CE 205

Course Syllabus

8/2/2013

Part I Course Organization

CE 205 Statics (2 units)

2013 Fall Semester — Course Syllabus

Lecture	Monday and Wednesday	10:00 – 10:50 a.m.	GFS101
Discussion Classes	Wednesday 11:00-11:50am KAP165		
	Wednesday, 1:00 – 1:50 a.m., KAP 138 Friday, 10:00 – 10:50 p.m., KAP 165		
Professor	Dr. Vincent Lee		
Office	KAP 230B		
Phone	(213) 740-0568		
Email	vlee@usc.edu		
Office Hours	MW 9-10am		
Teaching Assistant	Hemmat Abiri, Elham		
Email	USC_mantawy <mantawy@usc.edu> , Elham Hemmat Abiri <hemmatab@usc.edu>		
Prerequisite	PHYS 151L Fundamentals of Physics I		
Co-Requisite	Mechanics and Thermodynamics (4 units)		
Textbook	Engineering Mechanics: Statics (12th ed.), R. C. Hibbeler, Prentice-Hall, 2009 ISBN 978-0-13-607790-0 ***— or —***		
	Engineering Mechanics: Statics (11th ed.), R. C. Hibbeler, Prentice-Hall, 2007 ISBN 978-0-13-221500-4		
	ISBN 558862918 - Hibbleler - Engineering Mechanics: Statics $75 (soft) pperback copy		
Course Objectives	This course will present the theory and applications of basic engineering mechanics, includinG a review of vectors, the computation of resultant forces, the equations for equilibrium of particles and rigid bodies, the computation and diagramming of internal shear and moment forces, and dry friction.		
Learning Objectives	In this course, students will learn a basic knowledge of forces and moments on and between components of a structure with an emphasis on the fundamental steps (e.g., setup, analysis, solution, discussion) of engineering problems. They will also learn to analyze: forces and moments on a static rigid body, moments on/between multiple static rigid bodies and internal forces/moments in a static rigid body.		
Grading Schema	12 Quizzes	**32 %**	
	Homework	**5 %**	
	Programming	**3 %**	
	All Exams	**60 %**	
	Total	**100 %**	

Date		Fall 2013 Topics	Friday Quiz	Weekly Posted Homework[1] (Due Next Monday)		Suggested[2] Problems	Section(s) to Read
Mon	Wed						
8/26		Introduction; Force Vector		# 1	1-15,20; 2-33,54	1-10,11; 2-14,19,58	
	8/28	Force Vector	**Quiz 1**				1, 2.1–2.3
9/2		Labor Day University Holiday					
	9/4	Force Vector	**Quiz 2**	# 2	2-78,92,108,118	2-63,79,82,93,106,131	2.4–2.9
9/9		Particle Equilibrium					
	9/11	Force Vector; Particle Equilibrium	**Quiz 3**	# 3	3-4,14,19,61	3-6,20,62,63	3.1-3.4
9/16		Force System Resultants;		# 4	4-65,66,79,86	4-37,58,75,87,90	4.1–4.4
	9/18	Force System Resultants	**Quiz 4**				4.5-4.6
9/23		Force System Resultants		# 5	4-124,127,137,140,148	4-121,138,153,158	4.7–4.8
	9/25	Force System Resultants	**Quiz 5**				4.9-4.10
9/30		Distributed Loads; Rigid Body		#6	5-10,18,29,47,53	5-3,19,43,51	5.1–5.2
	10/2	Rigid Body Equilibrium	**Quiz 6**				5.3–5.5
10/7		Rigid Body Equilibrium; Review		# 7	5-63,65,79,89		5.5–5.7
	10/9	Wed MIDTERM 1: Chapters 1-5	**No Quiz**				
10/14		Structural Analysis (Trusses, Joints)		# 8	6-2,22,37,38(use method of joints)	6-3,17,42,45	6.1–6.2
	10/16	Zero-force members	**Quiz 7**				6.3
10/21		Structural Analysis (Trusses, Sections)		# 9	6-37,38(use method of sections),73,83	6-67,90,118,122	6.4
	10/23	Structural Analysis (Frames, Machines)	**Quiz 8**				6.6
10/28		Internal Forces		# 10	7-1,10,23,27	7-22,26,30	7.1
	10/30	Internal Forces	**Quiz 9**				
11/4		Internal forces; Review		# 11	7-13,17,34,35	**Programming HW3**	
	11/6	Wed MIDTERM 2: Chapters 6 and 7.1 Programming Example 3	**No Quiz**				
11/11		Shear/Moment Diagrams		#12	7-43,45,47,60	7-46,51,59,61	7.2
	11/13	Shear/Moment Diagrams	**Quiz 10**				
11/18		Shear/Moment Diagrams		# 13	7-69,78,82,87	7-75,82,83	7.3
	11/20	Shear/Moment Diagrams	**Quiz 11**				
11/25		Shear/Moment Diagrams , Dry Friction		# 14	7-88; 8-15,23,54	7-87; 8-6,27	7.3, 8.1,2
	11/27	**Wed PreThanksgiving USC Holiday**	***Turkey Quiz 12***				
		11/28 - 11/30 Thanksgiving Holiday					
12/02		Dry friction					8.1–8.2
	12/04	Review or MIDTERM 3	**Make-UpTest**		Emphasis on Ch 6-8		
12/16		Comprehensive Final Exam					
		Christmas Holidays					

[1] **This will be posted Weekly on Blackboard. <Note: They are NOT problems from the Textbook>**
[2] **Additional suggested multiple-choice problems from Prentice-Hall's Hibbeler Website**

STATEMENT ON ACADEMIC INTEGRITY

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own.

All students are expected to understand and abide by these principles. *SCampus,* the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

STATEMENT FOR STUDENTS WITH DISABILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible.

DSP Contact Information

OFFICE LOCATION	HOURS OF OPERATION	PHONE NUMBER
STU 301	8:30 a.m. until 5:00 p.m., Monday through Friday	(213) 740-0776

Part II Detailed Course Objectives

CE 205 Statics 2 Units

USC | SONNY ASTANI DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Course Objectives

Course Information, Textbook, and Supplementary Materials

Course Description: This course will present the theory and applications of basic engineering mechanics, including a review of vectors, the computation of resultant forces, the equations for equilibrium of particles and rigid bodies, the computation and diagramming of internal shear and moment forces, and dry friction.

Required for: All Civil and Environmental Engineering undergraduate degree programs

Prerequisite: PHYS 151L Fundamentals of Physics I

Co-requisite: Mechanics and Thermodynamics - 4 units

Required Textbook: *Engineering Mechanics: Statics* (11th ed.), R. C. Hibbeler, Prentice-Hall

Reference: None

Topics Covered	Learning Outcomes
Basic knowledge of forces and moments on and between components of a structure. Emphasis on the fundamental steps (e.g., setup, analysis, solution, discussion) of engineering problems.	Students will understand forces and moments and analysis in the following areas of study: 1. Forces and vectors, Cartesian vector notation and operations 2. Particle equilibrium 3. Moments and force system resultants 4. Rigid body equilibrium 5. Structural analysis of trusses and frames/machines 6. Internal forces, shear/moment diagrams 7. Dry friction 8. Express force and position vectors in Cartesian vector form, determine unit vectors, vector sums, dot products, and cross products. 9. Draw and label free-body diagrams 10. Determine the resultant force acting on a particle 11. Determine the forces necessary for a particle to remain static using equations of equilibrium.
Analyzing forces and moments on a static rigid body	12. Determine the moments of forces in two or three dimensions 13. Determine force and moment resultants 14. Determine point loads statically equivalent to distributed loads 15. Replace supports with equivalent reaction forces 16. Write and solve equations of equilibrium of a rigid body
Analyzing forces and moments on/between multiple static rigid bodies	17. Use the methods of joints and sections to analyze truss structures 18. Determine the forces acting between members of frames and machines composed of pin-connected members
Analyzing internal forces/moments in a static rigid body	19. Use the method of sections to determine internal forces 20. Determine internal shear and bending moments using loading equations 21. Understand and draw shear / bending moment diagrams

Lecture and Lab Schedule			
Lecture		**Lab**	
Sessions per Week	Duration per Session	Sessions per Week	Duration per Session
2	1 hour	n/a	

Contribution of Course to Meeting the Professional Component (Criterion 4)

Engineering Topics

In this course, students will learn a basic knowledge of forces and moments on and between components of a structure with an emphasis on the fundamental steps (e.g., setup, analysis, solution, discussion) of engineering problems. They will also learn to analyze: forces and moments on a static rigid body, moments on/between multiple static rigid bodies and internal forces/moments in a static rigid body.

Relation of Course Objectives to Program Outcomes

The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.

This course contributes to the program outcomes as outlined in the adjacent table.

Course Contribution to Program Outcomes *(a-k)*	✓ Key
a. An ability to apply knowledge of mathematics, science, and engineering.	
e. An ability to identify, formulate and solve engineering problems.	

Prepared by: Dr. Vincent Lee
Professor of Civil Engineering

Date: Fall 2013