CE235

Course Syllabus

1/1/2019

Part I Course Organization

CE235 Dynamics (3units)

Lecture: KAP163	Mon 11:00-11:50am	Wed 11:00-11:50am	Fri 11:00-11:50am
Discussion (2)	W 1:00-1:50pm vKC257	Th 10:00-10:50am SOSB47	
Professor	Vincent Lee		
Office	KAP230B		
Phone	213-7400568		
Email	Through https://blackboard.usc.edu and https://piazza.com		
Office Hours	MW 10:00-11:00am other times through Piazza		
Teaching Assistant	tbd		
Office	Meeting at KAP239 or tba		
Email	Through https://blackboard.usc.edu and https://piazza.com		
Office Hours	tbd		
Prerequisites	CE205, Statics		
Textbook(s)	Engineering Mechanics: Dynamics 14th ed. Russell C Hibbeler 2016 Pearson ISBN-13: 978-0133915389		
References			
Course Descriptions	Elements of vector algebra; dynamics of particles, systems of particles and rigid bodies; kinematics; momentum relations, energy methods; vibrations; Euler's Equations		
Course Objectives	This course is appropriate for engineering students who need a strong background in the applications of physics-based mechanics principles in their work. These engineering students are primarily those dealing with structural design, machine design, aerospace structures, and manufacturing.		
Learning Objectives			
Policies on:			
Late work	Partial Credit		
Make-up work	Partial Credit		
Incomplete work	Partial Credit		
Extra credit	Case by case		

Finalgrade schema isbasedon the following percentagesof gradedcoursework :					
Homework	7	%			
Best 11Quizzes	33	%			
Midterms& Final	60	%			
Total	100	%			

CE225 Mechanics of Deformable Bodies Spring 2018 Class Schedule

Week	Date	Topics	Assignments	Problem Set	Quiz
1	Jan 7-11	Application of Vector Algebra.	Chap1	#1	
2	Jan 14-18	Jan14 M.L.King Holiday; Kinematics: Rectilinear and Cartesian Coordinates	Chap1	#2	Wed #1
3	Jan 21-25	**Kinematics: Curvilinear Coordinates**	Chap1&2	#3	Mon#2
4	Jan29 -Feb2	Kinetics: Equation of Motion MT#1	Chap3	#4	
5	Feb 4-8	Kinetics of a System of particles	Chap3	#5	Mon#3
6	Feb 11-15	Work and Energy	Chap4	#6	Mon #4
7	Feb 18-22	Feb18 President's Day; Impulse and Momentum	Chap5	#7	Wed #5
8	Feb25 -Mar1	Plane rigid body kinematics MT#2	Chap6	#8	
9	Mar 4-8	Plane rigid body kinematics cont.	Chap6	#9	Mon#6
10	Mar 11-15	Spring Recess			
11	Mar 18-22	Kinetics of rigid bodies (2D)	Chap7	#10	Mon#7
12	Mar 25-29	Kinetics of rigid bodies (2D) cont.	Chap7	#11	Mon#8
13	Apr 1-5	Work & Energy of 2D Rigid Bodies MT#3	Chap8	#12	
14	Apr 8-12	Work & Energy of 2D Rigid Bodies cont.	Chap8	#13	Mon#9
15	Apr 15-19	Impulse & Momentum (2D)	Chap9	#14	Mon#10
16	Apr 22-26	Impulse & Momentum (2D) cont.	Chap9		Mon#11
	May1	Wed 11am-1pm Final			
	May10	Friday: Commencement			

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
STU301	8:30 a.m.until5:00p.m.,MondaytoFriday	(213)740-0776

Part II Detailed Course Objectives

CE 225 Mechanics of Deformable Bodies 3 units

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ABET Course Syllabus

Course Information, Textbook, and Supplementary Materials

Course Description: Analysis of stress and strain; axial, flexural, and torsional behavior of slender bars; elastic deflections; combined stresses; introduction to elastic stability and energy methods.

Required for: BSCE, BSCE Structural, BSCE Building Science, and BSCE Environmental

Prerequisites: CE 205 Statics

Co-Requisite: none

Required Textbook: Beer, Johnston & DeWolf, *Mechanics of Materials*, 4th ed. (2006)

Reference: none

Topics Covered	Learning Outcomes
Analysis of stress and strain; flexual and torsional behavior of slender bars; elastic deflections; combined stresses; introduction to elastic stability and energy methods	Students will understand the following topics, and perform analyses and calculations in these areas of study 1. Internal forces of members subjected to axial and torsional loads 2. Stress and strain, 1-D and generalized Hooke's Law Stresses, strains and deformations of axially loaded members 3. Stresses, strains and rotations of torsionally loaded circular bars 4. Normal and shear bending stresses in beams 5. Combined stresses, Mohr's circle 6. Beam Deflections in statically determinate and indeterminate problems 7. Design of beams subjected to vertical, horizontal and moment loads
Analysis of the internal forces and moments of a structure	8. Determine the axial forces of both statically determinate and indeterminate members 9 Determine the axial torques in both statically determinate and indeterminate circular solid and hollow shafts 10. Determine the internal shears, moments and axial force reactions in beams, and draw the Shear and moment diagrams
Analysis of stress	11. Determine the internal stresses of statically determinate and indeterminate members 12. Determine the internal stresses of statically determinate and indeterminate circular solid and hollow shafts 13. Determine the normal and shear bending stresses in rectangular beams, beams with flanges and built up beams of various shapes 14. Determine the principal and maximum shear stresses by the transformation formula and/or Mohr's circle for plane stress
Deflections in a loaded beam	15. Calculate beam deflections by direct integration, superposition and moment-area methods 16. Analyze the statically indeterminate beams

Lecture and Lab Schedule

Lecture		Discussion	
Sessions per Week	Duration per Session	Session per Week	Duration per Session
3	50min	1	50min

Contribution of Course to Meeting the Professional Component

Engineering Topics ı Design

Students will understand the design process and learn approaches used to solve various engineering problems that are representative of those found in a professional environment. They will practice decision-making skills as they apply their knowledge of basic sciences, mathematics, and the engineering sciences to convert resources optimally to meet the stated needs of a project

This course will cover the design of beams subjected to vertical, horizontal and moment loads.

Engineering Topics ı other

Constraints and Considerations. Students will understand the diverse constraints and considerations that are representative of what they will encounter in an engineering practice. This course covers the following topics:

Economic ı Manufacturability

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.	
i) Recognize the need for and to engage in lifelong learning.	

Prepared by: V. Lee
Professor of Civil Engineering

Date: Spring 2016