



LEHIGH

UNIVERSITY

Course Syllabus, Fall 2023

ISE 403 :

Research Methods

Course Information:

Lectures: Tuesdays & Thursdays, 1:35pm-2:50pm, Mohler 375

Office Hours: Mondays, 10:00am-12:00pm on Zoom (sign up on [Calendly](#))

Instructor Information:

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Description: This course is designed to provide skills that are necessary for transitioning from being an undergraduate or master's student to a doctoral student in engineering, specifically in the Department of Industrial and Systems Engineering (ISE) at Lehigh University. It solidifies a foundational understanding of topics in mathematics and computing that are useful for all students in the program. The course also provides skills for technical reading, technical writing, and literature reviewing. Emphasis is placed on skills required to conduct cutting-edge research in an ethical and responsible manner.

Course Objectives: The objectives of this course are for students to do the following:

- Develop a firm understanding and appreciation for the expectations of a doctoral student in engineering and how they differ from those of an undergraduate or master's student.
- Learn (or review) mathematical background topics and learn (or review) computing skills pertaining to Linux, git, L^AT_EX, and on-campus (high performance) computing resources.
- Learn fundamental skills for technical reading, technical writing, and literature reviewing skills.
- Explore how to formulate research topics that are worthy of in-depth investigation and the preparation of articles and other written products for publication.
- Practice how to present data visually in an effective manner.
- Develop a firm understanding and appreciation for ethics in research.

Prerequisite: Being enrolled as a doctoral student in the Department of ISE at Lehigh University.

Textbook: None.

Important dates:

Day	Date	Note
Tuesday	August 29	First lecture
Tuesday	September 26	No lecture (Prof. Curtis travel)
Tuesday	October 17	No lecture (Prof. Curtis travel)
Tuesday	November 7	No lecture (Civic Engagement Day)
Thursday	November 23	No lecture (Thanksgiving Day)
Thursday	December 7	Last lecture

Course Model: Lectures will be held in person unless otherwise announced. If circumstances make it such that a lecture cannot be held in person, then it will be held virtually by Zoom in a synchronous manner; any such lecture can be accessed at <https://lehigh.zoom.us/my/frank.e.curtis>.

Office Hours: Please come to office hours if you have any questions about the course. Office hours will be held over Zoom by appointment. To sign up for an appointment, use the Calendly link on the previous page, which is also available on Course Site. I am also available through e-mail (always) and on Google Chat (often). If I do not respond to an e-mail within 24 hours, then please assume that I have not received it and send a follow-up e-mail. If I do not respond on Google Chat, then I am either busy or you are contacting me too late in the day, in which case you can try again the next day or send an e-mail instead. I am also willing to meet at other times, but in such cases please e-mail me in advance to set up a mutually convenient time.

Zoom: Zoom sessions, either for lectures (as needed) or office hours, work best when all students who join are ready to participate and follow the same guidelines regarding the use of video. I will be asking all students to turn on their cameras during Zoom sessions. If you have a strong preference not to do so, then please let me know in advance of the Zoom session. Students should respect everyone's privacy by not taking screenshots nor recording the live sessions. I do *not* plan to record any lectures, although if requested a Zoom session can be recorded if all participants agree. If recordings are ever made, then they would only be shared with students in the class and will be deleted at the end of the semester.

Course Site: Lecture notes will be posted on Course Site. Homework assignments, solutions, announcements, and other important material will also be posted on Course Site. Important information, corrections, and updates about the course may also be sent by Course Site.

Grading: Your grade will be calculated based on the following percentages.

Participation:	5%
Quizzes:	40%
Homeworks:	25%
Project:	30%

See the subsequent sections for information about each of these components. Once numerical grades are calculated, a letter grade will be assigned based on the following table of outcomes.

[100, 93]	(93, 90]	(90, 87]	(87, 83]	(83, 80]	(80, 70]	(70, 60]	(60, 0]
<i>A</i>	<i>A−</i>	<i>B+</i>	<i>B</i>	<i>B−</i>	<i>C</i>	<i>D</i>	<i>F</i>

Participation: Attendance will not be taken. However, participation will factor into your grade. Participation means being an active member of the course during lecture times by answering questions, asking questions, offering insights, etc. If you need to miss one or a few lectures, then this will not necessarily adversely affect your participation grade. However, if you are not an active member of the lectures that you attend, then it will adversely affect your participation grade.

Quizzes: There will be a few in-lecture quizzes throughout the semester. It is your responsibility to contact me in advance of any absence from lecture so that you may take the quiz before the lecture from which you will be absent. Only in the case of a documented emergency would it be possible to take a quiz after a lecture in which it is given. A missed-quiz grade will be 0. No quiz grades will be dropped.

Homeworks: There will be a few homework assignments throughout the semester, generally assigned and due every few weeks. Each homework must be submitted electronically via Course Site. No credit will be given for any late assignment. You are free to consult with other students when working on homeworks, but the work you submit must be your own. *Please cite any references you use, including fellow students.* Your homework grade will be determined by the number of points you accumulate over the entire semester as compared to the maximum number of points that are possible to accumulate. In this manner, homeworks with more questions will effectively have a higher weight in determining your homework grade. No homework grades will be dropped. See below for further instructions about submitting work as L^AT_EX-generated PDFs.

Project: There will be a course project—namely, to write a “research proposal”—due at the end of the semester, components of which will be assigned throughout the semester.

Submitting Work and L^AT_EX: Your solutions for each homework assignment and the course project must each be submitted as a single PDF file. There are no exceptions to this requirement. Please do not attempt to submit multiple files for any assignment or project, and please do not attempt to submit any other type of file besides a PDF file. Once L^AT_EX is covered in the course, all subsequent work must be submitted as documents produced with L^AT_EX. There are no exceptions to this requirement.

Collaboration Policy: The sharing of ideas is educationally useful and you are encouraged to discuss assignments with other students. However, *plagiarism* of any kind is destructive, fraudulent, and unacceptable. You are *strictly* forbidden to copy another student’s written work, whole or in part, and submit that work under your name. You are also *strictly* forbidden to make trivial or mechanical changes to another student’s written work and submit that work under your name. Note that while electronic plagiarism is easier to perform (via copy-and-paste), it is also easier to detect. Plagiarized work will receive no credit and repeat offenses will result in more severe action. A sure way to avoid this issue is to discuss the assignments with fellow students, but then write your solutions individually and independently.

Emergencies: Everyone is responsible for all material covered and announcements made in lecture. If you believe you will miss a long period of time in the course due to illness, a family emergency, etc., then please contact me as early as possible. Under no circumstances will credit be given for missed work unless you have discussed your absence with me in advance.

Regrade Requests: If you disagree with a grade you receive, then you may submit a regrade request. This request must be written and submitted no more than 48 hours after you receive the grade.

Recording Devices: Voice and/or video recording devices may be used only with the approval of everyone. Please let me know in advance if you wish to record voice and/or video.

Accommodations for Students with Disabilities: Lehigh University is committed to maintaining an equitable and inclusive community and welcomes students with disabilities into all of the University’s educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact Disability Support Services (DSS), provide documentation, and participate in an interactive review process. If the documentation supports a request for reasonable accommodations, DSS will provide students with a Letter of Accommodations. Students who are approved for accommodations at Lehigh should share this letter and discuss their accommodations and learning needs with instructors as early in the semester as possible. For more information or to request services, please contact Disability Support Services in person in Williams Hall, Suite 301, via phone at 610-758-4152, via email at indss@lehigh.edu, or online at <https://studentaffairs.lehigh.edu/disabilities>.

Lehigh University Policy on Harassment and Non-Discrimination: Lehigh University upholds [The Principles of Our Equitable Community](#) and is committed to providing an educational, working, co-curricular, social, and living environment for all students, staff, faculty, trustees, contract workers, and visitors that is free from harassment and discrimination on the basis of age, color, disability, gender identity or expression, genetic information, marital or familial status, national or ethnic origin, race, religion, sex, sexual orientation, or veteran status. Such harassment or discrimination is unacceptable behavior and will not be tolerated. The University strongly encourages (and, depending upon the circumstances, may require) students, faculty, staff or visitors who experience or witness harassment or discrimination, or have information about harassment or discrimination in University programs or activities, to immediately report such conduct. If you have questions about Lehigh’s Policy on Harassment and Non-Discrimination or need to report harassment or discrimination, contact the Equal Opportunity Compliance Coordinator (Alumni Memorial Building / 610.758.3535 / eocc@lehigh.edu).