

## EGMT 1520: EMPIRICAL AND SCIENTIFIC ENGAGEMENT

**UPDATES AVAILABLE!****About me:**

I was a math major in undergrad before earning a PhD degree in Quantitative Psychology from the University of Notre Dame. As a quantitative psychologist, I focus on understanding the needs of psychologists to develop new statistical methods and apply appropriate methods to address important and novel substantive questions in psychology. I came to UVA as a Psychology professor in 2014. Now, when I'm not teaching or doing research, I practice yoga, go hiking, and love my three young children. By virtue of being a woman in STEM in academia, I hope to inspire young people to stay the course of study and research despite the unique challenges in science.

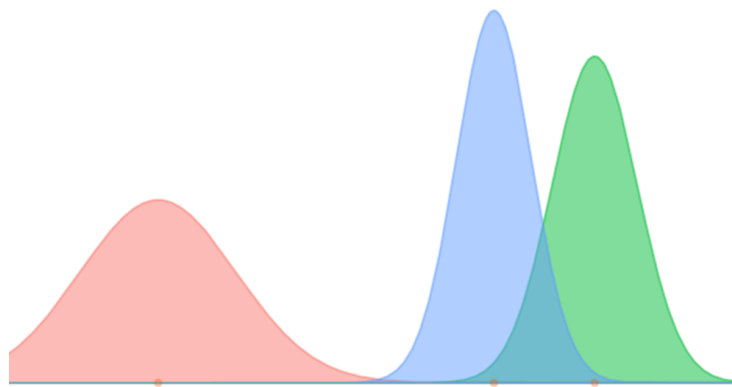
**How to reach me:**

- Email: [xt8b@virginia.edu](mailto:xt8b@virginia.edu)
- Website: <https://xtong.org/>



- Office hours: Mon & Wed 11-Noon
- Zoom ID: 949 605 0008

I would love to see you in office hours! We can meet in person or via Zoom.

**COURSE DESCRIPTION**

The world is rapidly changing with new information being pushed to us every day. Our society and the problems within it evolve over time. The outdated conclusion may not apply to today anymore and the current findings may not apply in the future. How do we take advantage of the prior knowledge we preserve? How do we understand the new data we observe especially if they are inconsistent with our prior knowledge? When updates are available, how do we combine the new information with our old data?

In this course, we will develop our answers to the motivating questions by learning and understanding the idea of Bayesian methodology. We will explore the dynamic procedure of knowledge processing, how prior knowledge can contribute to our understanding, and how biased prior information may lead us to incorrect conclusions. We will use discussions to identify Bayesian data science issues that we are interested in at different stages of the course, use lectures to learn new concepts and tools, and use engaging activities and games in and outside of the classroom to strengthen our understandings.

## LEARNING OBJECTIVES

This **empirical and scientific engagement course** aims to:

- Articulate the logic of Bayesian methods and recognize the importance of their applications;
- Understand the concept of prior knowledge and how it contributes to empirical deduction and inference;
- Develop a framework for discerning Bayesian knowledge based on what is empirically observable in the social and theoretical worlds;
- Frame empirical questions, analyze empirical evidence, and interpret claims in the context of continuously updated data;
- Consider how Bayesian statistics enabled intensive computations and empowered us to tackle a wide range of data science and modeling problems;
- Respond to ethical questions and biases in data science, and consider what they mean in real life.

If these learning objectives make you think what Bayesian methodology is, here is a typical example used in many textbooks. If we toss a coin 10 times and we get 10 heads, we want to figure out whether the coin is biased toward heads or the coin is fair but we happen to observe the unusual results, and how confident we are in that assertion. Bayesian methodology could be used as it is a data analysis approach where available knowledge about a statistical model is updated with the information in observed data. The prior knowledge and the observational data are combined to yield posteriors which can be used for making predictions about future events.

## COURSE MATERIALS

There is no textbook for this course. I will post weekly readings to Canvas. My hope is that they will be enjoyable and inspiring for you to read, help you to think and create work of your own, and deepen your understanding of the concepts.

## ASSESSMENTS

**NOTE: THIS CLASS EARNS 2 CREDITS IN ½ THE USUAL TIME (7 WEEKS), THUS IT HAS THE WORKLOAD OF A 4-CREDITS-IN-14-WEEKS-CLASS. SUCCESSFUL STUDENTS SET ASIDE AND EXPECT TO WORK 8-10 HOURS/WEEK OUTSIDE OF CLASS TO EARN THESE 2 CR IN 7 WEEKS.**

**30% Questions** – Students will submit at least one good discussion question based on assigned readings to Canvas by midnight the night before the class session during which those readings will be discussed. **(10 submissions total, 3 points per submission)**

**40% Reflections** – Write **weekly** reflective journal entries in response to our theme and class discussions, due every Friday by midnight to be uploaded to Canvas. The journal has to be at least one full page.

**10% Presentation** – Choose one topic that is related to our themes during the quarter and submit a **5-minute oral presentation** to Canvas. The presentation should demonstrate a strong, positive feeling about topic. Information should be presented in a logical and interesting sequence which audience can follow. The presentation can be submitted anytime during the quarter and is **due by Oct. 8**.

**10% Participation** – Participation will be judged in terms of how frequently you interact with the instructor and/or your classmates regarding the materials. The interactions can be during class, outside of class via Canvas collaborative tools (e.g., discussion forum, comments, etc.)

**10% Engagement Experience** – As a student at the University of Virginia, you are part of an exciting and robust intellectual community. The goal of the Engagement Experience (EE) is to make you feel welcomed into this community, where you'll discover new ideas and meet fascinating people. The EE is part of the Engagements program, existing alongside the Engagement course you are currently taking.

There are three components of EE:

- 1) Attend the Fall '23 Engagements Experience event (in person or virtually--more information below)
- 2) Complete an Academic Advising Activity
- 3) Complete an Engaging Grounds experience (more information below)

### **Component 1: Engagements Experience Lecture**

Attend—either virtually, or in person—ONE Engagements event each quarter. **This fall, the first event is Professor A.D. Carson's performance and discussion on September 18<sup>th</sup> at 7 pm in Old Cabell Hall.** We will host a convocation party prior to the event starting at 6 pm on the lawn in front of Old Cabell Hall and provide delicious local refreshments. For those of you who are unable to attend in person, the talk will be recorded and you must watch that recording.

**\*This event is open to the entire university community and seats are limited. Arrive early to ensure you have a chance to get one.**

If you attend in person, you **MUST** plan to stay the entire time. This is a chance to practice scholarly expectations, which include hearing all of an event and the Q&A.

### **Component 2: Academic Advising Activity**

As you approach the start of your first year at UVA, you need to consider how you will fulfill your general education requirements and move towards declaring a major at the end of your second year. The EE will help keep you on track by asking you to complete one academic

advising activity during each quarter. These activities will help prepare you for coursework in the following semester.

### Quarter 1 - Complete the Engagements Pathway Checklist

The Engagements Pathway checklist includes all your general education requirements. Take some time to complete the form during the first quarter of the semester. If you're unsure what courses have been used to complete your requirements, you can always refer to your *Academic Requirements Report* in SIS.

### **Component 3: Engaging Grounds**

Each quarter you will participate in one *Engaging Grounds* experience. This quarter, your Engaging Grounds required activity is to ***go to a UVA library, find a Bayesian book, take a selfie, and upload your selfie to Canvas.***

Attest that you have completed all elements of the Engagements Experience by writing “**On my honor, I have completed all components of the EE**” under the Canvas assignment titled “Engagement Experience” by October 11.


### **Grading scale:**

100% = A+	93-99% = A	90-92% = A-
87-89% = B+	83-86% = B	80-82% = B-
77-79% = C+	73-76% = C	70-72% = C-
69-69% = D+	63-66% = D	60-62% = D-
<60% = F		

## ATTENDANCE

Because participation is essential to learning in this class, everyone is expected to attend every class, unless they have a contagious illness or another acceptable reason. In such extreme circumstances please contact me and your Association Dean as soon as possible. A late arrival to class or unauthorized use of a device in class counts as a half-absence; it's easy for me to tell if someone is not attending to the class or on a device. I will note both types of absences in an attendance file I keep but will not disrupt the class to call them out. Also, if your table dynamics are not positive, please come to see me immediately so we can find a resolution.

## DEVICE POLICY

Computers are needed for research and activities during some classes (you will see a  icon for those classes in the Course Schedule). Please do not engage in non-class related activities during class time (e.g., text, email, read books, do work for other classes, etc.). If you see others violating this class policy, please remind them that their participation is important.

## HONOR AND RESPECT

I abide by the Honor Code (<https://honor.virginia.edu/>), and expect all students do as well. Violations will be referred to the Honor Committee. We strive to respect each other, all of life, and the principles of honor.

As your professor and as a faculty member, know that I care about you and your well-being and stand ready to provide support and resources as I can. If you are feeling overwhelmed, stressed, or isolated, you can make an appointment with me to talk in private. Alternatively, there are also other University of Virginia resources available. The Student Health Center offers Counseling and Psychological Services (CAPS) for its students. Call 434-243-5150 (or 434-972-7004 for after hours and weekend crisis assistance) to get started and schedule an appointment. If you prefer to speak anonymously and confidentially over the phone, call Madison House's HELP Line at any hour of any day: 434-295-8255.

If you or someone you know is struggling with gender, sexual, or domestic violence, there are many community and University of Virginia resources available. The Office of the Dean of Students, Sexual Assault Resource Agency (SARA), Shelter for Help in Emergency (SHE), and UVA Women's Center are ready and eager to help. Contact the Director of Sexual and Domestic Violence Services at 434-982-2774.

I recognize and value the many perspectives my students bring to the classroom. Many factors—social identities, visible and invisible disabilities, family circumstances, physical location, mental health, access to the internet—all influence the experiences that every individual can have in my courses. I am committed to building an environment to support your learning, one in which you will be supported and rewarded for going out on a limb to communicate and defend your ideas.

## COURSE SCHEDULE

