CVEG 2043-P02 - Engineering Mechanics I - Spring 2016

Department of	Civil & Envir. Engineering	College of Engineering

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Office Hours:	**TR 10.30 AM-12.30 PM**
Virtual Office Hours:	**Via email**

Course Location:	***WILSON 103***
Class Meeting Days & Times:	**TR 12:30 pm - 1:50 pm**
Course Abbreviation and Number:	**CVEG 2043**
Catalog Description:	Credit 3 semester hours. Fundamental concepts and principles; vector algebra and applications; equilibrium of particles and rigid bodies in two and three dimensions; moments and couples, distributed forces; centroids; moments of inertia; friction; introduction to analysis of structures. Prerequisites: PHYS 2513.

Prerequisites:	PHYS 2513
Co-requisites:	None

Required Text:	**Engineering Mechanics: Statics, R.C. Hibbeler, 13th ed., 2012, Prentice-Hall/Pearson**

References	F.P. Beer & E.R. Johnston, Jr., "VECTOR MECHANICS FOR ENGINEERS - DYNAMICS", 10th ed., McGraw Hill, New York, 2012.

Access to Learning Resources:	PVAMU Library: phone: (936) 261-1500; web: http://www.tamu.edu/pvamu/library/ University Bookstore: phone: (936) 261-1990; web: https://www.bkstr.com/Home/10001-10734-1?demoKey=d

Course Goals or Overview:

To develop the ability to apply knowledge of mathematics, science and engineering in solving engineering problems

Course Objectives/Accrediting Body *ABET* **Standards Met:** *SACS and ABET*

To provide the student with a clear and thorough understanding of the theory and applications of Engineering Mechanics, specifically:

1. to develop the ability to analyze engineering mechanics problems using the principles of science and mathematics
2. to develop the ability to describe and predict the conditions of equilibrium of particles, rigid bodies, and structures
3. to develop the ability to determine center of gravity, centroid, and moment of inertia.

At the end of this course, the student will demonstrate				
		Civil Engineering Program Objectives		ABET Criteria
1	an ability to apply knowledge of mathematics, science, and engineering	1 and 2		a
2	an ability to identify, formulate, and solve engineering problems	1 and 2		e

Course Evaluation Methods

Lecture Topics:

- General Principles (Chapter 1)
- Force Vectors (Chapter 2)
- Equilibrium of a Particle (Chapter 3)
- Force System Resultants (Chapter 4)
- Equilibrium of a Rigid Body (Chapter 5)
- Structural Analysis (Chapter 6)
- Internal Forces (Chapter 7)
- Friction (Chapter 8)
- Center of Gravity and Centroid (Chapter 9)
- Moments of Inertia (Chapter 10)

Based on the topics above, this course will utilize the following instruments to determine student grades and proficiency of the learning outcomes.

Exams - written tests designed to measure knowledge of presented course material
H.W. Assignments - homework assignments designed to supplement and reinforce course material
Class Participation – daily attendance and participation in class discussions

GRADE DISTRIBUTION:

Class Participation and Quizzes	10%
Homework	15%
3 Tests @ 15%	45%
Final Exam (Comprehensive)	30%
Total	100%

GRADE SCALE:

90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

Professional Organizations
ASCE < www.asce.org>

LESSON SCHEDULE AND ASSIGNMENTS

CLASS	TOPIC	HW#	HOMEWORK Problems will be announced in class	DUE DATE **
1	Introduction & Course Outline			
2	General Principles & Units of Measure (1.1-5) Scalars and Vectors (2.1)	**Ch 1**		
3 4	Vector Operations (2.2-4) Cartesian Vectors (2.5-6) Position Vector (2.7-8) Dot Product (2.9)	**Ch 2**		
5	Equilibrium of a Particle; F.B. Diagram (3.1-2) Coplanar Forces (3.3-4)	**Ch 3**		
6 7 8 9 10	**Test #1** Force System Resultants (4.1-5) Moment of a Couple (4.6) Equivalent Systems (4.7-8) Distributed Loading (4.10)	**Ch 4**		
11 12	Equilibrium of a Rigid Body (5.1-2) F.B. Diagram (5.2-3) 2-F & 3-F Members (5.4-5) Equations of Equilibrium (5.6-7)	**Ch 5**		
13 14	Simple Trusses (6.1) Method of Joints (6.2) Method of Sections (6.3-4)	**Ch 6**		
15 16	Internal Forces (7.1) **TEST #2 (MIDTERM)**	**Ch 7**		
17	Shear & Moment Equations (7.2-3)			
18 19	Friction (8.1-2) Wedges & Screws (8.3-4) Belts (8.5)	**Ch 8**		
20 21	C.G.& Centroid of System of Particles (9.1) Center of Gravity and Center of Mass (9.2) Centroid of Bodies (9.2) Composite Bodies (9.3-6)	**Ch 9**		
22 23	Moment of Inertia (10.1) Moment of Inertia of Areas (10.1) Parallel Axis Theorem (10.2) Radius of Gyration (10.3)	**Ch 10**		
24 25	**TEST #3** Moment of Inertia by Integration (10.4) Moment of Inertia for Composite Areas (10.5)			
26	Moment of Inertia (10.9)			
27	Moment of Inertia (10.9) Review **REVIEW of F.E. Format Exam**			
	FINAL EXAM			

** Due date will be announced in class at the completion of instruction and discussion of the respective chapter.

University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class, should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):
You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.

2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process
Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Civil Engineering Program Educational Objectives and ABET Criterion 3

Civil Engineering program graduates will be able to

1. have careers in civil engineering or related fields that lead to increasing levels of responsibility and leadership;
2. obtain professional licensure/certifications;
3. complete graduate studies in civil engineering or related fields;
4. engage in professional development and service.

CIVIL ENGINEERING PROGRAM OUTCOMES

Students who graduate with a BSCE degree from the Civil & Environmental Engineering Department will have

(a) An ability to apply knowledge of mathematics, science, and engineering.
(b) An ability to design and conduct experiments, as well as to analyze and interpret data.
(c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, wealth and safety, manufacturability, and sustainability.
(d) An ability to function on multi-disciplinary teams.
(e) An ability to identify, formulates, and solves engineering problems.
(f) An understanding of professional and ethical responsibility.
(g) An ability to communicate effectively.
(h) The broad education necessary to understand the impact of engineering solutions in a global and societal context.
(i) Recognition of the need for, and an ability to engage in life-long learning.
(j) Recognition of contemporary issues.
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

EXPECTED OUTCOME FOR THIS COURSE

Upon completion of this course, students should be able to: use vectors; draw free-body diagrams; solve engineering problems involving trusses, beams with point and distributed loads, dry friction; find center of gravity and centroid, and moment of inertia.

Estimated ABET Category Content:

Engineering Science:		100% or 3 credits
	TOTAL:	100% or 3 credits

Mapping of Program Educational Objectives (PEOs) onto Student Outcomes (SOs)

PEO ID	Objectives	CVEG Student Outcomes										
	Graduates from the Civil Engineering program will:	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
PEO 1	have careers in civil engineering or related fields that lead to increasing levels of responsibility and leadership	X	X	X	X	X	X	X	X	X	X	X
PEO 2	obtain professional licensure/certifications	X		X		X						X
PEO 3	complete graduate studies in civil engineering or related fields	X	X	X		X		X	X	X	X	X
PEO 4	engage in professional development and service						X	X	X	X	X	X

Mapping: CVEG Courses Vs. PEOs Vs. Student Outcomes {Fall 2015 Degree Plan}

Course No	Course Title	CVEG Program Educational Objectives				CVEG Student Outcomes										
		1	2	3	4	a	b	c	d	e	f	g	h	i	j	k
CVEG 1011	Intro to Engineering	X			X						M			M		
CVEG 1021	Intro to Civil Engineering	X	X		X							M				M
CVEG 2001	Emerging Issues in CE Prof	X	X		X				M							M
CVEG 2043	Engineering Mechanics I	X	X			M				M						
CVEG 2061	**Materials & Dynamics Lab**	X	X			M			M							
CVEG 2063	Mechanics of Materials I	X	X			M				M						
CVEG 2081	**Surveying & Geospatial Concepts**	X	X				D								M	
CVEG 3023	Geotechnical Engineering	X	X				M					M				
CVEG 3031	**Concrete & Steel Lab**	X					M					M				
CVEG 3043	Environmental Engineering	X	X				M D			M						
CVEG 3051	**Professional Engineering I**	X	X		X						M			M		
CVEG 3053	Transportation Engineering	X	X							M			M			
CVEG 3063	Hydraulics	X	X		M		M D									
CVEG 3073	Structural Analysis I	X	X							M						M
CVEG 3083	Steel Design	X	X	X	X			M								M
CVEG 4013	Reinforced Concrete	X	X	X	X			M								M
CVEG 4021	**Geotechnical Engineering Design Lab**	X	X							M			M			
CVEG 4043	Environmental Eng Design	X	X	X	X			M						M		
CVEG 4053	Transportation Eng Design	X	X	X	X			M							M	
CVEG 4063	Water Resources Eng.	X	X	X	X			M			M			M		
CVEG 4072	**Systems Engineering and Uncertainty**	X		X												
CVEG 4141	**Engineering Management & Ethics**	X	X		X						M				M	
CVEG 4472	Sr. Design & Professionalism I	X	X	X	X			M	M		M			M		
CVEG 4482	Sr. Design & Professionalism II	X	X	X	X			M				M	M		M	

X means the Program Objective is achieved
M means that the skills described in the program outcome is covered in greater details and measured in the course.
D design of experiments
* Evidence needs to be collected to satisfy CE Program Criteria explaining basic concepts in Management, Business, Public Policy and Leadership.

The Assessment Process

Student Outcomes assessment are determined by conducting both **direct** and **indirect** measurements. Direct measurements are derived from any of designated homework, tests, lab reports project reports or other assignments. Indirect measurements are drawn from end-of-semester Student Opinion Surveys (SOS) and EBI surveys completed by graduating seniors. The above listed Student Outcomes are measured in a yearly cycle and an assessment report is prepared annually.

TEXT BOOK
POLICIES AND PROCEDURES

PURPOSE OF PROGRAM

The purpose of the Textbook Loan program is to provide short-term, interest free loans in the form of a book voucher to students who have declared a major in the Roy G. Perry College of Engineering so that they may obtain the required engineering textbooks for their class by the 10th class day. Students must demonstrate a financial need in order to be eligible to apply for a textbook voucher. The voucher can only be used at the Campus Bookstore. This voucher is a loan and must be repaid to the College of Engineering prior to the start of pre-registration for the next semester. If the loan is not repaid, a hold will be placed the students account.

TEXTBOOK POLICY

Students must acquire the textbook that is listed as "required" on the course syllabus. The textbook must be acquired by the 10th class day. Students are not allowed to share textbooks with other students who are currently registered in the same class. Failure to acquire (or show proof of purchase) the required textbook by the 10th class day will result in the student being administratively dropped from the course. The University will assess financial obligations for the course to the student as with any other dropped class according to the fee schedule. In addition, your financial aid may be affected by the subsequent registration action(s).

FUNDING SOURCE

Primary funding for this program will be from private donations (i.e. corporate, individual donors, faculty, etc.) and other discretionary resources in the College of Engineering.

HOW FUNDS WILL BE USED

Financial contributions directed to support the Textbook funds will be used only to provide short-term loans to students in the Roy G. Perry College of Engineering who have demonstrated a financial need of assistance in acquiring the textbooks required for the courses that they are registered.

ELIGIBILITY

To be eligible for the College of Engineering Textbook Loan Program, students must meet the following criteria:

- Enrolled in Prairie View A&M University
- Must be a declared major in the Roy G. Perry College of Engineering (engineering, computer science and/or technology)
- Students must be in good standing at Prairie View A&M University (i.e., no academic probation, or other disciplinary action)
- Demonstrate a financial need

ADMINISTRATION OF PROGRAM/RESPONSIBLE AUTHORITY

The Assistant Dean is responsible for the administration of the Textbook Program. The Assistant Dean is responsible for reviewing and evaluating the applications as well as administration of the awards. The Dean and/or Associate Dean will periodically review the process.

HOW TO APPLY

Application materials should be submitted as a hardcopy to the Dean's Office located in SR Collins RM 349. Students must submit a completed application packet that includes the application and all supporting documents. Supporting documents that must be included are the following:

- Class Schedule
- Account Summary
- Financial Aid Award Letter
- Housing Contract or Lease Agreement
- "View Hold" screen

FORMS
Application materials can be obtained from the Dean's Office located at SR Collins RM 349 or online at the College of Engineering Website under Current Student Resources at the following URL: http://www.pvamu.edu/pages/195.asp.

EVALUATION
Applications will be evaluated within 2-3 business days of submission. Incomplete applications will not be reviewed. Awards will be determined based on the supporting documents submitted by the students and demonstration of a "financial need" (see sample evaluation form). Financial need is determined by comparing the cost of attendance (including tuition, housing, meals) with the financial award (including loans, grants, and scholarships). The students will also be asked to provide proof of the cost of the required textbooks based on the University Bookstore pricing. If the difference between the cost of attendance and the financial award is less than the amount of the required textbooks, the student will be awarded a voucher up to the total amount to purchase the textbooks. Students receiving an overpayment (after applicable tuition, fees, room and board) that is larger than the amount of the total cost of the books will not be eligible to receive a textbook loan.

DISTRIBUTION OF AWARD
Students will be notified of the decision regarding their application by mail, email, and/or phone. Book vouchers should be picked up and documents signed in the Dean's Office (SR Collins Rm 349) within 3 business days. Failure to pick up the voucher and sign documents within this timeframe will void the award. Student will then have to reapply. Students will have 7 business days to use the book voucher at the University Bookstore. The voucher will be canceled after 7 days.

UNUSED FUNDS
Any unused book voucher funds will be returned to the College of Engineering Textbook Funds. Students are responsible for repaying only the actual amount used to purchase textbooks.

STUDENT RESPONSIBILITY
In accepting the loan, students are responsible for the following:
1. Repaying the loan prior to pre-registration period.
2. Submitting a copy of the receipt of sale showing the engineering textbooks purchased and the actual amount of purchase.
3. Purchasing the engineering textbooks that are specified in the application.

REPAYMENT
Students are expected to repay the loan prior to the pre-registration period for the semester in which the loan is awarded. Payment should be made to the Dean's Office located on the third floor of SR Collins. Loans are to be paid in full. Failure to repay the loan prior to pre-registration will result in a hold being placed on the student account by the College of Engineering

NOTES:

1. Grade will be computed on an absolute scale, i.e., no curve. Final grade will be determined by total points earned.

2. No make-up test/exam will be given in the course. If you miss a test/exam, you will receive zero credit for that test/exam. If you have an excused absence, notify the instructor ahead of time.

3. Assignment is due on assigned date at the beginning of the class. Late assignments **will not be accepted**.

4. Attendance in the scheduled classes is a requirement for the course. Remaining absent for four or more classes may constitute sufficient reasons to receive a failing grade in the course. **SEE ATTACHED "CLASS ATTENDANCE POLICY"**.

5. Any form of cheating, plagiarism and/or academic dishonesty will result in an "F" in the course for the individual(s) involved.

6. If you fail to take the final exam, you will receive an automatic "F" in the course.

7. See the following pages for detailed lesson schedule.

SPECIAL NOTES ON HOMEWORK:

All assignments must be submitted to complete the course.
The following areas will be graded:

1. Completeness: Did you work all parts of the assignment?
2. Accuracy: Did you get the "correct" answer and indicate the units?
3. Format and Neatness: Is your presentation of the solution easy to follow, legible and in a professional manner?

SPECIAL NOTES ON EXAM/TESTS:

1. Mid-term Exam (TEST #2) **may** be given in F.E. Exam Format and will carry 15% of the total grade of the course.

2. The Final Exam will be prepared by the College FE TQM Team in FE Exam Format and will carry 30% of the course grade.

3. Your Instructor will explain and illustrate the examination procedure and format. **REMEMBER ABOUT 50% OF YOUR GRADE MAY BE DETERMINED BY FE EXAM FORMAT. PLEASE GET USED TO THE FE EXAM PROCEDURE.**

♦ **Student Academic Appeals Process (undergraduate catalog, 2014-2015)**