

ISyE 4803 Design for Humans, Environment and Economy

Georgia Tech Early Summer Session, 2026

Day, Time and Location for residential section

Monday, Tuesday, Wednesday and Thursday 9:30 – 11:40

May 18 to June 24

Clough 272

Instructor and email

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Teaching Assistant

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Prerequisite

ISYE 2027, ECON 2100 or ECON 2101 or ECON 2105 or ECON 2106

Course Description

This course introduces how industrial and systems engineers (ISE) apply systems thinking to design responsible processes and products that serve the humans (designers, workers, customers and communities), minimize environmental impacts and maximize economic values.

Artificial Intelligence (AI) has changed how we study and work. We will introduce human cognition, intelligence, behavior, and strategies to learn and work in the age of AI. We will introduce the human and environmental impact of economic activities and through life cycle assessment (LCA) to consider the system holistically. Finally, we will introduce project financial analysis. You will apply what you learned by designing alternative simple solutions to some current process or product of your concern and evaluate them for humans, environment and economy.

Course Learning Outcomes

At the end of this course, the students will be able to:

1. Understand different aspects of responsibilities of industrial and system engineers;

2. Articulate human cognition, instinct and behavior and their impact intellectual development;
3. Understand human mental and physical capacities and industrial standards for work design;
4. Articulate the strategies to study and work in the age of AI;
5. Articulate various aspects of environmental footprint of economic activities;
6. Understand basics of life cycle assessment (LCA) and system thinking through case studies and USEEIO;
7. Manipulate cash flows to obtain equivalent values for a different time point or time frame;
8. Understand engineering economic decision criteria, including net present value, internal rate of return, and benefit cost ratio.
9. From alternatives and derive valid cost/benefit estimations from available data.
10. Compare alternatives that have unequal economic lives.
11. Perform after tax cash flow analysis, applying standard depreciation accounting rules.
12. Reflect inflation and uncertainty in analyses.
13. Work in teams effectively on a project.

Required Course Materials

Course Notes, to be available on Canvas.

Grading Policy

This course is graded on a letter grade basis. $A \geq 90$, $B \geq 80$, $C \geq 70$, $D \geq 60$. The weights of graded components are:

- 10 quizzes 40%, the lowest grade will be dropped.
- Team project, 2 stages, 15% + 15% = 30%
- Final Exam, 30%

Description of Graded Components

There will be 10 quizzes on Canvas under Quizzes.

There will be a team project in which you design alternatives to existing systems and evaluate your alternative for the customer/user, environmental impact and financial performance.

The final exam is comprehensive. The test is on paper to be proctored in an approved testing center. You will have 2:50 minute window to complete the final win a 24 hour window based on Atlanta time. More details are in the Announcement in Canvas.

USG required Course Policies

Attendance and/or Participation

You are required to view the lecture videos within 24 hours of posting.

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. Please review [Georgia Tech's Honor Code](#), the student [Code of Conduct](#).

Any student suspected of cheating or plagiarism 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.

Core IMPACTS

Not applicable

Additional Georgia Tech Required Policies

Accommodation 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.

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.

Collaborations, Group Work

You are allowed to work in groups on assignments, but any submission must be written in your own work. The assignments are for learning so that you can demonstrate your understanding on the test without these assistances. class tests and exams will be closed book and notes, but I will provide an equation sheet.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

20% deduction per day will apply for late assignments or quizzes. After the solutions are published, no credit will be awarded. Make-up work can be given only with approval from Deans office https://cm.maxient.com/reportingform.php?GeorgiaTech=&layout_id=5 or from Institute Approved Absences <https://registrar.gatech.edu/info/institute-approved-absence-form-for-students>.

Use of Generative AI

Generative Artificial Intelligence (Gen AI, or AI) has changed how we learn and work in the human-in-the-loop decision or design process. You can use Chatbots to achieve better results and to develop your own intellectual capabilities. You can also take the path of minimum effort to achieve plausible result without learning. Your own contribution during your career will depend on your own capabilities in asking good questions, solid command of fundamentals, critical thinking of the AI generated results, logical thinking to link the fundamentals to the results, and the ability to judge your final submission. The discussion in human cognition, cognitive capacity, human behavior, human decision and intellectual development in this class will help you be more conscientious about how to use these tools to improve results and your intellectual development.

In this course, you can use any AI tools for learning. However, you must report

1. Which tool and how you used to tool on which problem in what way.
2. How the use of tools helped you to better understand the fundamentals, critical and logical thinking.