



MASTER COURSE OUTLINE

Prepared By: Gregory Crane

Date: January 2014

COURSE TITLE

Theory of Flight

GENERAL COURSE INFORMATION

Dept.: AVF

Course Num: 114

(Formerly:)

CIP Code: 49.0102

Intent Code: 21

Program Code:

Credits: 5

Total Contact Hrs Per Qtr.: 55

Lecture Hrs: 55

Lab Hrs:

Other Hrs:

Distribution Designation: General Elective

COURSE DESCRIPTION (as it will appear in the catalog)

This course covers basic aerodynamic theory of flight, aircraft instruments, performance, stability, control, airframe stress, structural limits, constant speed propellers, and turbocharging.

PREREQUISITES

AVF112

TEXTBOOK GUIDELINES

Flight Theory for Pilots by Charles E. Dole, IAP, Inc. Publication, University of Southern California

COURSE LEARNING OUTCOMES

Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills:

1. Define and explain key terms and concepts relating to aircraft operation and performance.
2. Apply mathematical rules and concepts in the analysis of aerodynamic theory and aircraft performance.
3. Describe and analyze the four aerodynamic forces, which act on an airplane in flight (i.e. lift, drag, thrust, gravity).
4. Define and discuss basic aerodynamic terms and concepts using diagrams, equations, and analytic geometry as appropriate.
5. Describe the construction and operation of the vacuum and pressure driven flight instruments.
6. Analyze aircraft performance pertaining to takeoff, climb, cruise, glide and landing.
7. Discuss and explain the concepts of stability and control as they relate to weight and balance and aircraft design features.
8. Discuss and explain airframe structural limits as they pertain to weight and maneuvering flight using mathematical analysis as appropriate.
9. Discuss and explain the theory and operation of constant speed propellers.
10. Discuss and explain the theory and operation of engine turbo-charging systems.

INSTITUTIONAL OUTCOMES

IO2 **Quantitative Reasoning:** Students will be able to reason mathematically

COURSE CONTENT OUTLINE

1. Physics Terms & Concepts
2. Mathematics Review
3. Aerodynamic Forces
4. Balancing the Forces
5. Performance
6. Airplane instruments
7. Stability and Control
8. Stress and Operational Limits
9. Constant speed propellers
10. Power plant considerations
11. Turbo charging

DEPARTMENTAL GUIDELINES *(optional)*

Three mid-term tests will be given plus a comprehensive final. Quizzes will be used to maintain study motivation and supplement the overall-testing program. Attendance is a factor in the final grade. Grades will be earned according to the following numerical system. Note *70% is lowest passing grade.

98-100%	4.0	88%	3.0	78%	2.0
97%	3.9	87%	2.9	77%	1.9
96%	3.8	86%	2.8	76%	1.8
95%	3.7	85%	2.7	75%	1.7
94%	3.6	84%	2.6	74%	1.5
93%	3.5	83%	2.5	73%	1.3
92%	3.4	82%	2.4	72%	1.1
91%	3.3	81%	2.3	71%	0.9
90%	3.2	80%	2.2	70%	0.7
89%	3.1	79%	2.1		

DIVISION CHAIR APPROVAL

DATE