PRAIRIE VIEW A&M UNIVERSITY

SYLLABUS

CVEG 2454: STATICS AND DYNAMICS
Spring 2019

Instructor: Dr. Ethelbert Opara
Section # and CRN: Section P01, CRN: 26410
Office Location: 109B in C.L. Wilson Building
Office Phone: 936.261.1655
Email Address: bertopara1@gmail.com and eoopara@pvamu.edu

Office Hours: 10am – 12pm on Monday and Wednesday
Mode of Instruction: Face to Face

Course Location: New Electrical Engineering Building, Room #137
Class Days & Times: 8am – 9:50am on Monday and Wednesday
Catalog Description: Fundamental concepts; equilibrium of particles and rigid bodies, centroids, moments of inertia, friction, and introduction to analysis of structures. Kinematics and kinetics of particles and rigid bodies; equations of motion, work and energy; impulse and momentum.

Prerequisites: PHYS 2513
Co-requisites: None

Required Text: R. C. Hibbeler, Engineering Mechanics - Statics and Dynamics, Pearson Prentice Hall, 14th Ed., (2016)

Recommended Texts: None

Student Learning Outcomes:

	Upon successful completion of this course, students will be able to (**bold** letters in brackets correspond to ABET Criterion 3 measured in the course)**:**	**Program Learning Outcome # Alignment***	**Core Curriculum Outcome Alignment**
1	Thorough understanding of the theory and applications of engineering mechanics (**a and e**);	ABET 3 (1)	
2	Thorough understanding of the theory and applications of engineering mechanics (**a and e**);	ABET 3 (1)	
3	Describe and predict through calculations the conditions of equilibrium of particles, and bodies on application of forces (**a and e**); and	ABET 3 (1)	
4	Describe and predict through calculations the behavior of bodies subjected to forces resulting in dynamic motion (**a and e**).	ABET 3 (1)	

* The Civil Engineering Program Learning Outcomes are derived from ABET Criterion 3 (Student Outcomes)

ABET Criterion 3 and Civil Engineering Program Educational Objectives

***ABET Criterion 3. Student Outcomes**

Engineering programs must demonstrate that their graduates have:

1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

3) an ability to communicate effectively with a range of audiences
4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Civil Engineering Program Educational Objectives (PEOs):

Civil Engineering program graduates will:

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.

Table: Outcome Measures

Course	CVEG Objectives				ABET Criterion 3						
	1	2	3	4	1	2	3	4	5	6	7
CVEG 2454					x						

x are the outcomes measured for this course

The following policy is only for students who have declared a major (Engineering, Computer Science, and/or Technology) in the Roy G. Perry College of Engineering.

College of Engineering (CoE) Textbook Policy:

Students MUST acquire the required textbook that is listed on the course syllabus for this course. The textbook must be acquired by the 10th class day. Students are not allowed to share textbooks with 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 as well as your financial aid may be affected.

If you are not financially able to purchase a required textbook for an engineering course prior to the 10th class day, you may apply to the College of Engineering Textbook Fund for a textbook voucher. The voucher can only be used at the Campus Bookstore. Additional information about the College of Engineering Textbook Policy and the CoE Textbook Fund may be found at http://www.pvamu.edu/engineering/. The student may need to contact the Director of Engineering Student Services) in the CoE Dean's office (350 SR Collins).

Major Course Requirements

TOPICS COVERED

1. Particle Equilibrium
2. Equivalent Force Systems
3. Rigid Body Equilibrium
4. Method of Joints and Method of Sections
5. Centroid and Moment of Inertia
6. Friction
7. Kinematics of a Particle
8. Kinetics of a Particle: Force and Acceleration
9. Kinetics of a Particle: Work and Energy
10. Kinetics of a Particle: Impulse and Momentum
11. Planar Kinetics of a Rigid Body: Force and Acceleration
12. Planar Kinetics of a Rigid Body: Work and Energy
13. Planar Kinetics of a Rigid Body: Impulse and Momentum

Method of Determining Final Course Grade

Based on the topics above, this course will utilize the following instruments to determine student grades and proficiency of the learning outcomes.		
Course Grade Requirement	**Percent Value**	**Total Points**
1) Pre-requisite Test/Exam	6%	60
2) Tests/Exams	44%	440
3) Homework Assignments	20%	200
4) TaskStream Assignment	5%	50
5) Final Exam (Comprehensive)	25%	250
Total:	100%	**1000**

Grading Criteria and Conversion:

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

Detailed Description of Major Assignments:

Assignment Title or Grade Requirement	**Description**
Pre-requisite Exam	Written test designed to measure knowledge and retention of Physics I concepts
Periodic Exams	Written tests designed to measure knowledge of presented course material
Homework Assignments	Periodic written assignments designed to engage students in collaborative, team-based learning and to supplement as well as reinforce course material
TaskStream Assignment	Assignment designed to engage students in the accreditation process
Final Exam	Comprehensive closed book examination.

Additional Notes:

- Attendance in the class is mandatory and students are expected to report to class on time. If you know that you will be late to class or have to leave class early, please speak with or email me before class and enter/leave the classroom quietly. Attendance will be taken at the beginning of class and may be taken at the end of class. Please read the attached University Class Attendance Policy.
- Turn cell phones and other electronic devices off prior to the start of class. They must remain off while class is in session whether we are in the classroom or outside the classroom. If you are expecting an emergency call, please keep the cell phone in silence mode and exit the classroom to take the call.
- Course review topics will be provided for the mid-term and final exam on the designated date.
- No makeup test(s) will be given. If you miss a test you will receive zero credit. If you have an excused absence please discuss with me ahead of time. Failure to take the final examination will result in an automatic "F" grade unless other arrangements are made in advance.
- Late homework will not be accepted. The format for submitting homework will be discussed on the designated dates.
- Cheating on an exam or homework and other forms of academic dishonesty will result in referral with the maximum penalty recommended.
- Grading/class related Appeals (see undergraduate catalog)

Important Semester Dates

- Week 2 – Martin Luther King, Jr. Holiday on Monday, January 21, 2019
- Week 3 – Last Day to Withdraw from Course(s) without academic record by Wednesday, January 30, 2019
- Week 3 – Withdrawal from course(s) with academic record ("W") Begins on Thursday. January 31, 2019
- Week 8 – Mid-Semester Examination Period, Thursday – Saturday, March 7-9, 2019
- Week 9 – Spring Break, March 11-16, 2019
- Week 10 – Mid-Semester Grades Due on Tuesday, March 19, 2019

- Week 11– Withdrawal from course(s) with academic record ("W") Ends on Friday, March 29, 2019
- Week 13 - Priority Registration Period Fall 2019 and Summer 2019 Begins
- Week 16 – Last Class Day for Spring Semester, Tuesday, April 30, 2019

TaskStream
TaskStream is a tool that Prairie View A&M University uses for assessment purposes. At least one of your assignments is **REQUIRED** to be submitted as an "artifact," an item of coursework that serves as evidence that course objectives are met. More information will be provided during the semester, but for general information, you can visit **TaskStream** via the link in eCourses.

Course Procedures

Submission of Assignments:
Assignment Submission
Dates to submit assignments will be provided to you at the time the assignment is handed out. **LATE ASSIGNMENTS WLL NOT BE ACCEPTED!!** Your homework should be complete, neat, and professionally presented. Use the following format for all of your homework;

1. Use **only engineering paper (no graph paper)** for submitting your homework
2. Your homework should have the following on top of the first sheet
    a. Your name and Roster Number
    b. Course name and section
    c. Homework number
    d. Date
3. Show all steps for arriving to the final answer clearly. Include all appropriate sketches.
4. Reference all figures, tables, constant values, equations, and conversions used to complete the problem.
5. Include all the appropriate units throughout the solution. Points will be deducted for answers presented without the appropriate units.
6. Start a new page for every new problem.
7. Problems should be in the order assigned.

Exam Policy:
Exams should be taken as scheduled. No makeup examinations will be allowed except under documented emergencies (See Student Handbook).

Professional Organizations and Journals

References

- *Engineering Mechanics - Statics and Dynamics*, I. H. Shames, **Prentice Hall,** 4th Ed.**,** (1997), Upper Saddle River, NJ.
- *Engineering Mechanics Volume I-Statics*, J. L. Meriam and L. G. Kraige, **John Wiley and Sons,** (1986), New York, NY.
- *Engineering Mechanics Volume II – Dynamics*, J. L. Meriam and L. G. Kraige, **John Wiley and Sons,** (1986), New York, NY.
- *Vector Mechanics for Engineers,* F. P. Beer and E. R. Johnston, **McGraw Hill Professional,** 8th Ed.**,,** (2007**),** New York, NY.
- *Engineering Mechanics: Dynamics,* A. Pytel and J. Kiusalaas, **CENGAGE Learning,** 3rd Ed., (2010), Stamford, CT.

16 WEEK CALENDAR

Week 1: Topic(s)	General Principles & Course Maintenance
Chapter(s):	Chapter 1
Assignment(s):	None
Week 2: Topic	Martin Luther King, Jr. Holiday & Force Vectors; and Equilibrium of a Particle
Chapter(s):	Chapter 2-4
Assignment(s):	None
Week 3: Topic(s)	Force Vectors; and Equilibrium of a Particle
Chapter(s):	Chapter 2-4
Assignment(s):	**Pre-requisite Exam & Homework # 1: Select Problems are Assigned**
Week 4: Topic(s)	Force System Resultants; Equilibrium of a Rigid Body

Chapter(s):	Chapter 5
Assignment(s):	**Homework # 2: Select Problems are Assigned**
Week 5: Topic(s)	Structural Analysis
Chapter(s):	Chapter 6
Assignment(s):	**Exam #1**
Week 6: Topic(s)	Center of Gravity and Centroid
Chapter(s):	Chapter 9
Assignment(s):	None
Week 7: Topic(s)	Moments of Inertia
Chapter(s):	Chapter 10
Assignment(s):	**TaskStream #1 and Homework #3 – Select Problems are Assigned**
Week 8: Topic(s)	Moments of Inertia & Friction
Chapter(s):	Chapters 10 & 8
Assignment(s):	**Exam #2**
Week 9: Topic(s)	**Spring Break, March 11-16, 2019**
Chapter(s):	None
Assignment(s):	None
Week 10: Topic(s)	Friction
Chapter(s):	Chapter 8
Assignment(s):	None
Week 11: Topic(s)	Kinematics of a Particle
Chapter(s):	Chapter 12
Assignment(s):	**Homework #4: Select Problems are Assigned**
Week 12: Topic(s)	Kinematics of a Particle
Chapter(s):	Chapter 12
Assignment(s):	**Exam #3**
Week 13: Topic(s)	Force and Acceleration (e.g., particles and rigid bodies)
Chapter(s):	Read Select Sections of Chapters 13 and 17
Assignment(s):	None
Week 14: Topic(s)	Impulse and Momentum (e.g., particles and rigid bodies)
Chapter(s):	Read Select Sections of Chapters15 and 19
Assignment(s):	**Homework #5: Select Problems are Assigned**
Week 15: Topic	Work and Energy (e.g., particles and rigid bodies)
Chapter(s):	Read Select Sections of Chapters 14 and 18
Assignment(s):	**Exam #4**
Week 16: Topic(s)	Last Class Day; Course Evaluation; Course Review for Final Examination
Assignment(s):	**Comprehensive Final Exam – Date/Time - To Be Announced**

Student Support and Success

John B. Coleman Library
The library and its partners have as their mission to provide resources and instructional material in support of the evolving curriculum, as a partner in Prairie View A&M University's mission of teaching, research, and service and to support the University's core values of access and quality, diversity, leadership, relevance, and social responsibility through emphasis on ten key areas of service. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty. https://www.pvamu.edu/library/ Phone: 936-261-1500

The Learning Curve (Center for Academic Support)
The Learning Curve offers Tutoring via peer tutoring. The services include workshops (i.e., Save My Semester, Recalculate Your Route), seminars (i.e., Tools You Can Use: TI-84), group review sessions (i.e., College Algebra Topic Reviews, GRE Preparation), group study opportunities (i.e., TSIA, HESI, Study Break, Exam Cram), and test-taking strategies (How to take Notes, Study Buddy, 5 Day Study Guide). The Learning Curve is a nationally certified tutoring program through the National Tutoring Association. The peer tutors are trained and certified by the coordinator each semester. Location: J.B. Coleman Library Rm. 207F. Phone: 936-261-1561

The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS)
The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS) is designed to help Prairie View students in their second year and beyond navigate towards graduation by providing the following services: Academic Advisement, Targeted Tutorials for Personalized Learning, Campus-Wide Referrals, and Academic & Social Workshops. Location: J.B. Coleman Library Rm. 306. Phone: 936-261-1040

Writing Center
The Writing Center provides student consultants on all aspects of the writing process and a variety of writing assignments. Writing Center consultations assist students in such areas as prewriting, brainstorming, audience awareness, organization, research, and citation. Students taking on-line courses or courses at the Northwest Houston Center or College of Nursing may consult remotely or by email. Location: Hilliard Hall Rm. 121. Phone: 936-261-3724.

Student Counseling Services
The Student Counseling Services unit offers a range of services and programs to assist students in maximizing their potential for success: short-term individual, couples, and group counseling, as well as crisis intervention, outreach, consultation, and referral services. The staff is licensed by the State of Texas and provides assistance to students who are dealing with academic skills concerns, situational crises, adjustment problems, and emotional difficulties. Information shared with the staff is treated confidentially and in accordance with Texas State Law. Location: Owens-Franklin Health Center Rm. 226. Phone: 936-261-3564

Testing
The Department of Testing administers College Board CLEP examinations, the HESI A2 for pre-nursing majors, LSAT for law school applicants and MPRE for second-year law students, the Experiential Learning Portfolio option, the Texas Success Initiative (TSI) Assessment, which determines college readiness in the state, and exam proctoring, among other service such as SAT and ACT for high school students. Location: Delco Rm. 141. Phone: 936-261-4286

Office of Diagnostic Testing and Disability Services
As a federally-mandated educational support unit, the Office of Disability Services serves as the repository for confidential disability files for faculty, staff, and students. For persons with a disability, the Office develops individualized ADA letters of request for accommodations. Other services include: learning style inventories, awareness workshops, accessibility pathways, webinars, computer laboratory with adapted hard and software, adapted furniture, proctoring of non-standardized test administrations, ASL interpreters, ALDs, digital recorders, livescribe, Kurtzweil, and a comprehensive referral network across campus and the broader community. Location: Evans Hall Rm. 317. Phone: 936-261-3585

Veteran Affairs
Veterans Services works with student veterans, current military and military dependents to support their transition to the college environment and continued persistence to graduation. The Office coordinates and certifies benefits for both the G.I. Bill and the Texas Hazlewood Act. Location: Evans Hall Rm. 323. Phone: 936-261-3563

Office for Student Engagement
The Office for Student Engagement delivers comprehensive programs and services designed to meet the co-curricular needs of students. The Office implements inclusive and accessible programs and services that enhance student development through exposure to and participation in diverse and relevant social, cultural, intellectual, recreational, community service, leadership development and campus governance. Location: Memorial Student Center Rm. 221. Phone: 936-261-1340

Career Services
Career Services supports students through professional development, career readiness, and placement and employment assistance. The Office provides one-on-one career coaching, interview preparation, resume and letter writing, and career exploration workshops and seminars. Services are provided for students at the Northwest Houston Center and College of Nursing in the Medical Center twice a month or on a requested basis. Distance Learning students are encouraged to visit the Career Services website for information regarding services provided. Location: Evans Hall Rm. 217. Phone: 936-261-3570

University Rules and Procedures

Disability Statement (Also See Student Handbook):
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Evans Hall, Room 317, or call 936-261-3585/3.

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.

Title IX Statement
Prairie View A&M University (PVAMU) is committed to supporting students and complying with the Texas A&M University System non-discrimination policy. It seeks to establish an environment that is free of bias, discrimination, and harassment. If you experience an incident of sex- or gender-based discrimination, including sexual harassment, sexual assault or attempted sexual assault, we encourage you to report it. While you may talk to a faculty member about an incident of misconduct, the faculty member must report the basic facts of your experience to Ms. Alexia Taylor, PVAMU's Title IX Coordinator. If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are individuals who can meet with you. The Title IX Coordinator is designated to handle inquiries regarding non-discrimination policies and can assist you with understanding your options and connect you with on- and off-campus resources. The Title IX Coordinator can be reached by phone at 936-261-2123 or in Suite 013 in the A.I. Thomas Administration Building.

Class Attendance Policy (See Catalog for Full Attendance Policy)
Prairie View A&M University requires regular class attendance. Attending all classes supports full academic development of each learner whether classes are taught with the instructor physically present or via distance learning technologies such as interactive video and/or internet.

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 during regular semesters and summer terms. Each faculty member will include the University's attendance policy in each course syllabus.

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.

TECHNICAL CONSIDERATIONS

***Minimum* Recommended Hardware and Software:**

- Intel PC or Laptop with Windows 7; Mac with OS X; Smartphone or iPad/Tablet with Wi-Fi
- High speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, Internet Explorer or Firefox

Note: Be sure to enable Java & pop-ups in the Web browser preferences

Participants should have a basic proficiency of the following computer skills:

- Sending and receiving email
- A working knowledge of the Internet
- Proficiency in Microsoft Word (or a program convertible to Word)
- Proficiency in the Acrobat PDF Reader
- Basic knowledge of Windows or Mac O.S.

***Technical Support*:**

Students should go to https://mypassword.pvamu.edu/ if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Office of Distance Learning at 936-261-3283

***Communication Expectations and Standards*:**

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement:

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplished by the use of the discussion board. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, it/they should be copied and pasted to the discussion board.

Civil Engineering Program Outcomes (Student Learning Outcomes)
ABET EAC Criterion 3 {[1] - [7] Student Outcomes (SOs} *Beginning Spring 2019*

1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3) an ability to communicate effectively with a range of audiences
4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Civil Engineering Program Criteria (2019-2020)

*Curriculum: The curriculum must prepare graduates to apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, **and at least one additional area of basic science**; **apply probability and statistics to address uncertainty**; analyze and solve problems in **at least four technical areas** appropriate to civil engineering; conduct experiments in **at least two technical areas** of civil engineering and analyze and interpret the resulting data; design a system, component, or process in at least two civil engineering contexts; **include principles of sustainability in design**; explain basic concepts in **project management**, **business**, **public policy**, and **leadership**; analyze issues in **professional ethics**; and explain the importance of **professional licensure**.*

*Faculty: The program must demonstrate that faculty teaching courses that are primarily design in content are **qualified** to teach the subject matter by virtue of **professional licensure**, or by **education** and **design experience**. The program must demonstrate that it is **not critically dependent on one individual**.*

Civil Engineering Program Educational Objectives (PEOs)

Graduates from the Civil Engineering program will:

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

Mapping of Program Educational Objectives (PEOs) onto Program Outcomes

PEO	Objectives	CVEG Program Outcomes						
1.	*Graduates from the Civil Engineering program will*:	[1]	[2]	[3]	[4]	[5]	[6]	[7]
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
PEO 2	obtain professional licensure/certifications	X	X					
PEO 3	complete graduate studies in civil engineering or related fields	X	X	X	X		X	X
PEO 4	engage in professional development and service	X	X	X	X		X	X

Mapping of CVEG Courses onto PEOs and Program Outcomes [Beginning Spring 2019]

Course No	Course Title	CVEG Program Educational Objectives				CVEG Program Outcomes						
		1	2	3	4	[1]	[2]	[3]	[4]	[5]	[6]	[7]
CVEG 1011	Intro to Engineering	X			X							
CVEG 1021	Intro to Civil Engineering	X	X		X							I
CVEG 2001	Emerging Issues in CE Prof	X	X		X			I	M	I		R
CVEG 2043	Engineering Mechanics I	X	X									I
CVEG 2061	Materials & Dynamics Lab										M	
CVEG 2063	Mechanics of Materials I	X	X				I					
CVEG 2081	Surveying & Geospatial Concepts							R			M	
CVEG 3023	Geotechnical Engineering	X	X				I					
CVEG 3031	Concrete & Steel Lab	X									M	
CVEG 3043	Environmental Engineering	X	X					R			M	
CVEG 3053	Transportation Engineering	X	X					R		M		
CVEG 3063	Hydraulics	X	X					M		R		
CVEG 3073	Structural Analysis I	X	X			I						M
CVEG 3083	Steel Design	X	X	X	X	M	M	R				
CVEG 4013	Reinforced Concrete	X	X	X	X	R	M					
CVEG 4021	Geotech Engineering Design Lab						R					M
CVEG 4043	Environmental Eng Design	X	X	X	X	M	M	R				
CVEG 4053	Transportation Eng Design	X	X	X	X	M		M	M	M		
CVEG 4063	Water Resources Eng.	X	X	X	X	M	M					I
CVEG 4072	Systems Engineering and Uncertainty						M					M
CVEG 4141	Engineering Mgmt & Ethics								M			
CVEG 4472	Sr. Design & Professionalism I	X	X	X	X		M	M	M	M		M
CVEG 4482	Sr. Design & Professionalism II	X	X	X	X	M	M	M	M			

I - means the described outcome is introduced (not measured) but could be monitored.
M - means that the skills described in the program outcome are covered and measured in the course.
R - means the described outcome is reinforced in the course (not measured) but could be monitored.

Additionally evidence are to be collected to satisfy CE Program Criteria covering basic concepts in Management (CVEG 3053, 4053, 4472, 4482, 4072), Business (CVEG 2001, 4141, 4472, 4482), Public Policy (CVEG 2001, 4141, 4472, 4482), Professional Ethics (CVEG 3051, 4141), Leadership (CVEG 4472, 4482); and considerations of sustainability in developing engineering solutions (CVEG 4043, 4053, 4063)

Note: Courses with a mixture of students from other Programs are intentionally excluded when possible.

The Assessment Process

Student Learning outcomes are measured using both **direct** and **indirect** measurements. Direct measurement are derived from either designated homework, tests, lab reports project reports or other assignments. Indirect measurement are drawn from end-of-semester Student Opinion Surveys (SOS) and any surveys completed by graduating Seniors. The above listed Student Learning Outcomes (Program Outcomes) are measured and evaluated in specified cycles and an Assessment Report is prepared annually for the purposes of continuously improving the Program's learning outcomes.