Department of Civil Engineering
CE 1301: Civil Engineering Fundamentals (CRN 27116)
UGLC 346
TTh 7:30 am-8:20 am
Laboratory
E-213
M, T, W, R 8:30am-11:20 am;

Instructor Contact Information and Biography

Dr. Ivonne Santiago
Engineering Annex A218
500 W. University Ave
El Paso, TX 79968
Office: A-218
Office Hours: T 11:30am-12:15 pm and Thursdays 1:00 pm-2:00 pm in office and/or in virtual office in BB or by appointment
E-mail: **isantiago@utep.edu**. **For class matters use Blackboard e-mail under the class comumication tools.** I will repond to your emails within 24 business hours..
Phone: 915-747-8478

I grew up in Guayanilla (**http://en.wikipedia.org/wiki/Guayanilla,_Puerto_Rico**) , a municipality of Puerto Rico, located on the southern coast of the island, bordering the Caribbean Sea, south of Adjuntas, east of Yauco; and west of Peñuelas and about 12 miles (20 km) west of Ponce, the 2nd largest city of Puerto Rico.(**http://en.wikipedia.org/wiki/Ponce,_Puerto_Rico**) (population <200,000).

I have a Bachelor's degree in Civil Engineering from the University of Puerto Rico at Mayaguez (UPRM), a Master's degree in Environmental Systems Engineering from Clemson University, and a Ph.D. in Civil Engineering, Specialized in Environmental Engineering, from New Mexico State University. In Puerto Rico, I was a professor in Civil Engineering at UPRM and worked in research (EPA, DOD, NSF) dealing with removal of contaminants from water using natural adsorbents, remote telemetry systems for monitoring of a small community drinking water treatment plant, physical modeling of transport of explosive related chemicals in sub-surface environments, and odor problems of combined sewer-overflows. I worked as consultant to the Comptroller of Puerto Rico as an auditor of the 10 largest water and wastewater treatment plants in Puerto Rico. I was part of the Puerto Rico Environmental Quality Board (PREQB) and Director of the Water Quality Area in the PREQB. I am currently a Clnical Professor in the Department of Civil Engineering, I am an appointed member of the El Paso Water Public Service Board (PSB), and I am on my third term as a member of the Environmental Protection Agency National Advisory Committee (NAC). The NAC advises the administrator of the EPA on environmental policy issues related to the implementation of the North American Agreement on Environmental Cooperation. I was also a member of The Good Neighbor Environmental Board (GNEB) that advises the President and Congress of the United States on good neighbor practices along the U.S. border with Mexico. Since I have been at UTEP. I have taught courses in Environmental Engineering, Engineering Economy, Engineering Statics, Water and Wastewater Engineering, Capstone Senior Design Courses (I and II), Thermo-fluids, and Experimental Design. There is not enough space in this syllabus to explain why I left "paradise" for El Paso, but my family ended up here in 2006. I can say I really have come to love UTEP and our students. I have found hard-working students that truly want to build a better future for themselves and their families. You can learn more about my teaching philosophy at http://engineering.utep.edu/announcement073117a.htm

Course Description and Objectives

This course involves a hands-on survey of the five disciplines of civil engineering (geotechnical, structural, transportation, environmental, and construction) and an introduction to engineering mechanics with a focus on the fundamentals of statics. The objectives of this course are to develop:

- an understanding of the breadth of the civil engineering profession and the significant role that civil engineers provide in civilization
- an understanding of several typical career pathways for civil engineers, especially including professional engineering licensure
- an intuitive understanding of loads and moments
- a mathematical vector analysis of forces and moments in static structures
- fundamental analysis of reaction forces and moments on static rigid bodies
- introduction to dynamics with conservation of energy, momentum, and angular momentum A few things I want to share about this class

Course Resources

Required Course Materials:

- MasteringEngineering for "CE1301SPR18SANTIAGO"

AND

- Engineering Mechanics: Statics & Dynamics, 14th Edition, R.C. Hibbeler, 2015, Pearson(Alternatively, you may purchase the 14th Ed. Statics and 14th Ed. Dynamics textbooks separately.)

Supplemental Materials:

- Engineering Statics by Carnegie Mellon (https://oli.cmu.edu/jcourse/webui/guest/join.do?section=statics)
- Khan Academy: forces and torque (moments)
  - https://www.khanacademy.org/math/trigonometry
  - https://www.khanacademy.org/science/physics/forces-newtons-laws
  - https://www.khanacademy.org/science/physics/torque-angular-momentum/torque-tutorial/v/introduction-to-torque

Blackboard: This is a *Technology Enhanced Course (TEC).* This means that we will be using Blackboard as the main means of communication, information sharing, on-line quizes, uploading homeworks, and resource materials. Your homeworks and course material for the week will be posted every Monday by COB, so make sure you make visiting BB part of your weekly routine and schedule.

EDPuzzle: Go to https://EDpuzzle.com and create an account as a student and join the class "CE1301-Civil Engineering Fundamentals-Spring 2018" using the code **vuofovu**. Alternatively you can visit this link: https://edpuzzle.com/join/vuofovu . We will use this tool to create out of class quizes or homeworks that are embedded in the class videos.

Iclicker cloud: Instructions to register can be found in Blackboard. You can also follow http://admin.utep.edu/Default.aspx?tabid=74573 for additional information. This is an important tool that will be used for quizzes, polling, and attendance. You can use your own mobile device (laptop, tablet, or smartphone) or cliker to submit your responses to iclikcer cloud.

ABCD card: Low-tech in class response system for just-in-time teaching. You will be given one copy. If you lose it, you need to reprint it. We will use ABDC cards for " just in time teaching" and quick polling.

Approved calculators:

NCEES has approved the following list of calculators for use in the April and October 2013 exam administrations:

Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name. Examples of acceptable Casio fx-115 models include but are not limited to the following:

- fx-115 MS
- fx-115 MS Plus
- fx-115 MS SR
- fx-115 ES
- fx-115 ES Plus

Hewlett Packard: The HP 33s and HP 35s models, but no others.
Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name. Examples of acceptable TI-30X and TI-36X models include but are not limited to the following:

- TI-30Xa
- TI-30Xa SOLAR
- TI-30Xa SE
- TI-30XS Multiview
- TI-30X IIB
- TI-30X IIS
- TI-36X II
- TI-36X SOLAR
- TI-36X Pro

Class format

Team Based Learning: Team-based learning (TBL) is a structured form of small-group learning that emphasizes student preparation out of class and application of knowledge in class. Students will be organized into diverse teams of 5-7 students that work together throughout the semester.

Flipped classes: We will often have flipped classes (especially when I am away on UTEP-related travel). That means that you need to study ahead of time the material that may include videos and complete in-class homeworks during the regular class time.

Blackboard: Please be aware that this is a very Blackboard-intensive course that will help you be engaged with the class outside the classroom. You need to make sure that you check Blackboard for homework announcements and deadlines. Generally, you will receive an e-mail with the announcement. If you have a smart phone, make sure you receive your UTEP e-mails on your phone so you have real-time announcements.

Expectations

Participation: More than simply attending class, you are invited to think, and participate in the lectures and discussions. I encourage you to be curious and inquisitive during lectures and discussions.

Preparedness: I recommend that you bring the textbook, a personal course notebook, a pen or pencil, a calculator, completed homework assignments, and questions from the homework and assigned reading.

Punctuality: You are expected to be on time to class, laboratory exercises, and tours. Assignments submitted late will not be graded and will receive no credit.

Ethics: In engineering, personal integrity is of utmost importance, especially in the design of civil infrastructure. Also, in most cases, it is necessary to work in teams to develop and design optimal solutions to problems and challenges, and it is essential that each team member contribute to the productivity of the team. In this course, I strongly recommend that you complete homework assignments in teams; in many cases, you will help each other through the solution of difficult problems. My goal for the homework is for you to develop proficiency in the basic application and calculations in design. Thus, every student is accountable for understanding the concepts, analysis, and solution. My goal for team projects is for you to have opportunity to apply this theory in a deeper and more meaningful way than homework. Each student is accountable for understanding and contributing (equitably) to the team projects. Any student committing plagiarism (e.g., copying another's work) or any other form of academic dishonesty will be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for disciplinary action (which may include expulsion from the University). For a concise summary of engineering ethics, I have provided here the Fundamental Canons within the Code of Ethics of the American Society of Civil Engineers (ASCE):

1. Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development in the performance of their professional duties.

2. Engineers shall perform services only in areas of their competence.

3. Engineers shall issue public statements only in an objective and truthful manner.

4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.

5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.

6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity, and dignity of the engineering profession and shall act with zero-tolerance for bribery, fraud, and corruption.

7. Engineers shall continue their professional development throughout their careers, and shall provide opportunities for the professional development of those engineers under their supervision.

8. Engineers shall, in all matters related to their profession, treat all persons fairly and encourage equitable participation without regard to gender or gender identity, race, national origin, ethnicity, religion, age, sexual orientation, disability, political affiliation, or family, marital, or economic status.Assignments and quizes

Homework

Pearson: Homework assignments will be completed through Pearson MyLab, which is provided to you through UTEP Blackboard (available from https://my.utep.edu/). Registration instructions are posted on the Blackboard homepage for this course. You will need to purchase access before the 14-day trial expires, and. Homework assigned will be due the following class day (i.e., homework assigned on Tuesday will be due Thursday, and homework assigned on Thursday will be due Tuesday).

On-line homeworks: On-line homeworks will anounced on Blackboard and it can be in the form of an on-line test or a quiz using Edpuzzle.com.

Ticket to Class (TTC) Homeworks: Homeworks classified as TTC homeworks must be turned in before the class starts. TTC homeworks submitted on paper, need to be turned in at the beginning of the class. TTC homeworks are usually problems that we started solving in the class but did not have time to complete. As soon as you come in place homework on the table without having to ask me. Make-up homeowrks or homeworks turned in 15 minutes after the class starts will not accepted.

RATs: A RAT or a Rapid Assessment Test is an individual short-answer or multiple choice quiz given at the beginning of class. Usually a RAT will be followed by an group IF-AT (Inmediate Feedback assessment test) or a group assessment quiz.

Exams and grades

Partial exams: Three partial exams will be given. You must take the exams during the scheduled exam periods. These dates are announced on the first day of class although the dates may be changed according to the progress of the class. Do NOT make other plans on these days. Do NOT schedule airline flights on these days. You will NOT be excused. If you are not present for the exam, you will receive a grade of zero. **No Make-up exam will be given under any circumstance (excused or unexcused)**. Final exam grade will count for missing or lowest partial exam grade.

Final Exam: The final exam is a **closed book-closed note** comprehensive exam. Every student is required to take the final exam at the end of the semester and pass it with at least a grade of 50%, otherwise you get an F in the course.

Attendance: University policy dictates that all students attend all scheduled classes. Attendance can be checked randomly, and not necessarily in every class, by the instructor through sign-up sheets, exams, roll calling, randomly picked names for problem solving in class, or other mechanisms. YOU AND ONLY YOU ARE RESPONSIBLE FOR SIGNING ATTENDANCE SHEETS, WHEN PASSED AROUND THE CLASS. You need to be present at the moment of the roll call, otherwise it will be considered an absence. Additionally, all exams, and quizzes may be given at the beginning or end of the classes. No additional time nor make up quizzes will be given to late attendees or early leavers.

Grade Distribution:

Description	Content	Percent of Final Grade
Homework	Pearson and EdPuzzle. Sections covered during the week. You may have either a homework, a quiz, team-work, or all in any given week.	**30%**
Quizzes	Short quizes, RATs, and/or I-CLicker	**5%**
4 Partial Exams	Refer to Exam Schedule	**30%**
Laboratory and participation	Laboratory exercises or attendance to field trips	**10%**
Final Exam	Comprehensive	**25% but if you get less than 50% you get an F in the course**

Grading Scheme: The instructor reserves the right to revise this grading plan. However, students will be informed of any changes.Your final grade will be calculated based on the points you have accumulated as follows:

A **>89.5**
B **>79.5 but <89.5**
C **>69.5 but <79.5**
D **>59.5 but <69.5**
F **<59.5**

Note that 89.44 is B, 79.44 is C, 69.44 is D, 59.44 is F. This is where your bonus points come to your rescue!

A NOTE ON CLAIMS: You have **two weeks after the due date to stop by my office in cases of claims in points** for homeworks (TTC, Blackboard Homeworks, IF-ATs, etc.). Also, you only have **two weeks after I return your graded exams** to do this. **The end of the semester or after the final exam is too late to come to my office to "fish" for extra points in homeworks or exams.**

I reserve the right to modify or augment this syllabus for the sake of improving the educational effectiveness of this course. Notice will be provided in class and by email, and the current version of the syllabus will be posted on Blackboard.

Class Policies

Purpose: These policies serve to help make the learning experience optimally effective and enjoyable for everyone.

Professional conduct: Be kinder than neccesary! During this course, I expect you to deal with your peers and with me in a professional manner. Be courteous and honest and always communicate with each other in a way that shows respect and sensitivity to cultural, religious, sexual, and other individual differences. I expect you to come to class on time and stay focused on the lecture and learning activities.

Cell Phones ringtones are OFF in Class: First, professionals turn off their cell phone ringtones in a meeting with other professionals in order to give full attention to the discussion. Second, a ringing phone disrupts because the sound of a phone attracts attention. Disruptions of the learning process are annoying. Your meeting time in class is valuable, chat and text with your friends outside of your team meeting. Having said that, if you have a smartphone, we will be using it during class.

Use of Laptops: If you do not have a smart phone, you will need to bring a laptop to class. Do not allow your laptot to disrupt your learning process! Do not surf the internet on topics not related to your class activities, or answer your email, instant message, facebook, video viewing, music playing, game playing, etc. These activities show a lack of respect for your classmates and myself, and also shows a disinterest in the course which is un-professional and un-acceptable. A few suggestions that will help the use of laptops in class:

1. Charge your laptop batteries fully before coming to class.
2. Set your laptop volume control to mute or off before coming to class.
3. Keep your laptop closed during presentations and other specific in-class activities.
4. If I see you playing games or surfing the net on subjects not related to the class, I have the right to ask you to leave the classroom.

Be a premeditated learner! Learning does not come from just listening, taking notes, and studying the night before the exam. Understand how you learn best and continuously improve on it. Make connections between the material covered in class and the world around you so you can make of this class not just a lecture but a life-learning experience.

Cheating, Plagiarism, Scholastic Dishonesty, and Student Discipline: Cheating is unethical and not acceptable. Plagiarism is using information or original wording in a paper without giving credit to the source of

that information or wording: it is also not acceptable. Do not submit work under your name that you did not do yourself, ever. You may not submit work for this class that you did for another class. If you cheated or plagiarized, you will be subject to disciplinary action as stated in the UTEP undergraduate catalog policy.

"Scholastic dishonesty (which includes the attempt of any student to present the work of another as his or her own, or any work which s(he) has not honestly performed, or attempting to pass any examination by improper means) is a serious offense and will subject the student to disciplinary action. The aiding and abetting of a student in any dishonesty is held to be an equally serious offense. All alleged acts of scholastic dishonesty should be reported to the Dean of Students for disposition. It is the Dean of Students' responsibility to investigate each allegation, dismiss the allegation, or proceed with disciplinary action in a manner which provides the accused student his or her rights of due process."

Refer to http://www.utep.edu/dos/acadintg.htm for further information.

You must cite, reference, or quote information obtained from other sources so you give credit where credit is due. If you do not know how to do that, ask. In addition, when an assignment specifies that you must perform a task individually, asking for your classmates' help is scholastic dishonesty. Do NOT copy any material, regardless of where you obtained it, into your own work. Do NOT submit work under your name if you did not complete it entirely yourself; be honest and tell me you did it together. The consequences will be less severe when you are up front about it than when you try to hide it.

UTEP now has a site license for Turnitin.com, a plagiarism detection tool that you can also use to check your own work for this or other classes to prevent getting in trouble. I will report any instances of plagiarism and dishonesty to the Dean of Students Office and the grade for the assignment will be an "F" or "zero".

If you want to test your understanding of plagiarism, take the self-assessment at http://education.indiana.edu/~frick/plagiarism or visit http://www.turnitin.com

Students with Any Type of Disability:

UTEP seeks to provide reasonable accommodations for all qualified individuals with disabilities, including learning disabilities. This university will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required affording equal educational opportunity. It is the student's responsibility to register with Center for Accomodation and Support Services (CASS) in the East Union Bldg., Room 106 within the first two weeks of classes, and inform the faculty member to arrange for appropriate accommodations.

Center for Accomodation and Support Services (CASS) can also be reached in the following ways:
Web: http://sa.utep.edu/cass/
Monday thru Friday 8:00a.m.-5:00p.m.
Union Building East Room 106
Phone:(915) 747-5148
cass@utep.edu

Time Management

The tentative schedule contains practice problems. Expect to spend three hours on preparation and learning assignments for every semester credit hour. Since this class is a 3-semester credit hour class, expect to spend about 9-10 hours out of class on assignments in addition to 3 hours of in-class time for a total of about 12 hours per week to obtain an "A" in this class. One of your tasks is to develop a Time Management Plan for yourself. This means that you will:

1) Create a weekly calendar containing you class times, your work times, your family activities, your breakfast, lunch and dinner activities, your physical activities and exercise (no excuses, you are a Kinesiology major!), time to go shopping, etc.

2) Create a semester calendar for including the months of August, September, October, November, and Decemeber, in which you enter your weekly activities and the quizzes and exams for each of your courses. Create your plan and stick to it!!

Tentative schedule (subject to change)

Class	Day	Date		Topics	Reading	Assignment
1	T	JAN	16	Introduction to Civil Engineering & Honor Code	-	HW 1
2	R		18	General Principles	Ch. 1.1-6	HW 2
3	T	JAN	23	Trig review and resolving vectors into components	Ch. 2.1-3	HW 3
4	R		25	Addition of force vectors	Ch. 2.1-3	HW 4
5	T		30	Solving for an angle to balance forces	Ch. 2.1-3	HW 5
6	R	FEB	1	Addition of a system of coplanar forces	Ch. 2.4	HW 6
7	T		6	Cartesian (3D) vectors: single force comps. & angles	Ch. 2.5	HW 7
8	R		8	Cartesian vectors: resultant force	Ch. 2.6	HW 8
9	T		13	Position vectors and force vector along a line	Ch. 2.7-2.8	HW 9
10	R		15	**EXAM 1 – Statics Ch. 1-2.4**	-	**HW 1-6**
11	T		20	Dot product	Ch. 2.9	HW 10
12	R		22	Particle Equilibrium and Free-Body Diagrams	Ch. 3.1-3	HW 11
13	T		27	Coplanar Force Systems with springs	Ch. 3.1-3	HW 12
14	R	MAR	1	Three-dimensional force systems	Ch. 3.4	HW 13
15	T		6	Dry friction	Ch. 8.1-2	HW 14
16	R		8	**EXAM 2 – Statics Ch. 2.5-9, 3.1-4**	-	**HW 7-13**
				MAR 12-16 SPRING BREAK		
17	T		20	Moment of a force: scalar formulation	Ch. 4.1	HW 15
18	R		22	Moment of a force: vector formulation	Ch. 4.2-3	HW 16
19	T		27	Principle of Moments; 3D moments	Ch. 4.4	HW 17
20	R		29	Reduction of a simple distributed loading	Ch. 4.9	HW 18
21	T	APR	3	Equilibrium of a rigid body	Ch. 5.1-3	HW 19
22	R		5	Rectilinear Kinematics	Ch. 12.1-2	HW 20
23	T		10	Projectile Motion	Ch. 12.4-6	HW 21
24	R		12	**EXAM 3 – Statics Ch. 8.1-2; 4.1-4,9; 5.1-3**	-	**HW 14-19**
25	T		17	Circular motion: normal and tangential	Ch. 12.7	HW 22
26	R		19	Equations of motion	Ch. 13.1-4	HW 23
27	T		24	Conservation of Energy (potential & kinetic)	Ch. 14.1-3, 6-7	HW 24
28	R		26	Conservation of Momentum	Ch. 15.1-3	HW 25
28	T	May	1	**EXAM 4 – Dynamics Ch. 12-15**	-	**HW 17-25**
29	R		3	Review		
30				*FINAL EXAM*	*(comprehensive)*	*HW 1-25*

When I have UTEP-related travel, classes will be flipped. This means that I will provide you with the material to study before the class and you will be ready for an in-class homework with the TA.

Tentative Laboratory Schedule (MTWR) – *subject to change*

Week	Starting		Activities
-	Jan	15	*First week of class (no labs)*
1	Jan	22	Soil bearing strength
2		29	Concrete mix and cylinders
3	Feb	5	Water resources and treatment
4		12	Construction drawing scavenger hunt
5		19	City Engineering Office Tour
6		26	Compression test concrete cylinders
7	Mar	5	Tire-pavement friction
-		11	*Spring Break (no labs)*
8		19	Weld steel straps
9		19	Tensile test welded steel bars
10	Apr	2	City Engineering Office Tour
11		9	Fred Hervey Reuse Plant Tour
12		16	Tower strength testing
13		23	TXDOT office tour
14		30	Marble roller coaster launcher