Course Specifications (2011 - 2012)

A. Basic Information

Course Title	Structural Analysis (2-B)				Course Code:	CVE 221	
Lecture:	3	Tutorial:	3	Practical	0	Total	6
Programme (s) on which this course is given:				B.Sc. Civil Engineering (Structures)			
Major or minor element of program:			Major				
Department offering the program:			Civil Engineering				
Department offering the course:			Civil Engineering				
Academic Year of program:	Second			Level of program:		Second Semester	
Date of specifications approval:				16/3/2010			

B. Professional Information

1. Overall aims of course

By the end of the course the students will be able to:

To have enough knowledge on the fundamentals of analysis and theory of structures, and to help the students to be familiar with the principles of the design of the structures including safety requirements and economical design.

2. Intended Learning outcomes of Course (ILOs)

a. Knowledge and Understanding:

a.3) Understand characteristics of engineering materials related to discipline.
a.4) Understand principles of design including elements design, process and/or a system related to specific disciplines.
a.13) Apply Engineering principles in the fields of reinforced concrete and metallic structures analysis and design, geo-techniques, and foundations, hydraulics and hydrology, water resources, environmental and sanitary engineering, roadways and traffic systems, surveying and photogrametry.

b. Intellectual Skills

b.2) Select appropriate solutions for engineering problems based on analytical thinking.
b.3) Think in a creative and innovative way in problem solving and design.
b.4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
b.7) Solve engineering problems, often on the basis of limited and possibly contradicting information.

c. Professional and Practical Skills

c.1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to
c.2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, product and/or services.
c.4) Practice the neatness and aesthetics in design and approach.

d. General and Transferable Skills

d.6) Effectively manage tasks, time, and resources.
d.7) Search for information and engage in life-long self learning discipline.
d.9) Refer to relevant literatures.

3. Contents

Week #	Topics	No. of Hours	ILOS	Teaching / learning methods and	Assessment method
1	Introduction, statically indeterminate beams, super	3	a3, a4, a13 b2, b3, b4, b7	Lectures Case study	Assignments Quiz

1	position eq., 3 moments equation.	3	c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
2	Applications of 3 moments equation to continuous beams.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
3	Applications of 3 moments equation to frames without side sway and settlement of supports.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
4	Virtual work theory, Maxwell theory, deformations due to internal forces, work done by the internal forces.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
5	determination of displacements and slope angles, numerical evaluation of integration. Applications of virtual work to beams.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
6	Applications of virtual work to frames, computation of deformations, statically indeterminate frames (externally)	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
7	statically indeterminate frames internally, deformations of trusses by virtual work.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
8	Midterm Exam		a3, a4, a13		
			b2, b3, b4, b7		
			d6, d7, d9		
9	Applications of virtual work to statically indeterminate trusses (externally&internally)	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam

	(externally&internally).		d6, d7, d9	Tutorial	Final exam
10	Influence line for statically determinate beams.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
11	Influence line for statically determinate frames.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
12	Influence line for statically determinate trusses.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
13	introduction to influence line for indeterminate structures.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
14	Introduction to buckling of columns.	3	a3, a4, a13	Lectures	Assignments
			b2, b3, b4, b7	Case study	Quiz
			c1, c2, c4	Class activity	Mid-term exam
			d6, d7, d9	Tutorial	Final exam
15	Final Exam		a3, a4, a13		
			b2, b3, b4, b7		
			c1, c2, c4		
			d6, d7, d9		
Total		**39**			

4- Teaching and Learning Methods:

Check using the symbol √

√	Lectures
	Practical training / laboratory
	Seminar / workshop
√	Class activity
√	Case study

	Project work
√	Tutorial
	Computer based work
	Other :

5- Student Assessment Methods:

Check using the symbol √

√	Assignments	to assess	a3, a4, a13	b2, b3, b4, b7		d6, d7, d9
√	Quiz	to assess	a3, a4, a13	b2, b3, b4, b7		d6, d7, d9
√	Mid-term exam	to assess	a3, a4, a13	b2, b3, b4, b7		d6, d7, d9
	Oral exam	to assess				
√	Final exam	to assess	a3, a4, a13	b2, b3, b4, b7	c1, c2, c4	d6, d7, d9
	Design Project	to assess				
	Report	to assess				
	Experimental write up	to assess				
	Informally assessment	to assess				
	Other	to assess				

6. Assessment schedule

Assessment 1 Assignments on weeks	2 to 14
Assessment 2 Quizzes on weeks	4, 6, 10, 12
Assessment 3 Mid-term exam on week	8
Assessment 4 Oral Exam on week	
Assessment 5 Final exam on week	15
Assessment 6 Design Project on weeks	
Assessment 7 Report on weeks	
Assessment 8 Experimental write up on weeks	
Assessment 9 Informally assessment	

7. Weighting of Assessments

Assignments	8%
Quiz	8%
Mid-term exam	17%
Oral exam	
Final exam	67%
Design Project	
Report	
Experimental write up	

Informally assessment	
Other	
Total	100%

8. List of References

8.1 Course Notes

Lecture notes and handouts prepared by instructor

8.2 Essential Books (Text Books)

8.3 Recommended Books

Theory of structures: part I and part II by Eldakhakhni
Mechanics of Materials by Beer and Johnson
Visual Mechanics by Miller.

8.4 Periodicals Web sites, etc

9. Facilities Required for Teaching and learning

Lecture room equipped with overhead projector
Presentation board, computer and data show
Laboratory

Course Coordinator:	Prof. Osama Ahmed Kamal Mahmoud	
Course instructor:	Dr. Ibrahim Mohamed Mahdi Bazan	
Head of department:	Prof. Ahmed AdbulFattah Mahmoud Ahmed	

Signature:

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Date:	4	1	2012