STAT 490: Data Science for Actuarial Science

Meets: Thursday from 4:30 to 5:20 in Creighton 1011

Instructor: Jeff Beckley
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Virtual Office Hours:
Tuesday   9:00 am to 10:15 am
Thursday   9:00 am to 10:15 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:
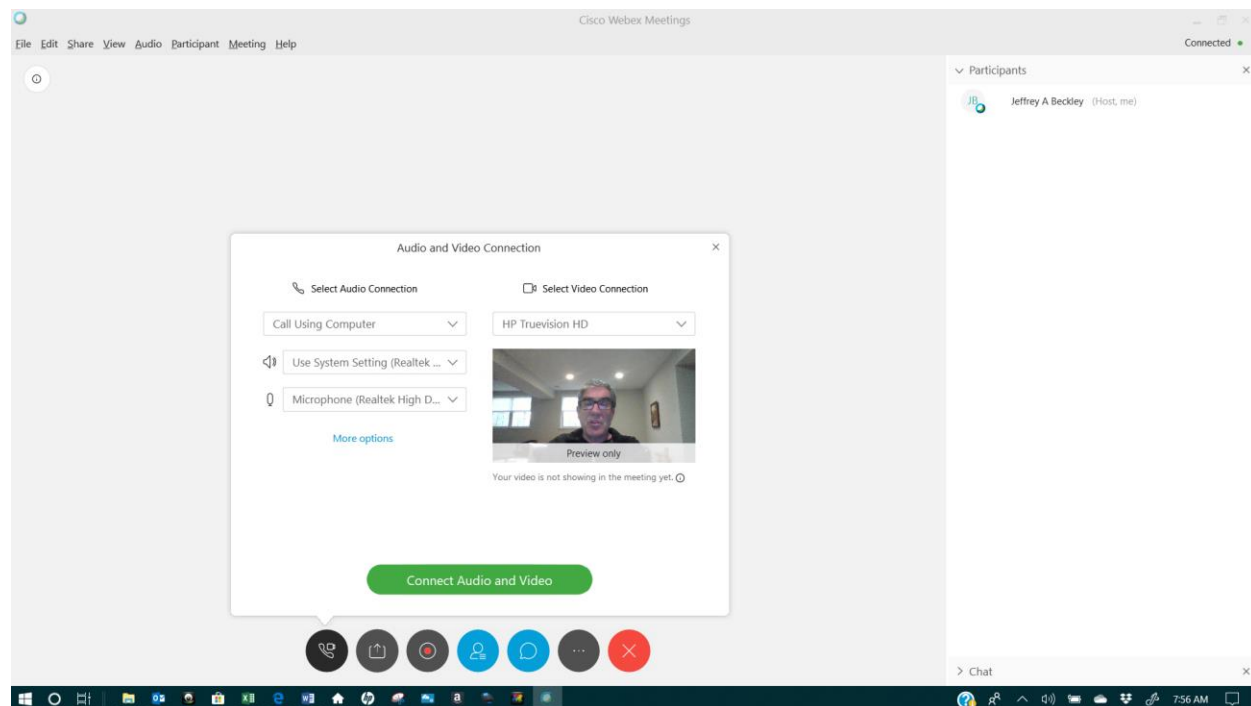
Select Call Using the Computer and Push the green button so we are connected.

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

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.

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.

Class Structure

This is a hybrid class. While the class is set up so that all registered students may attend all the lectures in person, you will also be able to complete this class without coming to class if necessitated by your illness or because the University suspends in person classes. 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 is not taken and you will not be penalized for not being present in class. However, if you miss class, I would appreciate an email letting me know that you are okay and just missed class or are sick. If you miss two classes in a row and do not contact me, I will contact you to check on you.

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 both in Brightspace and on the class website. You will submit your homework in Brightspace. Therefore, whether you able to attend class will not impact the homework.

The process for tests and quizzes will be discussed below.

Students should stay home and contact the Protect Purdue Health Center (496-INFO) if they feel ill, have any symptoms associated with COVID-19, or suspect they have been exposed to the virus. In the current context of COVID-19, in-person attendance will not be a factor in the final grades, but the student still needs to inform the instructor of any conflict that can be anticipated and will affect the submission of an assignment or the ability to take an exam. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts 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 conflict, when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email or by 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 of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via email or phone at 765-494-1747

If you become quarantined or isolated at any point in time during the semester, in addition to support from the Protect Purdue Health Center, you will also have access to an Academic Case Manager who can provide you academic support during this time. Your Academic Case Manager can be reached at acmq@purdue.edu and will provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify me via email. We will make arrangements based on your particular situation. The Office of the Dean of Students (odos@purdue.edu) is also available to support you should this situation occur.

Classroom Procedures

The Protect Purdue Plan, which includes the Protect Purdue Pledge, is campus policy and as such all members of the Purdue community must comply with the required health and safety guidelines. Required behaviors in this class include: staying home and contacting the Protect Purdue Health Center (496-INFO) if you feel ill or know you have been exposed to the virus, wearing a mask in classrooms and campus building, at all times (e.g., no eating/drinking in the classroom), disinfecting desk/workspace prior to and after use, maintaining proper social distancing with peers and instructors (including when entering/exiting classrooms), refraining from moving furniture, avoiding shared use of personal items, maintaining robust hygiene (e.g., handwashing, disposal of tissues) prior to, during and after class, and following all safety directions from the instructor.

Students who are not engaging in these behaviors (e.g., wearing a mask) will be offered the opportunity to comply. If non-compliance continues, possible results include instructors asking the student to leave class and instructors dismissing the whole class. Students who do not comply with the required health behaviors are violating the University Code of Conduct and will be reported to the Dean of Students Office with sanctions ranging from educational requirements to dismissal from the university.

Any student who has substantial reason to believe that another person in a campus room (e.g., classroom) is threatening the safety of others by not complying (e.g., not wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss next steps with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights.

Procedures

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

There will be 8 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:

Quizzes	35%
Homework	35%
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
August 24, 2020

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 27	Introduction	
September 3	Data Validation	
September 10	Data Validation, Quiz 1	
September 17	Data Cleansing, Quiz 2	
September 24	Data Cleansing, Quiz 3	
October 1	Data Visualization, Quiz 4	
October 8	Data Visualization, Quiz 5	
October 15	Discussion of Individual Projects	
October 22	Work on Individual Projects	
October 29	Work on Individual Projects	
November 5	Data Fitting and Analysis, Quiz 6	
November 12	Data Fitting and Analysis, Quiz 7	
November 19	Report Writing, Quiz 8	
December 3	Presentation to Company	

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.