# Methods in Empirical Analysis, Syllabus

CSCE 5310:

Spring 2022 at University of North Texas

## Instructor Contact

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**Assistants:**

**TA:**Thasina Tabashum

**Office hours:**With prior arrangement over email,TBD at  zoom TBD

**Zoom Link:**

**Communication Expectations:**

You will be expected to regularly check university email and attend class regularly. When you miss a class, you are expected to check the course calendar shortly after class to be aware of assignments, quizzes, and other materials. Questions not answered in class are best asked before or after class. For quick questions, email is preferred and you can expect a response within 24 hours during the work week (M-F).

For involved questions or discussions, please contact the TA/grader, and if the issue is not resolved, office hours or meetings through the posted meeting scheduler link are preferred. Please pick 15 minute slots, particularly for individual meetings - we can always consider extending. Also, If meeting about a group project, it is beneficial to meet with multiple people simultaneously (rather than separate individual meetings discussing the same project) so please coordinate with your group to schedule a project-related meeting.

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## Course Description

**Official:**Methods in Empirical Analysis. 3 hours. Introduction to applied analysis. Topics include concepts in the design of empirical computer science research and the application of the appropriate associated statistical analysis methods; the nature and importance of scientific hypotheses in computer science, the design of valid experiments to test such hypotheses, and the basic techniques of applied statistical analysis including the exploration of the meaning of results and methods of describing data on individual variables and examining association between variables including estimation, tests of mean differences, differences in distributions, and correlation between variables; random sampling, probabilities, and independent and identically distributed data concepts are discussed as a basis for understanding how to infer results from samples to the populations from which they are drawn.

**This semester:** This course covers elements in an introduction to applied statistics with a focus on proper experimental design. Both of these elements are heavily biased towards methods which take advantage of computational power and sampling strategies.

## Course Structure

**Time:** M/W 18:00pm - 19:20pm

**Location:** Discovery Park B185, with limited accommodation for remote participation.

**Credit hours:** 3

## Course Prerequisites

* Experience with Python/Matlab is beneficial as it is used extensively in the course, but significant prior programming experience with any language will be sufficient

## Materials

**Textbook:**No textbook is required. Materials will be provided consisting of online API documentation, tutorials, and academic papers. However, the following online resources may be useful:

1. Introduction to Probability and Statistics, MIT Open Course [[link](https://ocw.mit.edu/courses/mathematics/18-05-introduction-to-probability-and-statistics-spring-2014/class-slides/)]
2. Computational Statistics (Python resources) [[link](https://people.duke.edu/~ccc14/sta-663-2017/)]
3. Experimental Design and Analysis, Howard Seltman [[link](https://www.stat.cmu.edu/~hseltman/309/Book/)]

**Course communication:**

We will be using the following class google group set up at the beginning of the course: TBD

* Make sure to setup your canvas notification to receive announcements Canvas discussion
* Contact the instructor if you are not available to access the discussion forum after the first week of the course.

## Technical Requirements and Skills

### Minimum Technology Requirements

* Computers are **required for exams**
  + **In-class exams:**You will need to bring a laptop on exam days. These will be done individually on your computer in class. You will be expected to connect to the UNT wireless network.
  + Quizzes and exams will use the Canvas quiz system
    - [Canvas Technical Requirements](https://clear.unt.edu/supported-technologies/canvas/requirements) (https://clear.unt.edu/supported-technologies/canvas/requirements)
  + Computers are **optional during class, outside of exam times**
    - There will be occasional in-class activities along with lecture that are not required, but may help in understanding and applying the material
  + Students will be expected to Download and install Anaconda Python version 3 and be able to open a Jupyter notebook

## Course Requirements

### Readings, Quizzes, and Exams

**Readings/Tutorials:** Generally, quizzes will be given based on the readings and tutorial material. As will be clear in the first few weeks, quizzes will test your knowledge on the most important aspects of the readings only.

**Canvas take-home quizzes:** These quizzes are meant to focus students on the important aspects of the readings or lectures. **You will be allowed to take these quizzes online, as many times as you would like.** All canvas quizzes will be due the last day of class, but it is suggested that you finish them in the suggested period in preparation for discussions and exams.

**Exams:** Exam days are already posted and are considered fixed. Prior arrangements can potentially be made without loss of points, but have to be discussed. **Missed exams:** Exams cannot be missed without prior arrangements or later documented proof of extenuating circumstances.

### Assignments

Assignments are designed to engage you in your learning, so you can begin to apply these principles in practice and tailor them to your needs.

**Assignments** are generally due at the end of the day one week after they are assigned, unless otherwise specified. Reports and presentation slides are to be turned in as PDF. Code is to be turned in with both Jupyter notebook and PDF form, along with any files necessary to run your assignment. Results should be presentable, with appropriate comments for someone to follow what you have done. Assignments are to be turned in individually, although students are encouraged to work together extensively. As observed below in class grade points, these small assignments will have minimal impact on grades - they are for learning and self-evaluation rather than grading.

**Projects:**You will select among a small number of collaborative projects. Project proposals, progress reports, and final reviews will be part of the process. You are required to work in groups, as this is part of a full and complete education. All people in the group are expected to contribute. This is your opportunity to demonstrate what you have learned in a way that reaches beyond the selection of tools, data sets, and approaches demonstrated in the course. Commonly students find a unique, complex data set and associated learning problem and apply the techniques presented in the class. The expected result is to create a coherent, completed project for presentation demonstrating your efforts on your project.

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## Grading

Grades are determined by a simple points system, with a total of at least 100 pts as the goal though more than 100 points are likely. The expected distribution of points is given below, with the exact scale determined by point values given for each assignment, quiz, or exam - this is subject to minor modification based on actual points given. Note, due to the nature of the course, exams and quizzes are a significant means of establishing your final grade, so please complete the assignments in a timely way and study appropriately prior to each quiz and exam.

* Assignments and take-home quizzes: 30 pts
  + Canvas take-home quizzes: 5pts
  + Assignments: 25 pts
* Projects: 30 pts
  + Proposal: 6 pts
  + Update: 4 pts
  + Report: 10 pts
  + Project presentations: 10 pts
* Exams: 40 pts (best 2 of 3)
  + Exam I: 20 pts
  + Exam II: 20 pts
  + Exam III: 20 pts

**Grading Scale:** A=90, B=80-89.9, C=70-79.9, D=60-69.9, F=0-59.9 pts. No exceptions. If class grades are low (e.g. I expect the vast majority of students will end with A’s and B’s), extra quizzes or assignments will be given to add points to the class. (Note, **these grades are based on points and not percentages, so if 120 points are given, you only need 90/120 for an A!**)

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## Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course.

## Course Policies

### Examination Policy

Exams will be on the computer using the Canvas quiz system. You need to bring a laptop on the appropriate exam days if in person. Exams must be taken at the same time whether remote or in person unless special accommodations have been made through the Office of Disability Accommodation (ODA). Other accommodations must be given by prior arrangement with the instructor, otherwise documentation proving an extenuating circumstance will have to be provided after the missed exam. Time will be limited, and all work will be individual. You are strongly encouraged to attempt to solve the tasks iteratively and incrementally - write code that works first, but works poorly, and improve from there, rather than write perfect code top to bottom. Exams will focus on the most recent material but are expected to be cumulative in scope.

### Technical errors during exams

If during an online quiz or exam there is a technical error which affects your ability to complete the assignment, you are immediately to let the quiz or exam proctor know and the instructor will discuss ways to allow you to resume the test without giving an unfair advantage. In the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will extend the time windows and provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor.

### Late Policy

When assignments and project work are turned in after the due date, this places an undue burden on the instructor and TA, especially when this policy is abused. As a compromise, if the assignment or project work is turned in prior to gradingthere will be no reduction in points, however, grading can occur any time after the due date (including the following morning!). A request for missing submissions may be sent at the discretion of the TA or instructor, but is not guaranteed, and a reduction of points may also occur in a way that is consistent for the rest of the class.

### Attendance Policy

You are expected to attend lectures and to complete all readings, however, this course does not use participation points and there is no penalty for missing days without exams, or group project efforts. There is no need to let the instructor know you have missed a class, however, you are responsible for keeping up with the material covered in the class if you are not present. If a class is missed, you are expected to proactively reach out to classmates, the TA, or the instructor if there are any questions.

Individual attendance is not required except on exam days and group project presentations. There is no direct participation grading, but in the past there has been a strong correlation between engagement and accomplishment in courses - especially for those that are struggling with the material. Feel free to prioritize your time, but prioritize wisely.

**Covid-specific:** Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course.  It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals.  Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community. If you are experiencing any [symptoms of COVID-19](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fsymptoms-testing%2Fsymptoms.html&data=04%7C01%7CMark.Albert%40unt.edu%7C78ae8efa93934faf9b2c08d964c2f85b%7C70de199207c6480fa318a1afcba03983%7C0%7C0%7C637651610818315514%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=p6KzO09o70uu%2FaLmEx5uqCXyiaxfOV1EiVOc4Vpe6Ww%3D&reserved=0) ([https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fsymptoms-testing%2Fsymptoms.html&data=04%7C01%7CMark.Albert%40unt.edu%7C78ae8efa93934faf9b2c08d964c2f85b%7C70de199207c6480fa318a1afcba03983%7C0%7C0%7C637651610818325511%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=rP%2Blhoazq0Yd9kHX9J4npYFxsYwxwpkBj0mpy2AjVsY%3D&reserved=0)) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Team at COVID@unt.edufor guidance on actions to take due to symptoms, pending or positive test results, or potential exposure.

### Syllabus Change Policy

Any substantial changes to the syllabus will be highlighted in red on the online platform. Approximate point values on future assignments may change, but after being assigned they will be fixed.

## UNT Policies

### Academic Integrity Policy

Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

### ADA Policy

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one’s specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the [ODA website](https://disability.unt.edu/) (https://disability.unt.edu/).

### Emergency Notification & Procedures

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.

### Retention of Student Records

Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Blackboard online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about student’s records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University’s policy. See UNT Policy 10.10, Records Management and Retention for additional information.

### Acceptable Student Behavior

Student behavior that interferes with an instructor’s ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT’s [Code of Student Conduct](https://deanofstudents.unt.edu/conduct) (https://deanofstudents.unt.edu/conduct) to learn more.

### Access to Information - Eagle Connect

Students’ access point for business and academic services at UNT is located at: [my.unt.edu](https://my.unt.edu/). All official communication from the University will be delivered to a student’s Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail [Eagle Connect](https://it.unt.edu/eagleconnect)(https://it.unt.edu/eagleconnect).

### Student Evaluation Administration Dates

Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the [SPOT website](http://spot.unt.edu/) (http://spot.unt.edu/) or email spot@unt.edu.

### Getting Help

### Technical Assistance

[**UIT Help Desk**](http://www.unt.edu/helpdesk/index.htm) (http://www.unt.edu/helpdesk/index.htm)

**Email**: [helpdesk@unt.edu](mailto:helpdesk@unt.edu)

**Phone**: 940-565-2324

**In Person**: Sage Hall, Room 130

**Walk-In Availability**: 8am-9pm

**Telephone Availability**:

* Sunday: noon-midnight
* Monday-Thursday: 8am-midnight
* Friday: 8am-8pm
* Saturday: 9am-5pm

**Laptop Checkout**: 8am-7pm

### Student Support Services

* Registrar (https://registrar.unt.edu/registration)
* [Financial Aid](https://financialaid.unt.edu/) (https://financialaid.unt.edu/)
* [Student Legal Services](https://studentaffairs.unt.edu/student-legal-services) (https://studentaffairs.unt.edu/student-legal-services)
* [Career Center](https://studentaffairs.unt.edu/career-center) (https://studentaffairs.unt.edu/career-center)
* [Multicultural Center](https://edo.unt.edu/multicultural-center) (https://edo.unt.edu/multicultural-center)
* [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (https://studentaffairs.unt.edu/counseling-and-testing-services)
* [Student Affairs Care Team](https://studentaffairs.unt.edu/care) (https://studentaffairs.unt.edu/care)
* [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-and-wellness-center) (https://studentaffairs.unt.edu/student-health-and-wellness-center)
* [Pride Alliance](https://edo.unt.edu/pridealliance) (https://edo.unt.edu/pridealliance)

### Academic Support Services

* [Academic Resource Center](https://clear.unt.edu/canvas/student-resources) (https://clear.unt.edu/canvas/student-resources)
* [Academic Success Center](https://success.unt.edu/asc) (https://success.unt.edu/asc)
* [UNT Libraries](https://library.unt.edu/) (https://library.unt.edu/)
* [Writing Lab](http://writingcenter.unt.edu/) (http://writingcenter.unt.edu/)
* [MathLab](https://math.unt.edu/mathlab) (https://math.unt.edu/mathlab)