

# Syllabus: Basics of Space Flight Astronomy 0087, Fall 2019

**Lecture:** TuTh 2:30PM - 3:45PM, Thaw Hall 102

**Professor:** Dr. David Pekker  
Allen Hall 218  
Department of Physics and Astronomy  
[pekkerd@pitt.edu](mailto:pekkerd@pitt.edu)

**Office Hours:** immediately following each lecture and by appointment as needed. Please schedule appointments either via email or in person.

**Grader:** TBD

**Course Materials:** There is no required text to purchase for this course. Instead, the course will rely on free online resources.

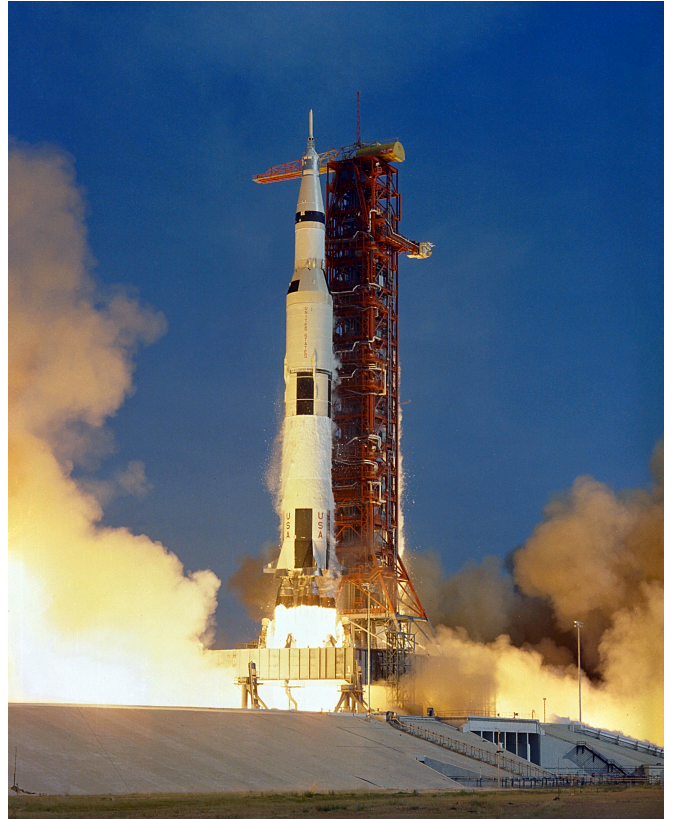
- (1) Regina E. Schulte-Ladbeck "Basics of Spaceflight" (2016). This is an online text book available at: <https://reslscience.weebly.com/space-books.html>
- (2) Dave Doody NASA-JPL tutorial "Basics of Space Flight" available at: <https://solarsystem.nasa.gov/basics/>

Course notes, homework assignments, links, videos, etc. will be posted on CourseWeb. Students should consult CourseWeb regularly for announcements and updates. Homework problems and subjects from the assigned readings will appear on the exams.

**Course description:**

**Major content areas:**

- (1) Astronomy
  - (1) The solar system: Sun, Planets, Moons
  - (2) Stars & Galaxies
  - (3) Cosmology
- (2) Rocket science (rocket engineering)
  - (1) Laws of motion
  - (2) History of rocketry
  - (3) The rocket equation
  - (4) Orbital motion
  - (5) Rocket engines
  - (6) Spacecraft failures & engineering ethics
- (3) What is science?



Apollo 11 Launch (from wikipedia)

- (1) Philosophy of scientific inquiry
- (2) What do scientist actually do all day?
- (3) From Newton to Einstein
- (4) Applications of spaceflight
  - (1) National defense
  - (2) Human and robotic space exploration
  - (3) Commercial uses of space
  - (4) Space policy
- (5) Spaceflight & science fiction
- (6) Outlook on future of spaceflight

**Grading policy:** The course grade will consist of the following components:

Exams (best 2 out of 3) — 75%

Homework (best 4 out of 5) — 20%

Class participation — 5%

**Extra-credit projects:**

In addition to the above mentioned components, students can earn extra-credits. Extra-credits can be used to earn up to a 10% grade boost. You can select one or more extra-credit projects from the list below. Additionally, I encourage you to think about extra-credit projects that are not on the list. If you have a creative idea for such a project please discuss it with the professor in order to (1) verify that the project is appropriate and (2) come to an agreement about the amount of extra-credits that it will be worth.

- (a) 5% — 1-3 minute video about space or spaceflight broadly defined. Your video will be shown and briefly discussed in class (so please make it appropriate for the audience).
- (b) 5% — 1-3 minute presentation about space or spaceflight. The presentation can be in any format you want ranging from dance to a blackboard lecture.
- (c) 5% — construct a water rocket (we will fly it on “launch day”).
- (d) 2.5% — construct a 3D printed model of a rocket or rocket part(s) that demonstrate their functionality.

**Exams and Exam policy:**

Students must bring their **ID cards** to all Exams, and must have their **PeopleSoft Number**. Three exam of equal point value will be given and the lowest exam grade will be dropped.

All exams will be **cumulative** (any topic covered in lecture or homework before the exam is fair game). Moreover, the same question can appear on more than one exam! Therefor if you missed a questions it is strongly suggested that you review it before the next exam.

The tentative exam dates are:

Exam 1: Thursday, September 26

Exam 2: Thursday October 24

Exam 3: Thursday November 21

Generally, there will be no make-up exams as you are allowed to drop one exam grade. Exceptions to this rule will only be made in case of extreme circumstances, at the discretion of the professor.

**Homework and homework policy:**

Five homework sets of equal point value will be assigned and the lowest homework grade will be dropped.

Generally, late homework will not be accepted as you are allowed to drop one homework assignment. Exceptions to this rule will only be made in case of extreme circumstances, at the discretion of the professor.

**Class participation:**

Instead of clickers, we will use TopHat in order facilitate audience participation.

Class participation grade will be based on answering discussion questions. Points will be given regardless of whether the question was answered correctly or not. Points will not be given if you are not in class to answer the questions.

**Succeeding in this course:**

Read the assigned sections before class. Attend class prepared. Ask questions! Respond when I ask you questions. Take notes during class! I will make use of some slides and movies, but will do most work on the blackboard and show experiments. The homework and reading assignments are there to prepare you for succeeding on the exams – participate!

If you **miss a class**, make sure to get the notes from another student in this course.

Students are strongly encouraged to **form study groups!** Of course the exact text of your homework and exam answers must be your own.

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**Academic Integrity Policy:**

Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

Turnitin: Students agree that by taking this course all required papers and other assignments may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin reference database solely for the purpose of detecting plagiarism of such papers. Use of Turnitin page service is subject to the Usage Policy and Privacy Pledge posted on the Turnitin.com site.

**Disability Resources:**

If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and the Disability Resources and Services no later than the 2nd week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call 648-7890 (Voice or TTD) to schedule an appointment. The Office is located in 216 William Pitt Union.

**E-mail Communication Policy:**

Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from

knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to <http://accounts.pitt.edu>, log into your account, click on Edit Forwarding Addresses, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to [www.bc.pitt.edu/policies/policy/09/09-10-01.html](http://www.bc.pitt.edu/policies/policy/09/09-10-01.html).)

### **Classroom Recording Policy:**

This course will adhere to the University's Senate Educational Policy Committee recommendation on classroom recording of May 4, 2010:

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussions, recitations, and/or other activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

### **Intellectual Property Policy:**

Per the University's policies regarding copyright and intellectual property, <http://www.library.pitt.edu/copyright-pitt>, the instructor retains the rights to all original course materials – including, but not limited to, lectures, lecture notes, slides or other presentations, assignments, exams, papers, diagrams, etc. – and none of this material may be used, shared, or reproduced in any way, for other than a student's own private educational use.

In addition, legal rights for all third-party materials, whether used by direct permission or under the Fair Use educational rules, is fully retained by the original authors. None of this material may be used, shared, or reproduced, in any way, for other than a student's own private educational use, unless permission is granted by the original authors or sources.

### **Sexual Misconduct, Required Reporting, and Title IX:**

The University is committed to combatting sexual misconduct. As a result, you should know that University faculty and staff members are required to report any instances of sexual misconduct, including harassment and sexual violence, to the University's Title IX office so that the victim may be provided appropriate resources and support options. What this means is that as your professor, I am required to report any incidents of sexual misconduct that are directly reported to me, or of which I am somehow made aware.

There are two important exceptions to this requirement about which you should be aware:

A list of the designated University employees who, as counselors and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: <http://www.titleix.pitt.edu/report/confidentiality>

An important exception to the reporting requirement exists for academic work. Disclosures about sexual misconduct that are shared as part of an academic project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX office.

If you are the victim of sexual misconduct, Pitt encourages you to reach out to these resources:

Title IX Office: 412-648-7860



SHARE @ the University Counseling Center: 412-648-7930 (8:30 A.M. TO 5 P.M. M-F) and 412-648-7856 (AFTER BUSINESS HOURS)

If you have a safety concern, please contact the University of Pittsburgh Police, 412-624-2121.

Other reporting information is available here: <http://www.titleix.pitt.edu/report-0>

**Diversity and Inclusion:**

I consider this classroom – i.e. both our shared physical and digital spaces - to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. Students in this class are encouraged to speak up, share their ideas, and participate during class meetings, and in online forums and assignments. All members of this class are also expected to conduct themselves in a professional manner that contributes to a respectful, welcoming, and inclusive environment for every other member of the class.

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“Exploration is in our nature. We began as wanderers, and we are wanderers still. We have lingered long enough on the shores of the cosmic ocean. We are ready at last to set sail for the stars.”

— Carl Sagan, Cosmos