# ISYE 3106 Syllabus

**Cornerstone Design for Industrial Engineers, Section A, 3.00 Credits**

**Spring 2027**

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## Instructor Information

**Instructor**: Dr. Velma Lopez

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## General Course Information

### Description

This course introduces students to problems in Industrial and Systems Engineering through project-based learning utilizing past Senior Design projects. Emphasis is on identifying and specifying the opportunities for improving a system through diagnostic data analysis, scoping a solution strategy, and writing/presenting a proposal for addressing the client's needs. In addition, students will receive guidance to help develop their professional skills in communication, professionalism, and teamwork.

### Course Learning Outcomes

Upon successful completion of this course, students should be able to:

- Identify, break down, and define a problem/opportunity statement for an industrial engineering design project
- Practice the information and data collection process to define the problem, understand the context, and identify the opportunities
- Develop the essential components of writing and presenting a business/ Industrial Engineering design proposal
- Be effective in a collaborative and inclusive team to meet objectives
- Learn to provide feedback
- Write and present a proposal for solving problems addressed with Industrial Engineering methodologies

### Required Course Materials

No textbook is assigned; we will use a series of readings and Senior Design cases.

Canvas and MS Teams are the mandatory communication tools in this class. All class-related materials are posted there. Students are responsible for all announcements and changes in the schedule that are made in class, posted on MS Teams, Canvas or sent via email.

## Grading Policy

| Assignment | Weight |
|---|---|
| Attendance | 10% |
| Participation in class work | 10% |
| Individual Mini Assignments | 10% |
| Team Projects: | |
| Cost vs. Service Study Project | 20% |
| Design Challenge Project | Total 20% |
| Frame-the-Design Project | Total 25% |
| Team pod | Total 5% |
| Total | 100% + Extra Credits* |

*Extra credits may be earned by attending Capstone Design Expo, ISYE Senior Design finalist presentations (show case), and submitting course evaluations.

Georgia Tech has provided guidance that students should be able to easily translate their scores on assignments, tests, and projects to their course letter grade. To this end, we have the following conversion table.

| Grade* | Criteria |
|---|---|
| A | 90 – 100% |
| B | 80 – 89% |
| C | 70 – 79% |
| D | 60 – 69% |
| F | below 60% |

* Note that we may relax the above criteria if we feel that mercy is appropriate.

## Description of Graded Components

**Attendance and Participation:**

Attendance is expected unless there is an excused absence. If you miss a class due to a reasonable excuse, tell me in advance and copy the TA. Excused absences will not negatively impact your attendance grade. If you are sick or have symptoms of an infectious disease, you should not attend class.

Class participation is a very important part of the learning process in this course. Your participation grade will be based on the quality of your contributions and insights. Participation includes interactions in class, on Canvas or MS Teams discussions, interactions during workshops, interactions with your teammates (assessed by the peer evaluations), interactions during presentations, and completing class participation exercises. Quality comments possess one or more of the following properties:

- Offers a different and unique, but relevant, perspective;

- Contributes to moving the discussion and analysis forward;
- Builds on other comments.

While your participation grade is subjective, it will not be random or arbitrary. And, clearly, more frequent quality comments are better than less frequent quality comments.

**Mini-assignments and samples of past pre-proposals analysis:**

Students are required to complete assignments based on in-class exercises involving analysis of past preliminary proposals submitted in senior design and concepts introduced in class on capacity, variability, etc. These will be individual submissions. Announcements about the submission format will be made in class and on Canvas. Make sure that your Canvas setting alerts/notifies you when new materials are posted. There will be some extra credit opportunities.

**Cost vs. Service Study Project:**

Each project team will complete a project to investigate the relationship between service (measured using customer cycle time) and cost (measured using resource utilization). It's obvious that there is a direct relationship between the number of resources in a system and their cost. It's not obvious, however, the relationship between service (e.g., waiting time for customers) and the number of resources. This project aims to get students to identify the data they need to quantify those relationships for a queueing system, collect that data, analyze it, and identify potential opportunities in that system to improve service without increasing resources.

**Design Challenge Project:**

Teams will play the role of consultants called in to suggest how a hypothetical system should redesign/change its operations to accommodate customer service. Each team will complete the design challenge project in three stages:

1. Client description,
2. Business problem, and
3. System design problem and presentation.

Teams may also practice data collection. Each team will submit a short report in each stage, and will present in stage three. More information will be provided later. This project aims to get students to describe the system, and identify the objectives, processes, required resources, constraints, potential opportunities, and other design components.

**Frame-the-Design (Final) Project:**

This is the third and the final project and is based on a past senior design project. Your assignment has two stages:

1. Developing and writing a preliminary proposal and
2. Presentation (each team will both present and play client role).

The system to be studied and the required data for this project will be provided and discussed during the semester. You are expected to articulate what the project goal should be, why this project is important to the business/organization, what opportunities you have identified for achieving the goal, what data analysis you conducted to identify the system design opportunities, what data you would need for your design strategy (solution), and what value you bring to the client by redesigning this system.

**Team Pod:**

Each team will assume a manager role and assess other teams' written and presentation performances. Team pod activities will take place after Design the Challenge - Part 3 and after the Frame-the-Design (Final) project. Additional details will be shared later.

## Course Policies

### Attendance and/or Participation

Attendance and participation are graded in this course (10% each). The details are given above.

### 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 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

Core IMPACTS is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated career competencies. This resource developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas that you may adapt for your course.

### 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.

## 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.

## Pre- &/or Co-Requisites

ISYE 3030 with concurrency.

## Extra Credit Opportunities

There will be some extra credit opportunities that we have prepared for you. Extra credits will be added to your total score (up to 1.5%). For example, say, your total is 88.5 out of 100, it'll be 90 (if you completed all).

1. CIOS Course Evaluations (0.5 pt): Please fill out the CIOS course evaluation survey. We really do take all your comments into account, and we will use them to improve the course for future students. If the Course/Instructor Opinion Survey (CIOS) response rate exceeds 80%, everyone will get an extra 0.5 pt.
2. GT Capstone Design Expo (0.5 pt): Come check out the impressive set of ISYE projects- along with other disciplines- and congratulate these hard-working graduating seniors on almost finishing senior design. There will be a discussion assignment for this opportunity.
3. Senior Design Finalist Presentations (0.5 pt): The top honor in ISyE Senior Design; being selected as ISyE Best of Senior Design Finalist. Lunch 11am – 12pm in the ISYE Atrium, followed by live presentations by the top finalist teams so we can determine the Spring 2026 winning team. That Tuesday is reading period and you can take a break from finals, have a free lunch, and cheer your upper classmates. We will create an assignment for this extra credit opportunity with more information.

The Fall 2027 Senior Design students are strongly encouraged to attend both events.

## Collaboration, Group Work, and Use of Generative AI

**Team Formation:**

Students are allowed to form their teams (four or five students in each team). We will announce the teams the second week of classes. Team membership does not change throughout the semester unless there are extenuating circumstances. If you plan to withdraw from the course, it is important that you tell your instructor and teammates as soon as you have decided to do so. This is a project-team-based course, and your decisions impact the performance of your teammates.

**Collaboration & Group Work:**

For the individual assignments, each student is expected to turn in their own individual work. No copying from other students, from the internet, or from any other source is allowed. You may form study groups to prepare prior to an assignment deadline. For projects, students will work in small groups. Each group is expected to turn in only one report. If you have questions about the collaboration policy, ask us.

**Artificial Intelligence Use:**

Generative AI tools are now becoming a more integral part of how we derive knowledge, how companies do business, and what employment opportunities are available. However, they are a two-edged sword. While they provide opportunities for learning, they can also hamper self-learning if that new knowledge and learned concepts are not solidified for understanding, replication, and rigorous analysis. Such tools may also interfere with the development of accurate knowledge since such tools tend to make up an answer if they don't know the answer.

In our course, the use of Generative AI tools should be considered a parallel to collaboration with other people: you are welcome to talk about your work with other peers/students as well as with AI-based assistants. However, all work you submit must be your own. You should never include in your work anything that was not written or computed or modeled directly by you without proper reference.

Generative AI tools could be useful in your project as follows:

- Inquiries about (basic) concepts, public information, media, references including methods, etc. You will have to thread this carefully since the information provided by such tools may not be accurate/correct/rigorous. Do not use these tools as your only approach to complement learning.
- Inquiries about the use of computer codes and implementations without using actual project data. AI tools may provide additional support that could improve your use of methods, for example, better ways to develop visual analytics, or use of computer code in a more efficient way.
- To check the grammar of sentences from your reports (as long as those sentences are yours).

You are NOT allowed to use Generative AI

- To generate text for your report.
- To generate slides for your presentations.
- To generate a script for your presentations.

In other words, do not let AI do thinking and writing for you.

It is your responsibility to follow all applicable rules and to recognize that information generated by AI tools may not always be accurate.

Students should be aware of the potential harm to their learning that may arise from improper AI use. Submitting any part or the entirety of a project using AI tools in a manner that does not comply with Georgia Tech policies will be considered an Honor Code violation.

Please read carefully the Georgia Tech Guidelines:

https://gatech.service-now.com/home?id=kb_article_view&sysparm_article=KB0043472

https://oit.gatech.edu/ai/guidance

Please read about some heuristics and recommendations at:
https://www.cc.gatech.edu/news/new-policies-navigate-role-ai-assistants-cs-courses.

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

**Peer Evaluations:**

Students are required to provide evaluations after each project: evaluations of team members' contributions. This input will be used in addition to the instructor's opinions when determining grade adjustments and/or reductions to a project grade. Failing to complete the peer evaluation survey results in a significant grade penalty applied to the missed evaluation. The penalty for insufficient contribution ranges from 10% to 100% of the project weight.

Late submissions of an assignment will have a penalty ranging from 10% to 100% deduction on that assignment depending on the lateness. Time to complete an assignment will be more than sufficient. Assignments submitted 24 hours or later will not be accepted.

Incomplete Grade: An "I" will be granted only if a passing grade has been maintained, 70% of the course work is completed, and there is a documented family or medical emergency through the Dean of Students.

### Inclement Weather and Digital Learning Days

If campus operations are affected by a weather-related event, we will pivot to digital instruction. An announcement and email will be sent with instructions and the access link.

### Student Use of Mobile Devices in the Classroom

Please turn off your cell phone. You are not allowed to make or answer a phone call during class.

If you use your laptop or any electronic devices, that activity should be ISYE 3106 related, i.e., you are not allowed to do your other course assignments, check your personal massages, texts, YouTube, or any social media.

## Campus Resources for Students

### Undergraduate Student Academic Success Resources

Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend

scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

### Student Well-Being

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 (https://students.gatech.edu/student-resource-guide).

### Special Circumstances

In some cases, religious observances or other events may conflict with scheduled class activities. In such situations students can be given an alternative means of meeting the academic requirement. Students must notify the instructor of any such conflicts, with the specific dates, within the first two weeks of classes. Students requiring disability accommodation are also requested to make arrangements with the instructor within the same period if possible.