

Memorandum

To: The Faculty of the College of Engineering
From: The School of Aeronautics and Astronautics
Date: November 14, 2025
Re: AAE 33401 updating course learning outcomes and Prerequisites

Course: AAE 33401 Aerodynamics Laboratory**Current AAE 33401 Learning Outcomes:**

1. Use wind tunnel instrumentation to measure flow velocity and lift and drag.
2. Describe the dependence of airfoil pressure distribution, lift, and drag on angle of attack and flaps and slats.
3. Describe the effect of finite span, wing tip vortices.
4. Use schlieren or shadowgraph techniques to visualize compressible flows.
5. Sketch pressure distributions across oblique and normal shock waves, and expansion fans
6. Describe the pressure distribution inside a compressible flow converging-diverging nozzle and possible nozzle exit conditions.

Proposed AAE 33401 Learning Outcomes Description:

1. Use wind tunnel instrumentation to measure flow velocity and lift and drag.
2. Describe the dependence of airfoil pressure distribution, lift, and drag on angle of attack and flaps and slats.
3. Describe the effect of finite span, wing tip vortices.
4. Use schlieren or shadowgraph techniques to visualize compressible flows.
5. (Language Change) Describe the pressure distributions across oblique and normal shock waves and expansion fans.
6. Describe the pressure distribution inside a compressible flow converging-diverging nozzle and possible nozzle exit conditions.
7. (New outcome) Design an experiment to meet a defined objective, conduct the experiment, analyze the data, and draw conclusions.

Reasons: Learning outcome 5 was modified to broaden the tasks students could complete to demonstrate mastery of the learning outcome. Learning Outcome 7 was added for alignment with ABET Student Outcomes.

Current AAE 33401 prerequisites/corequisites:

Corequisite: AAE 33400

Proposed AAE 33401 prerequisites/corequisites:

Prerequisite: AAE 33301 Corequisite: AAE 33400

Reasons: AAE 33301 (Fluid Mechanics Laboratory) is being removed as a prerequisite for AAE 33400. Therefore, to enforce tracking in our curriculum we are adding AAE 33301 as a prerequisite to AAE 33401. Additionally, completing AAE 33301 will better prepare students for AAE 33401.

William A. Crossley, Ph.D.

Uhrig & Vournas Head of Aeronautics and Astronautics

Professor of Aeronautics and Astronautics