Natural Sciences
The Human Experiences and Endeavors Curriculum

Courses submitted for inclusion in the Natural Sciences Core must already exist or must be approved by the Undergraduate Council.

Course Title: Natural Hazards and Disasters
Department and Course Number: GEOL 50443
Instructor(s): Dr. Esayas Gebremichael

Please indicate below which *Student Action Steps*** are appropriate for your course for each *Learning Outcome**. Using the bulleted instructions on page 2 of this form, please provide examples that explain how students will, through the use of *Student Action Steps,* achieve the *Learning Outcomes* in your course.

***Competency*:** TCU graduates will be literate in the natural sciences.

Learning Outcomes:	***Student Action Steps:*** **Indicate which are to be used in your course or add others you will use to reach the selected *Learning Outcome(s).***
Students will demonstrate a basic understanding of some of the methods of investigation in the natural sciences.	Students will explore investigation methodologies and principles through multiple experiences involving laboratory experiments, field studies, or simulations appropriate to the natural science discipline. For each investigation process or principle, students will: determine its purpose, describe it, and compare and contrast it with alternative methodologies. **[X]** Other:
Students will demonstrate a basic understanding of some of the great ideas in the natural sciences.	Students will examine some of the major ideas appropriate to the area of study, including how such ideas resulted from a scientifically reasoned investigation. For each concept, principle, or theory, students will: describe it, review its history, determine its importance (including influences on other areas of study), review the evidence supporting it, and compare and contrast it with alternative concepts, principles, or theories. **[X]** Other:
Students will demonstrate a basic understanding of some of the relationships among the natural sciences, technology, and society.	Students will explore the relationships between science, technology, and society appropriate to the natural science discipline. Students will: describe the roles that each plays in the others' development, and identify the benefits and problems associated with each relationship. **[X]** Other:

*The *Learning Outcomes* are statements of what we expect our students to know or be able to do upon completion of a course in that category.

**The *Student Action Steps* identify the process(es) that will lead to the intended *Learning Outcome*. As such, *Student Action Steps* must specify an action(s) to be taken by a student to fulfill a specific *Learning Outcome* and be reasonable within the context and time frame of the course. The *Student Action Steps* above are provided as examples of how students might achieve the *Learning Outcomes*.

- Please provide examples that explain how students will, through the use of *Student Action Steps,* achieve the *Learning Outcomes* in your course (2 or 3 examples will suffice). To facilitate understanding, please use language accessible both to faculty who might be outside your discipline as well as to students who might see such language in a course syllabus.

    - The GEOL 50443 is designed to give students an overview of the various types of natural hazards/disasters including earthquakes, tsunamis, volcanoes, floods, landslides, hurricanes, tornadoes, and wildfires. The fundamental Earth surface and subsurface processes that trigger natural hazards/disasters, and the possible influences of human activity in exacerbating their effects will also be discussed. Lab exercises will focus on the use of geospatial technology tools to understand key concepts as well as assess the impacts of natural disasters on communities, infrastructure, and the environment. The relationship between population density and distribution, economic development, and other relevant factors and disaster vulnerability/susceptibility will be discussed/demonstrated using various case studies across the globe. The key learning outcomes are:
        1. Students will gain an understanding of the various kinds of natural hazard and disaster processes and discern the differences between the two processes.
        2. Students will learn the various processes that give rise to natural hazards and disasters, and the cascading relationship that exists between various natural hazards.
        3. Students will be taught the possible role of human-led activities in aggravating the impact of natural disasters.
        4. Students will be taught how to acquire readily available datasets relevant to a specific hazard from various sources, perform analysis (including impact mapping) using the latest data analysis techniques, undertake result interpretations, and propose possible disaster mitigation, adaptation, and resiliency solutions.

- Please attach a syllabus as the primary supporting document for your course proposal. Syllabi should reflect the *Learning Outcomes* and the use of the indicated *Student Action Steps*. They should also indicate how student performance will be evaluated with respect to the outcomes.

SYLLABUS

GEOL/ENSC 50443 – NATURAL HAZARDS AND DISASTERS

FALL 2023

INSTRUCTOR NAME:	Dr. Esayas Gebremichael
SEMESTER/YEAR:	Fall 2023
NUMBER OF CREDITS:	3 Credit hours
CLASS LOCATION:	TUC 002
CLASS MEETING DAYS/TIME:	Lecture: Monday/Wednesday – 2:00 – 2:50 PM Lab: Thursday – 2:00 – 3:20 PM
OFFICE HOURS:	M/W: 3:30 PM – 4:30 PM/by appointment
OFFICE:	Sid Richardson Building, Room 205
TELEPHONE:	817-257-4740
EMAIL:	e.gebremichael@tcu.edu
RESPONSE TIME:	Response to emails will be provided within a maximum of 8-hour duration (usually much less than that) except on weekends (maximum of 24 hours)

FINAL EXAM DATE & OTHER IMPORTANT DATES

Final Exam will be held on ____ in TUC 002.

Rescheduling of Finals Policy: According to the Faculty/Staff Handbook "Rescheduling of Finals" section, rescheduling a final exercise must be made one week prior to the last day of classes. Rescheduling of finals is permitted 1) for meeting the 24-hour rule or 2) for graduating seniors whose faculty members must submit final grades by Wednesday 5pm of finals week. Unless the student is graduating, the exam must be taken during final examination week.

COURSE DESCRIPTION

The course is designed to give an overview of the various types of natural hazards/disasters including earthquakes, tsunamis, volcanoes, floods, landslides, hurricanes, tornadoes, and wildfires. The fundamental Earth surface and subsurface processes that trigger natural hazards/disasters, and the possible influences of human activity in exacerbating their effects will also be discussed. Lab exercises will focus on the use of geospatial technology tools to understand key concepts as well as assess the impacts of natural disasters on communities, infrastructure, and the environment.

COURSE OBJECTIVES/LEARNING OUTCOMES:

- Students will gain an understanding of the various kinds of natural hazard and disaster processes and discern the differences between the two processes.
- Students will learn the various processes that give rise to natural hazards and disasters, and the cascading relationship that exists between various natural hazards.
- Students will be taught the possible role of human-led activities in aggravating the impact of natural disasters.
- Students will be taught how to acquire readily available datasets relevant to a specific hazard from various sources, perform analysis (including impact mapping) using the latest data analysis techniques, undertake result interpretations, and propose possible disaster mitigation, adaptation, and resiliency solutions.

REQUIRED TEXTS/MATERIALS:

Required

- Natural Hazards, Earth's Processes as Hazards, Disasters, and Catastrophes, 5th Edition by Edward A. Keller and Duane E. DeVecchio, 2019; ISBN: 978-1-138-05722-7 (pbk); ISBN: 978-1-315-16429-8 (ebk)

Not required

- Other resources will be also used for lecture and lab activities (note: these are reference books and you are not expected to buy these books. Most of the books are available in TCU library (books that are not available in TCU library can be requested and acquired through interlibrary loan)).
- Natural Hazards and Disasters, 5th Edition by Donald and David Hyndman, 2017
- Natural Disasters, 11th Edition by Patrick L. Abbott, 2020

These are reference books and you are not expected to buy these books. Most of the books are available in TCU library (books that are not available in TCU library can be requested and acquired through interlibrary loan).

ADDITIONAL/SUPPLEMENTARY RESOURCES

- Additional materials will be uploaded/posted on the TCU Online website or will be handed out in class.

COURSE POLICIES AND REQUIREMENTS:

The class has two regularly scheduled lecture session and one lab session per week. Lab sessions will be dedicated for practical demonstrations of topics discussed during lectures. There will be three exams (two exams after the completions of major topics and one final exam); final exam will be comprehensive covering the lab and lecture topics discussed and demonstrated throughout the semester. A term paper will be completed by each student.

- **Laboratory Exercises**

The lab session involves using various datasets for natural hazard/disaster application. Each week's data and derived products should be saved in the working drive (D drive). Data products from previous weeks might be used in future sessions and as a result of that (and to save time copying datasets from one computer to another), the seat you are in on the third day of class will be your permanent seat for the remainder of the semester. Lab assignments are due at the beginning of the lab on Thursdays unless and otherwise a new submission date is announced. Late submissions of assignments will be docked 20% per week. Late submissions of assignments will be docked 10% if submitted within 4 weeks after the due date and 20% thereafter.

- **Reviewing and Presenting Peer-Reviewed Articles**

  A 7-minutes long presentation of peer-reviewed articles on selected natural hazards and disasters topics is required (topics will be provided by the instructor during class). In addition, a 2-page long summary of the (presented) peer-reviewed articles will be uploaded on TCU Online. This activity will be helpful guide in the preparation of the term paper (discussed below).

- **Final Paper**

  Completion of one term paper (10 – 12 pages) and presenting it in class will be required for this class. The term paper can be on any topic related to Natural Hazards and Disasters. In-depth literature review and reflection (of at least five peer-reviewed articles) is required (the due date will be announced during class). Each student will make a brief presentation (10 minutes) towards the last weeks of the semester. Graduate students are expected to work on a project relevant to their own field of specialization. One aim of the course is to help graduate students advance their research by working on a project relevant to their research and as a result, extra effort and quality on the term paper is expected. The TCU Online submission will include a submission to TurnItIn to assess the possibility of plagiarism in the paper. Detailed instructions and grading rubric information are posted on TCU Online.

- **Participation / Engagement (Attendance)**

  Attendance is mandatory. IT IS CRUCIAL THAT YOU ARE ON TIME FOR CLASS AND ALWAYS BRING YOUR TEXTBOOK. Regular and punctual class attendance is essential for academic success and no assigned work is summarily excused because of absence regardless of the cause.

  I encourage your active participation in class. If you don't understand a topic in class, please ask me during class or during office hours. There will be several in-class extra-credit opportunities during lectures that will be completed individually or as a group. I reserve the right to give pop quizzes if situations warrant.

- **Grading**

Final Grade Elements/Grade Breakdown:

Item	Percent of Final Grade: UNDERGRADUATE	Percent of Final Grade: GRADUATE
Lab Exercise/Hands-on Assignments	25%	25%
Midterm Exams	20%	20%
Final Exam	25%	20%
Peer-reviewed Article Summary and Presentation*	5%	5%
Final paper and Presentation*	15%	20%
Attendance, Quizzes	10%	10%

*Peer-assessment

Grading Scales: Undergraduate

Letter Grade	Score	Grade	Score
A	92–100	C	74–76.99
A-	90–91.99	C-	70–73.99
B+	87–89.99	D+	67–69.99
B	82–86.99	D	64–66.99
B-	80–81.99	D-	60–63.99
C+	77–79.99	F	0–59.99

Letter Grade	Score	Grade	Score
A	93–100	C	70–74.99
A-	90–92.99	F	0–69.99
B+	87–89.99		
B	82–86.99		
B-	80–81.99		
C+	75–79.99		

Class Norms & Netiquette

All members of the class are expected to follow rules of common courtesy in all email messages, discussions, and chats. If I deem any of them to be inappropriate or offensive, I will forward the message to the Chair of the department and appropriate action will be taken, not excluding expulsion from the course. The same rules apply online as they do in person. Be respectful of other students. Foul discourse will not be tolerated. Please take a moment and read some basic information about netiquette (http://www.albion.com/netiquette/).

Participating in the virtual realm, including social media sites and shared-access sites sometimes used for educational collaborations, should be done with honor and integrity. Please review the relevant sections of the Student Handbook (https://deanofstudents.tcu.edu/student-handbook/) for TCU's network and computing policies and communication guidelines.

Technology Policies

Email

Only the official TCU student email address will be used for all course notification. It is your responsibility to check your TCU email on a regular basis.

Course Materials

TCU students are prohibited from sharing any portion of course materials (including videos, PowerPoint slides, assignments, or notes) with others, including on social media, without written permission by the course instructor. Accessing, copying, transporting (to another person or location), modifying, or destroying programs, records, or data belonging to TCU or another user without authorization, whether such data is in transit or storage, is prohibited. The full policy can be found at: https://security.tcu.edu/polproc/usage-policy/.

Violating this policy is considered a violation of Section 3.2.8 of the Student Code of Conduct found in the Student Handbook (https://deanofstudents.tcu.edu/student-handbook/), and may also constitute Academic Misconduct or Disruptive Classroom Behavior. TCU encourages student debate and discourse; accordingly, TCU generally interprets and applies its policies, including the policies referenced above, consistent with the values of free expression and First Amendment principles.

Computer Use and Cell Phone Use:

CELL PHONES SHOULD BE TURNED OFF DURING CLASS. Students should not be texting or accessing any social media, email or other electronic communication during class using a cell phone, laptop or classroom computer. Classroom computers are to be used only for activities associated with the class. Students will not use the classroom computers until directed by the instructor. If the instructor considers a student's use of a cell phone or computer inappropriate and/or disruptive, the student may be asked to leave the classroom. Also, cell phones and recording devices are not to be used or visible during an exam.

Academic Misconduct

Academic Misconduct (Section 3.4 of the Student Code of Conduct found in the Student Handbook (https://deanofstudents.tcu.edu/student-handbook/)): Any act that violates the academic integrity of the institution is considered academic misconduct. The definitions and procedures used to resolve suspected acts of academic misconduct are available in the offices of the Academic Deans and Dean of Students, and are also listed in detail in the Undergraduate Catalog (http://tcu.smartcatalogiq.com/current/Undergraduate-Catalog/Student-Policies/Academic-Conduct-Policy-Details) and the Graduate Catalog (http://tcu.smartcatalogiq.com/en/current/Graduate-Catalog/Academic-Conduct).

Specific examples include, but are not limited to:

- **Cheating**: Copying from another student's test paper, laboratory report, other report, or computer files and listings; using, during any academic exercise, material and/or devices not authorized by the person in charge of the test; collaborating with or seeking aid from another student during a test or laboratory without permission; knowingly using, buying, selling, stealing, transporting, or soliciting in its entirety or in part, the contents of a test or other assignment unauthorized for release; substituting for another student or permitting another student to substitute for oneself.

- **Plagiarism**: The appropriation, theft, purchase or obtaining by any means another's work, and the unacknowledged submission or incorporation of that work as one's own offered for credit. Appropriation includes the quoting or paraphrasing of another's work without giving credit therefore. **Be aware that your term paper is submitted automatically into Turnitin as a spot check for plagiarism detection**.
- **Collusion**: The unauthorized collaboration with another in preparing work offered for credit.
- **Abuse of Resource Materials**: Mutilating, destroying, concealing, or stealing such material.
- **Computer misuse**: Unauthorized or illegal use of computer software or hardware through the TCU Computer Center or through any programs, terminals, or freestanding computers owned, leased or operated by TCU or any of its academic units for the purpose of affecting the academic standing of a student.
- **Fabrication and falsification**: Unauthorized alteration or invention of any information or citation in an academic exercise. Falsification involves altering information for use in any academic exercise. Fabrication involves inventing or counterfeiting information for use in any academic exercise.
- **Multiple submission**: The submission by the same individual of substantial portions of the same academic work (including oral reports) for credit more than once in the same or another class without authorization.
- **Complicity in academic misconduct**: Helping another to commit an act of academic misconduct.
- **Bearing False Witness**: Knowingly and falsely accusing another student of academic misconduct.

TCU ONLINE LEARNING MANAGEMENT SYSTEM

TCU D2L Online learning management system will be used to help communicate all the requirements, materials and grades for this class. All assignments with appropriate instructions and due dates will be posted on TCU Online. All lecture notes and supplemental materials will also be posted at this location. Students are to submit completed homework assignments as instructed into the appropriate submission folders using TCU Online. Student progress and grades for assignments will also be communicated using the online system.

Getting Started with TCU Online:

Technical Requirements: Check your computer is ready by looking at the specifications list. (https://community.brightspace.com/s/article/Brightspace-Platform-Requirements)

Log In: (using your TCU Network Credentials)

Option 1: Access via my.tcu.edu > Student Quick Links > TCU Online

Option 2: Login at http://d2l.tcu.edu

*For information about logging into TCU Online, view these instructions. (http://tcuonline.tcu.edu/kb/how-do-i-log-in/).

Student Orientation Tutorial for TCU Online: If you have not yet taken the TCU Online Student Orientation Tutorial, please do so now. To access it, click on the Orientations semester OR view all courses in your My Courses widget visible upon logging in to TCU Online. Click on the "Student Orientation Tutorial" to enter the orientation course. Follow the instructions in the course. You can return to this tutorial at any time.

Getting Help with TCU Online

If you experience any technical problems while using TCU Online, please do not hesitate to contact the D2L HELP DESK. They can be reached by phone or chat 24 hours a day, 7 days a week, 365 days a year.

Phone: 1-877-325-7778

Chat: Chat is available within TCU Online in the Help menu on the navigation bar.
If you are working with the helpdesk to resolve a technical issue, make sure to keep me updated on the troubleshooting progress.

If you have a course-related issue (course content, assignment troubles, quiz difficulties) please contact me.

Personal Settings & Notifications for TCU Online

As a student, you should set up your account settings, profile, and notifications. To do this you will login to TCU Online and select your name on the top right of the screen. You can upload a photo of yourself and add personal information to your profile. In the notifications area, you can add your phone number to receive text messages when grades are given, as well as reminder texts for upcoming assignments and quizzes.

Student Success Tools for TCU Online: Pulse

Pulse is a phone app which gives you access to the course calendar, assignments, grades, and announcements. This app provides a graph that can help you manage your time. Based on the number of assignments and events on the course calendar for your classes, the graph will display busy times for class work in the upcoming week. You can use this app to manage your daily workload, and it includes the ability to view and access course materials offline. You can download Pulse from the Google Play or Apple Store. You can learn more and download Pulse here: https://www.d2l.com/products/pulse/.

ReadSpeaker

ReadSpeaker includes a number of tools that can enhance your understanding and comprehension of course materials. ReadSpeaker can create an audio version of content that you can listen to while on a page within a course or that you can download to listen offline. ReadSpeaker can also read Microsoft Office files and PDFs. There are additional tools and features to assist you with reading and focusing in TCU Online, tools that provide support for writing and proofing text, and tools that can read non-TCU Online content aloud. You can learn more about how to use ReadSpeaker tools here: https://tcuonline.tcu.edu/how-to- hub/instructor-how-to-hub-for-tcu-

online/integrations-and-mobile/readspeaker/

SUPPORT FOR TCU STUDENTS

Campus Offices

- Academic Advising (817-257-7486, Jarvis 104)
- Brown-Lupton Health Center (817-257-7938 or 817-257-7940)
- Center for Digital Expression (CDeX) (cdex@tcu.edu, Scharbauer 2003)
- Center for Writing (817-257-7221, Reed Hall 419)
- Counseling & Mental Health Center (817-257-7863, Jarvis Hall 2nd floor)
- Dean of Students (817-257-7926, the Harrison 1600)
- Mary Couts Burnett Library: Reference Desk (817-257-7117)
- Office of Religious & Spiritual Life (817-257-7830, Jarvis Hall 1st floor)
- Student Access & Accommodations (817-257-6567, The Harrison 1200)
- Student Success (817-257-8345, Samuelson Hall, West Entrance)
- Substance Use and Recovery Services (817-257-7100, Jarvis Hall 2nd floor)
- Transfer Student Center (817-257-8345, Samuelson Hall, West Entrance)
- Veterans Services (817-257-5551, Jarvis Hall 2nd floor)

Anti-Discrimination and Title IX Information

Statement on TCU's Non-Discrimination Policy

TCU is committed to providing a positive learning, living, and working environment free from unlawful discrimination, harassment, sexual misconduct, and retaliation. In support of this commitment, in its policy on Prohibited Discrimination, harassment, sexual misconduct and retaliation, TCU has a range of prohibited behaviors, including unlawful discrimination and harassment and related sexual and other misconduct based on age, race, color, religion, sex, sexual orientation, gender, gender identity, gender expression, national origin, ethnic origin, disability, predisposing genetic information, covered veteran status, and any other basis protected by law. The **Office of Institutional Equity (OIE)** is responsible for responding to all reports of discrimination, harassment, sexual misconduct and retaliation.

- Please use the following links to review TCU Policy 1.008 Prohibited Discrimination, Harassment, Sexual Misconduct and Retaliation or to review TCU Policy 1.009 Responding to Reports of Prohibited Discrimination, Harassment, Sexual Misconduct, and Retaliation.
- To make a report, you may call OIE at 817-257-8228, email oie@tcu.edu, visit us at The Harrison, Suite 1800 or click here: Make a Report.
- To learn about the Campus Community Response Team (CCRT) and Report a Bias Incident click here: https://inclusion.tcu.edu/campus-community-response-team/

Title IX

TCU's Title IX Coordinator works within OIE. Andrea Vircks-McDew serves as TCU's Title IX Coordinator. You may call 817-257-8228 to make a report, email oie@tcu.edu or a.vircks@tcu.edu, or make a report here. Additional Title IX resources and information are available at https://www.tcu.edu/institutional-equity/title-ix/index.php.

Mandatory Reporters

ALL TCU employees, except confidential resources, are considered Mandatory Reporters. Mandatory reporters are required to immediately report to OIE any conduct that raises Discrimination, Harassment, Sexual Misconduct (Title IX or Violence Against Women (VAWA)) or Retaliation. Mandatory reporters cannot promise to refrain from forwarding the information to OIE.

Confidential On-Campus Resources

Campus Advocacy, Resources & Education
www.care.tcu.edu | 817-257-5225

Counseling & Mental Health Center
www.counseling.tcu.edu | 817-257-7863

Religious & Spiritual Life
www.faith.tcu.edu | 817-257-7830

On Campus Resources

TCU Police

www.police.tcu.edu | 817-257-8400 Non-emergency | 817-257-7777 Emergency

TCU Policy for Religious Observations & Holidays

"Students who are unable to participate in a class, in any related assignment or in a university required activity because of the religious observance of a holy day shall be provided with a reasonable opportunity to make up the examination or assignment, without penalty, provided that it does not create an unreasonable burden on the University." For more information, please visit the TCU Policy for Religious Observations & Holidays webpage.

Student Access and Accommodation

Texas Christian University affords students with disabilities reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. To be eligible for disability-related academic accommodations, students are required to register with the TCU Office of Student Access and Accommodation and have their requested accommodations evaluated. If approved for accommodations, students are required to discuss their official TCU Notification of Accommodation with their instructors. Accommodations are not retroactive and require advance notice to implement. The Office of Student Access and Accommodation is located in The Harrison, Suite 1200. More information on how to apply for accommodations can be found at https://www.tcu.edu/access-accommodation/ or by calling Student Access and Accommodation at (817) 257-6567.

Audio Recording Notification

Audio recordings of class lectures may be permitted by the instructor or as an approved disability accommodation through Student Access and Accommodation. Recordings are not to be shared with other students, posted to any online forum, or otherwise disseminated.

EMERGENCY RESPONSE INFORMATION

View TCU's L.E.S.S. is More public safety video to learn about Lockdown, Evacuate, and Seek Shelter procedures. (https://publicsafety.tcu.edu/less-is-more/)

View the TCU Building Safety Maps that show the specific seek shelter locations and building rally points for evacuation. (https://publicsafety.tcu.edu/less-safety-maps/)

View the TCU Evacuation Rally Point Map to see all rally points for evacuation. (https://publicsafety.tcu.edu/wp-content/uploads/2020/01/TCU-Rally-Point-Map.pdf)

Download the *Frogshield* Campus Safety App on your phone. (https://police.tcu.edu/frogshield/).

In the event of an emergency, call the TCU Police Department at **817-257-7777**

COURSE SCHEDULE:

This calendar represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunities. Such changes will be clearly communicated.

Week	Date	Lecture Topics	Labs
1		Introduction to Natural Hazards and Disasters	No lab
2		Internal Structure of the Earth, Plate Tectonics, and Physical Hazards	Lab 1
3		Earthquakes and Tsunamis	No lab (dedicated for lecture because of Labor Day)
4		Volcanoes	Lab 2
5		Atmospheric Processes and Severe Weather: Tornadoes and Lightening, Exam 1	Lab 3
6		Atmospheric Processes and Severe Weather: Storms and Hurricanes	Lab 4
7		Streams and Flood Processes, Human Interactions	Presentation 1 (Group 1)
8		Wildfires	**FALL BREAK**
9		Mass Movements, Exam 2	Presentation 1 (Group 2)
10		Coastal Processes and Hazards	Lab 5
11		Climate Change and Natural Hazards	Lab 6
		Last day to drop for this session	
		Last day to select P/NC for this session	
12		Sinkholes, Land Subsidence, and Swelling Soils	Lab 7
13		Asteroid and Comet Impacts; Drying and Extinctions	Lab 8
THANKSGIVING RECESS			
14		Final Presentation	Final Presentation
15		Final Exam Review	Last Day of Class (December 8)
16	**Final Exam:----------**		

Student Perception of Teaching (SPOT)

Towards the end of the term you will receive an email asking you to complete your SPOT for this course. I appreciate your thoughtful and reflective feedback to help make this course successful for future students. You can fill out the SPOT by clicking on the link in the email or in TCU Online when SPOTs open.

TCU Mission Statement

To educate individuals to think and act as ethical leaders and responsible citizens in the global community.

College of Science and Engineering Mission Statement

To foster knowledge of and curiosity about science, mathematics, and engineering by offering personalized, rigorous instruction that emphasizes research and internship opportunities.