

University of Wisconsin-Madison

AAE 770: Introduction to Quantitative Methods in Resource and Energy Economics

INSTRUCTORS

Bethany Glinsmann, Associate Faculty Associate

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Virtual office hours: Tuesday 1-2:30pm CDT, Wednesday 6:30-8pm CDT,

Friday 8:30-10am CDT, and by appointment

Teaching Assistant: Qinan Lu, PhD Candidate in AAE

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LOGISTICAL INFORMATION

Term: Summer 2019

Course designations & attributes: Graduate

Prerequisites: Declared in REDA program

Instructional mode: Online

Course website: <https://learnuw.wisc.edu/>

Learning Management System (LMS): Canvas

Note: If there is a Canvas outage, please notify the instructor via email. The instructor will provide information regarding adjustments to deadlines (if any).

Meeting time & location: N/A. Students can complete this course from anywhere.

Course dates: July 8 – August 16, 2019 (6 weeks)

Credits: 3; Students will progress through the course modules independently, including reading material on Canvas pages, reading textbooks and other material, watching videos online, participating in online discussions, completing practice problems and problem sets, and completing quizzes. Students should expect to spend approximately 20-40 hours per week, depending on the extent of their quantitative background.

COURSE DESCRIPTION

The fundamental mathematics and statistics necessary for the study of quantitative methods in resource and energy demand. Topics include the mathematics of optimization and its role in basic welfare theory and consumer demand; linear and matrix algebra and their application in both modeling consumer behavior and the statistical analysis of models; and the fundamentals of statistical analysis relevant to econometric analysis of resource and energy demand, including probability theory, sampling distributions, and statistical inference.

LEARNING OUTCOMES

After completing this course, you should be able to:

1. Solve a constrained optimization problem by applying calculus rules.
2. Create and interpret basic data visualizations.
3. Articulate the law of large numbers as it pertains to empirical economic analysis.
4. Determine statistical significance of parameter estimates & interpret the results.
5. Use Excel and R for basic calculations and simulations.
6. Describe economic concepts to a general audience.
7. Explain statistical concepts to a general audience.

COURSE STRUCTURE

This course is structured around six modules, each covering a mathematical or statistical topic. Students will complete one module per week. Each module consists of readings & videos, large and small group discussions, practice problems, a problem set, a small group weekly challenge, and a quiz. The chart below indicates the recommended days that students complete activities. Graded activities are due according to the deadlines stated in the chart.

Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Readings & videos						
		Lg group discussion (due: 11:59pm)				
		Practice Problems				
				Problem set (due: Thur 1pm; solution key released: 2pm)		
				Small group weekly challenge (due: Fri 11:59pm)		
				Small group discussion (Initial post due Wed. 11:59pm; responses due Friday 11:59pm)		
						Timed Quiz (due: Fri 11:59pm)
			Virtual office hours (1-2:30 pm)	Virtual office hours (6:30-8 pm)		Virtual office hours (8:30-10am)
		Instructor communication via Canvas, Piazza, email, phone				

Note: Modules will open the previous Friday at 11:59pm. All material & activities will be available at the start of the module.

This chart indicates the instructor's expectations for when students are working on each item. All times listed are Central Daylight Time (CDT).

MODULES

#	Topic	Dates
0	How to be successful in this course [Online Learning]	June 28 – July 7
1	Tools for allocating scarce resources [Calculus]	July 8-12
2	Programming in R	July 13-19
3	Getting to know your data [Data Exploration & Visualization]	July 20-26
4	Modeling uncertainty [Random Variables]	July 27-August 2
5	Characterizing data [Statistical Distributions]	August 3-9
6	Assessing statistical evidence [Hypothesis Testing]	August 10-16

EVALUATION

Modules 1-6 will be equally weighted when calculating the final grade. All submissions must be typed, with the exception of quizzes. Handwritten submissions will be given **zero credit**.

- 40% Problem sets
- 35% Quizzes
- 10% Small group discussions
- 5% Weekly challenges
- 5% Large group discussions
- 5% Participation in Piazza, office hours, etc.

GRADING SCALE

- ≥ 93% A
- < 93% & ≥ 88% AB
- < 88% & ≥ 83% B
- < 83% & ≥ 78% BC
- < 78% & ≥ 70% C
- < 70% & ≥ 60% D
- < 60% F

LATE POLICY

Due to the accelerated pace of this course, **late assignments will be given zero credit**.

In the event of an emergency, students may request an extension from the instructor. All extension requests should be made at least 24 hours before the deadline when possible, or no later than 24 hours after the deadline.

Examples of emergencies include a medical emergency for you or an immediate family member, and a Learn@UW or Canvas outage. Poor time management and/or conflicts due to work or other activity schedules are not considered emergencies.

WHO/HOW TO ASK FOR HELP

When you have a question, I recommend that you:

1. Check the course syllabus and Canvas website for information. If you can't find an answer, then:
2. Post all content, logistical, and IT questions on the Piazza discussion forum, where your fellow students can respond to your question (shorter response time) and avoid repeating the question themselves. I will check the Piazza forum at least once per business day during the course to clarify any unresolved questions. **Do not discuss quiz material with other students.**
3. Email or call the instructor if your question is personal or sensitive in nature. I will respond to your email within one business day. Note that I will not be checking emails regularly on weekends, so please plan your study time appropriately.
4. Attend the virtual office hours for in-depth content questions.

Piazza is a good way for you to share helpful resources with your peers. Feel free to post links to useful videos, webpages, or other resources that you've identified.

ACADEMIC INTEGRITY

I have a zero tolerance policy for plagiarism. Any plagiarized assignment will automatically earn a 0 score. For more information on plagiarism, please refer to the [UW Writing Center](#).

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to <https://conduct.students.wisc.edu/academic-integrity/>.

SPECIAL ACCOMMODATIONS

Please notify the instructor within the first week of the course if you have a conflict due to observance of religious holidays.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Please notify the instructor within the first week of the course if you have a disability that requires special accommodations.

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Disability Resource Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

McBurney Center information: <https://mcburney.wisc.edu/>

DIVERSITY & INCLUSION

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world. <https://diversity.wisc.edu/>