



AE-714 Advanced Flight Dynamics I Fall 20xx

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Preferred Method of Contact:	Email
Office Hours:	TBD
Classroom; Days/Time:	TBD
Prerequisites:	P:AE-514

How to use this syllabus

This syllabus provides you with information specific to this course, and it also provides information about important university policies. This document should be viewed as a course overview; it is not a contract and is subject to change as the semester evolves. Updates may be made during the semester, with an updated syllabus uploaded to blackboard.

Prerequisite: AE-514

If you do not have these prerequisites you should not be taking this course. Lectures and assignments are prepared and given on the basis of these prerequisites. **If you have mistakenly enrolled in AE714 without the above described prerequisites please contact the instructor and a no fee withdrawal can be arranged.**

Academic Honesty

Students are responsible for knowing and following the Student Code of Conduct http://webs.wichita.edu/inaudit/ch8_05.htm and the Student Academic Honesty policy http://webs.wichita.edu/inaudit/ch2_17.htm.

You are expected to do all your work individually. Cheating of any kind will not be tolerated. Cheaters will receive an F in the class and will be subject to further discipline by the college and university.

Course Description

Aircraft nonlinear equations of motion are derived for the general case of motion with six degrees of freedom. Dynamics of first and second order linear systems as well as that of nonplanar rigid-body motion are reviewed. Nonlinear steady state level trim and maneuvers are considered. Equations of motion are linearized for analyzing the linear modes of motion and dynamic stability analysis. Nonlinear simulation is also performed. Euler angles, Quaternions and stall spin dynamics are covered.

Definition of a Credit Hour

Example for 3 credit hour class: Success in this 3 credit hour course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction and preparation/studying or course related activities for a total of 135 hours. For this 3 credit hour class, this amounts to at least 6 hours study time every week outside the classroom.

Go to: <http://webs.wichita.edu/?u=academicaffairs&p=/definitionandassignmentofcredithours/> for the policy and examples for different types of courses and credit hour offerings.

Measurable Student Learning Outcomes

1. an ability to apply knowledge of mathematics, science, and engineering [ABET criterion 3(a)]
2. an ability to design a system, component, or process to meet desired needs [ABET criterion 3(c)]
3. an ability to identify, formulate, and solve engineering problems [ABET criterion 3(e)]
4. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice [ABET criterion 3(k)]

For more information on ABET outcome criteria, visit: <http://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2016-2017/#outcomes>

Required Texts/Readings Textbook

Airplane Flight Dynamics and Automatic Flight Controls, Part I, J. Roskam.

Other References:

Dynamics of Flight, Stability and Control, Third Edition, B. Etkin, L. Reid

Introduction to Flight, Fifth Edition, John Anderson, Jr.

Class Protocol: Attendance

It is important that you attend all meetings of the class, and that you arrive on time for class. Arriving late is disruptive and unfair to those students that have arrived to class on time. Chronic attendance problems will affect your ability to learn the material and your grade and could result in your removal from the class.

Grading Scale

WSU uses a +/- grading scale for final grades and to calculate grade point averages. In this class, grades are assigned according to the following chart. (Other classes might assign grades differently: Be sure to understand the different grading scales in all of your classes.)

Points/percentages, as instructor chooses	Letter grade	Grade Points	Interpretation
90% or above	A	4.00	<i>The A range denotes excellent performance.</i>
At instructors discretion	A-	3.70	
At instructors discretion	B+	3.30	
80% or above	B	3.00	<i>The B range denotes good performance.</i>
At instructors discretion	B-	2.70	
At instructors discretion	C+	2.30	
70% or above	C	2.00	<i>The C range denotes satisfactory performance.</i>
At instructors discretion	C-	1.70	
At instructors discretion	D+	1.30	
60% or above	D	1.00	<i>The D range denotes unsatisfactory performance.</i>
At instructors discretion	D-	0.70	
50% or below	F	0.00	<i>F denotes failing performance.</i>

Assignments

Homework: Homework assigned via blackboard will be due at the beginning of class on the day it

is due. Each student who turns in homework must be present in class. Late assignments will not be accepted for a grade unless arraignments are made with the instructor prior to the due date.

1. Use 8+1/2" by 11" paper only.
2. Write on only one side of the page.
3. Put problems in same order as the assignment
4. STAPLE THE PAGES TOGETHER.

And remember at all times that it is not good enough if only you know what you are doing. If I cannot read it, I will not grade it. Homework that is disorganized and not in correct order will receive a grade deduction.

Exams and Grading:

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

Final Grades:

Exams	300
Homework	100
=====	
Total	400

Undergraduate vs. Graduate Credit (for 700 level courses)

Undergraduate students enrolled in 700 level courses will receive undergraduate credit (not graduate credit) unless they have a previously approved senior rule application or dual/accelerated enrollment form on file in the Graduate School. Undergraduate credit earned in 700 level courses cannot later be counted toward a graduate degree.

Important Academic Dates

For Fall 2015 semester, classes begin August 18, 2015 and end December 3, 2015 . The last date to drop a class and receive a W (withdrawn) instead of F (failed) is _____, 20___. There are no classes during Labor Day, Sept 6, 2016 and Fall Break, October 13, 2015. The final exam period is Thursday, Dec 10, 2015 3:00-4:50 PM

Disabilities

If you have a physical, psychiatric/emotional, or learning disability that may impact on your ability to carry out assigned course work, I encourage you to contact the Office of Disability Services (DS).

The office is located in Grace Wilkie Annex, room 150, (316) 978-3309 (voice/tty) (316-854-3032 videophone). DS will review your concerns and determine, with you, what academic accommodations are necessary and appropriate for you. All information and documentation of your disability is confidential and will not be released by DS without your written permission.

Counseling & Testing

The WSU Counseling & Testing Center provides professional counseling services to students, faculty and staff; administers tests and offers test preparation workshops; and presents programs on topics promoting personal and professional growth. Services are low cost and confidential. They are located in room 320 of Grace Wilkie Hall, and their phone number is (316) 978-3440. The Counseling & Testing Center is open on all days that the University is officially open. If you have a mental health emergency during the times that the Counseling & Testing Center is not open, please call COMCARE Crisis Services at (316) 660-7500.

Diversity and Inclusive

Wichita State University is committed to being an inclusive campus that reflects the evolving diversity of society. To further this goal, WSU does not discriminate in its programs and activities on the basis of race, religion, color, national origin, gender, age, sexual orientation, gender identity, gender expression, marital status, political affiliation, status as a veteran, genetic information or disability. The following person has been designated to handle inquiries regarding nondiscrimination policies: Executive Director, Office of Equal Employment Opportunity, Wichita State University, 1845 Fairmount, Wichita KS 67260-0138; telephone (316) 978-3186.

Intellectual Property

Wichita State University students are subject to Board of Regents and University policies (see http://webs.wichita.edu/inaudit/ch9_10.htm) regarding intellectual property rights. Any questions regarding these rights and any disputes that arise under these policies will be resolved by the President of the University, or the President's designee, and such decision will constitute the final decision.

Shocker Alert System

Get the emergency information you need instantly and effortlessly! With the Shocker Alert System, we will contact you by email or text the moment there is an emergency or weather alert that affects the campus. Sign up at www.wichita.edu/alert.

Student Health Services

WSU's Student Health clinic is located in 209 Ahlberg Hall. Hours are 8:00am to 7:00pm (8:00 am to 5:00 pm on Fridays), though the clinic may be closed occasionally on Wednesdays from noon to 1:30pm. The telephone number is (316) 978-3620. In addition to outpatient and preventive care (including immunizations, a prescription service, and testing/counseling for sexually transmitted infections), Student Health can handle minor injuries. All services are confidential. For more information see www.wichita.edu/studenthealth.

Copyright Notice: Course materials prepared by the instructor, together with the content of all lectures presented by the instructor, are the property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. Unless explicit permission is obtained from the instructor, recordings of lectures may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.

The Heskett Center and Campus Recreation

Whether you are wanting to be active on campus, relieve the stress from classes or take care of your body, Wichita State Campus Recreation is the place for you. Campus Recreation, located inside the Heskett Center, contributes to the health, education, and development of Wichita State University students, faculty, staff, alumni, and community members by offering quality programs and services. With many programs and facilities which are free to all students and members, Campus Recreation offers its members limitless opportunities. For more information about our services see www.wichita.edu/heskett.

Video and Audio Recording

Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. Unless explicit permission is obtained from the instructor, recordings of lectures may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.

Tentative Schedule for 15 week class (updated at beginning of semester)

Date	Topic	Reading	Homework
	Introduction, Force Equation	1.1-1.2	To Be Announced
	Moment Equation		
	Axis Systems	1.3-1.6	
	Steady State and Perturbed Equations	1.7-1.9	
	Longitudinal Forces and Moments – Lift	3.1.1-3.1.2	
	Drag	3.1.3	
	Pitching Moment	3.1.4-3.1.6	
	Lateral Directional Forces and Moments – Rolling Moment	3.1.7-3.1.8	
	Side Force	3.1.9	
	Yawing Moment	3.1.10	
	Thrust		
	Overview and Static Stability Review	4.1	
	Longitudinal Trim	4.2-4.2.2	
	Review		
	Exam I		
	Lateral Trim	4.2.6	
	Fall Break		
	Maneuvering Trim	4.3-4.3.2	
	Perturbed Forces and Moments – Longitudinal	3.2.1-3.2.3	
	Alpha dot, q, control surfaces	3.2.4-3.2.7	
		3.2.8-3.2.19	
	Lateral Directional – roll and sideslip	3.2.12-3.2.14	
		3.2.15-3.2.19	
	Exam II		
	Longitudinal equations and transfer function	5.0-5.1	
	Longitudinal roots and examples	5.2.1	
	Short Period and Phugoid	5.2.2-5.2.5	
	Lateral directional dynamic stability	5.2.5-5.2.6	
	Dutch Roll Spiral and Roll	5.3 - 5.3.1	
	Thanksgiving Break	5.3.2-5.3.7	
	FAR Regulations - Longitudinal	6.1-6.4	
	FAR Regulations – Lateral Directional		
	EXAM III During Finals Thursday. Dec 10, 3:00-4:50 PM		