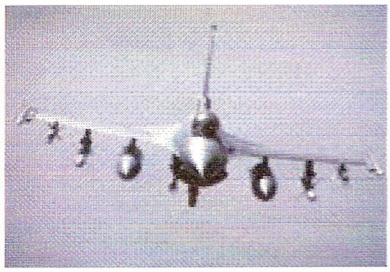
Gabriel Staples
8-14-07



UNITED STATES AIR FORCE ACADEMY

Department of Aeronautics

Aero Engr 315
Fundamentals of Aeronautics

COURSE SYLLABUS

Fall 2007

Text: *Introduction to Aeronautics: A Design Perspective, Second Edition* by Steven A. Brandt, Randall J. Stiles, John J. Bertin, and Ray Whitford

LESSON	DATE	TOPIC	TEXT READING ASSIGNMENT (Before Lesson)	HOMEWORK PROBLEMS (After Lesson)	GRADED ASSIGNMENTS DUE
1	9, 10 Aug	Introduction / Course Overview			Pre-Quiz#1*
2	13, 14 Aug	Intro to Design History of Aeronautics	Course Policy Letter History WIM-1 1.1 - 1.4.5 1-24 1.5-1.5.6		Pre-Quiz#2
3	15, 16 Aug	Flow Properties, Perfect Gas Hydrostatic and Manometer Eqs Standard Atmosphere Altimetry	2.1-2.2.1 41-44 2.2.2-2.3.2 44-46 2.1.2, 2.4.1 2.4.2, 2.5.1 2.5.2 46-47, 51-52 Flow Properties	A-2.1, A-2.3, A-2.4, A-2.5, A-2.7	Pre-Quiz#3
4	17, 20 Aug	Continuity Equation Incompressible & Compressible Flow	3.1-3.2.2 61-64 3.2.4 65-66 Streamlines Continuity Eqs	A-3.3	Pre-Quiz#4
5	21, 22 Aug	Euler's Equation Bernoulli's Equation Pressure & Shear Forces	3.2.3 64-66 3.2.4, 3.3.5, 3.6.3 94-98 3.3.6- 3.3.7 74-79 Pressure & Shear	A-3.5, A-3.8, A-3.15	Pre-Quiz#5
6	23, 24 Aug	Airspeed Measurement ICeT	3.3.1, 3.3.4 3.3.2-3.3.3 66-74 ICeT	A-3.10, A-3.12, A-3.16	Pre-Quiz#6
7	27, 28 Aug	Viscous Flow - Part 1	2.7.1, 3.4, 3.7.5 54-56 77-85 104-106 Drag Laminar/Turbulent	A-3.18	Pre-Quiz#7
8	29, 30 Aug	Viscous Flow - Part 2	2.7.1, 3.4, 3.7.5 54-56 77-85 104-106 Stall	A-3.21, A-3.22	Pre-Quiz#8

9	31 Aug, 4 Sep	Airfoils	85 - 95 3.5.1-3.5.8 Airfoils Airfoil Lift		Pre-Quiz#9
10	5, 6 Sep	Airfoil Data / NACA Airfoil Charts	3.6.5-3.6.6 Lift vs Velocity Lift vs AOA Reading Charts	A-3.23, A-3.24, A-3.25, A-3.29	Pre-Quiz#10
11	7, 10 Sep	***Airfoil Lab, Aero Lab Demo Day*** ***A Sections meet in Aero Lab***	*Airfoil Lab Handout* 2.3.1, Examples 2.2 & 2.3 44-45 Laws of Aero 46	.0012 NACA	Pre-Quiz#11
		B Sections meet in classroom and accomplish Lesson 12			
12	11, 12 Sep	3-D (Finite) Wings - Part 1	4.1-4.2 113-124 Wingtip Vortices Vortices in Lab	A-4.4	Pre-Quiz#12
		Airfoil Lab, Aero Lab Demo Day ***B Sections meet in Aero Lab***		This is my Presentation H.W. problem!	
13	13, 17 Sep	3-D (Finite) Wings - Part 2	4.1-4.2 113-124 Vortices on Shuttle	A-4.2	Pre-Quiz#13
14	18, 19 Sep	High Lift Devices	- All H.W. collected today 4.3 124-128	A-4.5 part a) & b)	Pre-Quiz#14
15	20, 21 Sep	Catch Up / GR Review	obtain slides!		Pre-Quiz#15 Airfoil Lab due !!!
16	24, 25 Sep	***GR 1 (In Class)***			GR 1
17	26, 27 Sep	Whole Aircraft Lift and Drag Aircraft Drag Polar	128-132 4.4-4.5 slides!	A-5.1	Pre-Quiz#17
18	28 Sep, 1 Oct	Supersonic Flow - Part 1	102-103, 132-143 3.7.3, 4.6 Mach Number Mcrit Supersonic Flight slides!	A-4.6, Example 4.3	Pre-Quiz#18
19	2, 3 Oct	Supersonic Flow - Part 2	3.7.3, 4.6 132-143 Shock Waves Supersonic F-14 Area Rule Wing Planform Choices slides!		Pre-Quiz#19
20	4, 5 Oct	Introduction to Performance	5.1 - 5.2 173-175 Intro F-22 Flyby slides		Pre-Quiz#20
21	9, 10 Oct	**Propulsion** **A Sections in Aero Lab**	5.3.1, 5.3.3-5.3.6, 5.3.11 175, 179-185, Thrust 187-188 Jet Engines slides/notes		Pre-Quiz#21

		B Sections meet in classroom and accomplish Lesson 22			
22	11, 12 Oct	Thrust Available Thrust Required	5.4 - 5.5 Slowdown Analysis F-16 Slowdown	A-5.2, A-5.5, A-5.8	Pre-Quiz#22
		Propulsion B Sections in Aero Lab			
23	15, 16 Oct	Power Required Power Available Altitude/Weight/Configuration Effects	5.6 5.7, 5.15.4	A-5.10, A-5.12	Pre-Quiz#23
24	17, 18 Oct	RASP			Pre-Quiz#24
25	19, 22 Oct	Gliding Flight Climbing Flight and Ceilings	5.8 5.9 Gliding FBD Best Glide Speed	A-5.13, A-5.16	Pre-Quiz#25
26	23, 24 Oct	Cruise Range and Endurance	5.3.11, 5.10 - 5.10.2, 5.10.5 - 5.10.7	A-5.7, A-5.17,A-5.18	Pre-Quiz#26
27	25, 26 Oct	Takeoff and Landing Performance	5.11 STOL	A-5.21	Pre-Quiz#27
28	29, 30 Oct	Turn Performance	5.12, 5.13	A-5.25, 26, 27, 31	Pre-Quiz#28 RASP Part 1
29	31 Oct, 1 Nov	V-n Diagrams	5.12, 5.13		Pre-Quiz#29
30	1, 5 Nov	Energy Height Specific Excess Power	5.14 Streak Eagle (Short) Ps Comparisons	A-5.32, A-5.33 A-5.35	Pre-Quiz#30
31	6, 7 Nov	Maneuverability Diagrams	5.16.1		Pre-Quiz#31
32	8, 9 Nov	Catch Up / GR Review	5.15		Pre-Quiz#32 RASP Part 2
33	13, 14 Nov	***GR 2 (In Class)***			GR 2
34	15, 16 Nov	Intro to Stability and Control Longitudinal Static Stability - Part 1	6.1 - 6.2, Stability Control Glider Design Handout Glider Design Spreadsheet	A-6.6, A-6.7	Pre-Quiz#34

35	27, 28 Nov	Longitudinal Static Stability - Part 2	275 - 285 6.3 - 6.4 6.8.4 - 6.8.5 295-299 Negative Static Stability	A-6.9	Pre-Quiz#35
36	29, 30 Nov	Lateral/Directional Static Stability	6.3 - 6.4 275-285 6.8.4 - 6.8.5 295-299		Pre-Quiz#36
37	3, 4 Dec	Aircraft Dynamic Stability Glider Construction Tips	6.6, 6.8.6 Poor Dynamic Stability Negative Dynamic Stability		Pre-Quiz#37 RASP Flyoffs
38	5, 6 Dec	**Stability and Control Demo Day**			RASP Flyoffs
39	7, 10 Dec	***Terrazzo Tour (Meet on Terrazzo at F-4)***	6.5, 6.7, 6.8.7		RASP Part 3
40	11, 12 Dec	Course Review and Critique			
Final		***FINAL EXAM***			FINAL

*Note: Pre-Quiz 1 is the only Prequiz which must, of necessity, be completed during or after the class for which it is assigned