INF391F : Quantitative Research Methods
Syllabus – Fall 2024

Instructor: Dr. Jacek Gwizdka
Office: 5.532
Office Hours: By appointment (in person or online)
Email: jacekg@utexas.edu **(please always include QuantRM in the email's subject)**
Note: direct email is by far the best way to contact your instructor

CLASS MEETS: Thursdays 12:30pm-3:30pm in UTA 1.504

Canvas @ UT: https://utexas.instructure.com/
Course schedule: a separate one-page document on Canvas
(look on the Canvas course home page and under Canvas Syllabus)
Course announcements and mailing list: through Canvas

COURSE DESCRIPTION

This course starts by discussing broad landscape of epistemological and theoretical perspectives and styles of reasoning and by situating in it quantitative research. It introduces you to the foundational concepts in quantitative research methods, such as causality, conceptualization, operationalization, measurement and sampling. It presents experimental design, survey design, and basic descriptive and inferential (frequentist) statistics, as well as a brief introduction to Bayesian inference and statistics.

LEARNING OBJECTIVES

Upon completion of this course, you will be able to:

- Recognize philosophical stances towards research;
- Understand research design, and know how to evaluate the appropriateness of designs;
- Understand main research designs and methods;
- Appreciate the strengths, weaknesses, and validity concerns of a variety of research methods;
- Be able to design surveys with good questions;
- Be able to assess the quality and soundness of quantitative research and its design;
- Be able to design quantitative experiment;
- Understand descriptive statistics, and know how to use them to present numerical data;
- Understand hypothesis testing in the frequentist statistical paradigm;
- Understand the basic inferential statistics, and be able to use them;
- Appreciate the difference between frequentist and Bayesian statistics.

COURSE MATERIALS

Selected chapters from books (all available online, some on Canvas):

BC: Balnaves, M., & Caputi, P. (2001). Introduction to Quantitative Research Methods. SAGE Publications, Ltd. (most chapters)
MC: Matthew DeCarlo (2019). Scientific Inquiry in Social Work. Pressbooks. (sel. chapters)

WT: William M.K. Trochim (1999 and newer). Research Methods Knowledge Base. Cornell University / Conjointly. (sel. chapters)
GD: Gray, D. E. (2018). Doing Research in the Real World. SAGE Publications. (Ch 2)
KR: Kuehl, R. O. (2000). Design of Experiments: Statistical Principles of Research Design and Analysis. Duxbury/Thomson Learning. (Ch 1)
MESR: McElreath, R. (2020). Statistical Rethinking: A Bayesian Course with Examples in R and Stan. CRC Press LLC. (Ch 1 & perhaps 2)

More readings (articles) and other materials (e.g., podcasts, videos) are listed on the page with **weekly class topics** (on Canvas and at the end of the long version of the syllabus).

CLASS LECTURE SLIDES AND OTHER HANDOUTS

For your reference, the PDF versions of class lecture slides will be posted on Canvas. You have my permission to print a copy for your personal use. Assignment and project descriptions are also posted on Canvas.

HOMEWORK

Due dates are on Canvas. Even if the instructor doesn't announce each homework in class, it's your job to know when you should be working on one and when they are due. Ask when in doubt.

Submitting written homework and project assignments

You must prepare your assignments using a word processor and submit it by uploading to Canvas by the due date/time. Please upload only documents in Word, PowerPoint or PDF file formats. Please always use appropriate three- or four-letter file extensions in submitted filename (e.g., .docx for Word files, .pdf for Adobe portable document format). Assignments may not be submitted via email.

All documents that you are submitting should include on the front page your name (spelled in the same way as in the course roster), course number/name, instructor's name, semester and the date of submission. For group work, please also always include on the front page all group member names, your project group number, and your project short name (or title).

GRADING POLICY AND ASSIGNMENTS

Ongoing: Before-Class Questions and After-Class Reflection	10%
A1. Article analysis – theoretical perspectives	10%
A2. Article analysis – research design components	5%
A3. Article analysis – experimental design	5%
A4. Data Analysis (with experimental design)	20%
Project 1. Topic and RQs	5%
Project 2. Preliminary Experimental Design	0%
Project 3. Final Experimental Design	15%
In-class Debates and Presentations	20%
Class Participation (other than the above)	10%
Total	**100%**

GRADING SCALE

- 96 or above (A superior)
- 90-95 (A- distinguished)
- 87-89 (B+ good)
- 84-86 (B satisfactory)
- 80-83 (B- barely satisfactory)
- unsatisfactory: 77-79 (C+), 74-76 (C), 70-73 (C-).

Note: Final grading does not happen just by calculations. I take into account many factors, and so your "Canvas points/%" are only a rough indication of the final grade. Ask when in doubt.

GENERAL EXPECTATIONS

Course Readings: Read the course readings critically in advance of the class session. Prepare for in-class presentations, discussions and debates.

Before-Class Questions "What I want to know" and **After-Class Reflections** "What I learned this week": Post your questions and reflections every week.

Canvas: Check out the Canvas site on a regular basis. Course readings, lecture notes, assignment instructions, grades, and other course-related resources will be communicated via the Canvas site.

CLASS PARTICIPATION

Class participation includes active role in in-class activities as well as active participation in classroom discussions. Participation in debates and in before/after class online discussions is graded separately.

This is a doctoral course, which requires active participation. My expectations for class participation and grading criteria are as follows:

- Outstanding Contributor (96-100): This student consistently asks questions in class and volunteers answers that contribute to the learning of the class by suggesting thoughtful ideas or encouraging more students to participate in discussions. Posts questions before class and writes reflections after class almost every week. Attends every class session and always arrives to class on time.
- Good Contributor (90-95): This student often volunteers answers to questions and asks questions that are appropriate and helpful to class. Posts questions before class and writes reflections after class frequently. Rarely absent (not from than 2 class meetings) and always arrives to class on time.
- Adequate Contributor (87-89): This student infrequently volunteers answers to questions or asks questions, but his or her contributions are relevant. Posts questions before class and writes reflections after class once in a while. Occasionally is absent from class sessions and arrives late.
- Non-Participant (80-85): This student rarely participates in class. Rarely posts questions before class or writes reflections after class. Absent from 4 class sessions. Arrives to class late consistently.

UNIVERSITY AND COURSE POLICIES

Due dates and times for handing in homework and project assignments

All homework and project assignments must be turned in on time by the due date. You should think of all due dates for assignments as firm. Any assignment that you do not hand in on time may be penalized in grading. If you are not able to complete an assignment by the due date, it would be best for you to hand in as much of it as you have done. It will help if you notify me about special circumstances that will adversely affect completion of an assignment.

Attendance

You will not be graded directly on attendance. You are adults in a graduate-level course and are *expected* to be present for all course-related activities. Beyond the occasional need to be absent from class for a good reason, please consider that much of the learning for the course occurs in class. You cannot participate in this learning if you are not present.

If you are absent or unable to participate on the day that your team meets, you are responsible for providing your team with the necessary information to compensate for your absence. It is crucial to keep in communication with your team members; you are responsible for letting both us and your team know if you cannot make it to a class.

Excused Absence: The only absences that will be considered excused are for religious holy days or extenuating circumstances due to an emergency. If you plan to miss class due to observance of a religious holy day, please let us know at least two weeks in advance. For religious holy days that fall within the first two weeks of the semester, the notice should be given on the first day of the semester. You will not be penalized for this absence, although you will still be responsible for any work you will miss on that day if applicable. Check with us for details or arrangements.

If you have to be absent, use your resources wisely. Ask your team and other classmates to get a run-down and notes on any lessons you miss. If you find there are topics that we covered while you were gone that raise questions, you may come by during office hours or schedule a meeting to discuss. Email specific questions you have in advance so that we can make the most of our time. “What did I miss?” is not specific enough.

If you have to miss class for an extended period due to a protracted illness or similar reason, we will treat your needs as a special case and I will do everything I can to help you survive.

Q Drop Policy

If you want to drop a class after the 12th class day, you’ll need to execute a Q drop before the Q-drop deadline, which typically occurs near the middle of the semester. Under Texas law, you are only allowed six Q drops while you are in college at any public Texas institution. For more information, see: http://www.utexas.edu/ugs/csacc/academic/adddrop/qdrop

Class Recordings:

Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings.

Sharing of Course Materials is Prohibited

No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class without explicit, written permission of the instructor. Unauthorized sharing of materials promotes cheating. It is a violation of the University's Student Honor Code and an act of academic dishonesty. The University is well aware of the sites used for sharing materials, and any materials found on such sites that are associated with a specific student, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity (Student Conduct and Academic Integrity) in the Office of the Dean of Students (Office of the Dean of Students). These reports can result in sanctions, including failure of the course.

Computer use in the classroom

You can use your laptops and other computing devices (e.g., tablets, smartphones) in the classroom. However, their use during class time is ***restricted*** to the course-related activities. Students who use their devices for non-class related activities will be excused from the class and may have participation points deducted.

The use of generative AI tools (genAI)

The creation of artificial intelligence tools for widespread use is an exciting innovation. These tools have both appropriate and inappropriate uses in classwork. The use of artificial intelligence tools (such as ChatGPT, Gemini, Llama, Claude, Perplexity, Elicit, and any other and generative language models (LLMs), generative programming tools or generative multimodal tools) **in this class shall be permitted on a limited basis**. Generally, allowed are "local" uses, while "global" uses are not. "Local" uses include using an LLM to check or improve language of a phrase or a sentence. Prohibited "global" uses include using AI to generate outlines, answer questions, solve problems, improve or create original language for large sections of an assignment, or rewrite a whole assignment. There may be other allowed uses, such as when generating charts from data. **In all cases, the use of AI should be properly attributed.** You should be explicit where and how you used a genAI tool and provide appropriate citations. When using genAI to find information, you should always ask it for citations/links and verify sources before including information from genAI in your assignment. You are also welcome to seek my prior approval for other uses of genAI tools on any assignment.

Using AI writing tools without my permission, or failing to properly cite AI even where permitted, shall constitute a violation of UT Austin's Institutional Rules on academic integrity.

E-mail Notification Policy

In this course e-mail will be used as the main means of communication with students. You will be responsible for checking your e-mail regularly for class work and announcements. If you are an employee of the University, your e-mail address in Canvas is your employee address. Please make sure that your email is configured in such way as to show your name in the same way as it appears on the official course roster. This most likely means that it should be spelled using Latin alphabet characters only.

All email messages you send concerning the class should be addressed to the instructor. I will make every effort to answer your email in a timely fashion. However, you should not necessarily always expect to get an immediate reply. In particular, don't expect to get answers to questions about a homework or project assignment within the last few hours before that assignment is due. Please put **QuantRM** as part of the subject line of your email; that will help me identify your emails more quickly.

The University has an official e-mail student notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. Read the policy: http://www.utexas.edu/its/policies/emailnotify.html.
You can find and change your official email address of record at :
https://utdirect.utexas.edu/apps/utd/all_my_addresses

STUDENT RIGHTS & RESPONSIBILITIES

- You have a right to a learning environment that supports mental and physical wellness.
- You have a right to respect.
- You have a right to be assessed and graded fairly.
- You have a right to freedom of opinion and expression.
- You have a right to privacy and confidentiality.
- You have a right to meaningful and equal participation, to self-organize groups to improve your learning environment.
- You have a right to learn in an environment that is welcoming to all people. No student shall be isolated, excluded or diminished in any way.

***With these rights come responsibilities**:*

- You are responsible for taking care of yourself, managing your time, and communicating with the teaching team and with others if things start to feel out of control or overwhelming.
- You are responsible for acting in a way that is worthy of respect and always respectful of others.
- Your experience with this course is directly related to the quality of the energy that you bring to it, and your energy shapes the quality of your peers' experiences.
- You are responsible for creating an inclusive environment and for speaking up when someone is excluded.
- You are responsible for holding yourself accountable to these standards, holding each other to these standards, and holding the teaching team accountable as well.

ACADEMIC INTEGRITY

Each student in the course is expected to abide by the University of Texas Honor Code: "As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity." **Plagiarism is taken very seriously at UT.** Therefore, if you use words or ideas that are not your own (or that you have used in previous class), you must cite your sources. Otherwise you will be guilty of plagiarism and subject to academic disciplinary action,

including failure of the course. You are encouraged to discuss assignments with classmates, but anything submitted must reflect your own, original work. If in doubt, ask the instructor.
Students who violate University rules on academic dishonesty are subject to *severe* disciplinary penalties, such as automatically failing the course and potentially being dismissed from the University. **PLEASE do not take the risk**. We are REQUIRED to automatically report any suspected case to central administration for investigation and disciplinary hearings. Honor code violations ultimately harm yourself as well as other students, and the integrity of the University, academic honesty is strictly enforced. You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: https://deanofstudents.utexas.edu/conduct/standardsofconduct.php

UNIVERSITY RESOURCES FOR STUDENTS

DISABILITY & ACCESS (D&A)

The university is committed to creating an accessible and inclusive learning environment consistent with university policy and federal and state law. Please let me know if you experience any barriers to learning so I can work with you to ensure you have equal opportunity to participate fully in this course. If you are a student with a disability, or think you may have a disability, and need accommodations please contact Disability & Access (D&A). Please refer to the D&A wwebsite for contact and more information: http://diversity.utexas.edu/disability/. If you are already registered with D&A, please deliver your Accommodation Letter to me as early as possible in the semester so we can discuss your approved accommodations and needs in this course.

Counseling and Mental Health Center (CMHC)

I urge students who are struggling for any reason and who believe that it might impact their performance in the course to reach out to me if they feel comfortable. This will allow me to provide any resources or accommodations that I can. If immediate mental health assistance is needed, call the Counseling and Mental Health Center (CMHC) at 512-471-3515 or you may also contact Bryce Moffett, LCSW (iSchool CARE counselor) at 512-232-2983. Outside CMHC business hours (8a.m.-5p.m., Monday-Friday), contact the CMHC 24/7 Crisis Line at 512-471-2255. CMHC website: https://cmhc.utexas.edu/index.html

The Sanger Learning Center

Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas. For more information, please visit http://www.utexas.edu/ugs/slc or call 512-471-3614 (JES A332).

Undergraduate Writing Center: http://uwc.utexas.edu/
Libraries: http://www.lib.utexas.edu/
ITS: http://www.utexas.edu/its/
Student Emergency Services: http://deanofstudents.utexas.edu/emergency/

BeVocal

BeVocal is a university-wide initiative to promote the idea that individual Longhorns have the power to prevent high-risk behavior and harm. At UT Austin all Longhorns have the power to intervene and reduce harm. To learn more about BeVocal and how you can help to build a culture of care on campus, go to: https://wellnessnetwork.utexas.edu/BeVocal.

IMPORTANT SAFETY INFORMATION

If you have concerns about the safety or behavior of fellow students, TAs or professors, contact BCCAL (the Behavior Concerns and COVID-19 Advice Line) at https://safety.utexas.edu/behavior-concerns-advice-line or by calling 512-232-5050. Confidentiality will be maintained as much as possible, however the university may be required to release some information to appropriate parties.

CLASSROOM SAFETY

- For any illness, students should stay home if they are sick or contagious, not only to stop the spread, but also to promote their personal wellness.

CAMPUS SAFETY INFORMATION

The following are recommendations regarding emergency evacuation from the Office of Campus Safety and Security, 512-471-5767,

- Occupants of buildings on The University of Texas at Austin campus must evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.
- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.
- In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.
- For more information, please visit emergency preparedness: https://preparedness.utexas.edu/

CARRYING OF HANDGUNS ON CAMPUS

Texas' Open Carry law expressly prohibits a licensed to carry (LTC) holder from carrying a handgun openly on the campus of an institution of higher education such as UT Austin. Students in this class should be aware of the following university policies:

- Students in this class who hold a license to carry are asked to review the university policy regarding campus carry.
- Individuals who hold a license to carry are eligible to carry a concealed handgun on campus, including in most outdoor areas, buildings and spaces that are accessible to the public, and in classrooms.

- It is the responsibility of concealed-carry license holders to carry their handguns on or about their person at all times while on campus. Open carry is NOT permitted, meaning that a license holder may not carry a partially or wholly visible handgun on campus premises or on any university driveway, street, sidewalk or walkway, parking lot, parking garage, or other parking area.
- Per my right, I prohibit carrying of handguns in my personal office. Note that this information will also be conveyed to all students verbally during the first week of class. This written notice is intended to reinforce the verbal notification, and is not a "legally effective" means of notification in its own right.

STUDENT EMERGENCY SERVICES

UT's Student Emergency Services (http://deanofstudents.utexas.edu/emergency/) provides assistance, intervention, and referrals to support students navigating challenging or unexpected issues that impact their well-being and academic success. If you need to be absent from class due to a family emergency, medical or mental health concern, or academic difficulty due to crisis or an emergency situation, please register with Student Emergency Services. SES will verify your situation and notify your professors.

Emergency Evacuation Procedures

The following recommendations regarding emergency evacuation from the Office of Campus Safety and Security, 512-471-5767, http://www.utexas.edu/safety/

Coping with stress and personal hardships

The Counseling and Mental Health Center offers a variety of services for students, including both individual counselling and groups and classes, to provide support and assistance for anyone coping with difficult issues in their personal lives. As mentioned above, life brings unexpected surprises to all of us. If you are facing any personal difficulties in coping with challenges facing you, definitely consider the various services offered and do not be shy to take advantage of them if they might help. These services exist to be used.

Title IX Reporting

Title IX is a federal law that protects against sex and gender-based discrimination, sexual harassment, sexual assault, unprofessional or inappropriate conduct of a sexual nature, dating/domestic violence and stalking at federally funded educational institutions. UT Austin is committed to fostering a learning and working environment free from discrimination in all its forms. When unprofessional or inappropriate conduct of a sexual nature occurs in our community, the university can:

1. Intervene to prevent harmful behavior from continuing or escalating.
2. Provide support and remedies to students and employees who have experienced harm or have become involved in a Title IX investigation.
3. Investigate and discipline violations of the university's relevant policies.

Faculty members and certain staff members are considered “Responsible Employees” or “Mandatory Reporters,” which means that they are required to report violations of Title IX to the Title IX Coordinator. **I am a Responsible Employee and must report any Title IX-related incidents** that are disclosed in writing, discussion, or one-on-one. Before talking with me or with any faculty or staff member about a Title IX-related incident, be sure to ask whether they are a responsible employee. If you would like to speak with someone who can provide support or remedies without making an official report to the university, please email advocate@austin.utexas.edu. For more information about reporting options and resources, visit http://www.titleix.utexas.edu/, contact the Title IX Office via email at titleix@austin.utexas.edu, or call 512-471-0419.

LAND ACKNOWLEDGMENT

We would like to acknowledge that we are meeting on Indigenous land. Moreover, (I) We would like to acknowledge and pay our respects to the Carrizo & Comecrudo, Coahuiltecan, Caddo, Tonkawa, Comanche, Lipan Apache, Alabama-Coushatta, Kickapoo, Tigua Pueblo, and all the American Indian and Indigenous Peoples and communities who have been or have become a part of these lands and territories in Texas, here on Turtle Island.

INF391F : Quantitative Research Methods – Instructor: Dr. Jacek Gwizdka

Course Schedule (subject to *change*)

Fall 2024 - Thursdays 12:30 PM - 03:30 PM

#	Date	Topic	Reading Assignment (readings are ***before*** class)	In class activity	Assignments (due at beginning of the class, unless indicated otherwise)
1	Aug 29	Introductions	**BCCH1,2**	Intros.	
2	Sept 5	Foundations: Styles of reasoning. Philosophy of Science. Theoretical perspectives	**BCCH3:33-40. GDCH2. MCCH6-7. WPCHF-POR. ARTICLES.**	Discussion-Debate. Presentation: styles of reasoning	
3	Sept 12	Fundamental concepts in quantitative research.	**BCCH3:40-. MCCH7. WPCHM**	Discussion. Presentation: Causality in research process	A1. Article analysis - theoretical perspectives
4	Sept 19	Research design. Hypothesis testing.	**BCCH4:67-75. MCCH12. WPCHRD. KRCH1.**	Discussion.	A2. Article analysis - research components
5	Sept 26	Survey design	**BCCH4:75-90. MCCH11. WPCHM-SR**	Discussion. Presentation: Survey & Question design	
6	Oct 3	Exploring and describing data. Excel. Intro to "R" or Python	**BCCH5. WPCHA-DS**	Tutorial/presentation	A3. Article analysis – experimental design.
7	Oct 10	Analyzing data: frequentists (inferential) statistics - t-tests	**BCCH6. WPCHIS-T-TEST**		
8	Oct 17	Analyzing data: frequentists (inferential) statistics: ANOVA	**BCCH6. WPCHA-DS-CORR**		P1. Topic and RQs
9	Oct 24	Analyzing data: inferential statistics – rep. measures ANOVA. Correlation and associations (param and non-param)	**BCCH6. WPCHA-DS-CORR**		
10	Oct 31	Analyzing data: inferential statistics – regression. non parametric		Discussion.	P2. Preliminary Experimental Design
11	Nov 7	Analyzing data: inferential statistics	**WPCHIS-GLM.**	Discussion	
12	Nov 14	Bayesian statistics vs. Frequentist (inferential) statistics	**LSRCH17. CHBSCH1-P1. PODCAST. VIDEO.**	Discussion-Debate	
13	Nov 21	*No classes - Thanksgiving Holidays*			
14	Nov 29	TBD		Sparkling water (no sugar!)	
15	Dec 5	Final class meeting		Cookies and cakes	A4. Data Analysis P3. Final Experimental Design

Readings: **BCCH<#>**: Balnaves, M., & Caputi, P. (2001). Introduction to Quantitative Research Methods. SAGE Publications, Ltd.
MCCH<#>: Matthew DeCarlo (2019). Scientific Inquiry in Social Work. Pressbooks.
WTCH<#>: William M.K. Trochim (1999 and up). Research Methods Knowledge Base. Cornell University / Conjointly.
GDCH2: Gray, D. E. (2018). Doing Research in the Real World. SAGE Publications.
KRCH1: Kuehl, R. O. (2000). Design of Experiments: Statistical Principles of Research Design and Analysis. Duxbury/Thomson Learning.
MESRCH1-2: McElreath, R. (2020). Statistical Rethinking: A Bayesian Course with Examples in R and Stan. CRC Press LLC.
CHBSCH1: Chechile, R. A. (2020). Bayesian Statistics for Experimental Scientists: A General Introduction Using Distribution-Free Methods. MIT Press.
Note: This document lists only book chapters, additional articles, podcasts, videos are listed on Canvas (on "Readings by Week" Page)