

Qualitative Research Methods in Engineering

Fall 2026

T/Th, 3:30-4:45 PM in Van Leer (085), Room C340

Instructor Information

Instructor

Dr. Kelly J. Cross

Email

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Office Hours

TBD

General Course Information

Description

This qualitative methods course focuses on developing skills to implement, communicate, and design research across the five qualitative research method traditions, including approaches to ensuring research quality. This syllabus is intended to serve as a guide for the course. As the course and course materials are continually evolving, this document is subject to change. Please refer to the course Canvas site for the most up-to-date course information.

Pre- &/or Co-Requisites

Graduate engineering students may take the course. Recommended: Prior knowledge of research methods.

Course Goals and Learning Outcomes

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

- SLO 1: Apply engineering research and theory to advance the art, science, and practice of the discipline.
- SLO 2. Synthesize relevant theories, methodologies, and frameworks to inform qualitative research design.
- SLO 3. Apply research quality criteria for qualitative research methodologies.
- SLO 4. Critically analyze and critique existing qualitative research studies.

Course Structure and Design

The class is structured as a discussion-based seminar that includes online discussion boards and personal reflections on the course topics. Each class meeting we will use an “unpacking” method to start our discussion of the assigned articles. A basic guide to unpacking an article is posted on [Canvas], along with other handouts by Toulmin to guide you on analyzing and building logical arguments.

A Note on Discussion: Your opinion is highly valued in this course, and the discussion format of the course is designed to help you practice your skills of verbal argument. You are encouraged to focus on logical arguments that connect your opinions with different types of evidence.

Professionalism: In this graduate-level course students are expected to act professionally by attending all class meetings, arriving on time and prepared, actively participating, making logical arguments substantiated by evidence, and respecting others.

A Note on Reading: What should you look for when you are reading an article? There are certain elements of an article or paper that we want you to focus on. Why is this paper important? How

can/does it contribute to engineering education? What are the limitations of this piece? Most importantly, what future research is suggested by this work? Try not to focus solely on the limitations - all studies are flawed - as doing so can distract you from uncovering more important insights. Identify contexts where the study is relevant or not relevant.

This is a research methods class; theory and methods are interrelated, and you will be exposed to a range of research methodologies over the course of the class. Therefore, pay close attention to theories and methods **and** the alignment of theories and methods. Make a note of methods and theories you like or do not like and why. Keep an eye out for relevant/interesting citations. Some of the readings are from traditions that are often orthogonal to engineering and may assume significant background knowledge in other literatures. We do not expect you to completely understand or absorb all the readings, but by engaging with the material, you will gain important and diverse insights.

A Note on Writing: Writing is an integral part of scholarship. The writing assignments in the course are designed to help you start developing your own style and become a critical and reflective writer.

Writing does not come easy to anyone! Therefore, consider the assignments as an opportunity to get constructive feedback and improve as you move along

Course Requirements & Grading

Assignment	Date	Points
1. Reading Reflection (10 response x 2)		20
2. Tradition Summary (final presentation)		30
3. Theory in Qualitative research (report)		15
4. Data collection and analysis in Qualitative research (report)		15
5. Critique of Qualitative research (report)		15
6. Participation Attendance		5

Course Participation

Since this is an upper-level class and discussion-based, we expect significant participation from students. You will be expected to read all required materials and come prepared to discuss them in class and raise questions. Class participation is mandatory and occurs in both online and in-class discussions.

Expectations for student work: This is a three-credit course. Accordingly, expect the average workload for this course to be about 6 to 9 hours per week outside of class. Spending this time reading and reflecting on the material is essential. Complete all of your assignments on time, continuously self-evaluate your learning, keep track of questions regarding readings, and proactively seek help.

Readings: In addition to required readings, the instructor and guest speakers will suggest other relevant readings during the semester. Students are encouraged to share relevant articles/news with the class. We will be using Canvas to facilitate online discussions.

Description of Graded Components

1. Reading Reflection (response)

Due: ongoing; Mondays @ 10 pm starting in Week 2

Limit: see below

Points: 20

We will use the course readings as the central basis for our discussions. The purpose of this assignment is for you to reflect on the articles you read each week and to summarize them in a concise manner. In addition, this is an opportunity for you to shape class discussions. Please be sure to address the following:

- Briefly **summarize** each article or Chapter (75-word limit per article)
- What were the **clearest** takeaways from the articles as it relates to the week's topic? (125-word limit)
- What were the **most confusing** parts of the articles as it relates to the week's topic? (125-word limit)
- What did you learn that could have **practical usefulness**? (125-word limit)

2. Critique Qualitative Research Response (project report)

Due: Monday, October 26th at 10 PM

Limit: 2 pages

Points: 15

You will complete one read-and-respond or critique assignment. Your response will be evaluated based on your ability to make well-reasoned arguments with appropriate supporting evidence for each of your claims. The prompt for the response is provided below:

Critique the qualitative study design described in the paper by Marks and colleagues titled "Integrating Athlete Perspectives and Head Kinematics in Youth American Football" (pdf on Canvas)

In your response, please use appropriate sources from the course to:

- Justify your selection of the criteria used in your evaluation in relation to the purpose of the research
- Define each criterion and describe the basis by which you will determine compliance
- Provide concrete, detailed examples of the degree to which you think the study satisfies each criterion, identifying both strengths and weaknesses
- Offer constructive suggestions for addressing the identified weakness or leveraging existing opportunities within the described context.

In instances where you are required to make an assumption about the context, or would need additional information from the authors, please indicate so explicitly.

3. Data Collection and Analysis Response (project report)

Due: Monday, November 16th at 10 PM

Limit: 5 pages

Points: 15

Based on your research interests, select a relevant tradition and theory, and summarize an appropriate data management procedure informed by your selected tradition and theory. The purpose of this assignment is to demonstrate your ability to summarize data collection methods relevant to your research. For this assignment, you are required to do the following:

- Describe the data collection procedure for the two selected theories (including benefits and limitations of procedures)

- Describe and justify how the quality of qualitative methods could be added or improved in the theory
- Describe the researcher positionality and how it impacted the research
- Use course readings to justify your choices of methods for your selected theory topic

You may expand your literature beyond class materials. Make well-reasoned arguments with appropriate supporting evidence for each claim.

4. Theory in Qualitative Research Summary (project report)

Due: Monday, December 7th at 10 PM

Limit: 5 pages

Points: 15

Pick two theories that may be relevant to your research interests. The purpose of this assignment is to demonstrate your ability to summarize theories relevant to your research. For this assignment you are required to do the following:

- Describe the definitions of the main concept for (2) theories your project will address and discuss why they are important
- Describe the populations that has been studied with the theories
- Describe the main conclusions about each theory including any diversity, equity, and inclusion issues
- Use course readings to justify your evaluation of quality, both the limitations and future work of each theory

You may expand your literature beyond class materials. Make well-reasoned arguments with appropriate supporting evidence for each claim.

5. Final Project

Due: Week 16

Limit: 15 minutes

Points: 30

Qualitative research is an important part of the engineering education research mission to improve the engineering education experience. The purpose of the assignment is to develop a tool that other engineering education peers can use to become familiar with a particular qualitative tradition. You must develop a complete study design for your chosen tradition. You have the freedom to be as creative as you would like for this assignment, but your presentation must include the following:

- An overview/summary of the epistemological foundations or underpinnings of the selected tradition
- A list of tactics or procedures to achieve quality
- A clear discussion comparing and contrasting the data collection and analysis (e.g. limitations)
- A clear discussion on your tradition and the connection to your dissertation topic, explicitly stated in your presentation

Grading Scale

Your final grade will be assigned as a letter grade according to the following scale:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Course Materials

Required Course Materials

The required readings for the course will be provided on the course Canvas site. Engineering education is a multi-disciplinary field that draws on work from a broad range of academic traditions. Therefore, in addition to the primary journal of the field, Journal of Engineering Education, we will be reading articles from fields such as learning sciences, organizational studies, and higher education.

Optional Books Summary: “Qualitative Research in Practice: Examples for Discussion and Analysis” by Sharan B. Merriam and Robin S. Grenie is an eBook available on the Georgia Tech library website. The book is practical introduction to qualitative research across fields and disciplines Qualitative Research in Practice offers a hands-on introduction to qualitative research design, methods, data, and analysis. Designed as a companion text for any course involving qualitative research, this book explores the different types of qualitative studies with relevant examples and analysis by the researchers themselves. A link to the eBook is provided here: <https://ebookcentral.proquest.com/lib/gatech/detail.action?docID=5630257>

Additional Materials/Resources

If you plan to do qualitative research, the following are recommended resources. Dr. Cross has a copy of each you can preview.

- 1) Patton, M. Q. (2014). Qualitative research & evaluation methods (4th ed.). Thousand Oaks, CA: Sage Publishing.
- 2) Rossman, G. B., & Rallis, S. F. (2011). Learning in the field: An introduction to qualitative research (3rd ed.). Thousand Oak, CA : Sage.
- 3) Seidman, I. E. (2006). Interviewing as qualitative research: A guide for researchers in education and the social sciences (3rd ed.). New York: Teachers College Press.
- 4) Creswell, J. (2007). Qualitative inquiry and research design (2nd ed.). Thousand Oaks, CA: Sage.
- 5) Stake, R. (1995). The art of case study research. Thousand Oaks, CA: Sage.

Course Website and Communication

All communication with students will be conducted through announcements in Canvas. If you need to contact the instructional team, you must use your GATECH email, as non-GT emails may be filtered by Outlook. When sending an email to the instructional team, include the course code “BMED 88XX” and a brief description of your inquiry in the subject line. Please use professional and formal language in all correspondence with the instructional team. Address course instructors by their professional titles, such as Dr. or Prof. Our students are our top priority, and we strive to maintain clear and effective communication while fostering an environment of mutual respect.

Course Policies, Expectations, & Guidelines

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and nonvisible differences. **All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.**

Safe Zone Statement: I am a member of a Safe Zone Ally community network, and I am available to listen and support you in a safe and confidential manner. As a Safe Zone Ally, I can help you connect with resources on campus to address problems you may face that interfere with your academic and social success on campus as it relates to issues surrounding sexual orientation and gender identity. My goal is to help you be successful and to maintain a safe and equitable campus.

Preferred Name/Pronoun Statement: I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. [Review Georgia Tech's Honor Code](#) and the [student Code of Conduct](#).

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Attendance and/or Participation

As a discussion-based course, attendance and participation are required and contributes up to 5% of your final grade. Georgia Tech policy permits students to miss class without penalty for participation in approved institute activities and in specific religious observances ([click here for details](#)). Student absences limit your learning experience and ability to learn from other students in your course.

However, public health continues to be an important concern, and you are encouraged to stay home when sick in order to take care of yourself and other students. Inform the instructor as soon as you know you are sick and will be unable to attend and participate in class. With enough notice, alternative options to participate can be provided. Here are Institute [expectations and restrictions related to attendance](#), including information about excused absences.

Collaboration and Use of Generative AI

In this course, you can work (discuss topics and get feedback) with your classmates but it must be disclosed with the assignment. Similarly, working with or using Generative AI in course work is permitted within the course guideline. Using appropriate tools effectively is part of engineering, whether it is a slide rule, a computer, or ChatGPT. Using your tools effectively means three things (1) using them thoughtfully, (2) using them ethically, and (3) retaining responsibility for their outputs. This extends to learning and learning to use AI effectively is important to engineers. Using AI to replace learning or replace your thinking is *bad* for engineers because it violates 1, 2, and 3. For this course that translates into the following guidelines to make **RAD** use of AI tools:

- **Responsible** – You are responsible for the work you submit. From our experience, the quality of work we expect is higher than current AI can do. That means if you turn work over to AI, you will do poorly. The thinking required in this course requires cumulative knowledge, synthesis of concepts, and clear articulation of interrelated content, which current AI is less effective than your brain.
- **Allowed** – AI can also be helpful for this class. AI can digest more than you can, and AI provides a ‘statistically normative’ perspective on language. We allow and encourage AI to HELP you do good work in developing and gathering evidence to support your ideas and claims. However, you are ultimately accountable for the accuracy of what you report and write.
- **Disclosed** – You must disclose the use of AI on any assignment using our AI disclosure form (see canvas and assignments). This form, which asks how and why you used AI, is for data collection and transparency. There is no penalty for using AI per se, but there will be a penalty for not disclosing AI. This approach is akin to journals requiring you to share the data and analysis code that supports a research paper.

Extensions & Late Assignments

Late work with prior instructor approval and emergencies will be graded at full credit. Unapproved or unexcused late work will be graded for half (1/2) credit. **Late submissions for the final project will not be accepted.**

Note: Georgia Tech recognized some exceptions are made for “approved Institute activities” (e.g., field trips and athletic events) and religious observances to allow extensions. [Read more about approved exceptions](#). **Prior instructor approval is still required.**

Inclement Weather and Digital Learning Days

If a weather-related event affects campus operations, instructors have the discretion to cancel class or pivot to digital instruction based on departmental and/or program considerations. Check Canvas for any announcements regarding switching to digital learning formats

Note: The policy regarding the requirements, procedures, and responsibilities related to [Digital Learning Days for Modified Campus Operations](#).

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class. The Student-Faculty Expectations Agreement is considered part of this syllabus. We reserve the right to include a question on the contents of this agreement in any course assessment.

Student Use of Mobile Devices in the Classroom

The use of mobile devices for non-academic activities is prohibited during class time to avoid distraction and promote active listening and engagement with class discussion. Research on learning shows that unexpected noises and movement automatically divert and capture people’s attention, which means that one student’s use of a mobile devices (laptops, cell phones, tablets, etc.) can distract another student, thus disrupting their ability to learn.

However, mobile phone and laptops may be used for academic activities and supporting student engagement in the class discussion. Research indicates that students taking notes on laptops tend to process less as they take notes, and the depth of their learning suffers. Overall these devices should be used in a way that does not prevent the learning of other students in the class.

Additional Course Policies

Food and drinks should be avoided in class unless they are able to be consumed in a manner that is not distracting to other students engaging in the class discussion.

Audio or video recording: Surreptitious or covert videotaping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. **This class may be videotaped or audio recorded only with the written permission of the instructor.** In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students will be notified and should understand that their comments during class may be recorded.

Campus Resources for Students

Graduate Student Academic and Professional Success Resources: Below is a list of resources for graduate students provided by the [Office of Graduate and Postdoctoral Education](#) website. Specific information for current graduate students includes

- [Academic Resources](#) such as the Communications Center, Language Institute, Library, Catalog, Registrar, resources for conducting research, Advocacy and Conflict Resolution resources, and how to manage unexpected situations that may impact your academic performance;
- [Student Resources](#) such as Campus Services, Child Care/Family programs, Health & Wellness, Career Services, and the Student Resource Guide; and
- [Professional Development](#) such as the programming from the Career Center and other professional development resources and events”]

Student Well-Being: [Some faculty include resources that support students’ mental and emotional well-being. Including these additional resources on your syllabus communicates to students that you care about them and that you are committed to facilitating their academic progress. For all courses, a sample statement that might be included in your syllabus is

“At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A [comprehensive list](#) of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being ([student-resource-guide \(gatech.edu\)](https://student-resource-guide.gatech.edu))

More resources on supporting student well-being on the syllabus and beyond are available through the [Learning Well Initiative](#).

Course Schedule (Tentative)

Week	Class Dates	Topic	Assignments & Due Dates
1	Aug. 25 & 27	Course Introduction	Reflection 1 due Mon., Aug. 31 at 10:00 PM
2	Sept. 1 & 3	Traditions Overview	Reflection 2 due Mon., Sept. 7 at 10:00 PM
3	Sept. 8 & 10	Credibility and Trustworthiness	Reflection 3 due Mon., Sept. 14 at 10:00 PM
4	Sept. 15 & 17	Purpose Statements and RQs	Reflection 4 due Mon., Sept. 21 at 10:00 PM
5	Sept. 22 & 24	Study Design and Theory	Reflection 5 due Mon., Sept. 28 at 10:00 PM

6	Sept. 29 & Oct. 1	IRB, Audit Trail, & Ethics	Reflection 6 due Mon., Oct. 5 at 10:00 PM
7	Oct. 6 & 8	Interview Protocols	Reflection 7 due Mon., Oct. 12 at 10:00 PM
8	Oct. 13 & 15	The Art of Interviews	No Reflection
9	Oct. 20 & 22	Workday: Interview Tips	Critique Response due Mon., Oct. 26 at 10:00 PM
10	Oct. 27 & 29	Transcribing and Coding	Reflection 8 due Mon., Nov. 2 at 10:00 PM
11	Nov. 3 & 5	Group Coding	Reflection 9 due Mon., Nov. 9 at 10:00 PM
12	Nov. 10 & 12	Codes to Results	Data Collection due Mon., Nov. 16 at 10:00 PM
13	Nov. 17 & 19	Presenting Qualitative Results	Reflection 10 due Mon., Nov. 23 at 10:00 PM
14	Nov. 24 & 26	Thanksgiving Break	No Class
15	Dec. 1 & 3	Workday: Alignment	Theory Summary due Mon., Dec. 7 at 10:00 PM
16	Dec. 8	Tradition Summary	Final Presentation: TBD