

8/22/01

REVISED

AE-324, Fundamentals of Atmospheric Flight
Section #21545, Fall 2001

Instructor: Kamran Rokhsaz**Office:** 202 Wallace Hall**Text Book:** *Introduction to Flight*, Fourth Edition, John Anderson**Hours:** 2:30-4:00 MTWTh

Purpose of the Course: To develop a road map for aerospace engineering students. An introduction to thermodynamics, fluid mechanics, and aerodynamics is provided. Aircraft performance analysis is introduced. Elementary concepts from stability and control as well as from propulsion are discussed.

Prerequisite: AE-223, Statics**Corequisite:** AE-227, Engineering Digital Computation

Date	Class	Topic	Reading
8-20	1	Introduction	Chapter 1
22	2	Pressure, Units and Thermodynamics	Chapter 2
HW#1 24	3	Hydrostatics	Chapter 3
27	4	Standard Atmosphere	" "
29	5	Manometry	" "
HW#2 31	6	Continuity Equation (Conservation of Mass)	4.1-4.2
9-3 7	7	Momentum Equation (Conservation of Momentum)	4.3-4.4
5	8	Application of Bernoulli's Equation	" "
HW#3 7	9	Elements of Thermodynamics & Isentropic Flow	4.5-4.6
HW#4 14	10	Speed of Sound & Wind Tunnels	4.7-4.11
17	11	Viscous Flow & Boundary Layers	4.15-4.16
19	12	" " " "	4.17-4.19
HW#5 21	13	Drag Coefficient	4.20-4.21
24	14	Airfoil Characteristics	5.1-5.3
26	15	TEST I (Chapters 1 through 4, Wednesday)	*****
28	16	" " " "	5.4-5.6
10-1 17	17	" " " "	5.7-5.9
3	18	Airfoils in Supersonic Flow	5.10-5.12
HW#6 5	19	Finite Wings	5.13-5.15
8	20	Finite Wings and High Lift Devices	5.16-5.19
10	21	Review as Needed	5.16-5.19
HW#7 12	22	Equations of Motion	6.1-6.2
15	23	Fall Break	
17	24	Thrust and Power Required (Level Flight)	6.3-6.4
19	25	TEST II (Chapter 5, Wednesday)	*****
22	26	Power Available	6.5-6.6
24	27	Rate of Climb and Hodograph	6.7-6.8
HW#8 26	28	Effects of Altitude and Ceilings	6.9-6.11
29	29	Range and Endurance for Propeller Driven Aircraft	6.12
31	30	Range and Endurance for Jet Aircraft	6.13-6.14
HW#9 11-2	31	Take-Off and Landing	6.15-6.16
5	32	Maneuvers & V-n Diagram	6.17
7	33	Longitudinal Static Stability	7.1-7.3
HW#10 9	34	Effects of Wing and Fuselage	7.4-7.8
12	35	Neutral Point, Static Margin, and Longitudinal Control	7.9-7.13
14	36	TEST III (Chapter 6, Wednesday)	*****
16	37	Lateral-Directional Stability and Control	7.17-7.18
19	38	Review as Needed	
26	39	Propellers	9.1-9.2
28	40	Propellers	Notes
30	41	Propellers	Notes
12-3 42	42	Reciprocating Engines	9.3
5	43	Jet Engines	9.4-9.6
7	44	Rocket Engines	9.7-9.10
10	45	Review as Needed	

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COURSE PROCEDURE

All work in this course is expected to be performed individually.

Homework:

1. Homework will be assigned in class.
2. Homework will be assigned every Monday to be collected the following Friday.
3. Homework will count as the equivalent of 100 points.
4. LATE HOMEWORK WILL NOT BE ACCEPTED.

Exams:

1. There will be three (3) one-hour exams, 100 points each.
2. There will be a 200 point comprehensive final.
3. NO MAKE-UP TESTS WILL BE GIVEN.

Project:

A research-oriented project will be assigned sometime during the semester. This project will draw on the subjects discussed in this course. However, carrying out this project will also require independent library search and studying outside of the material covered in this course. Therefore, the project will be worth the equivalent of one test.

Grading Policy:

1. The lowest score from the three exams will be discarded. In case an exam is missed, its grade will be considered as the lowest test score.
2. Total number of points:

Exams and Project	300	82, 94, 70
Homework	100	90.9
Final	200	
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Total	600	

3. From the above totals you need a minimum of
 - 540 for A
 - 480 for B
 - 420 for C
 - 360 for D

(33)

Regarding Homework:

1. Use 8+1/2" by 11" paper only. Quality does not matter.
2. Write on only one side of the page.
3. Start each problem on top of a new page.
4. STAPLE THE PAGES TOGETHER.
5. Try to follow the given format;
 - Given: Short statement of the problem
 - Basic Equations: Equations that are to be used
 - Basic Assumptions: Simplifying assumptions
 - Solution: Orderly solution of the problems. This includes solution of the problem as far as possible before plugging in numbers.

And remember at all times that it is not good enough if only you know what you are doing. I will not try to fish out the solution from whatever you turn in. If I cannot easily follow your solution, I will not grade it.

Final Exam: Monday, December 17, 2001, 1:00-2:50 p.m.
 Last Drop Date: Wednesday, October 30, 2001.