

# **CE 205**

## Course Syllabus

8/27/2012

# Part I Course Organization

**CE 205 Statics (2 units)**  
**2012 Fall Semester — Course Syllabus**

Lecture	Monday and Wednesday	10:00 – 10:50 a.m.	GFS116
Discussion Classes	Wed 11:00 – 11:50 a.m. KAP 167    Wed 1 – 1:50 p.m. KAP 138		
	Fri 10:00 – 10:50 a.m. KAP 137    Fri 12:00 – 12:50 p.m. KAP 134		
Professor	Dr. Vincent Lee		
Office	KAP 230B		
Phone	(213) 740-0568		
Email	vlee@usc.edu		
Office Hours	MW 9-10am		
Teaching Assistant	To be assigned		
Email			
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 — <b>or</b> —		
	Engineering Mechanics: Statics (11th ed.), R. C. Hibbeler, Prentice-Hall, 2007 ISBN 978-0-13-221500-4 — <b>or</b> —		
	<i>ISBN 558862918 - Hibbeler - Engineering Mechanics: Statics \$75 (soft) <b>paperback copy</b></i>		
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	Best 10 of 12 Quizzes	33 %	
	Homework	7 %	
	All Exams	60 %	
	Total	100 %	

## CE 205 Statics — Fall 2012 Class Schedule

<sup>1</sup> This will be posted Weekly on Blackboard. <Note: They are NOT problems from the Textbook>

<sup>2</sup> Additional suggested multiple-choice problems from Prentice-Hall's Hibbeler Website

Date		Topics	Weekly Quiz	Weekly Posted Homework <sup>1</sup> (Due Next Monday)		Suggested <sup>2</sup> Problems	Section(s) to Read
Mon	Wed						
8/27		Introduction; Force Vector		# 1	1-15,20; 2-33,54	1-10,11; 2-14,19,58	1, 2.1–2.3
	8/29	Force Vector	Quiz 1				
9/3		Labor Day University Holiday					
	9/5	Force Vector	Quiz 2	# 2	2-78,92,108,118	2-63,79,82,93,106,131	2.4–2.9
9/10		Particle Equilibrium		# 3	3-4,14,19,61	3-6,20,62,63	3.1-3.4
	9/12	Force Vector; Particle Equilibrium	Quiz 3				
9/17		Force System Resultants;		# 4	4-65,66,79,86	4-37,58,75,87,90	4.1–4.4
	9/19	Force System Resultants	Quiz 4				4.5-4.6
9/24		Force System Resultants		# 5	4-124,127,137,140,148	4-121,138,153,158	4.7–4.8
	9/26	MIDTERM 1: Chapters 1-4					
10/1		Force System Resultants					4.9-4.10
	10/3	Distributed Loads; Rigid Body	Quiz 5	#6	5-10,18,29,47,53	5-3,19,43,51	5.1–5.2
10/8		Rigid Body Equilibrium		# 7	5-63,65,79,89		5.3–5.5
	10/10	Rigid Body Equilibrium; Review	Quiz 6				5.5–5.7
10/15		Structural Analysis (Trusses, Joints)		# 8	6-2,22,37,38(use method of joints)	6-3,17,42,45	6.1–6.2
	10/17	Zero-force members	Quiz 7				6.3
10/22		Structural Analysis (Trusses, Sections)		# 9	6-37,38(use method of sections),73,83	6-67,90,118,122	6.4
	10/24	Structural Analysis (Frames, Machines)	Quiz 8				6.6
10/29		Internal Forces		# 10	7-1,10,23,27	7-22,26,30	7.1
	10/31	MIDTERM 2: Chapters 5-6					
11/5		Internal Forces		# 11	7-13,17,34,35		
	11/7	Internal forces; Review	Quiz 9				
11/12		Shear/Moment Diagrams		# 12	7-43,45,47,60	7-46,51,59,61	7.2
	11/14	Shear/Moment Diagrams	Quiz 10				
11/19		Shear/Moment Diagrams		# 13	7-69,78,82,87	7-75,82,83	7.3
	11/21	Wed PreThanksgiving USC Holiday	Turkey Quiz 11				
		11/21 - 11/24 Thanksgiving Holiday					
11/26		Shear/Moment Diagrams	Quiz 12				
	11/28	Shear/Moment Diagrams , Dry Friction		# 14	7-88; 8-15,23,54	7-87; 8-6,27	7.3, 8.1,2
12/3		Dry friction					8.1–8.2
	12/5	MIDTERM 3: Chap7&8			Emphasis on Ch 6-8		
Christmas Holidays							

<sup>1</sup> This will be posted Weekly on Blackboard. <Note: They are NOT problems from the Textbook>

<sup>2</sup> 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 STU 301	HOURS OF OPERATION 8:30 a.m. until 5:00 p.m., Monday through Friday	PHONE NUMBER (213) 740-0776
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## Part II Detailed Course Objectives

## 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: <ol style="list-style-type: none"> <li>1. Forces and vectors, Cartesian vector notation and operations</li> <li>2. Particle equilibrium</li> <li>3. Moments and force system resultants</li> <li>4. Rigid body equilibrium</li> <li>5. Structural analysis of trusses and frames/machines</li> <li>6. Internal forces, shear/moment diagrams</li> <li>7. Dry friction</li> <li>8. Express force and position vectors in Cartesian vector form, determine unit vectors, vector sums, dot products, and cross products.</li> <li>9. Draw and label free-body diagrams</li> <li>10. Determine the resultant force acting on a particle</li> <li>11. Determine the forces necessary for a particle to remain static using equations of equilibrium.</li> </ol>
Analyzing forces and moments on a static rigid body	<ol style="list-style-type: none"> <li>12. Determine the moments of forces in two or three dimensions</li> <li>13. Determine force and moment resultants</li> <li>14. Determine point loads statically equivalent to distributed loads</li> <li>15. Replace supports with equivalent reaction forces</li> <li>16. Write and solve equations of equilibrium of a rigid body</li> </ol>
Analyzing forces and moments on/between multiple static rigid bodies	<ol style="list-style-type: none"> <li>17. Use the methods of joints and sections to analyze truss structures</li> <li>18. Determine the forces acting between members of frames and machines composed of pin-connected members</li> </ol>
Analyzing internal forces/moments in a static rigid body	<ol style="list-style-type: none"> <li>19. Use the method of sections to determine internal forces</li> <li>20. Determine internal shear and bending moments using loading equations</li> <li>21. Understand and draw shear / bending moment diagrams</li> </ol>

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)
<p><b>Engineering Topics</b></p> <p>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.</p>

**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.	
h. The broad education necessary to understand the impact of engineering solutions in a global economic and environmental and societal context.	
j. Knowledge of contemporary issues.	

**Prepared by:** Dr. Vincent Lee  
Professor of Civil Engineering

**Date:** Fall 2012