

ASE-6001 Syllabus

Fundamentals of Modern Systems Engineering

Fall 2026

Instructor Information

Instructor: Joseph Angel

Email: joe.angel@gtri.gatech.edu

General Course Information

Description

This course is the cornerstone of the 2-year Professional Masters in Applied Systems Engineering (PMASE) program at Georgia Tech. Individual and group assignments provide a structured and hands-on Systems Engineering foundation. In 7 fast-paced weeks, the PMASE cohort forms engineering teams that walk through the engineering life cycle for projects selected during the first week.

Course Learning Outcomes

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

- Identify systems thinking
- Demonstrate use of common Systems Engineering methods, tools, and terms
- Apply systems engineering tools to structure a transparent and coherent systems development
- Apply Georgia Tech and PMASE processes and academic tools

Required Course Materials

- Systems Engineering Handbook (5th Edition), INCOSE, ISBN: 978-1-119-81429-0
- Systems Engineering, Principles and Practice, Kossiakoff, 3rd edition, ISBN: 978-1-119-51666-8
- The Memory Jogger 2, by Michael Brassard, ISBN, 9781576812310

Grading Policy:

- A>90, B>80, C>70, D>60

Assignments

- Case Study Exercises: P/F
- Project Proposal: P/F
- Laboratory Exercises (five): 50%
- Quizzes (six): 3%
- Class Participation: 10%
- Final Project: 37%

Description of Graded Components

- A combination of team and individual work permits learning through application of foundational Systems Engineering topics. Each student is expected to perform a combination of individual work and team work.
- Team scores apply to the entire team, while individual assignments are scored to assess performance of each participant.

Course Policies

Attendance and/or Participation

The course is arranged in a weekly format. Each week has a theme highlighted in the syllabus. The first week, in-residence at the Atlanta campus, is designed to provide each student with the tools needed to succeed in the PMASE program. Access to distance tools, forming teams, familiarization with the course, and basic Systems Engineering concepts are just a few of the topics in week one.

Subsequent weeks have content arranged to satisfy course goals. Two "live session" weekend (Friday afternoon and all day Saturday) events provide additional interactive exposure to the cohort and faculty. The live sessions are held via a web-based platform. Each week has a set "office hours" scheduled between the engineering teams and assigned mentors/faculty.

Attendance and participation are expected at all academic sessions (in-residence and the two "live session" weekends. Attendance at weekly office hours is optional but recommended.

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.

Collaboration, Group Work, and Use of Generative AI

This course is intentionally structured around team-based systems engineering practice. Students are expected to collaborate extensively within their assigned teams while maintaining individual accountability for learning and contributions.

Collaboration Expectations

- Team collaboration is authorized and expected for all team-based deliverables (e.g., labs, proposal, final project).
- Each student must contribute meaningfully to team outputs; free-riding is unacceptable and may result in individual grade adjustments.
- Individual assignments (e.g., quizzes, certain exercises) must reflect independent work unless explicitly stated otherwise.

- Teams are encouraged to adopt structured collaboration practices (e.g., work breakdown structures, role assignments, configuration control of artifacts).

Use of External Resources

- Use of external references (texts, standards, prior work, etc.) is permitted and encouraged when properly cited.
- All submitted work must clearly distinguish original student work vs. sourced material.

Use of Generative AI

- Generative AI tools are permitted as engineering aids, not as a substitute for thinking. Any use of Generative AI must be explicitly disclosed.
- Unacceptable uses:
 - Submitting AI-generated content as your own work without modification
 - Using AI to complete quizzes or individual graded assessments
 - Generating technical analyses, requirements, or architecture without verification and understanding

Extensions and Late Assignments

This course is highly time compressed and the penalty for late submissions is set in order to sustain a high tempo of limited faculty staffing and ensure each student receives timely "in-cycle" feedback on performance.

A late submission of a team assignment applies to the entire team. Individual assignments are penalized on the student.

Personal situations (health, natural disasters, riots, wars, weddings, births, deaths, etc.) should be communicated directly with the primary instructor.