[AE 4699] Syllabus

Undergraduate Research, AE 4699, Variable Credit

Instructor Information

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General Course Information

Description

Independent research conducted under the guidance of a faculty member.

Course Learning Outcomes

At the completion of this course, students will be able to

- Understand and explain the basic process flow of CFD software
- Create moderately complex geometries inside the ANSYS workbench.
- Create structured and unstructured meshes using the ANSYS Workbench.
- Set up the physical problem and boundary conditions in ANSYS Fluent.
- Set up the Numerical Solver for convergence monitoring.
- Post-process the results for the flow visualization and interpret the physical phenomena captured by the solution.

Required Course Materials

Freely available student edition of ANSYS Fluent on personal laptops, or versions of ANSYS Fluent available on College of Engineering virtual PC systems.

Grading Policy:

Students will complete the first four topics listed below for 1 credit hour. Students will complete all the 8 topics to earn two credit hours.

90% or above: 'A'

80% to 89%: 'B'

70% to 79%: 'C'

60% to 69%: ‘D’

59% or below: ‘F’

Description of Graded Components

Assignments are equally weighted. Specifically, students who complete four assignments for one-hour credit will earn 25% maximum for each assignment towards the course grade. Students who complete all eight assignments will earn 12.5% for each assignment towards the course grade.

Here are the list of topics/assignments:

1. Laminar and Turbulent viscous flow over a flat plate
2. Subsonic and transonic viscous flow over 2-D airfoils
3. Steady/Unsteady Non-Newtonian Blood Flow through an artery with stenosis shape
4. Compressible flow through an axisymmetric nozzle
5. Flow through a vertical axis wind turbine
6. Transonic flow over a wing
7. Supersonic flow over a wedge
8. Supersonic flow over an axisymmetric blunt body

Course Policies

Attendance and/or Participation

This is a self-study course. However, online tutorial sessions will be offered once a week. These sessions will be recorded. Attendance is optional.

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

Not applicable

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-Requisites and Co-Requisites

AE 2010, with a 'C' or better grade

AE 3030, with concurrency

Extra Credit Opportunities

None

Collaboration, Group Work, and Use of Generative AI

All assignments are for individual grades. Collaboration between students, or the use of generative AI tools to complete the assignments is not allowed and would lead to a failing grade.

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

A late penalty of 10% of the assignment grade will be imposed for each day an assignment is late, unless an extension has been granted by the instructor for valid reasons (health issues, institute approved event participation, etc.).

Inclement Weather and Digital Learning Days

N/A, Participation in online recitation sessions is voluntary.

Student Use of Mobile Devices in the Classroom

N/A

Campus Resources for Students

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 (student-resource-guide (gatech.edu)