

STAT 490: Data Science for Actuarial Science

Meets: Tuesday from 4:30 to 5:20 in UNIV 001

Instructor: Jeff Beckley
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Virtual Office Hours:

Tuesday 10:00 am to 11:30 am

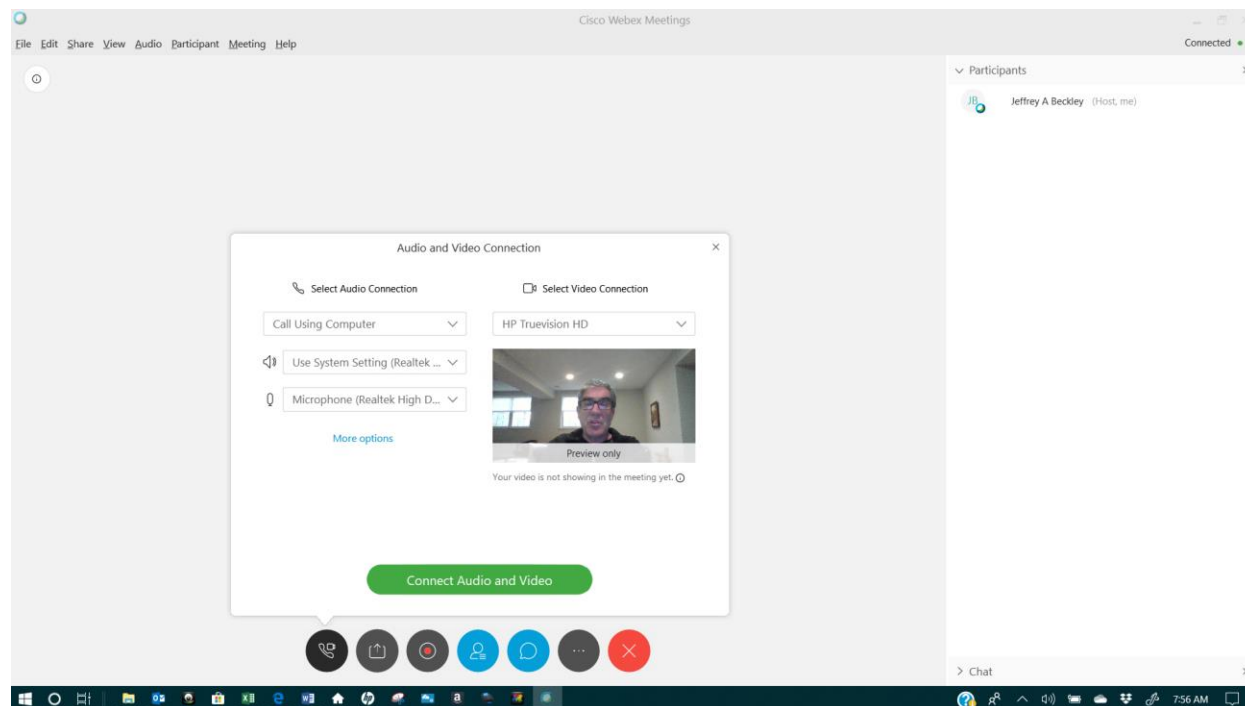
Thursday 10:00 am to 11:30 am

or by appointment

To enter the Virtual Office Hours, open a browser and type the following URL into your browser:
purdue.webex.com/purdue/meet/jbeckley

You will be asked to enter your name and email address. You may then need to install a webex addin for your browser.

After about 30 seconds your screen should look like this:



Select Call Using the Computer and Push the green button so we are connected.

If you have any problem, call me at 317-698-8543.

Please check email daily as this is the method that I will use to communicate with you.

Mask Requirement

If you attend the class in person, you must wear a mask that covers from the bridge of your nose to your chin. If you do not wear such a mask, you will be asked to leave the classroom.

Expectations

For each hour of class, you will spend 2 to 3 hours outside of class working on this class.

General Information

The Learning Objectives for this course are:

- Understand the application of Data Science to an Actuarial Science Case Study
- Understand data quality issues and be able to identify common data errors
- Apply techniques to data to identify and fix data errors
- Understand data visualization techniques and apply those techniques to the data
- Use R, Excel, and other tools and techniques to analyze the data
- Use various data analytic techniques on the data and identify previously unidentified relationships
- Develop presentation skills for a professional setting
- Understand the Actuarial Standards of Practice applicable to this work

Textbook: No Textbook is required for this course.

This is an in-person class. You are expected to attend each class in person. It is my intent to record each lecture. However, if a recording of the classroom lecture fails for any reason, then no recording will be available. You are strongly encouraged to attend class provided that you are healthy. There is value in attending the class versus watching the video of the lecture. However, if you are not healthy, you should NOT attend class. Please be considerate of your classmates (and me). Attendance will be taken and you earn bonus points by attending class.

All lectures will be recorded and made available to all the students in the class. For students who attend class, you may or may not want to take advantage of the recorded lectures. If you are unable to make it to class, then you should watch the recorded lecture.

As mentioned below, all homework for this class will be provided on the class website. You will submit your homework in Brightspace.

The process for tests and quizzes will be discussed below.

Classroom Procedures

Attendance

This course follows Purdue's academic regulations regarding attendance, which states that students are expected to be present for every meeting of the classes in which they are enrolled. Attendance will be taken at the beginning of each class. When conflicts or absences can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency absences when advance notification to the instructor is not possible, the student should contact the instructor as soon as possible by email or phone. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases falling under excused absence regulations, the student or the student's representative should contact or go to the [Office of the Dean of Students website](#) to complete appropriate forms for instructor notification. Under academic regulations, excused absences may be granted for cases of grief/bereavement, military service, jury duty, and parenting leave. For details, see the [Academic Regulations & Student Conduct section](#) of the University Catalog website.

Guidance on class attendance related to COVID-19 are outlined in the [Protect Purdue Pledge for Fall 2021](#) on the Protect Purdue website.

In Event of Quarantine or Isolation

If you must miss class at any point in time during the semester, please reach out to me via email so that we can communicate about how you can maintain your academic progress. If you find yourself too sick to progress in the course, notify your adviser and notify me via email. We will make arrangements based on your particular situation. Please note that, according to [Details for Students on Normal Operations for Fall 2021](#) announced on the Protect Purdue website, "individuals who test positive for COVID-19 are not guaranteed remote access to all course activities, materials, and assignments."

Procedures

Evaluation will be based on a combination of attendance, quizzes, homework assignments, a final written report, and the class ending presentation.

You will earn 1 point for each class that you attend. If you attend 12 out of 14 classes, you get full credit. If you attend every class, you get 14 out of 12 points.

There will be 6 quizzes during the semester. Quizzes are listed below in the schedule. The lowest quiz grade will be dropped and disregarded.

At the end of the class, you will write a written report on your findings. Additionally, you will make a professional presentation which summarizes your findings to the class.

Final grades will be based on the following weights:

Attendance	12%
Quizzes	25%
Homework	33%
Written Report	15%
Presentation	15%
Total	100%

Grades

Grades will be on a plus/minus scale as follows:

Score	Grade
99.5% and above	A+
94-99.4	A
90-93.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
73-76.9	C
70-72.9	C-
67-69.9	D+
63-66.9	D
60-62.9	D-
59.9 and below	F

Cheating

- **Academic Dishonesty will not be tolerated!**
- **If you cheat on a Quiz, the penalty is a zero on the Quiz and you will lose 5% of the total score for the class. The score of zero will not be dropped.**

Purdue has a student-initiated Purdue Honors Pledge:

“As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.”

You will be asked to sign this pledge for each quiz.

Students can report issues of academic integrity that they observe, either through the Office of the Dean of Students (purdue.edu/odos), call 765-494-8778 or email integrity@purdue.edu .

Academic Adjustments

In this course, accommodations are managed between the instructor, the student and the DRC Testing Center.

Students should see me before or after class or during office hours to share your Accommodation Memorandum for the current semester and discuss your accommodations as soon as possible.

Course Outline

October 7, 2021

While this outline tries to be complete and accurate, there will be changes in the schedule of the course; these will be announced in class and on the class website.

Date	Subject Matter	Assignments
August 24	Introduction	
August 31	Data Validation	Prior to class on August 31, Read and familiarize yourself with Actuarial Standard of Practice 23 (ASOP 23) which is available on the class website. The applicable pages are pages 1-7.
September 7	Data Validation, Quiz 1	
September 14	Data Cleansing, Quiz 2	
September 21	Data Cleansing, Quiz 3	
September 28	Data Visualization	
October 5	Data Visualization	
October 12	Fall Break	
October 19	Discussion of Individual Projects, Quiz 4	See homework assignment in Class Website
October 26	Work on Individual Projects	
November 2	Work on Individual Projects	
November 9	Data Fitting and Analysis, Quiz 6	
November 16	Data Fitting and Analysis, Quiz 7	
November 23	Thanksgiving Break	
November 30	Report Writing, Quiz 8	
December 7	No Class	
December 14	Presentations	

Copyright

In general, notes are “considered to be ‘derivative works’ of the instructor's presentations and materials, and they are thus subject to the instructor's copyright in such presentations and materials.” I consider class notes, tests, and quizzes to be derivative works and therefore copyrighted. Class notes, tests, and quizzes may not be sold, bartered, or even given to websites or other resources. Examples of such websites are Course Hero, Chegg, or Quizlet.

Nondiscrimination Statement

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Mental Health Statement

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try [WellTrack](#). Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources, please contact or see the [Office of the Dean of Students](#). Normal drop-in hours are M-F, 8 am- 5 pm.

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

Emergency Preparation

A link to Purdue’s Emergency Preparedness resources is:

https://www.purdue.edu/ehps/emergency_preparedness/

You are strongly encourage to review these procedures.

There are emergency procedures outlined in the attachment.

Violent Behavior Policy

Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity. See our course Brightspace under University Policies for a link to the full Violent Behavior Policy.

Diversity & Inclusion Statement

In our discussions, structured and unstructured, we will explore a variety of challenging issues, which can help us enhance our understanding of different experiences and perspectives. This can be challenging, but in overcoming these challenges we find the greatest rewards. While we will design guidelines as a group, everyone should remember the following points:

- We are all in the process of learning about others and their experiences. Please speak with me, anonymously if needed, if something has made you uncomfortable.
- Intention and impact are not always aligned, and we should respect the impact something may have on someone even if it was not the speaker's intention.
- We all come to the class with a variety of experiences and a range of expertise, we should respect these in others while critically examining them in ourselves.

Basic Needs Security

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students from 8:00 – 5:00, Monday through Friday. Considering the significant disruptions caused by the current global crisis as it related to COVID-19, students may submit requests for emergency funds. Click [here](#) for details and the request form.