

**AMERICAN INTERNATIONAL COLLEGE
PHYSICS 115/117 SYLLABUS SPRING 2011
ASTRONOMY**

LECTURER: Dr. John K. Dayton, Associate Professor, Physics Department Chairman
OFFICE: Breck 315
OFFICE HOURS: Mon, Wed, Fri 2:00 - 4:00
NON-OFFICE HOURS: when available: by appointment or just come by
PHONE: 205-3381
EMAIL: John.Dayton@aic.edu
WEB SITE: <http://www.collegephysics.com>

COURSE DESCRIPTION:

Physics 115, Astronomy for the Liberal Arts , is a thorough overview of introductory astronomy. It begins by developing a perspective of astronomy as a science and what that science studies. Then the basic physical laws of the universe and the tools of astronomy are studied. Following these fundamental perspectives, the course examines the Solar System and its formation. An in depth study of stars follows. This includes types of stars, how they are formed, how they function and produce energy, and what becomes of them in the end when they no longer produce energy. The larger structures of the universe, galaxies and clusters of galaxies, will then be studied. The final study will be a selection of topics in modern astronomy including cosmology, dark matter and dark energy.

REQUIRED MATERIALS:

TEXT:

Horizons: Exploring the Universe, 12th edition by Michael Seeds

LABORATORY MANUAL:

Lab Instructions provided in lab.

CALCULATOR:

Any scientific calculator such as a TI-30 XIIS which is recommended. A calculator is necessary to participate in lab and for some homework. It is not optional. Credit card type and cell phone calculators should not be used and are not acceptable.

THE TEXTBOOK:

Students are assigned to read each chapter of the textbook as the course progresses. Pay attention to definitions of the physical quantities, basic mathematical relations between physical quantities and the examples that are worked out in detail. These examples are among the basic building blocks of the course you need to master the material. The online homework assignments use the same problems from the end of each chapter. It will be to your benefit if you try additional end of chapter problems from the textbook not assigned as homework. If you do not read or study from the textbook, you are throwing away a vital learning resource and experience.

SUPPLEMENTARY MATERIAL:

Supplementary material is located on Prof. Dayton's website <http://www.collegephysics.com> and on the Manhattan classroom for this course. These materials include PowerPoints, self-study workbooks, lists of equations, and links to other instructional sites. Some files such as PowerPoints published by your textbook company require a username and password to access. Use the following:

username:

password:

PROHIBITED EQUIPMENT:

In order to minimize disruptions and safeguard against academic dishonesty, the following personal electronics are not allowed to be on or used during lecture, exams and lab:

- Cell Phones. Make sure they are turned off. Using a cell phone during lecture is rude and disrespectful.
- PDA's and laptops
- MP3, CD, DVD, or tape players
- Headphones or ear-buds
- Cameras of any kind

Students using any of this equipment during class will be asked to place it on the front counter until the end of the class when it can be picked up. Also, attendance credit for being in class will not be given.

As a matter of safety, students are not permitted to wear hoods during class. Please consider what may be inappropriate attire in a classroom, such as pajamas and bedroom slippers, and choose more suitable clothing.

ACADEMIC OBJECTIVES OF THE COURSE:

The goal of this course is to develop an understanding and appreciation for the fundamentals of astronomy.

THE LEARNING OBJECTIVES, GOALS and EXPECTATIONS:

The learning objectives may be divided among several categories: basic science, history, the Solar System, stars, galaxies, and cosmology. Within each category students will be responsible to know basic factual information, identify and describe important physical processes that may apply, and explain their relevance and importance to us.

Basic Science: the scientific method

 the metric system

 distance measurements and the scale of the universe

History: Babylonian and Greek contributions

 early contributors: Ptolemy, Copernicus, Brahe, Kepler, Galileo, Newton

 modern contributors: Einstein, Hubble, Penzias and Wilson

The Solar System: formation, components, history, place in Galaxy

Stars: structures and types, life cycle of low and high mass stars

Galaxies: basic structures and types, evolution of galaxies
Cosmology: theories and models of the universe, the Big Bang model and the future of the Universe.

GENERAL EDUCATION COMPLIANCE:

COMMUNICATION SKILLS: There are ten laboratory exercises for which students will write reports.

QUANTITATIVE REASONING: Throughout the course students will have opportunities to perform calculation concerning motion, force, energy production, mass conversion, and distance..

COMPUTER APPLICATIONS: Students will gain valuable computer experience using computers to acquire measurement data and create graphs of physical relationships.

CRITICAL THINKING SKILLS: Students will analyze quantitative data and employ selected physical principles, concepts and laws to calculate answers to a wide variety of questions. Students will also explore Earth's position in time and space and come to an understanding of our place in the universe.

SCIENTIFIC AWARENESS: In this broad survey of science students will study the interrelations between astronomy, physics, chemistry as they explore our place in time and space.

METHODS OF INSTRUCTION:

During class students will be presented a clear and thorough description of the theoretical development and application of physical principles, laws and the basic relations between physical quantities. Instructional methods will include didactic lectures, examples and applications, historic discussions, demonstrations and questions asked of students in the Socratic style. Additional instructional methods include supplementary materials in the form of PowerPoints and self-study workbooks online. The focus of each lecture will be the *learning* objectives/goals. Students are encouraged to ask questions and participate in the discussion.

ATTENDANCE POLICY:

Absence from lecture: There will be a loss of 1 point from the final grade for every class missed in excess of 5 classes. There is no reason to provide any excuses for missed classes. Do not send emails explaining any absences since 5 absences don't count against you. Such events as jury duty, illness, sports activities, car accidents fall within the free 5 absences but after 5 free absences any additional absences will be penalized.

Extended absences excused through the Student affairs office will be recognized and excused.

Absence from lab: No report can be submitted and will be counted as 0 unless arrangements are made with the lab instructor for a single lab makeup. All other missed labs will be grades as 0's. If a student misses four labs, there will be no make up and the student will automatically receive a grade of E (failure) for the lab.

Missed Exam: Only one missed exam can be made up with no excuse required. Other missed exams will be marked as 0 unless a valid excuse is provided. Makeup exams will be different exams than those given in class and will also be more difficult.

Leaving class early will be considered not attending unless prior approval is granted. Also, using a cell phone or engaged in other non-class activity may also be counted as not attending.

STUDENT RESOURCES:

There is also a lot of useful information on the web site located at www.collegephysics.com.

EVALUATIONS AND GRADING:

Students can demonstrate mastery of the course material via 1: homework, 2: exams, and 3: the final exam.

- Homework consists of online assignments in WebAssign. See the section on WebAssign for more information about online service.
- Homework will count 20% of the final grade.
- There will be four exams during the semester. Exams are collectively worth 60% of the final grade.
- The final exam will be cumulative and given during the scheduled final exam period: Tuesday, May 10 at 11:00 pm. It will be 20% of the final grade.
- No exams will be rescheduled for individuals except in cases of emergencies.
- Absences from class will be used when computing final grades.
- The laboratory is a separate grade and is evaluated separately.
- Individual assignments and exams are not curved. A grading curve partly based on the class average will be applied to the final grade at the end of the semester.

The Final Exam is on Tuesday May 10, at 11:00pm. Do not make travel arrangements that conflict with this schedule.

General Rules For Grades:

- | | | |
|-----|--|---------------|
| • A | outstanding scholarship in all aspects of the course | 90% and above |
| • B | superior scholarly understanding and ability | 80% to 89% |
| • C | average scholarly understanding and ability | 70% to 79% |
| • D | minimal scholastic progress | 60% to 69% |
| • E | no scholastic progress | below 60% |

WebAssign:

You do not have anything new to purchase and have access to WebAssign even if you have not purchased the textbook. Follow these steps:

1. Go to <http://www.webassign.com>. Your account already exists so all you need to do is log in.
2. Your username consists of the first initial of your first name followed by your last name, all in lowercase letters with no special characters. If your last name is hyphenated, the second part is not included. EXAMPLE: If your name is Joseph Aaron Davis or Joseph Aaron-Davis, your username would then be jdavis. There are no capital letters, hyphens, apostrophes or periods in

- any username. Enter your username in the username box.
3. Enter aic (lowercase again) in the institution box.
 4. Enter your password in the password box. Your password is initially set to be exactly the same as your username.
 5. Press the login button.
 6. Change your password to something nobody but you will know. You should write it down and place it in a safe place.

Following this you should be brought to the class WebAssign home page where you can navigate to homework assignments.

Notes:

- Students are required to access WebAssign immediately upon starting class to insure they indeed have access. If you have any problem, you must see me immediately.
- To contact me online use my first class address John.Dayton@aic.edu, and not through WebAssign.
- You can print the assignments and work on them off-line but will have to go back to WebAssign to enter your answers. This may be useful if you have to use campus computers.
- Note the due date and time for each homework assignment. Once that time has passed, you can obtain a 2-day extension through WebAssign with a 20% late penalty. A second extension may also be obtained. Such extensions will only be available within 7 days of the original due date for each assignment. After 7 days, no extensions will be available.
- Plan to complete assignments BEFORE the due day/time since internet outages seem to be frequent. In such events use a different computer on which the internet is working.

INSTRUCTIONAL SUPPORT vs ACADEMIC AND INTELLECTUAL CHALLENGE:

The Physics Faculty understands the mix of students enrolled in physics courses. We also understand the needs each of you have in order to progress within your programs. Our purpose is that you learn the content of this physics course, develop the critical thinking skills needed to apply that knowledge, develop self-reliance and competency and successfully progress within your programs. In order to do that we must present our students with an appropriate level of academic and intellectual challenge. You will never be without support from the Physics Faculty but the level of the support we extend may be less than what you are comfortable with. It will always be more than sufficient for students who apply themselves to the learning tasks to be successful. Too much support creates dependency and diminished learning. The Physics Faculty will continue working diligently to maintain an appropriate balance between support and challenge to maximize student learning and success.

The pace of the lectures is determined by the amount of material we must go through. Otherwise this course will not meet the academic standards and requirements of your programs. All lecture content will be presented clearly and fully and usually everything will be repeated two or three times. Many of the concepts are difficult to understand the first time they are heard. That does not reflect on how clearly they are presented. As in any communications, the receiver must also function properly to fully grasp the meaning of the message. Not paying full attention in class or being half asleep are reasons why many students do not understand what is being clearly stated by their physics instructor.

LAB SAFETY AND CONDUCT:

The Physics Department works hard to provide an appropriate and safe learning experience for all students. Misconduct and inappropriate language are not conducive to this experience because of the distractions they causes and the potential risks to equipment and student safety. Students who do not comply with the following rules may be dismissed from lab.

Rules to be observed whenever students are in or by the lab room:

- Use safety goggles when required during chemistry experiments.
- Observe all safety procedures without exception.
- No food, candy or drinks.
- Do not use the table compartments or sinks for trash.
- Do not write on the tables or other equipment.
- Do not write on or tear up bulletin board displays.
- Do not remove any equipment or supplies from the lab. All cases of theft will be reported.

STUDENTS PLANNING TO GRADUATE IN MAY:

Any students participating in this course for the required general education laboratory science credit and planning to graduate in May must pass this class. This is your responsibility. The time for every student to be interested and concerned with their course grade begins now. Be aware there are no provisions for extra credit work.

INSTRUCTIONAL SUPPORT vs ACADEMIC AND INTELLECTUAL CHALLENGE:

The Physics Faculty understands the mix of students enrolled in physics courses. We also understand the needs each of you have in order to progress within your programs. Our purpose is that you learn the content of this physics course, develop the critical thinking skills needed to apply that knowledge, develop self-reliance and competency and successfully progress within your programs. In order to do that we must present our students with an appropriate level of academic and intellectual challenge. You will never be without support from the Physics Faculty but the level of the support we extend may be less than what you are comfortable with. It will always be more than sufficient for students who apply themselves to the learning tasks to be successful. Too much support creates dependency and diminished learning. The Physics Faculty will continue working diligently to maintain an appropriate balance between support and challenge to maximize student learning and success.

The pace of the lectures is determined by the amount of material we must go through. Otherwise this course will not meet the academic standards and requirements of your programs. All lecture content will be presented clearly and fully and usually everything will be repeated two or three times. Many of the concepts are difficult to understand the first time they are heard. That does not reflect on how clearly they are presented. As in any communications, the receiver must also function properly to fully grasp the meaning of the message. Not paying full attention in class or being half asleep are reasons why many students do not understand what is being clearly stated by their physics instructor.

LABORATORY WORK:

The laboratory manual contains instructions for almost all of the labs. Students will work with one or two lab partners as a team to perform the experiments and record data. Each student will then complete an individual report or worksheet.

The following rules are to be followed throughout the semester by all students:

- Do not miss, skip or change laboratory sessions.
- Reports can not be submitted for labs that were not attended.
- Arrive on time, prepared to begin. Students arriving late may be excluded from lab.
- Always have your calculator and other materials needed for lab.
- Pay attention to instructions and write them down as they are given.

In Addition:

- One-and-only-one missed lab may be made up at the end of the semester.
- Missed labs will be counted as zeroes. If four labs are missed, a grade of E will be given and no makeups will be allowed.
- Part of the laboratory evaluation is based on complying with these rules.

SYLLABUS ACCEPTANCE FORM:

In addition to being given a copy of this syllabus students will also receive a syllabus acceptance form. This form serves several purposes. It helps students understand what the syllabus contains and what is expected of them. By correctly completing and signing the form student's agree to accept the way the course will be conducted, how the classroom will be managed, and how their work will be evaluated. Signed forms will be returned for corrections until a correctly completed form is signed. Signed forms are due the next class day after being given a printed syllabus. Students objecting to anything in the syllabus should not sign this form and will be given an opportunity to discuss their objection with the instructor privately.

STUDENT RATING OF TEACHING EFFECTIVENESS:

Near the end of the semester students may be asked to complete a rating form. The information students provide on these forms is used by Administrators to rate instructors, not the courses. Understand that your input will be interpreted as feedback about the instructor, not the course. What you think of physics as a subject or why you may have been made to take this course should not be considered. Please take this process with all seriousness and limit your input to objective, realistic and meaningful feedback about how the instructor conducted the course.

Please be aware that the survey data is processed and evaluated by the Administration without regard for the difficulty of the course. Physics rating data will be compared on par with that of far less challenging courses and of greater student interest.

In addition, the instructor may administer a Physics Department survey about the course and instruction which is more specific and better aligned with this course.

PROBLEMS WITH COURSE:

Any student with a problem or complaint about the course, even a small one, is encouraged to speak to me about it at the earliest possible time. Bring problems to your instructor's attention as soon as possible so they can be dealt with before they develop into crises that effect your grade.

WITHDRAWING FROM THE COURSE:

All students are encouraged to apply themselves to the learning objectives, attend all classes and labs and complete all assigned work on time. In that endeavor the Physics Faculty is ready and willing to assist you in any way. If we work together, you may not only receive an outstanding grade but truly appreciate the course and the physical sciences as a life-long field of personal study.

The last date to withdrawing from a class without academic penalty is March 16, 2011. By that time you will have had two exams, more than several homework assignments and five lab reports. The Physics Department will provide course and grade progress following each exam. Students who are not on track for a passing grade by this time should seriously consider what their goals and intentions are. Continuing to do the same level of unsatisfactory work, with the same performance, with the same outcome will only result in a failing grade and having to repeat the course. If you find yourself in such a position, you must choose between two options: either seriously invest your remaining time and effort to fully engage the rest of the course on all levels, or withdraw. Staying in the class past the withdrawal date with a failing grade and continuing to do unsatisfactory work is not encouraged.

ACADEMIC INTEGRITY:

Students are expected to submit their own work for academic credit. Only sources for help that are permitted by the instructor are allowed. For example, receiving an answer to an exam question from another student (with or without that student's cooperation) or from notes constitutes dishonesty. All cases of suspected academic dishonesty must be investigated and if confirmed, reported to the Dean of Arts and Sciences.

Chapter homework assignments may be completed by students working together. However, submitting homework you did not work on, but copied from what was completed by another student, constitutes academic dishonesty. Likewise, do not allow students to copy your work.

DISCLAIMER:

The Physics Department will make every reasonable effort to adhere to this syllabus. However, keeping in mind that this syllabus is a tentative plan for the semester, unforeseeable circumstances may arise that warrant changes. The Physics Department has the authority to make due changes in order to maintain the quality of instruction and the fairness of evaluations as determined by your instructors.

PHYSICS 115/117 SYLLABUS ACCEPTANCE FORM SPRING 2011

I have received a printed copy of the syllabus for this course. Professor Dayton discussed the syllabus with the class and I have read it and clearly understand what will be expected of me. I have no questions at this time but I am aware of his office hours if any questions about the course arise. Based on the syllabus I am aware my responsibilities include:

Having a personal copy of the assigned textbook titled: _____.

Registering with WebAssign at web address: _____.

I also understand my grade will be based on the following:

_____ % on homework.

_____ % on exams. There will be at least _____ exams.

_____ % on the final exam. The final exam is scheduled for: _____.

There are _____ ways for me to demonstrate mastery of the course content. These are:

_____.

If I miss an exam: _____.

If I am absent from class : _____.

If I send text messages during class (list 2 things): _____.

The last day to withdraw from a course without academic penalty is: _____.

If I think something in lecture was unclear I should: _____.

List the methods of instruction which will be used: _____.

Supplementary materials are on the web and located at: _____.

Copies of this syllabus are available at: _____.

By placing my name on an exam or lab report I am: _____.

_____.

The feedback sought on end-of-semester student rating forms should be characterized by:

_____.

My physics professor's name is: _____, his office is: _____,

and his office hours are: _____.

With my signature below I pledge to abide by the rules specified in this syllabus and have no concerns or disagreements with the manner in which this class will be conducted or evaluated as specified.

STUDENT'S PRINTED NAME

STUDENT'S SIGNATURE

DATE: _____

This form will be returned for corrections to be resubmitted until it is correct.