ME 4753 Syllabus

Topics in Engineering Practice ME 4753, Section QAV, 3 credit hours

Fall 2026 Semester

Instructor Information

Instructor: Dr. Fedorov

Email: Andrei.fedorov@me.gatech.edu

General Course Information

Description

The GE Aviation Advanced Course in Engineering (ACE) is an intensive engineering training program with emphasis on technical competence, problem-solving capabilities, and technical communication skills. The ACE program was established in 1891 at the original General Electric site in Schenectady, NY and has since expanded to every GE business and site (both in the U.S. and abroad) with the objective to accelerate professional/technical growth and bridge the gap between industry and the classroom. The first year of ACE, known as "A-Course," consists of 32 weeks of in-house coursework, organized into five modules covering a wide range of technical subjects in the fields of mechanical engineering, aerodynamics, heat transfer, thermodynamics, materials science, controls engineering, systems engineering and statistics.

Course Learning Outcomes

The primary objective of the GE Aviation ACE program is to bridge the gap between undergraduate engineering education and applied methods used in industry. Key learning outcomes of the program are to build technical competence in the areas of mechanical and aerospace engineering, and to hone problem-solving and technical communication skills. A-Course consists of 32 weeks of coursework organized into five modules covering subjects in the fields of mechanical engineering, aerodynamics, heat transfer, thermodynamics, materials science, controls engineering, systems engineering and statistics. The figure below shows a layout of these five modules.

Required Course Materials

Lecture and Homework

Course materials for A-Course are created internally and are proprietary to GE Aviation. Weekly lecture presentations and homework assignments are available in the course library on the company intranet.

There are no textbooks required for this course, but students are free to utilize any texts or other outside resources they wish, unless specifically directed otherwise by instructor or course staff.

Additional Materials/Resources

All required classroom/lab materials, computer equipment, software, and other course supplies are provided directly by GE and the ACE staff. Students are free to utilize any other learning aids, textbooks, or supplies as they wish, unless specifically directed otherwise by instructor/staff and provided it does not violate company policy.

Course Website and Other Classroom Management Tools

General ACE program information, policies, schedules, etc. are provided on the Advanced Course in Engineering website, available on the GE Aviation intranet.

All A-Course lecture and homework materials are provided in the Support Central- Secure library on the GE Aviation intranet.

Weekly homework assignments are submitted and returned electronically to a secure GE Box folder, visible only to the student and A-Course staff.

Grading Policy:

Weekly assignments are graded per a rubric and are heavily weighted on technical results and analytical methodology. Students are also evaluated on their analytical assumptions, conclusions, a technical discussion, and the overall quality/presentation of their report. All calculations, computer code (MATLAB, Python, Excel, etc.), and other relevant data must be organized in an appendix with sufficient explanation/comments such that the reader can recreate the results as needed. Rubric grading criteria is specifically tailored for each assignment, but a typical weighting is shown below.

Description of Graded Components

Typical Homework Report Rubric Weighting:

Abstract	10%
Assumptions	5%
Results	25%
Analysis	30%
Discussion	20%
Report Quality	10%

Grading Scale

Students will be graded (on a 0-100% scale) on all homework assignments and presentations. For team assignments, all students on the team will be awarded the same grade. All grades are weighted equally, and **students must achieve a minimum average of 80% to pass the course.** Students' final A-course grades will be assigned as a letter grade according to the following scale:

A	90-100%
B	80-89%
C	70-79%
D	60-69%

F 0-59%

Course Policies

Attendance and/or Participation

In-person class attendance is required by all A-course students. Exceptions may be made for critical business reasons or other valid personal issues and students must alert the A-course supervisor to these issues as soon as possible. Virtual/remote participation options may be made available on occasion at the discretion of the course supervisor. All lectures are recorded and made available to students following class.

Collaboration & Group Work

GE Aviation and the ACE program promotes a culture of teamwork to accomplish the goal of solving complex problems. A-course students typically work in small teams (usually no more than 5 students) to engage on weekly homework assignments, but all submitted/written work is intended to be an individual effort (unless the assignment is specifically identified as a "Team Report").

Acceptable forms of collaboration may include discussing the problem boundary conditions, assumptions, potential solution approaches, and for providing help with troubleshooting when computational problems arise.

Excessive collaboration —- including sharing detailed solutions, calculations, computer code, etc. —- is a violation of the ACE Honor Code and will be subject to disciplinary action per company and program policy.

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.