

Spring 2012 Config Aero Weekly Plan and Diary of Classes – (Version: January 17, 2012)

Lesson

<u>No.</u>	<u>Week</u>	<u>Day</u>	<u>Spring 12 Chap</u>	<u>Topic</u>	<u>Activity Assigned</u>
1	1	W	Jan 18	1 Class Details/Objectives/Overview	• H1: AR/span
2	1	F	Jan 20	Obeying the Laws of Nature: The governing equations	• H2: L/D max
3	2	M	Jan 23	2 Fluid Mechanics for Aeros: Special Forms & Connections	• H3: W/S , <i>cruise CLs</i>
4	2	W	Jan 25	Fluid Mechanics for Aeros: Eqn “Type” & BCs	• P1: Read Waaland
5	2	F	Jan 27	<i>Discuss Irv Waaland’s Paper</i>	—
6	3	M	Jan 30	Approximations in Aero/Full Pot., etc CFL3D VGs	• H4: Drag of wire & airfoil
7	3	W	Feb 1	3 Drag: Intro & Overview (NACA TR 824 PDF)	• H5: Skin FRIC ION/ C_{D0}
8	3	F	Feb 3	Farfield Induced Drag/Spanloads	• H6: AWAVE test
9	4	M	Feb 6	Review & Farfield Wave Drag/Area Rule	• H7: LIDRAG ell/trap spnld
10	4	W	Feb 8	Review and Thrust-Drag Bookkeeping & the LES concept	• H8: AWAVE of vK or SH
11	4	F	Feb 10	Equiv Flat Plate/Junk Drag, Korn Eqn., and DPWs	• P2: Read DC-9/737 papers
12	5	M	Feb 13	4 Configuration Concept Options	• keep reading DC-9, B737
13	5	W	Feb 15	Configuration Concept Options and Review for Test	
				<i>Discuss the DC-9/B-737 Configuration papers</i>	• Study for test
14	5	F	Feb 17	Test I	—
15	6	M	Feb 20	5 Review/discuss Test I/ Aero Design Overview:	• H9: Straight Line Wrap
16	6	W	Feb 22	Aerodynamic Design	• P3: Read Shevelle, bugs
17	6	F	Feb 24	How to use codes in aero: validation of results	• H10: Areas under curve
				<i>Discuss Shevelle’s paper on aero bugs</i>	
18	7	M	Feb 27	Aero Design II: The X-29 Story	• H11: Warren 12 & <i>ac</i>
19	7	W	Feb 29	Use of Computational Aerodynamics in Aero Design	• H12: c_l/C_{Lmax} , η
20	7	F	Mar 2	Spanload, X-29 and Vulcan, etc.	—

Spring Break

Mar 3-11

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Tests: 2 Papers: 5 Project: 1 Exam: 1 Homeworks: 20

Config Aero Weekly Plan, Spring 2012 (Continued)

Lesson

No.	Week	Day	Spring 10	Chap	Topic	Activity Assigned
21	8	M	Mar 12	6	Review use of computational aero and design/optimization	• H13: XFOIL for 0012/4412
22	8	W	Mar 14		Subsonic Aerodynamics: Airfoils I & II	—
23	8	F	Mar 16		Subsonic Aerodynamics: Wings I	• H14: VLM Warren 12 <i>np</i>
24	9	M	Mar 19		Subsonic Aerodynamics: Wings II	• H15: Sensorcraft VLM <i>np</i>
25	9	W	Mar 21	7	Transonic Aero I: Fluid Mech. of Supercritical Airfoil Design	• H16: Sensorcraft drag <i>w/cg, twist, np & min</i>
26	9	F	Mar 23		Transonic Aero II: Wings and Configurations	• prepare presentations
27	10	M	Mar 26		Transonic Aero III: the current status	• prepare presentations
28	10	W	Mar 28		Team presentations, (will have to juggle to fit)	• P4: Read AMO Smith's paper
29	10	F	Mar 30	8	Intro to High Lift Aerodynamics	— keep reading
30	11	M	Apr 2		<i>Discussion of AMO Smith's Hi Lift paper</i>	• H17: XFOIL C_{Lmax}
31	11	W	Apr 4		High Lift Aerodynamics, Stratford's method	• H18: High lift configurations
32	11	F	Apr 6		Multielement Airfoils/Powered Lift/VSTOL issues	—
33	12	M	Apr 9		Course review for test	• study for test
34	12	W	Apr 11		Test II	—
35	12	F	Apr 13	10	Go over test/Supersonic Aerodynamics I	
36	13	M	Apr 16		Supersonic Aerodynamics II	• H19: Concorde C_L, W_p, W_f
37	13	W	Apr 18		Supersonic Aerodynamics III	—
38	13	F	Apr 20	9	High Alpha I: Spin Movie	—
39	14	M	Apr 23		High Angle of Attack II: Basics	—
40	14	W	Apr 25		High Angle of Attack II: F-22 & Amazing Stories/	—
41	14	F	Apr 27	11	Hypersonics Aerodynamics I: What's special?	• H20: Hypersonic $C_{L\alpha}$
42	15	M	Apr 30		Hypersonic Aerodynamics II:	• P5: Read Ben Rich
43	15	W	May 2		Last Class Discuss Ben Rich's paper & Wrap Up and Review	• Study for exam
Exam day		Tues.	May 8		Final exam: 7:45am	
Graduation			May 11/12			

Alternate homeworks:

- A380 80m gate box penalty
- Wing twist: LLT vs LamDes and straightline lofting
- Tandem Wing neutral point (thanks to Chase Ashton)
- Winglet vs span ext. (Test)
- Arrow Wing Aerodynamics