

9/15/2022 DATE

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 REQUIRED COURSE
 ELECTIVE COURSE

 MSD DIVISION
☐ NEW COURSE
☒ REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	PHY-239	TITLE: (30 Characters Max)		Mechanics I							
SEM CR HRS:	3	Lecture:	3	Lab:	0	SOE/Internship:		0	ECH:	3	
Course Level:	<input type="checkbox"/> Gen Ed / IAI <input checked="" type="checkbox"/> Baccalaureate /Non-IAI		<input type="checkbox"/> Career/Technical <input type="checkbox"/> Dev Ed/ Not in Degree Audit		Clinical Practicum:	0	SOE/Internship:		0	SOE ECH:	0
COURSE PCS #	11 - 14.1101		IAI Code				Contact Hours (Minutes Per Week)				
Repeatable (Y/N):		Pass/Fail (Y/N):		Variable Credit (Y/N):	Min:	Max:	16 Wks	150	8 wks	300	
Prerequisites:	PHY-140 with grade of 'C' or higher, MAT-242										
Catalog Description: (40 Word Limit)	This course is a study of the mechanics of static, rigid bodies for engineering students.										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Non-Clinical Internship/ SOE
Vectors	4			
Forces and Equilibrium	4			
Moments	5			
Equilibrium of a Rigid Body	6			
Analysis of Structures	4			
Centroids and Centers of Mass	5			
Moments of Inertia - (Area and Mass)	5			
Friction	3			
Internal Forces and Moments	6			
Virtual Work	3			
TOTAL	45	0	0	0

EVALUATION			
QUIZZES <input type="checkbox"/>	EXAMS <input checked="" type="checkbox"/>	ORAL PRES <input type="checkbox"/>	PAPERS <input type="checkbox"/>
LAB WORK <input type="checkbox"/>	PROJECTS <input checked="" type="checkbox"/>	COMP FINAL <input checked="" type="checkbox"/>	OTHER <input checked="" type="checkbox"/> homework

COURSE MATERIALS	
TITLE:	Engineering Mechanics: Statistics
AUTHOR:	R.C. Hibbeler
PUBLISHER:	Prentice Hall
VOLUME/EDITION/URL:	12th
COPYRIGHT DATE:	2010

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		<i>The student will be able to:</i>
Vectors		
Manipulating vectors 2-D & 3-D Dot Product Cross Products	4	<ul style="list-style-type: none"> Perform vector operations and use vectors to model problems in two and three dimensions.
Forces and Equilibrium Diagrams		
Forces and Free Body Diagrams 2-D Force Systems 3-D Force Systems	4	<ul style="list-style-type: none"> Create and use free-body diagrams and the concept of equilibrium to determine unknown forces in engineering problems.
Moments		
2-D Moments Moment Vector Moment of Force About a Line Couples Equivalent Systems	5	<ul style="list-style-type: none"> Demonstrate moments and calculate the moments exerted on a body due to applied forces. Students will also analyze problems by representing them with equivalent systems.
Rigid Body Equilibrium		

Supports and Reactions Equilibrium Equations 2-D Applications 3-D Applications Statically Indeterminate Objects Two-force and Three-force Members	5	<ul style="list-style-type: none"> Model various supports with equivalent forces and moments, and use the resulting system in equilibrium to solve for unknown or required forces and moments acting on objects.
Analysis of Structures		
Methods of Joints Method of Sections Space Trusses Frames and machines	4	<ul style="list-style-type: none"> Determine forces in members of trusses and frames using the method of joints or sections.
Centroids and Centers of Mass		
Volume, Area and Line Centroids Distributed Loads Centers of Mass	5	<ul style="list-style-type: none"> Determine the centroid or center of mass of an object in order to represent a distributed weight or force by a single equivalent force acting through the object's "center".
Moments of Inertia		
Area Moment of Inertia Area: Parallel Axis Theorem Mass Moment of Inertia Mass: Parallel Axis Theorem	5	<ul style="list-style-type: none"> Calculate the moments of inertia of simple objects and then use the parallel-axis theorems to determine the moments of inertia of more complex objects.
Friction		
Theory, Coefficients Applications	3	<ul style="list-style-type: none"> Involve friction in the analysis of problems involving surfaces in contact, specifically wedges, threaded connections, bearings and belts.
Internal Forces and Moments		
Axial & Shear Forces, Moments Force and Moment Diagrams Calculus Relationships Liquids and Gases	6	<ul style="list-style-type: none"> Determine the internal forces and moments in beams and create corresponding force and bending moment diagrams. Analyze the pressure distributions in liquids and gases.
Virtual Work	3	<ul style="list-style-type: none"> Apply the principle of virtual work to solve and analyze structural systems and problems
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	44	

COURSE OUTCOMES*	At the successful completion of this course, students will be able to:
	<ul style="list-style-type: none"> Calculate the net moment acting on objects due to couples and applied forces.
	<ul style="list-style-type: none"> Solve for unknown forces and required supports on objects, trusses and frames in static equilibrium.
	<ul style="list-style-type: none"> Calculate the centroid or center of mass of objects.
	<ul style="list-style-type: none"> Calculate and demonstrate the significance of moments of inertia and mass moments of inertia about various axes.
	<ul style="list-style-type: none"> Calculate internal shear forces and bending moment on a loaded beam.

* Course Outcomes will be used in the Assessment Software for Outcomes Assessment. Limit to 3 - 5.