

**Syllabus - Spring 2023**

<b>Prerequisites:</b>	MATH 1132Q is a prerequisite for this course. This course is a prerequisite for: CE 2710, CE 3220, and CE 4210
<b>Recommended Preparation:</b>	MATH 1131 or 1151. May not be taken out of sequence after passing CE 2210, 3220, 4210, or ENVE 2330.
<b>Catalog Description:</b>	Fundamentals of probability theory and statistics. Hypothesis testing, linear and multiple regression.
<b>Instructor:</b>	Dr. Monika Filipovska Office: CAST 330 Email: <a href="mailto:monika.filipovska@uconn.edu">monika.filipovska@uconn.edu</a>
<b>Teaching Assistants:</b>	<b>TA:</b> Zheng Ren, <a href="mailto:zheng.3.ren@uconn.edu">zheng.3.ren@uconn.edu</a> <b>UA:</b> Max Raha, <a href="mailto:max.raha@uconn.edu">max.raha@uconn.edu</a>
<b>Email Best Practices: (more information below)</b>	Include CE 2251 in email subject line. Write concise and specific questions. For content questions, please use the <i>Course Questions Forum</i> (HuskyCT Discussion Board). See guidelines in Course Orientation on HuskyCT.
<b>Lecture Time and Place:</b>	MWF* 2:30 – 3:20 PM, ROWE 122 *See course schedule for specifics (we do not meet every MWF each week)
<b>Office Hours:</b>	Dr. Filipovska: Fri 3:30 – 4:30 pm, CAST 330 (on Fridays with in-person class) Wed 3:30 – 4:30 pm, Zoom ( <i>Meeting ID: 860 486 2990 Passcode: mhzoom23</i> ) Teaching Assistants: Zheng Ren: Mondays 10 – 11 am, Tuesdays 3:30 – 4:30 pm, BRON 201 Max Raha: Wed 1:15 – 2:15 pm at CAST 205, Thurs 10 – 11 am at CAST 210
<b>Exams:</b>	Exam 1: February 15 (in scheduled class session) Exam 2: March 31 (in scheduled class session) Exam 3: April 28 (in scheduled class session) Optional Final Exam, Date & Time TBA *See course schedule for specifics

**Inclusion Statement**

Professor Filipovska is a member of the INCLUDE program team, an NSF-funded neurodiversity initiative that aspires to create an inclusive learning environment in which all students can thrive. The project emphasizes a strengths-based approach to education that encourages students to identify, develop, and leverage their unique abilities in addressing complex engineering problems. As part of this initiative, Professor Filipovska has educated herself about neurodiversity and strength-based approaches to education, participated in INCLUDE workshops and activities, and taken CETL inclusion and disability awareness training. This course is designed to help students identify, develop, and apply their strengths to activate motivation and accelerate learning. This course is specifically targeted towards employing the diverse thinking and learning styles of neurodivergent students.

Furthermore, the University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible.

- If you anticipate or experience physical or academic barriers due to a documented or undocumented disability or pregnancy, please let me know immediately so that we can discuss options.
- Students who require further accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or <http://csd.uconn.edu/>.

## Course Materials

### Required course materials should be obtained ASAP.

- Navidi, W. *Statistics for Engineers and Scientists*, 5th E-Edition, McGraw-Hill. McGraw-Hill Connect standalone access code in bookstore: 9781264303014 or purchase through McGraw-Hill Connect login.
- A student Connect account to access the homework and SmartBook assignments.
  - You can create the account through HuskyCT by navigating to a homework or SmartBook assignment where you will be prompted to register or sign in. See, <https://createwp.customer.mheducation.com/wordpress-mu/success-academy/prepare-your-students-for-connect-and-blackboard/?page=Search&term=registering%20through%20Blackboard>
- iClicker: The mobile application, REEF Polling is required. Download REEF Student Apps from <https://www.iclicker.com/students/apps-and-remotes/apps>. Find this course as “CE 2251 Probability and Statistics (Spring 2023)” and register by the add/drop deadline.
  - It is your responsibility to check if your mobile iClicker device is properly working without technical issues (wifi, phone battery, etc.) If the iClicker site is down, the session will not be graded.

The software/technical requirements for this course include:

- HuskyCT/Blackboard ([HuskyCT/ Blackboard Privacy Policy](#))
- iClicker ([www.iclicker.com](http://www.iclicker.com))
- McGraw-Hill e-Connect [Privacy](#) and [Accessibility](#) Statement
- [Adobe Acrobat Reader](#) ([Adobe Reader Accessibility Statement](#), [Adobe Reader Privacy Policy](#))
- Google Apps ([Google Apps Accessibility](#), [Google for Education Privacy Policy](#))
- Microsoft Office (free to UConn students through [UConn Software Catalog](#)) ([Microsoft Accessibility Statement](#), [Microsoft Privacy Statement](#))
- Internet access for readings and homework

NOTE: This course has NOT been designed for use with mobile devices.

For information on managing your privacy at the University of Connecticut, visit the [University's Privacy page](#).

## Course Format

This is a **flipped/hybrid** course -- part of the class content will be introduced to you through online video lectures, reviews, and readings to be completed outside class.

- Refer to the course's HuskyCT webpage for an introduction to the course and instructions of your weekly activities to be completed before, during and after each class.
- We will meet in-class twice weekly (for most weeks) and you will work on your own 1 day of the week. In-class time will be used for quick theory reviews, discussions, and problem solving. *Video lectures and reviews have been captioned so that they are accessible to a diverse population of student learners.*
- *Every week an announcement will be made with detailed instructions on what will be taking place that week and reminders for all upcoming deadlines. Please come to class prepared so that you get the maximum benefits of this learning experience.*

## Communication

Students are encouraged to ask questions and communicate with the teaching team. Please note the following:

- The primary place to ask questions is the 'Course Questions Forum' on the HuskyCT Discussion Board. All questions regarding the course, including asking for help or hints on assignments and homework should be posted there. Logistics-related questions should also be asked in the forum (e.g., questions about class schedule, exam time, and similar). This enables the entire class to benefit from each question and is the surest way to receive a quick response since you are asking the largest number of people.
- For any private questions (e.g., grade inquiries, progress in the course, etc.) you can email the instructor, TA or UTA directly. Emails should include CE2251 in the subject line. You will receive a response within 48 hours (or earlier), but not accounting for weekends.

## Course Objectives

The objective of the course is to introduce concepts and approaches from the field of probability and statistics that can be applied to the analysis of problems in civil engineering.

By the end of the semester, students should be able to:

1. Apply numerical and graphical summaries to describe data from experiments.
2. Estimate relationships between dependent and independent variables.

3. Apply statistical techniques to answer questions and solve problems.
4. Interpret results of statistical computations.

### Course Outline

- **Module 1:** Sampling & Summary Statistics, Probability and Random Variables
- **Module 2:** Propagation of Error and Discrete Probability Distributions
- **Module 3:** Continuous Distributions, Principles of Point Estimation, and Central Limit Theorem
- **Module 4:** Confidence Intervals
- **Module 5:** Hypothesis Testing
- **Module 6:** Correlation, Linear Regression and Multiple Linear Regression

### Course Requirements and Grading

A variety of activities were developed to help students meet the learning objectives. Some are geared towards basic understanding such as textbook readings with built-in quizzes and in-class activities, other are formative assessments such as homework assignments, while exams and projects are meant to assess more complete understanding. Students are expected to participate in all activities to aid in their learning.

#### Summary of Course Grading:

Course Components	Weights	
	Option 1	Option 2
A. Engagement with Course Content	10%	10%
B. Homework	20%	20%
C. Midterm Exams (1, 2, 3)	45% (15% each)	15% (5% each)
D. Semester Project (1, 2, 3)	15% (5% each)	45% (15% each)
E. Engagement in Course Activities	10%	10%
F. Optional Final Exam (replaces part or all of midterm exam grade)	(15%, 30% or 45%)	(5%, 10% or 15%)

**There are two tracks for course grade breakdown:** Option 1 primarily focusing on exams, and Option 2 primarily focusing on the course project. During the semester students will be encouraged to reflect on their learning process and self-evaluate their inclination toward either option, and eventually have the opportunity to choose their preferred grading breakdown option. Course components A, B and E will be graded evenly across the course.

#### A. Engagement with Course Content

- You will have assigned readings using a SmartBook version of the textbook.
  - It uses an adaptive reading and learning experience to help you master the material in less time.
  - To facilitate learning, you must complete reading assignments and associated reading quizzes before the due date.
  - Once the due date passes, you will receive credit for however much of the reading you completed by the due date. For example, if you completed 75% of the assignment by the due date, you will earn 75% of the credit for that reading assignment.
- The five lowest Reading/Quiz grades will be dropped.

#### B. Homework Assignments

- Homework is essential for practicing statistics! So, please do your assigned homework.
- There will be no homework make-ups and no late assignments accepted. All homework due dates are listed and available on HuskyCT in advance. You will also be reminded of due dates as they approach.

- You must actually SUBMIT your homework before the due date to get credit for your work. If you do not press SUBMIT you will not get any credit.
- Homework solutions are posted one day after the due date.
- The two lowest homework grades will be dropped for each student.

### C. Exams

- There will be three, 50-minute exams during the course. Each exam will cover a third of the course material. Exam 1 covers the first third of the course, Exam 2 covers the next third of material, and Exam 3 covers the remaining third of material.
- There is an optional comprehensive final exam which can be used to replace a low exam score on any one, two or all three of Exams 1, 2 or 3. This also serves as make-up for any and all exams.
- Exam dates are noted on the Class Schedule. Come to class on-time as exams start promptly at 2:30pm and are picked up at 3:20pm.
- Show your work and write neatly so we can evaluate the work for partial credit for incorrect responses.

### D. Semester Project

You will complete a semester project using a dataset assigned to you to practice computation of basic statistics including graphical and summary statistics, distributions, confidence intervals, hypothesis testing and linear regression. There are three deliverables (Part 1, Part 2, and Part 3) with due dates noted on the Class Schedule (see last three pages of this syllabus). The Semester Project Overview, data, and description of Parts 1, 2, and 3 requirements are available under the Semester Project tab in HuskyCT.

### E. Engagement in Course Activities

I expect each student to interact with me and their peers throughout the semester, both in class and on the HuskyCT Discussion Board. On the Discussion Board, this will include: 1) introducing yourself during the first week of class (see *Introductions* – in the Discussion Board on HuskyCT) and reply to at least one other post and 2) posting to the *Course Questions Forum* (posting a question OR responding correctly to another student's question count as a 'post').

- Discussion Board (DB) full credit is achieved by participation in class and completion of 10 weekly DB assignments (i.e. at least 1 question OR response to another student's question per week for 10 weeks).
- In-class participation grades will be based on the iClicker polling/short/multiple choice questions, or other learning activities in class. They are based on involvement in class activities, not on answer correctness.

### F. Optional Final Exam

The optional comprehensive final exam can be used to replace a low exam score on Exams 1, 2 or 3, or any combination of those. Students can replace anywhere from 5% to 45% of the final grade.

### Feedback and Grades

I will make every effort to provide feedback and post assignment grades within 1 week (or sooner) of the due date. To track your performance in the course, refer to My Grades in HuskyCT.

### Course Evaluation

Students will be provided an opportunity to evaluate instruction in this course using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE).

Additionally:

- Three structured surveys on student learning and success will be administered during the semester.
- These surveys are intended to prompt students to think critically their own learning in the course. They serve as a feedback mechanism to the instructor and a reflection opportunity for the students, to help them form an understanding of their strengths and growth throughout the semester.

## Course Schedule

This schedule contains the information about all weeks of the semester. Due to the nature of the course, the specific schedule (with days of the week and dates) will be posted and updated on HuskyCT.

*This schedule is tentative and will be subject to change. **See the detailed and correct schedule on HuskyCT!** Most up to date information on topics covered and assignments posted / due will be communicated via HuskyCT. Make sure that you receive notifications to always have access to the most up to date information.*

	Week	Sub-Module	Topic	SB	HW	Project
Module 1	1	1.1	Course Overview, Statistics Intro	SB1: 1.1-1.3		
	2	1.1 – 1.2	Descriptive Stats, Probability, Conditional and Independence	SB2: 2.1-2.3	HW1*	
	3	1.3	Random Variables	SB3: 2.4-2.5	HW2	
Module 2	4	2.1-2.2	Propagation of Error, Discrete Distributions, Binomial and Poisson	SB4: 3.1-3.2 SB5: 4.1-4.3	HW3	Part 1
	5		Exam 1 Practice / Q&A, EXAM 1	SB6: 4.5		
	6	3.1 - 3.3	Normal Dist, Lognormal Dist, Point Estimation, Central Limit Theorem	SB7: 4.6 SB8 : 4.9, 4.11		
Module 4	7	4.1 – 4.2	Confidence Intervals (CI), CI for Population Mean and Proportion, Student's T Dist,	SB9: 5.1, 5.3 SB10: 5.2	HW6	
	8	4.3, 5.1 – 5.2	CI for Difference Mean & Prop, Hypothesis Testing (HT)	SB11: 5.4-5.5 SB12: 6.1 -6.2 SB13: 6.4 – 6.5, 6.7		Part 2
	9		SPRING BREAK			
Module 5	10	5.1-5.2, 5.4	HT Means Pop. Proportion, Diff Pop. Proportion, Paired Data	SB14: 6.3, 6.6	HW7	
	11		Exam 2 Practice / Q&A, EXAM 2	SB15: 6.8	HW8	
	12	5.5	Chi-square test, F-Test	SB16: 6.10-6.11	HW9	
Module 6	13	6.1-6.2	Correlation, Linear Regression (LR), Uncertainties in Least Square Coeff., Estimating Predictors	SB17: 7.1 SB18: 7.2-7.3 SB19: 7.4		
	14	6.1-6.3	CI vs. Prediction, LR & Correlation Multiple Linear Regression (MLR) & Model Selection	SB20 : 8.1-8.3	HW10	Part 3
	15		Exam 3 Practice / Q&A, EXAM 3		HW11	

I will attempt to make reasonable accommodations in response to student requests for work submission deadlines or work missed by absence resulting from observation of **religious holidays**. Religious holidays must be communicated to the instructor early in the semester, and no later than January 30, 2023. Requests for accommodations will not be considered if made after the holiday and/or after work has already been missed.

### Note on CE 3251

CE 3251 students are responsible only for weeks 12 to 15 of the course, with the material in Module 6 (i.e., Chapters 7 and 8), including all grade components during that module, i.e., Smartbook assignments SB17, SB18, SB19, and SB20, homework assignments #10 and #11, participation in class (including discussion board and in-person classes) during Module 6, and Exam 3. It is recommended that the students take this exam during the Exam 3 time for CE 2251.

## Resources for Student Success

Course-Specific Resources	UConn-wide & General Resources
<p><b>Office hours</b></p> <ul style="list-style-type: none"> <li>○ Instructors and TA office hours are available each week</li> <li>○ Attend office hours early and frequently throughout the semester</li> </ul>	<p><b>Peer study groups</b></p> <ul style="list-style-type: none"> <li>○ You are strongly encouraged to form a study group with other students in the class.</li> <li>○ There is a study group application in Nexus that can help you get started.</li> <li>○ Check here for more information.</li> </ul>
<p><b>Recorded instructional videos with subtitles and check points</b></p> <ul style="list-style-type: none"> <li>○ Videos of recorded sessions will remain available throughout the semester.</li> <li>○ Videos are captioned and include checkpoints so you can easily navigate to the section of interest.</li> </ul> <p><b>Tutorials</b> for the use of Minitab software</p>	<p><b>The School of Engineering (SoE) Tutoring:</b>  <a href="https://undergrad.engr.uconn.edu/advising/tutoring">https://undergrad.engr.uconn.edu/advising/tutoring</a></p> <ul style="list-style-type: none"> <li>○ Academic peer tutoring is available to assist undergraduate engineering students with coursework in selected courses (including this course!).</li> <li>○ Tutoring is provided by well-qualified undergraduate students prepared to support students with the courses outlined in our schedule.</li> </ul>
<p><b>HuskyCT Discussion Board</b>, where you can ask questions and discuss course content or questions with other students</p>	<p><b>The Academic Achievement Center (AAC)</b>  <a href="https://achieve.uconn.edu/about-us-2/">https://achieve.uconn.edu/about-us-2/</a> resources:</p> <ul style="list-style-type: none"> <li>○ Drop-in coaching: academic counseling to help you achieve your goals</li> <li>○ Supplemental instruction</li> <li>○ Presentations &amp; Workshops on academic success strategies</li> <li>○ Access to mentorship</li> </ul>
<p><b>Practice sessions &amp; problems</b></p> <ul style="list-style-type: none"> <li>○ Practice class sessions with examples and guided problem solving</li> <li>○ Sample problems posted on HuskyCT for further self-guided learning and practice</li> </ul>	<p><b>The Quantitative Learning Center:</b>  <a href="https://qcenter.uconn.edu/">https://qcenter.uconn.edu/</a></p> <ul style="list-style-type: none"> <li>○ Provides resources for students taking quantitative intensive courses</li> <li>○ Provides direct assistance via peer tutoring and review sessions</li> <li>○ Provides access to learning tools</li> </ul>
<p><b>SmartBook</b> (online textbook) with practice problems and guidance</p> <ul style="list-style-type: none"> <li>○ Personalizes learning: pinpoints knowledge gaps and concepts requiring additional study</li> <li>○ Reading is accompanied with quick knowledge-checks and quizzes</li> </ul>	<p><b>Help with Husky CT</b></p> <ul style="list-style-type: none"> <li>○ If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through the <a href="#">Help Center</a>.</li> <li>○ You also have <a href="#">24x7 Course Support</a> including access to live chat, phone, and support documents.</li> </ul>
<p><b>Weekly HuskyCT announcements:</b></p> <ul style="list-style-type: none"> <li>○ Every Friday an announcement will be made to include information about: <ul style="list-style-type: none"> <li>▪ Material covered the previous week (with links and references)</li> <li>▪ Material to be covered the next week</li> <li>▪ On-line and in-person class sessions for the following week</li> <li>▪ Upcoming important dates</li> </ul> </li> <li>○ Ensure that you receive notifications to always have access to these announcements.</li> </ul>	<p><a href="#">Technical and Academic Help</a> provides a guide to technical and academic assistance.</p> <p><b>Technology training</b></p> <ul style="list-style-type: none"> <li>○ Student technology training is now available in a new HuskyCT short course created by students for students. It will prepare you to use the IT systems and services that you will use throughout your time at UConn, whether learning online or on-campus. It is available at <a href="https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline">https://lms.uconn.edu/ultra/courses/_80016_1/cl/outline</a></li> </ul>



## Class Conduct

- This course is fast-paced and cumulative! Keep current with the course content—do not fall behind or if you do, catch up quickly and/or ask for help!
- Attend classes, view the online course content, prepare for class, participate in classroom exercises and discussions, and ask questions! Please do not be shy!!
- Disruptive or disrespectful behavior of any kind will not be tolerated. Any disruptive or disrespectful behavior will be reported to the Assistant Dean for Undergraduate Education for further disciplinary action.
- Use of personal electronic devices including computers, cellphones and tablets in class for purposes not related to the class is distracting to you and your colleagues. Research shows that use of personal electronic devices for non-academic purposes during class LOWERS your grade (Carter et al. 2016; Duncan et al. 2012; Ravissa et al. 2017)!

## Resources for Students Experiencing Distress

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The University believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The University aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement.

Students who feel they may benefit from speaking with a mental health professional can find support and resources through the [Student Health and Wellness-Mental Health](#) (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern.

Mental health services are included as part of the university's student health insurance plan and also partially funded through university fees. If you do not have UConn's student health insurance plan, most major insurance plans are also accepted. Students can visit the **Student Health and Wellness-Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor**, or contact the office at **(860) 486-4705**, or <https://studenthealth.uconn.edu/> for services or questions.

## Minimum Technical Skills

To be successful in this course, you will need the following technical skills:

- Use electronic mail with attachments.
- Save files in commonly used word processing program formats.
- Copy and paste text, graphics or hyperlinks.
- Work within two or more browser windows simultaneously.
- Open and access PDF files.

## Evaluation of Course Experience

Students will be given an opportunity to provide feedback on their course experience and instruction using the University's standard procedures, which are administered by the [Office of Institutional Research and Effectiveness](#) (OIRE).

The University of Connecticut is dedicated to supporting and enhancing teaching effectiveness and student learning using a variety of methods. The Student Evaluation of Teaching (SET) is just one tool used to help faculty enhance their teaching. The SET is used for both formative (self-improvement) and summative (evaluation) purposes.

Additional informal formative surveys and other feedback instruments may be administered within the course.