

UNDERGRADUATE COUNCIL

Request for New Course

Originating unit requesting course: Environmental Sciences

New course title: Environmental Modeling

New course number: ENSC 50593

Appropriate computer abbreviation if title is more than 30 spaces: _____

Prerequisites for new course:

Permission of Instructor

Effective date for course (semester and year): Spring 2021

Instructional methodology (Click in box to the left of the name to select a course type.)

(See departmental chairperson or deans for definition of type.):

- | | | | |
|--------------------------------------|-----------------------------------|--|---------------------------------------|
| <input type="checkbox"/> activity | <input type="checkbox"/> clinical | <input type="checkbox"/> directed study | <input type="checkbox"/> internship |
| <input type="checkbox"/> laboratory | <input type="checkbox"/> lecture | <input checked="" type="checkbox"/> lecture w/integrated lab | |
| <input type="checkbox"/> performance | <input type="checkbox"/> research | <input type="checkbox"/> seminar | <input type="checkbox"/> study abroad |

Description of new course (as it will appear in catalog copy):

ENSC 50593 Environmental Modeling

Prerequisite: Permission of instructor. This course will cover physical and empirical models and their applications in areas such as hydrology, wildlife, ecology, and human health.

Class consists of 2 hours lecture, and 2 hours hands-on computer modeling laboratory.

(Crosslisted as ENSC/GEOL 50593)

1. Submit a representative course syllabus that includes the following:

- a. A concise course description including the course purpose (e.g. fulfill part of university, college, or department mission, discipline requirement, program enrichment, etc.) and course instructional methodology (e.g. lecture, laboratory, lecture and laboratory, clinical, internship, etc.)
- b. the goals of the course;
- c. a clear statement of course expectations - essentially, what students shall be expected to do in order to satisfactorily complete the course at different performance levels (generally speaking, what does it take to get an A, B, C, etc.?);
- d. a statement of the faculty member's policies on attendance, make-up work, missed exams, etc;
- e. information concerning major projects or papers and when these assignments must be completed by the students;
- f. information about the number and dates of the exams;
- g. statements reflecting TCU policy regarding accommodations under Americans with Disabilities Act (ADA) ([this disabilities statement](#) MUST be included *verbatim*) and university policy regarding academic misconduct ([this statement](#), while not required, may be used); and
- h. a statement indicating how the instructor can be reached and how office hour requirements will be met.

A [syllabus template](#), which includes these required elements and others, is available from the Koehler Center.

2. Faculty Resources: How will the unit provide faculty support for this course?

Describe how this course will impact other current departmental listings.

This course is currently a GEOL credit, but is taught by ENSC faculty. These departments are now entirely separate and we wish the catalog entry to more accurately reflect this. It contains both ENSC and GEOL material, which is why a cross-list and not a reclassification is requested. It will not impact any listings as it is already offered.

3. Educational Resources: Will this course require additional resources not currently available (e.g., space, equipment, library)? Yes No**4. If this course affects other units of the University, include a statement signed by chairperson of the affected unit(s).**

Support letter provided.

5. If cross-listed, provide evidence of approval of all curriculum committees appropriate to both the originating and cross-listed units.

Support letter provided.

6. If this course is to be delivered online, include a letter from the Koehler Center stating that program administrators and identified faculty are working with the Koehler Center to fulfill TCU Distance Learning requirement.

A handwritten signature in blue ink, consisting of a cursive name followed by a stylized set of initials.

Approval signature of chairperson of originating unit

Revised 11/2013

ENSC 50593– Environmental Modeling

Instructor Name: Dr. Gehendra Kharel

Semester/Year: Spring/2021

Number of Credits: 3

Class Location: SWR 217 (in person only)

Class Meeting Day(s) & Time(s): Thursday, 1:00 pm – 3:50 pm

Office: SWR 219; **Virtual Office:** <https://tcu.zoom.us/j/5147818839>

Office Hours: “where open doors open mind”. Stop by my office or set up an appointment. You may also use the zoom link <https://tcu.zoom.us/j/5147818839> for the virtual meeting. Connect to my virtual office or set up an appointment. I regularly check email and D2L to answer your questions or concerns.

Telephone: +1 817-257-5318 (office) 469 247 4370 (Cell)

Email: g.kharel@tcu.edu

Response Time: My goal is to respond to your email/D2L questions or concerns related to the course materials/content within 24 hours on weekdays and as soon as possible on weekends and holidays.

Important Note for the 2020-2021 School Year

Campus Life and the Student Experience Will Be Different This Year. The health and safety of students, faculty, and staff is Texas Christian University's highest priority. TCU has implemented public health interventions, which include the following local and state public health orders and CDC guidelines. These health interventions may impact your experience as a student both inside and outside the classroom. Safety protocols may change during the semester and may result in modifications or changes to the teaching format, delivery method, or the course schedule (e.g., altering meeting times or frequency; changing beginning or ending dates for a term, or partially or entirely moving from a face-to-face classroom teaching to an online teaching or remote learning format). Any changes in a teaching format, delivery method, or course schedule will not impact the credit hours for the course.

Health and Wellness: If you are exhibiting symptoms that may be related to COVID-19 (fever or chills, dry cough, shortness of breath, etc.) or are concerned that you may have been exposed to COVID-19, you must self-quarantine and consult with the Brown Lupton Health Center at 817-257-7949 for further guidance.

Also, you must notify the Campus Life Office immediately at 817-257-7926. Campus Life will inform your professors that you are unable to attend class and provide any assistance and support needed. Click here for detailed information concerning COVID-19 symptoms: <https://www.cdc.gov/coronavirus>.

If you are unwell but are not exhibiting potential COVID-19-related symptoms, please notify your instructor as soon as possible that you are ill and will not be attending class.

If you do not feel well enough to attend class in person, but feel well enough to attend class remotely, please notify your instructor as soon as possible before the class begins to arrange attendance via video conferencing.

Face Coverings and Physical Distancing: Face coverings are required on campus, unless you are alone in your private office or dorm room. Students will be expected to practice physical distancing and wear protective face coverings at all times while in public spaces on the TCU campus. Failing to do so in the classroom could result in the student being asked to leave the room and continue the class through remote access. Additionally, the instructor has the option to terminate the class period and continue it as a remote session. Failure to comply with the instructor's request to adhere to TCU policy regarding face coverings or repeat violations may be reported to Campus Life.

Important Dates and Details

No class: Thursday, March 11, 2020 (Spring Refresh)

Final Exam: 11:00 AM – 1:30 PM, Thursday, May 04, 2021

Course Description

Environmental problems result from interactions of processes that form our environment- a coupled natural-human system. These interactions are often complex and involve land, water, air and energy resources that affect human activities and attitudes and vice-versa. Models are used to capture, investigate, and understand those interactions and processes and to test the outcomes of different interventions in the system. Model results are useful in decision-making. This course aims to introduce the process of building and using models to simulate environmental problems by using physical, statistical, and empirical models including hydrological models such as Soil and Water Assessment Tool (SWAT). For this course, no previous programming skill is required, but students are expected to have a keen interest in learning and developing quantitative skills.

Learning Outcomes

This course is intended to be the first course in environmental modeling or introduction to models. It is comprised of lectures, assignments, and a modeling project to achieve the following goals:

1. Understand key principles, types, methodologies, and basic tools of environmental modeling. **(Knowledge)**
2. Become aware of scope and applications of modeling in environmental research, management & decision making. **(Knowledge)**
3. Develop models to address a given environmental research or problem. **(Application & Skill)**
 - a. Collect and prepare different types of data from various sources needed for model development.
 - b. Perform basic calculations, geospatial environmental data analysis and visualization.
 - c. Gain hands-on experience in the application of ArcGIS and SWAT software to perform modeling tasks.
4. Analyze, discuss, and evaluate the use and results of models in scientific applications. **(Analysis, Synthesis & Evaluation)**
5. Understand and apply the "language" of modeling to effectively communicate with a lay audience, stakeholders, and environmental professionals. **(Knowledge & Skill)**

Prerequisites / Program or Major Connections

There is no prerequisite to enroll in this course, however you need permission from the instructor.

A successful completion of this course can be used as one of the elective course requirements in majors/minors in Environmental and Geological sciences. This course prepares you to take advanced level courses in environmental modeling. You will learn modeling skill that includes data collection and preparation, and model development that may be useful in obtaining internship and conducting research.

Required Texts / Materials

There is no required textbook for this course. Course instructor will provide the relevant reading materials.

Instructional Methods

Classes will be held in person only once a week. Course materials, including lecture notes, quizzes/exams, discussions, assignments, presentations, will be administered via D2L.

Course Topics

- Models and Modeling: Introduction
 - Purpose of Models/Modeling
 - Types & Techniques of Models/Modeling
- Data needs for Modeling
 - Data Collection & Preparation
 - Data Representation & Visualization
- Model Development
 - Techniques & Steps
- Model Parameterization & Verification
 - Sensitivity Analysis
 - Calibration & Validation

Course Policies and Requirements

Exams (15%)

There will be one exam (final) during the semester. The final exam is cumulative and covers the materials from lectures, readings, quizzes, assignments, and discussions.

Modeling Project (65%)

The modeling project is comprised of three components – modeling assignments (45%), final report (15%), and oral presentation (5%).

Modeling Assignments

There will be several in-class or take-home assignments as part of the modeling project distributed throughout the semester. These assignments carry equal weights towards the total grade for the Assignment part. Due dates of each assignment may vary depending upon the difficulty level, time it may require completing it and the pace of the course.

Project Report & Presentation

Each student will write a report (minimum 10 pages) in the assigned topic/modeling problem and give a 10-minute long oral presentation.

Quizzes (15%)

There will be up to 10 weekly quizzes during the semester. The quizzes are related to the materials covered in lectures, readings, assignments, and discussions.

Attendance & Participation (5%)

This course is face-to-face, and it meets once a week, therefore you are expected to come to the class, engage fully, participate actively, and complete all assigned tasks by due dates. I'm here to help you learn and succeed in this course. I've found that students who have spent a minimum of six to nine hours per week outside of class and maintain their active and meaningful participation have succeeded in my courses. As an instructor, I ensure timely comments and feedback on your submitted assignments, quizzes, exams, and discussions, and I encourage you to contact me immediately if you have any questions or concerns regarding the course materials, assignments, and performance.

If you fail to demonstrate your presence for two or more consecutive weeks, I will report it to the TCU Campus Life Office. I do understand that unexpected circumstances may arise. Therefore, if you think you cannot demonstrate your presence in the course on any given day or week because of the university-sponsored activities, unforeseeable and emergency circumstances, please contact me as soon as possible or in advance so that we can make other arrangements if possible. Remember, my goal is to help you learn and succeed in this course.

Grading

Final Grade Elements / Grade Breakdown:

Category	Grade Elements/Description	Grade Breakdown	
Modeling Project	In-class and/or take-home assignments	45%	65%
	Report	15%	
	Oral presentation	5%	
Exams	Final comprehensive/cumulative exam	15%	30%
	Weekly quizzes	15%	
Attendance & participation	Class attendance	2.5%	5%
	Class discussion and engagement	2.5%	

Grading Scales

Assignment of final grades is not based on any preconceived thresholds for letter grades, but roughly follows as in the table below:

Grade	Score	Grade	Score
A	94–100	C	74–76.99
A-	90–93.99	C-	70–73.99
B+	87–89.99	D+	67–69.99
B	84–86.99	D	64–66.99
B-	80–83.99	D-	60–63.99
C+	77–79.99	F	0–59.99

Late Work

Due dates for each assignment/discussion will be posted in D2L. Students must complete and submit their assigned works by the due date. Late work will only be considered in cases where the instructor has been contacted ahead of time and granted permission for late submission and revised submission date. 10% is deducted from any assignment for every day the work is not submitted. For example, if a student submitted an assignment between 5:01 pm on Monday and 5 pm on Tuesday when the deadline was 5 pm on Monday, that incurs a 10% deduction, and if a student submits between 5:01 pm on Tuesday and 5 pm on Wednesday that is a 20% deduction, etc.

Grading Concerns

All grades will be posted on TCU Online as we progress through the course within 48 hours of assessment. It is your responsibility to check the grades and contact the instructors on time regularly (<7 days) if you have any concerns. Please note we cannot make any accommodations or changes once the grades are formally submitted, but we include the university's policy for grade appeals: <https://tcu.codes/policies/academic-affairs/grade-appeal/>

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. The foul discourse will not be tolerated. Please take a moment and read the [necessary information about netiquette](http://www.albion.com/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 TCU's guidelines on electronic communications](https://tcu.codes/policies/network-and-computing-policy/e-mail-electronic-communications-social-networks/) (email, text messages, social networks, etc.) from the Student Handbook. (<https://tcu.codes/policies/network-and-computing-policy/e-mail-electronic-communications-social-networks/>)

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 regularly.

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 3.2.15 of the Student Code of Conduct (this policy may be found in the Student Handbook at <https://tcu.codes/code/index/>), **and may also constitute Academic Misconduct or Disruptive Classroom Behavior** (these policies may be found in the undergraduate catalog at <https://tcu.smartcatalogiq.com/current/Undergraduate-Catalog/Student-Policies/Academic-Conduct-Policy-Details>). 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.

Academic Misconduct

Academic Misconduct (Sec. 3.4 from the [TCU Code of Student Conduct](#)): Any act that violates the academic integrity of the institution is considered academic misconduct. The procedures used to resolve suspected acts of academic misconduct are available in the offices of Academic Deans and the Office of Campus Life and are also listed in detail in the [Undergraduate Catalog](#), and the [Graduate Catalog](#). Specific examples include, but are not limited to:

- **Cheating:** Copying from another student's test paper, laboratory report, other reports, 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. The appropriation includes the quoting or paraphrasing of another's work without giving credit. I will use Turnitin to evaluate your submitted assignments.
- **Collusion:** The unauthorized collaboration with another in preparing work offered for credit.
- **Abuse of resource materials:** Mutilating, destroying, concealing, or stealing such content.

- **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 to affect 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: Our Learning Management 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). (<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>)

Log In: (using your TCU Network Credentials)

1. Access via my.tcu.edu > Student Quick Links > TCU Online
2. Login at the following [website](http://d2l.tcu.edu) (<http://d2l.tcu.edu>) my.tcu.edu

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

How This Course Will Use TCU Online

TCU Online (D2L) will be used in this class to deliver lectures, and post announcements, lecture notes, reading materials, assignments, exams, discussions, and grades. Students will be required to use TCU Online to submit quizzes, exams, discussions, and assignments. Remote access to TCU computers will be arranged for some of the assignments if needed.

Getting Help with TCU Online

If you experience any technical problems while using TCU Online, please do not hesitate to contact the TCU Online (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 Help Desk 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. In the Profile area, you can upload a photo of yourself and add personal information. 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](https://www.d2l.com/products/pulse/) is a phone app that 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 classwork 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 the Pulse here: <https://www.d2l.com/products/pulse/>.

ReadSpeaker

[ReadSpeaker](https://tcuonline.tcu.edu/how-to-hub/instructor-how-to-hub-for-tcu-online/integrations-and-mobile/readspeaker/) includes a number of tools that can enhance your understanding and comprehension of course materials. It can create an audio version of the content that you can listen to while on a page within a course or that you can download to listen offline. It can also read Microsoft Office files and PDFs. 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

- Alcohol & Drug Education Center (817-257-7100, Samuelson Hall basement)
- Brown-Lupton Health Center (817-257-7938 or 817-257-7940)
- Campus Life (817-257-7926, Sadler Hall 2006)
- Center for Academic Services (817-257-7486, Sadler Hall 1022)
- Center for Digital Expression (CDeX) (cdex@tcu.edu, Scharbauer 2003)
- Counseling & Mental Health Center (817-257-7863, Samuelson Hall basement)
- Mary Coats Burnett Library (817-257-7117)
- Office of Religious & Spiritual Life (817-257-7830, Jarvis Hall 1st floor)
- Student Development Services (817-257-7855, BLUU 2003)

- Center for Writing (817-257-7221, Reed Hall 419)
- Transfer Student Center (817-257-7855, BLUU 2003)
- Veterans Services (817-257-5557, Jarvis Hall 219)

Anti-Discrimination and Title IX Information

Statement on TCU's Discrimination Policy

TCU prohibits discrimination and harassment 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, except as permitted by law. TCU also prohibits unlawful sexual and gender-based harassment and violence, sexual assault, incest, statutory rape, sexual exploitation, intimate partner violence, bullying, stalking, and retaliation. We understand that discrimination, harassment, and sexual abuse can undermine students' academic success, and we encourage students who have experienced any of these issues to talk to someone about their experience, so they can get the support they need.

- [Review TCU's Policy on Prohibited Discrimination, Harassment and Related Conduct or to file a complaint: https://titleix.tcu.edu/title-ix/.](https://titleix.tcu.edu/title-ix/)
- [Learn about the Campus Community Response Team and Report a Bias Incident: https://titleix.tcu.edu/campus-community-response-team/](https://titleix.tcu.edu/campus-community-response-team/)

Statement on Title IX at TCU

As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and our one-on-one meetings. I will seek to keep any information you share private to the greatest extent possible. However, I have a mandatory reporting responsibility under TCU policy and federal law, and I am required to share any information I receive regarding sexual harassment, discrimination, and related conduct with TCU's Title IX Coordinator. Students can receive confidential support and academic advocacy by contacting [TCU's Confidential Advocate in the Campus Advocacy, Resources & Education office](https://care.tcu.edu/) at <https://care.tcu.edu/> or by calling (817) 257-5225 or the [Counseling & Mental Health Center](https://counseling.tcu.edu/) at <https://counseling.tcu.edu/> or by calling (817) 257-7863. [Alleged violations can be reported to the Title IX Office](https://titleix.tcu.edu/student-toolkit/) at <https://titleix.tcu.edu/student-toolkit/> or by calling (817) 257-8228. Should you wish to make a confidential report, the Title IX Office will seek to maintain your privacy to the greatest extent possible, but cannot guarantee confidentiality. Reports to law enforcement can be made to the Fort Worth Police Department at 911 for an emergency and (817) 335-4222 for non-emergency or TCU Police at (817) 257-7777.

Obligations to Report Conduct Raising Title IX or VAWA Issues

Mandatory Reporters: All TCU employees, except Confidential Resources, are considered Mandatory Reporters for purposes of their obligations to report, to the Coordinator, conduct that raises Title IX and/or VAWA (Violence Against Women Act) issues.

Mandatory Reporters are required to immediately report to the Coordinator information about conduct that raises Title IX and/or VAWA issues, including any reports, complaints or

allegations of sexual harassment, discrimination and those forms of prohibited conduct that relate to nonconsensual sexual intercourse or contact, sexual exploitation, intimate partner violence, stalking and retaliation involving any member of the TCU community, except as otherwise provided within the [Policy on Prohibited Discrimination, Harassment and Related Conduct](#).

Mandatory Reporters may receive this information in a number of ways. For example, a complainant may report the information directly to a Mandatory Reporter, a witness or third-party may provide information to a Mandatory Reporter, or a Mandatory Reporter may personally witness such conduct. A Mandatory Reporter's obligation to report such information to the Coordinator does not depend on how he/she received the information. Mandatory Reporters must provide all known information about conduct that raises Title IX or VAWA issues to the Coordinator, including the identities of the parties, the date, time and location, and any other details. Failure of a Mandatory Reporters to provide such information to the Coordinator in a timely manner may subject the employee to appropriate discipline, including removal from a position or termination of employment.

Mandatory Reporters cannot promise to refrain from forwarding the information to the Coordinator if it raises Title IX or VAWA issues or withhold information about such conduct from the Coordinator. Mandatory Reporters may provide support and assistance to a complainant, witness, or respondent. Still, they should not conduct any investigation or notify the respondent unless requested to do so by the Coordinator.

Mandatory Reporters are not required to report information disclosed (1) at public awareness events (e.g., "Take Back the Night," candlelight vigils, protests, "survivor speak-outs," or other public forums in which students may disclose such information (collectively, public awareness events); or (2) during an individual's participation as a subject in an Institutional Review Board approved human subjects research protocol (IRB Research). TCU may provide information about Title IX rights and available resources and support at public awareness events, however, and Institutional Review Boards may, in appropriate cases, require researchers to provide such information to all subjects of IRB Research.

Relevant reporting phone numbers are: 911 for an emergency and (817) 335-4222 for non-emergency or TCU Police at (817) 257-7777.

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. Students are required to provide instructors an official TCU notification of accommodation approved through Student Access and Accommodation. 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. Accommodations are not retroactive and require advance notice to implement.

Emergency Response Information

Please review [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/>)

[TCU's Public Safety website](#) provides maps that show our building's rally point for evacuation and the seek shelter location. (<https://publicsafety.tcu.edu/>)

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

Download the [Frogshield Campus Safety App](https://police.tcu.edu/frogshield/) on your phone. (<https://police.tcu.edu/frogshield/>).

Student Perception of Teaching (SPOT)

Towards the end of the term, you will receive an email asking 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 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.

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 communicated.

Date	Topics	Assessments	Modeling Project	Learning Outcomes
Jan 21	Course Introduction, Syllabus & Logistics			
Jan 28	Models & Modeling: <ul style="list-style-type: none"> • Introduction • Purpose 	Quiz 1	Environmental Problem/Issue	1
Feb 04	Types and Techniques of Models/Modeling	Quiz 2	Site Identification	1
Feb 11	Scope & Limitations of Models/Modeling	Quiz 3 Report Part I	Introduction to SWAT Model	2
Feb 18	Data Needs for Modeling	Quiz 4	Data Preparation	3
Feb 25	Data Collection, Preparation & Representation	Quiz 5 Report Part II		
Mar 04	Model Parameterization & Sensitivity Analysis	Quiz 6	Model Development	3, 4
Mar 11	No Class, Spring Refresh			

Mar 18	Model Verification: Calibration & Validation	Quiz 7 Report Part III	Model Parametrization, Verification & Calibration	4	
Mar 25	Project	Quiz 8	Scenario Development & Model Simulations	3, 4	
Apr 01		Quiz 9 Report Part IV			
Apr 08		Quiz 10			
Apr 15			Result Analysis		
Apr 22		Report Part V	Result Analysis		
Apr 29		Final Presentation, Final Report Due			4, 5
May 04		Final Exam			1, 5