Introduction to Aerospace Engineering
EAS 2011, Pugh Hall Room 170
Spring 2026, M W F, 7th period, 155-245p

Modifications to this syllabus may be required during the semester. Any changes that are made will be reflected in a posted version of the syllabus and announced in class.

Instructor

Adjunct Professor **Daniel (Dan) W Plonk, MSME, MBA**
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University of Florida, Gainesville, FL 32611-6250
Please contact me through the Canvas website
Emails to daniel.plonk@ufl.edu must include EAS 2011 in the subject line

Office Hours

- MWF 12-120p @ Reitz Union

Learning Assistants

Email:
Office Hour: TBD TBD

Email:
Office Hour: TBD TBD

TA Room:

Course Description

Course Catalog: "Overview of aerospace engineering. Standard atmosphere, basic aerodynamics, airplane performance, stability and control, propulsion, and space flight." (Credits: 3)

Course Pre-Requisites / Co-Requisites

PHY 2048 (Physics w/Calculus 1) or PHY 2060 (Enriched Physics w/Calculus 1); minimum grade of C

Course Objectives

This course introduces aircraft and spacecraft vehicles. By the end of this course, you will:

- Know the basic principles of flight in space: the two-body problem, spacecraft/satellite orbits, orbital transfers, orbital analysis of space missions and basic rocketry.
- Know the basic principles of flight in the atmosphere: the physics of flight, and steady aircraft flight and performance.
- Be able to effectively communicate this technical knowledge while accounting for realistic economic constraints.

Materials and Supply Fees

None.

Professional Component (ABET)

This course contributes to the Aerospace Engineering student's aeronautical knowledge of: aerodynamics, propulsion, flight mechanics, and stability and control. This course contributes to the Aerospace Engineering student's astronautical knowledge of: orbital mechanics, space environment, attitude determination and control, and rocket propulsion. The content of this course is approximately 10% engineering design, 30% mathematics, and 60% engineering science.

Relation to Program Outcomes (ABET)

Outcome	Coverage
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3. An ability to communicate effectively with a range of audiences	Low
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Low
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	Low
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

Coverage is given as high, medium, or low. An empty box indicates that this outcome is not part of the course.

Required Textbooks, Software, and Hardware

- Howard D. Curtis, "Orbital Mechanics for Engineering Students," 4th Ed., Butterworth-Heinemann, ISBN: 9780081021330, 2020. *Will be delivered in PDF form*
- N. Harris McClamroch, "Steady Aircraft Flight and Performance," Princeton University Press, ISBN: 9780691147192, 2011. *Will be delivered in PDF form*
- MATLAB (MathWorks), any recent release.
- Various handout materials provided digitally via Canvas.
- Scientific calculator (not your phone).
- It is important that you have your own laptop/mobile computer. Details are provided on the college and department websites:
  https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/
  https://mae.ufl.edu/students/undergraduate/computer-requirements/

Alternate (Reference) Textbooks

- Roger R. Bate, Donald D. Mueller, Jerry E. White, "Fundamentals of Astrodynamics," Dover Publications, Inc., ISBN: 9780486600611, 1971.
- John E. Prussing, Bruce A. Conway, "Orbital Mechanics," 2nd Ed., 2012.
- John D. Anderson, Jr., "Introduction to Flight," 8th Ed., 2016.
- Steven A. Brandt, Randall J. Stiles, John J. Bertin, Ray Whitford, "Introduction to Aeronautics: A Design Perspective," 3rd Ed., 2015.

Important Dates

- Classes Begin: Jan 12 (Mon)
- Holidays/Breaks/Reading Days: Jan 19 (Mon), Mar 16-20 (Mon-Fri), Apr 23-24 (Thu, Fri)
- Classes End: Apr 22 (Wed)
- Classes Canceled: TBD
- Quiz and Exam dates stated in this syllabus will be confirmed in class
- ***Quizzes, multiple choice via Canvas, at least bi-weekly starting Jan 21 (Wed)***
- Review for Midterm Exam: Feb 16, 18
- Midterm Exam: Feb 19 3-7p
- Project Assigned: Mar 13 (Fri)
- Project Due: Apr 19 (Sun) 6p
- Final Exam: Apr 30 (Thu) 3-7p

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Attendance Policy

- Students are expected to attend all lectures.

Class Expectations

- The student is solely responsible for their education. The instructor is the guide to their understanding of the field. I'll get you halfway there. The rest is your responsibility.
- Cell phones, laptops, etc.: **under no circumstances will disruptions from electronic devices be tolerated. Students are expected to take either handwritten notes with pen/pencil and paper, or electronic notes with stylus and tablet.**
- **Electronic notes must be printed out if used as reference material on examinations.**
- Respect and disruption: the instructor and students will be always respectful. Classroom disruption of any kind will not be tolerated.
- **The principles of the Honor Code must be always adhered to.** Individual effort is required on homework assignments, quizzes, and exams. Groups will be treated as individuals for projects. Students are bound by the Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code." On all work submitted for credit, the following statement is either required or implied:

  On my honor, I have neither given nor received unauthorized aid in doing this homework/quiz/report/exam.

  The Conduct Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies behaviors that are in violation of this code and the possible sanctions. You are obligated to report any academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or a TA.

  Course Zero-Tolerance Policy: *Any* violation or suspected violation of the Honor Code by a student may result in that student receiving a grade of E for the course.

Homework

The purpose of homework is to learn and understand the material. Weekly, most likely, I will send some problem solutions for your learning and understanding. **Students are responsible for performing and understanding the homework problems and solutions on their own.**

Software and Copyrighted Material Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing the use of software and the use of copyrighted material. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Quizzes and Exams

All quizzes are closed-book, closed-notes, closed-electronic devices. A scientific calculator (that is **not** your cell phone or laptop) will be permitted. **All exams are open-book, open-notes, closed-electronic devices except for a scientific calculator.**

Honorlock: Consistent with university policy, Honorlock may be used for Exam #1 and #2 and will be confirmed by the instructor. Please see https://pfs.tnt.aa.ufl.edu/teaching-and-technology-resources/online-proctoring/ for more information.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (https://disability.ufl.edu/get-started/). Students should share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Undergraduate Program Coordinator, advising@mae.ufl.edu
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa/

Instructor-Initiated Course Recording and In-Class Recording

No recording of class lecture will be done or allowed. Generally, I will send enough written material to make up for missed attendance. Being in class is a good thing, nonetheless.

Health and Wellness

U Matter, We Care

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing Staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

COVID-19, Cold, Flu, and Other Contagious Respiratory Illnesses

- You are expected to follow guidance from the Centers for Disease Control and Prevention (CDC) regarding the wearing of approved face coverings during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please call your primary care provider if you are ill and need immediate care or the University of Florida Student Health Care Center at 352-392-1161 to be evaluated for testing and to receive further instructions.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

Counseling and Wellness Center

https://counseling.ufl.edu/, and 352-392-1575; and the University Police Department: 352-392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the Office of Title IX Compliance (https://titleix.ufl.edu/), located at Yon Hall Room 427, 1908 Stadium Road, 352-273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 352-392-1161.

University Police Department

352-392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning Technical Support

352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://elearning.ufl.edu/

Career Connections Center

Reitz Union, 352-392-1601. Career assistance and counseling. https://career.ufl.edu/

Library Support

https://uflib.ufl.edu/. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center

Broward Hall, 352-392-2010 or 352-392-6420. General study skills and tutoring. https://academicresources.clas.ufl.edu/

Writing Studio

302 Tigert Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
https://writing.ufl.edu/writing-studio/

Students Complaints: On-Campus

https://ombuds.ufl.edu/student/

Students Complaints: Distance Learning

https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Evaluation of Grades and Grading Policy

The grading policy is at: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Evaluation Assignments	(%)
Quizzes (6)	18%
Project	12%
Midterm Exam	35%
Final Exam	35%
Extra Credit	4%

Homework

Students will submit solutions of the homework problems only via the course website. Students who turn in homework before the due date and time will have their homework graded. Not all homework problems may be graded, and a selection of problems may be randomly chosen for grading after the homework due date and time. Submitted homework that is partially- or fully-missing solutions to these chosen problems will not be eligible for full or partial credit for those problems, respectively, even if other non-chosen homework problems were completed. **Grading may be on completeness or on correctness.** However, it is the student's responsibility to check their solutions against posted homework solutions.

Exams

All students are expected to take all quizzes and exams. If a student is unable to take an exam for unforeseeable reasons then there will be a makeup exam in person.

Final Grade

Final grades may be calculated by the following table. For example, if a student earns 86.60% (Percent Grade Earned %GE = 86.60) then their grade point will be 3.33 (B+). %GE are rounded to the hundredths decimal place. For example, if a student earns 77.995% (Percent Grade Earned %GE = 77.995) it will be rounded up to 78.00%, and their grade point will be 2.67 (B-). Shifts in the grading table are at the discretion of the instructor.

Table 1. Grading Table. *%GE = Percent Grade Earned.*

Percentage Range	Grade Point
$92.00 \leq$ %GE $< 100.00 \Longrightarrow$ A	4.00
$88.00 \leq$ %GE $< 92.00 \Longrightarrow$ A-	3.67
$85.00 \leq$ %GE $< 88.00 \Longrightarrow$ B+	3.33
$81.00 \leq$ %GE $< 85.00 \Longrightarrow$ B	3.00
$78.00 \leq$ %GE $< 81.00 \Longrightarrow$ B-	2.67
$74.00 \leq$ %GE $< 78.00 \Longrightarrow$ C+	2.33
$71.00 \leq$ %GE $< 74.00 \Longrightarrow$ C	2.00
$67.00 \leq$ %GE $< 71.00 \Longrightarrow$ C-	1.67
$64.00 \leq$ %GE $< 67.00 \Longrightarrow$ D+	1.33
$61.00 \leq$ %GE $< 64.00 \Longrightarrow$ D	1.00
$60.00 \leq$ %GE $< 61.00 \Longrightarrow$ D-	0.67
$00.00 \leq$ %GE $< 60.00 \Longrightarrow$ E	0.00

Grade Corrections

Grade corrections should be submitted promptly in writing within three business days of the grade posting. Include a concise statement of why you believe that there has been an error. The instructor has the final determination in the assigned grade; if a grade change is made, the grade may be lower or higher.

Course Schedule, Approximately by Week Number

1	Jan 12,14,16	Space Flight History, Gravity, Newton's Law, 2-body Problem	OM Ch. 1-2
2	Jan 19, 21,23	MLK Day, 2-body Problem (circular, elliptical, hyperbolic)	OM Ch. 2
3	Jan 26,28,30	Orbital Maneuvers	OM Ch. 6
4	Feb 2,4,6	Interplanetary Trajectories	OM Ch. 8
5	Feb 9,11,13	Rocket Vehicle Dynamics	OM Ch. 13
6	Feb 16,18,20	Review, Exam week	Exam #1 (OM)
7	Feb 23,25,27	Aviation History, Aircraft Components/Subsystems	SAF&P Ch. 1
8	Mar 2,4,6	Fluid Mechanics & Aerodynamics	SAF&P Ch. 2
9	Mar 9,11,13	Aircraft Kinematics, Attitude, Forces/Moments, *Project assigned*	SAF&P Ch. 3
10	Mar 16-20	***!!!! Spring Break !!!!***	
11	Mar 23,25,27	Propulsion Systems	SAF&P Ch. 4
12	Mar 30,Apr 1,3	Steady Flight Analysis	SAF&P Ch. 5
13	Apr 6,8,10	Steady Level, Longitudinal Flight (Cruise)	SAF&P Ch. 7
14	Apr 13,15,17	Steady Longitudinal Flight (Climb/Descend)	SAF&P Ch. 8
	Apr 19	*Project Due by 6p*	
15	Apr 20,22	Review Week	
16	Apr 27-30	Exam Week	Exam #2 (SAF&P)

OM = Orbital Mechanics, SAF&P = Steady Aircraft Flight & Performance