

A&AE 421 Flight Dynamics and Control

1. Instructor Professor Dominick Andrisani
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login: andrisan@ecn.purdue.edu
2. Textbook: Airplane Flight Dynamics and Automatic Control
(Part I: Chapters 1-6 and Appendices A-D), **1994 edition**, by Jan Roskam. This book is published in as a paperback and as a **3-ring binder**.
3. Seating: Starting next class keep the same seat throughout the semester.
4. Grading 1/4 of grade is based on homework (not including the project)
1/4 of grade is based on in class tests (1 or 2)
1/4 of grade is based on the semester project
1/4 of grade is based on final.
5. I reserve the right to raise or lower your grade by as much as one letter grade based on my judgment of your knowledge of the material in this course.
6. Course prerequisite: A&AE 464 Control Systems Analysis.
7. Course prerequisite or corequisite: A&AE 340 Dynamics and Vibrations.
8. Class attendance is strongly recommended. You are responsible for obtaining notes and homework assignments which take place o days you miss.
9. We will cover all six chapters of the text.
10. Teaching assistant: Takayuki (Taka) Hoshizaki
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A&AE 421 Bibliography

Abbott, Ira H. and VonDoenhoff, Albert E, *Theory of Wing Sections Including a Summary of Airfoil Data*, Dover Publications, Inc., 1949, 1959.

Blakelock, John H., *Automatic Control of Aircraft and Missiles*, Second Edition, John Wiley and Sons, Inc., 1991.

Biezad, Daniel J., *Integrated Navigation and Guidance Systems*, AIAA Education Series, 1999.

- Etkin, Bernard, *Dynamics of Atmospheric Flight*, John Wiley and Sons, Inc., 1972.
- Etkin, Bernard, *Dynamics of Flight, Stability and Control*, John Wiley and Sons, Inc., 1959, also revised edition in 1981 or 1982.
- Hoak, D. E., *USAF Stability and Control DATCOM*, Air Force Flight Dynamics Laboratory, published in nine volumes or sections, Volume 4 is the most useful.
- Hodgkinson, John, *Aircraft Handling Qualities*, AIAA Education Series. 1999.
- McRuer, Dwane, Ashkenas, Irving, and Graham, Dunstan, *Aircraft Dynamics and Automatic Control*, Princeton University Press, 1973.
- Miele, Angelo, *Flight Mechanics Volume 1 Theory of Flight Paths*, Addison-Wesley Publishing Company, Inc., 1962.
- Nelson, Robert C., *Flight Stability and Automatic Control, Second Edition*, McGraw Hill, 1998.
- Pamadi, Bandu N., *Performance, Stability, Dynamics, and Control of Airplanes*, AIAA Education Series, 1998.
- Perkins, Courtland D. and Hage, Robert E., *Airplane Performance Stability and Control*, John Wiley and Sons, Inc., 1949.
- Roskam, Jan, *Airplane Flight Dynamics and Automatic Flight Controls, Part I*, Roskam Aviation and Engineering Corporation, 1979.
- Seckel, Edward, *Stability and Control of Airplanes and Helicopters*, Academic Press, 1964.
- Schmidt, Louis V., *Introduction to Aircraft Flight Dynamics*, AIAA Education Series, 1998.
- Smetana, F. O., *Computer Assisted Analysis of Aircraft Performance Stability and Control*, McGraw-Hill Book Company, 1984.
- Stevens, B. L. and Lewis, Frank L., *Aircraft Control and Simulation*, John Wiley and Sons, Inc., 1992.

Homework Policy

1. Homework is collected, graded, and returned.
2. NO LATE HOMEWORK IS ACCEPTED (unless your excuse makes me laugh or cry).
3. Cooperation on homework can be helpful in learning. Copying someone's homework will not be tolerated.
4. In reading assignments you are responsible for all material whether it is covered in class or not.
5. Homework will be graded by the TA.
6. Homework Format:
 - a. Staple multiple pages together.
 - b. Every answer must contain physical units. (e.g. feet, seconds, slugs, etc.)
 - c. All answers and physical units must be enclosed in a box.
 - d. Answers should generally contain three significant digits (i.e. 2.15, 3.24×10^{-4}).
 - e. Do not hand in a paper pulled from a spiral binder.
 - f. Sketches defining coordinate directions, axis system, etc. are almost always required.

NOTES ON NOTE TAKING

1. Date all notes. This indicates the start and end of a lecture for comparison with other notes.
2. Copy everything written on board.
3. Learn to take notes verbally without waiting for the notes to be written by the professor.
4. Take notes on material not written on the board as well. At least jot down key ideas. Fill in the explanation at home.
5. Review, correct and *copy over* all notes shortly after class. Use the text to help. Any questions which result should be resolved. After this process the copied over notes should contain no errors and you should understand them thoroughly. Notes should be as thorough as a book.

Remarks

Step 5 is important if the class is being taught without a textbook.

My Responsibilities in this Course

1. Facilitate your learning the material of this course.
2. Help you develop into mature, confident, competent, ethical engineers and citizens. This involves material not found in the book or course description.
3. Evaluate your level of skill (assign a grade to your work).

Your responsibilities

1. Learn the material in this course.
2. Conduct yourself in an ethical manner regarding homework and tests and your relationships with colleagues and Purdue University.
3. Achieve the level of skill you are capable of.
4. Learn to speak and write effectively.
5. Survive till tomorrow.

Necessary Student Skills

1. Note taking from lectures.
2. Note taking from book.
3. Time management skills including regular reading, regular homework, and regular review of notes.
4. Learn to perform well in time restricted situations, e.g., quizzes and tests.