

AE 6362 Syllabus

Safety by Design A/A01/Q/Q01 - 4 Credits

Summer 2026

Instructor Information

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General Course Information

Description

Aerospace vehicle safety, reliability, and certification considerations within the vehicle design process. Students will be introduced to core safety principles and the fundamental methods for incorporating safety analysis of aerospace systems alongside system design and engineering.

Course Learning Outcomes

This project-oriented course is aimed at introducing students to a functional safety management (FSM) approach for integrating complex aerospace system development with safety by design and flight certification processes. The FSM approach has been well accepted in many industries through the use of various industry standards and regulations. It is implemented through joint industry and government led Aerospace Recommended Practices (ARPs) and Document Orders (DOs).

This interactive approach between aircraft and system development and safety assessment begins with an initial Concept of Operations (CONOPS). Aircraft level requirements are identified and leveraged for architecture selection and vehicle sizing. In parallel, aircraft-level Function Hazard Analysis (FHA) provides initial insight into the vehicle's safety requirements, which are carried forward and refined through later stages of the vehicle, system, and item design and analysis.

There are three sections to the Course, which will introduce the overall FSM approach and provide insight into its various components and applications:

1. Introduction to FSM standards and to Reliability, Availability & Maintainability Fundamentals. At the completion of this section, students will be familiar with functional

safety and reliability concepts and their relationship to the development of aerospace systems.

2. Education on the Development Assurance approaches in Aerospace Recommended Practices (ARPs) and DO standards. At the completion of this section, students will be understand industry standard practices for incorporating safety assessment methods into the system design process.
3. Application to Aircraft and Spacecraft of Interest, both civil, military and autonomous UAS, to include a flight certification planning. At the completion of this section, students will be able to apply their understanding of functional safety approaches, reliability, and standard practices to an aerospace system of interest.

Required Course Materials

No textbook is used for this course. Course notes will be provided through the course website, typically in the form of PDF copies of lecture material.

Grading Policy:

Students are expected to attend course meeting times, which will include lectures, class discussions, case studies, and method demonstrations. Student participation in discussions and case studies is expected and questions during lectures are encouraged.

Over the course of the semester students will work in groups to conduct functional safety analysis on a relevant aerospace vehicle. The results of these analyses will presented in a midterm and final presentation over the course of the semester.

A representative distribution of the course grade between these aspects is provided for reference below:

Attendance – 5%

In-class participation – 15%

Midterm Project Review – 35%

Final Project Review – 45%

Description of Graded Components

Throughout the course, students will be expected to participate in a set of supervised and unsupervised activities. During the lecture component of the course some time will be devoted to consideration of case studies and example use cases. Students are expected to be engaged in these portions of the course, participating in class discussions and coordinating with class-mates during the lecture activities.

In addition to the lecture material, students will work in groups to conduct functional safety analysis on a relevant aerospace vehicle. Each student is expected to meaningfully contribute to the technical progress of their team's analysis. Technical progress will be checked at a midterm and final project review, which will include an assessment of each team member's contribution to the overall progress of the team.

Course Policies

Attendance and/or Participation

Students are expected to attend course meeting times, which will include lectures, class discussions, case studies, and method demonstrations. Student participation in discussions and case studies is expected and questions during lectures are encouraged. In person students should attend lectures at the assigned lecture location and times. Students within the distance learning section may attend lectures broadcast during the lecture time or review recorded lectures once they are posted to the course website.

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.

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.