

ME 4510(5510) Aerodynamics

- 2007 Catalog Data:** ME 4510(5510). Aerodynamics. Lec. 3. Credit 3.
Prerequisite: ME 3720. Fundamental principles and equations; thin airfoil theory; finite wings; wings in compressible flow; aerodynamic drag. [Elective Course]
- Prerequisites by Topic:**
1. Fundamentals of fluid dynamics
 2. Calculus and linear ordinary differential equations
 3. Elementary vector analysis
- Textbook:** Aerodynamics for Engineers, Bertin and Smith, 3rd Ed., Prentice-Hall, 1998
- Course Objectives:** This course is designed to present basic concepts of aerodynamics and aircraft performance that may be utilized in problems in aeronautics and other fields of engineering.
- Course Topics:**
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| T1. Momentum theory of propellers | (6%) |
| T2. Wind tunnels | (12%) |
| T3. Atmospheric fluid statics | (5%) |
| T4. Potential flow | (14%) |
| T5. Thin airfoil lift | (16%) |
| T6. Takeoffs/landings | (7%) |
| T7. Glides | (5%) |
| T8. Powered flight | (35%) |
- Class/Lab Schedule:** Minimum student contact time – 2200 minutes
- Course Outcomes:** Upon completion of this course the student will be able to:
- C1. Analyze propeller performance [a,e,i]
 - C2. Estimate "flat plate" drag on wings [a,e,i]
 - C3. Analyze aerostatics problems {a,e,i}
 - C4. Estimate "airfoil" lift on wings [a,e,i,l]
 - C5. Analyze aircraft performance problems involving takeoffs, landings, glides, and powered flight. [a,e,i,l]
 - C6. Analyze wind tunnel operation [a,e,i,l]
- Professional Component:** This course is an elective that can be used as part of the one and one-half years of engineering topics.
- Contribution of Course to Meeting the Professional Component:**
- Math and Basic Science:
General Education:
Engineering: 3 credit hours
Other:
- Relation to Program Objectives:** This course prepares students for both employment and graduate studies and illustrates the need for continued professional growth and learning .
- 5000-Level Credit:** Students registered for 5000-level credit will be given additional assignments commensurate with a graduate-level course. The exact nature of these assignments will be specified by the instructor in the Course Policy for that semester.
- Course Coordinator:** Undergraduate Program Committee
- Prepared by:** John Peddieson
- Date:** 1-15-08