

CE 4171 – Engineering Problems –Fall 2020

The University of Texas at El Paso
Department of Civil Engineering
Independent Study (no scheduled class meetings)
Lecture CRN: 15618
Corequisite: CE 3342

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NOTICE: To mitigate spread of COVID-19 (coronavirus SARS-CoV-2), this course will be only ONLINE. Homework assignments, quizzes, and exams will all be conducted asynchronously online, and communication will be sent by email through Blackboard.

Students are required to have a webcam to take online exams.

NOTICE: COVID-19

Students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms.

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at screening.utep.edu. If you know anyone who should report any of these three criteria, encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to COVIDaction@utep.edu.

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website (screening.utep.edu) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are pre-sent. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

NOTICE: Degree Plan Change

In previous semesters, CE 3342 was only lecture, and the CE 3153 laboratory was a separate course. However, in the new B.S. C.E. degree plan, CE 3342 is now an integrated lecture and laboratory. Thus, students taking this course this semester need to be aware of several directives:

- If you are on an old degree plan that requires both CE 3342 (lecture only) and CE 3153 (lab), then:
 - If you have not already taken CE 3342 (lecture only), then you will need to register for both the CE 3342 (now both lecture (18529) and a Mon (17421) or Wed (17422) lab) and CE 4171 Engineering Problems (15618), so that you can satisfy the four credit-hour requirement for your degree plan. When you apply for graduation, the combination of the new CE 3342 combined with CE 4171 will count together for credit for CE 3342 and CE 3153.
 - If you already passed CE 3342 (lecture only) in a previous semester but not CE 3153 (lab only), then you only need to register for CE 3153 (lab only), either Mon (17739) or Wed (17746).
 - If you already passed CE 3153 (lab only) in a previous semester but not CE 3342, then you need to register for CE 3342 (CRN listed above), and you need to complete the same book reading and Packback assignments as the students enrolled in CE 4171 (CRN listed above) to earn the full three hours of credit this semester.
- If you are on the new degree plan which does not require CE 3153 (lab), then you will need to register for CE 3342 (both the lecture and one of the labs).

Philosophy

I believe that *teaching* and *learning* are interdependent; you cannot have one without the other. You and I are partners and colleagues, working together to help you become a knowledgeable, curious, intrinsically motivated, and confident engineer. I want to help you become a critical thinker with sharpened skills of analysis, evaluation, and synthesis. I have a book reading (choose one of three options) in this course to help you prepare for professional practice and to help you develop as a more robust and intrinsically-motivated engineer. I have also realized that it is important to incorporate weekly responses (through an online forum called Packback), which helps students keep up with understanding and applying concepts. 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 class discussions and online forums.

Required Reading:

- Option 1:** **Marc Reisner (2017) Cadillac Desert: The American West and Its Disappearing Water, Revised Edition Penguin Books (ISBN 9780140178241)**
- Option 2:** **Scott Harrison (2018) Thirst: A Story of Redemption, Compassion, and a Mission to Bring Clean Water to the World, Currency (ISBN 9781524762841)**
- Option 3:** **McGuire & Pearthree (2019) Tuscon Water Turnaround: Crisis to Success, AWWA 20844 (ISBN 9781625763433)**

Description and Objectives

This course is a supplement to CE 3342 (as described in the Degree Plan Change section above). The reading options are: (1) Cadillac Desert (566 pages), a classic text in the field of water resources engineering in the arid and semi-arid southwestern United States, covering the origins of much of the large water storage reservoirs and conveyance infrastructure, as well as the modern challenges of overallocation and long-term sustainability; (2) Thirst (314 pages), a recent autobiographic text on the life and work of Founder & CEO of Charity: Water, describing the background, maturation, and professional development of author Scott Harrison as his career evolved and he created a non-profit to help provide people around the world with safe drinking water, and (3) Tuscon Water Turnaround (441 pages), a recent documentary text on the quest for water sustainability and resiliency by a municipal water utility in an arid desert landscape.

(You can compare the chapter titles of each book in the reading schedules listed at the end of this syllabus.)

Packback Forum

Packback is an online curiosity community where you can be fearlessly curious and ask big questions about how what we're studying relates to life and the real world. Packback will be assisting you with developing writing skills while enhancing your ability to critically analyze the discussions of this course to draw real-world conclusions. For a brief introduction to Packback Questions and why we are using it in class, watch this video: <https://vimeo.com/163888277>. I believe that your life-long learning is more affected by seeking to know WHY than WHAT. In this course, I want you to empower yourself through deep connections between the course materials and your why. Your time in my course will be brief, but your potential to make the most of your life is great. I hope that through this forum you are able to be inspired by your peers to make the most of your learning.

Before you start posting, be sure to read the Community Guidelines found in the tutorial on Packback. If your post doesn't follow the Packback Community Guidelines, there is a chance it will be removed and you won't receive points for that post. **There will be a weekly deadline of Monday at 1:00 am Mountain Time for submitting posts.** Note: it takes 24 hours for the Packback team to moderate a post and send a coaching email. If by any reason your post is moderated because it does not meet the Community Guidelines, you will need to edit and re-publish your post to receive credit for the week. It is important that you complete your Packback questions and responses several days in advance of the deadline in case your post is moderated.

How to Register on Packback: You will receive a welcome email from help@packback.co prompting you to finish registration and payment (\$25). Packback has already created an account for you with your UTEP email address, so all you need to do is reset your password. This email may be directed to spam or filtered out, so make sure you do a thorough scan of your inbox if you can't find the email. But, if you can't find the email, then you may register by following the instructions: First, create an account by navigating to <https://questions.packback.co> and clicking "Sign up for an Account". Or if you already have an account on Packback, then you can log in with your credentials. Second, then enter our class community's lookup key into the "Looking to join a community you don't see here?" section in Packback at the bottom of the homepage (Community Lookup Key: 3e35daab-5c96-418e-8a1d-541ce7066221). Finally, follow the instructions on your screen to finish your registration.

If you have ANY questions or concerns regarding Packback throughout the semester, please contact the customer support team at help@packback.co.

Since this involves weekly professional writing, I encourage you to use this opportunity this semester to improve your technical and professional writing skills. I strongly encourage you to use a grammar check (e.g., <http://www.grammarly.com>) and proofread your questions and responses before posting. Unfortunately, popular culture includes making opinionated statements on social media, but in this platform, we want to postulate questions and make statements based on factual information.

For CE 4171, your participation on Packback will count towards 100% of your overall CE 4171 course grade. Your Packback grade is based on weekly participation: post one Question and three Responses per week, relevant to the assigned chapter that week. By the end of the semester, you should have posted 14 Questions and 42 Responses to other students' Questions (*i.e.*, a total of 56 posts). Part of your Packback grade will be based on your average Curiosity score; an average Curiosity score of 80 will constitute full-credit for the Curiosity score component, and an average Curiosity score of 30 or less will receive no-credit. The Packback Participation Score (*PPS*) for CE 4171 will be calculated according to the following equation:

$$PPS_{CE\ 4171} = \left(\frac{N_Q}{14}\right)\left(\frac{N_R}{42}\right)\left(\frac{ACS - 30}{50}\right)\left(1 - \frac{N_{IW} - 1}{14}\right)$$

where N_Q is the number of questions posted, N_R is the number of responses posted, ACS is the Average Curiosity Score of all of your posts for the semester, and N_{IW} is the number of inactive weeks (no posts).

Course Grade

Assessment of your performance in this course will be determined by Packback participation. The course average will be computed by the following grading scheme:

Evaluation	Fraction (%)
Packback Participation Score (PPS)	100
<i>Total</i>	<i>100</i>

The final course grade will be determined according to the following:

Course Average (%)	Grade
≥ 90	A
80-89	B
70-79	C
60-69	D
< 60	F

I reserve the right to modify or augment this grading scheme for the sake of improving the educational effectiveness of this course.

General Student Services and Support:

UTEP provides a variety of student services and support:

Technology Resources

- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- [Engineering Technology Center \(ETC\)](#): Engineering software and computer support.
- [UTEP My.Apps](#): server-based software access

Academic Resources

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Engineering Tutoring Center \(ACES\)](#): Tutors are recruited from engineering and science student organizations and honor societies.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

Individual Resources

- [Military Student Success Center](#): Assists personnel in any branch of service to reach their educational goals.
- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.

Special Accommodations

The University of Texas at El Paso provides, upon request, appropriate academic accommodation for students with disabilities. For more information, contact the Center for Accommodations and Support Services (<https://www.utep.edu/student-affairs/cass/>).

Packback Schedule: Option 1 – Cadillac Desert

Week	Reading Assignment	Description	Packback Assignment
1	Introduction	A Semidesert with a Desert Heart	1
2	Chapter 1	A Country of Illusion	2
3	Chapter 2	The Red Queen	3
4	Chapter 3	First Causes	4
5	Chapter 4	An American Nile (I)	5
6	Chapter 5	The Go-Go Years	6
7	Chapter 6	Rivals in Crime	7
8	Chapter 7	Dominy	8
9	Chapter 8	An American Nile (II)	9
10	Chapter 9	The Peanut Farmer and the Pork Barrel	10
11	Chapter 10	Chinatown	11
12	Chapter 11	Those Who Refuse to Learn ...	12
13	Chapter 12	Things Fall Apart	13
14	-	<i>Thanksgiving</i>	-
15	Epilogue	A Civilization, If You Can Keep It	14

Packback Schedule: Option 2 - Thirst

Week	Reading Assignment	Description	Packback Assignment
1	Ch. 1-3	Numb, Poison, Family	1
2	Ch. 4-6	Getting Pure, Slide, “Wishy-Washy ...”	2
3	Ch. 7-9	Lord Scott Harrison, Pursuit, Captured	3
4	Ch. 10-12	Escape, Mercy, A New Day	4
5	Ch. 13-15	Patient No. 1, Ship Time, Homesick	5
6	Ch. 16-18	“Actions, ...”, “They Drink This?”, mercy.	6
7	Ch. 19-21	Better to Beg, Africa Time, No Strings Attached	7
8	Ch. 22-24	Nonprofits for Dummies, charity: water, Three Pillars	8
9	Ch. 25-27	True Believers, Vik, Born in September	9
10	Ch. 28-30	Oblivious, Running on Empty, Radical Transparency	10
11	Ch. 31-33	Do Something, Totally Undisciplined, Do Better	11
12	Ch. 34-36	Rachel’s Gift, Dirty Brown Laundry, With No One Looking Over Your Shoulder	12
13	Ch. 37-39	Just Keep Going, All the Sound Bites ..., Chief Water Boy	13
14	-	<i>Thanksgiving</i>	-
15	Ch. 40-41	The Spring, Someone Like You, You Are Invited	14

Packback Schedule: Option 3 – Tuscon Water Turnaround

Week	Reading Assignment	Description	Packback Assignment
1	Ch. 1-3	October Surprise for Tuscon, Water in the Sonoran Desert, Extending the Straw to Tuscon	1
2	Ch. 4	Selling the New Water Supply	2
3	Ch. 5	Designing Treatment for CAP Water	3
4	Ch. 6	Distribution System Woes	4
5	Ch. 7	Hayden-Udall Water Treatment Facility Operations	5
6	Ch. 8	Debacle Begins	6
7	Ch. 9	Wake-Up Calls	7
8	Ch. 10	Initial Efforts to Control the Problem	8
9	Ch. 11	Bifurcation to Abandonment	9
10	Ch. 12	Moving Beyond CAP Direct Delivery	10
11	Ch. 13-14	Searching for Solutions, Putting Customers First	11
12	Ch. 15	At the Tap Meets a New Leader	12
13	Ch. 16	Turnaround and Success	13
14	-	<i>Thanksgiving</i>	-
15	Ch. 17	Epilogue	14