Memorandum

To: The Faculty of the College of Engineering

From: The School of Aeronautics and Astronautics

Date: January 29, 2024

Re: Fast track EFD – AAE 33300 updating learning outcomes

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Courses: AAE 33300 Fluid Mechanics

Current AAE 33300 Course learning Outcomes: At the end of this class, students should be able to:

1. Calculate aerodynamic forces and moments from pressure and shear stress distributions
2. Apply dynamic similarity to scale up data
3. Apply global conservation of mass and momentum to engineering systems
4. Apply Bernoulli's equation (relating pressure and velocity)
5. Calculate lift for an arbitrary airfoil using panel methods
6. Calculate drag for an arbitrary airfoil using integral boundary layer methods.

Proposed AAE 33300 Course Learning Outcomes: At the end of this class, students should be able to:

1. Calculate hydrostatic pressure distributions, forces, and moments.
2. Calculate aerodynamic forces and moments from pressure and shear stress distributions.
3. Apply similitude to scale data.
4. Apply global conservation of mass and momentum (Control Volume analysis) to engineering systems.
5. Apply Bernoulli's equation to relate velocity and pressure.
6. Calculate velocity and pressure fields using potential theory.
7. Apply the Navier-Stokes Equations to obtain exact solutions and compute shear stress and other flow quantities.
8. Apply the Blasius Boundary Layer Solution and integral methods to obtain boundary-layer flow properties.

Reasons: A course review revealed that some outcomes were outdated, and some course outcomes were missing. The Proposed outcomes fix these issues.

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