

Astronomy 0087 Basics of Space Flight

Class meets:

T, Th 11:00 am —12:15 pm
343 Alumni Hall (Masonic Temple)

Recitations (Dan Wasikowski):

Wed 12:00- 12:50 (11 Thaw), 2:00-2:50 (11 Thaw)
Thu 1:00- 1:50 (11 Thaw)

Instructor:

Dr. D. John Hillier
Professor of Physics and Astronomy
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(Physics Office: 100 Allen Hall: Phone 412-624-9000)

Office Hours:

Tuesdays 12.30 - 1.30 pm, Thursdays 2.00 - 3.00 pm
ANYTIME when I'm free, or by appointment.



Course Comment:

Self-contained course for students not majoring in the physical sciences. Course is mostly descriptive in nature, but some use of arithmetic, algebra and geometry is needed.

Two Term Sequence (any order):

A0087 +

A0088 (Stonehenge to Hubble) or
A0089 (Stars, Galaxies, & Cosmology) or
P0089 (Physics and Science Fiction) or
G0870 (Planets)

Science and Engineering Majors:

Instead of taking A0087, those students with a **science** background interested in stars, galaxies, and cosmology **WILL** be better served by taking **ASTRONOMY 0113 (TH 1:00 to 2:15pm)**.



Text Books:

“Basics of Space Flight Learners’ Workbook”

Available on the WWW at URL:

<http://www.jpl.nasa.gov/basics/>

To Rise From Earth

Wayne Lee (Checkmark books, Physics library reserve)

Into the Final Frontier: The Human Exploration of Space

Bernard McNamara (Harcourt pub.; Physics library reserve.)

Additional reference for basic astronomy:

Stars, Galaxies, and Cosmology, The Cosmic Perspective

by Bennett, Donahue, Schneider, Voit (Addison-Wesley)

“Astronomy -- From the Earth to the Universe”

Pasachoff

“Explorations -- An Introduction to Astronomy”

Arny (McGraw-Hill)

“Astronomy -- A Beginner’s Guide” [or “Astronomy Today”]

Chaisson & McMillan (Prentice-Hill)

Universe

Kaufmann (W. H. Freeman and Company)



Study Technique:

Read the previous set of class notes.

Read the notes/chapter **BEFORE** lesson.

Simple note taking in class:

What does the lecturer emphasize?

Clarification comments.

Do not attempt to copy overheads. These notes will be made available to you in PDF format on **COURSEWEB**

Summarize each class (utilizing the text book, lecture material and other resources).

Write out important facts and dates.

Attempt all homework. Ask the TA or instructor for help if you have difficulty (alternatively visit the physics resource room).

Use the online resources that I will give as the course proceeds.

Old Exams

Old exams, with solutions, will be made available on **COURSEWEB**.



Exam Policy

Students **MUST** bring their ID cards to exams.

Students **MUST** bring a No 2 pencil & eraser to exams.

No calculators or notes permitted.

Cheating results in an immediate failure, and a report will be sent to the Dean.

Exams

First 3 exams (80 minute class tests):

Tuesday, Feb. 7th – 1st exam

Tuesday, Mar. 21st – 2nd exam

Thursday, Apr. 20th – 3rd exam

Generally not cumulative, cover ~1/3 of the course material.

Some material/concepts may be covered by all exams.

Final exam (2hrs):

Thursday, April 27th (8:00 to 9:50 am)

Cumulative.

Exam questions:

True-false, multiple-choice, or reading comprehension multiple-choice

Make-up exams **will not be given**.



NB: The instructor **MUST** be informed **PRIOR** to the exam if a student is to miss an exam for a reason which is **NOT** an emergency. The instructor reserves the right to reject any excuse which **THEY** deem not to be sufficient.

Grades:

75% of the course grade will be based on the 3 highest exam scores.

15% of the course grade will be allocated by the recitation instructor. 10% of the will be for homework. Effort is rewarded. 5% of the grade will be allocated for attending at least 10 of the recitations, although 2 consecutive recitations cannot be missed without special permission.

5% of the course grade will be for lecture attendance.

5% for class quizzes. These quizzes will be given at random times.

Course grades will be determined from a curve of the distribution of scores on the final cumulative grade (e.g., 10 to 20% of the students will get As, etc.). However, a student scoring

90% will receive at least an A,

78% will receive at least a B,

65% will receive at least a C,

50% will receive at least a D

NB: If you are taking the SN option, you need a C, or better, in order to be given credit for the course.



A student who is satisfied with their grade after the first 3 exams does not need to take the final. Students who have missed one of the four exams will not have the option of dropping their lowest grade. On the Friday after the 3rd exam, I will post your final grades **assuming you do not take the FINAL**. These grades cannot go down. However, they may improve if you take the final.

EXAM Review

A question/answer session will be given before each exam.

Generally these will start around 5:00 pm, on the day prior to the EXAM.

Times and dates will be provided as soon as possible.

There will be no in-class exam reviews.

Additional Resources

Physics Resource Room (staffed by physics graduate students)

Thaw Hall (near Physics Library / Physics Mail boxes)



EMAIL

Only EMAIL me when necessary.

DO NOT EMAIL me for grades.

DO NOT EMAIL for exam dates etc. which can be found in these notes.

Always begin the EMAIL subject line with **A0087**: If **A0087** is not included in the subject line I may not read the EMAIL

DO NOT EMAIL me .DOC files etc, or files with unnecessary rubbish. Send simple text messages.

You should receive an EMAIL from me the first week of term. If you do not, check your EMAIL service.

NB:

All EMAIL will be sent to your PITT account. Mail sent to this account can be automatically to your regular EMAIL account (ask CIS for help). Please check your PITT EMAIL account regularly, and delete unwanted messages. All EMAIL is saved, and the account may fill up. As a consequence you will not receive new EMAIL.



Homework:

Assigned each week:

It will consist of problems, descriptive answers, multiple choice questions, and assigned reading. Exam questions may be taken from the assigned reading, and the homework. Mathematical problems on the homework are generally more difficult than those on the exam, so DON'T panic. If you can't do a problem, ask the TA or the lecturer for assistance.

Homework essays may cover material not discussed in class.

Only one question will be completely graded, but solutions will be provided to all questions. A mark will be assigned by the TA on the basis of the graded question, overall neatness, and the number of questions seriously attempted.

No late homework will be accepted with out prior approval of the recitation instructor or myself. Homework more than a week late will only be accepted under exceptional circumstances, and with prior approval of the instructor.

Copied homework will receive a grade of zero. A report may be sent to the DEAN.

Please collect all homework the week after it was handed in. Please save your graded HW. Some HW questions will be examinable.



Extra credit

There is no extra credit given in this course.

Grades are based on the exam, attendance, quizzes, and homework only.

HELP

If you are having difficulty with course, see the instructor immediately.

If you have a personal problem which is affecting your performance, contact the instructor immediately.

If you can't make a lecture, EMAIL the lecturer before the class. If a quiz is given, and you have a valid excuse, you may be allowed to make up the quiz.

Requests for exemptions and special consideration, made at the end of term, will be rejected.



COURSE OUTLINE

Brief Overview of the Universe
The Solar System
Coordinates and Time
Gravity and Mechanics
History of Space-Flight
Rockets
Orbits and Trajectories
Electromagnetic Phenomena
Mission to Mars
Rockets of the Future
Life on other worlds

Important dates:

Monday, Jan. 16th	Holiday (Dr. Martin Luther King)
Tuesday, Jan. 17th	End add/drop
Mar 5 – Mar 12th	Spring recess
Friday, April 21st	Last day of classes

