finite elements

        * Transition to “modern design”
            . Nichols
            . Westegarad and Slater

    - ACI design procedure
        * Direct design method
        * Equivalent frame method

    - Informal design procedures
        * Strip method - lower bound

    - Yield line analysis - upper bound
    - Deflection
    - Detailing