

PHY 102: INTRODUCTION TO ASTRONOMY

with Dr. Tony Crider

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Meeting Times

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|----------|----------|----|----------|----------------------|-------|---------------|
| Classes: | 10:50 AM | to | 12:00 PM | McMichael - MCMI 207 | M/W/F | [Section A] |
| | 12:15 PM | to | 1:25 PM | McMichael - MCMI 207 | M/W/F | [Section B] |

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|---------------|---------|----|----------|----------------------|-------|
| Office Hours: | 9:15 AM | to | 10:30 AM | McMichael - MCMI 212 | M/W/F |
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During the hours listed above, I am in my office expressly to talk with students about coursework or other aspects of education at Elon. However, if you are unable to attend these hours, please e-mail me to schedule an appointment. Additionally, if you see me in my office with the door open, please feel free to come right in. Also, feel free to contact me through AIM at acrider@elon.edu. If I'm on-line, I can usually respond quickly.

Materials

For this class, you will need a copy of *Bad Astronomy* by Philip Plait (ISBN 0-471-40976-6), a copy of *The Trial of Galileo: Aristotelism, the "New Cosmology," and the Catholic Church, 1616-33* (ISBN 978-0321341327) and one license for the MasteringAstronomy on-line homework system (available from www.masteringastronomy.com). To gain a deeper understanding of the material, you may choose to supplement your studies with a traditional astronomy textbook, such as *The Essential Cosmic Perspective*. There are many different astronomy textbooks that can be checked out from Belk Library.

Description

Astronomy examines the nature of light, astronomical instruments and our attempts to understand the origin of our solar system and its constituents: the Sun, the planets, asteroids, comets and meteors (Elon University Academic Catalog).

Goals

Develop Critical Thinking Skills: Introduction to Astronomy is one of the many science courses for non-majors offered by this University. The primary goal of such courses is to equip students with the self-confidence and skills required of any citizen to critically evaluate the world that surrounds them. Through exposure to the tenets and procedures of astronomy, students in this class should learn to "think like a scientist" both within and beyond the classroom.

Instill Appreciation of Astronomy: The history of astronomy is an exemplary illustration of the evolution of science. By juxtaposing the study of ancient and modern astronomy, students should be able to compare the significance of historical discoveries to the excitement over daily findings reported in newspapers and journals.

Clarify Common Misconceptions: Several studies show that to understand the most basic phenomena visible in the sky, students must unlearn many core beliefs that they have about the Universe. The two most commonly cited topics involve the Earth's seasons and the phases of the Moon. Aside from simply rectifying these errors, students should learn to help others recognize and address their own misconceptions.

Objectives

The primary goal of developing critical thinking skills is largely addressed during lab activities, in-class debates, and critiques of astronomy in popular media. Meaningful conversations in the area of astronomy necessitate a passing familiarity with the material. Completion of required reading assignments will bring students to the class reasonably prepared. Additional discussions of pseudoscience, sprinkled throughout the semester, also provide suitable venues for skeptical inquiry.

The secondary goal of instilling appreciation of astronomy is met through participation in several observing labs and demonstrations. These opportunities allow students to experience astronomy first-hand by recreating historical observations. The results of modern space-based astronomy are also discussed and occasionally used in activities. Finally, student groups will engage in an astronomy outreach program, enabling them to witness firsthand the general public's fascination with astronomy.

The tertiary goal of clarifying misconceptions will be addressed with in-class surveys and exercises throughout the semester.

Academic Honor Code

Elon's honor pledge calls for a commitment to Elon's shared values of Honesty, Integrity, Respect and Responsibility. To be clear about what constitutes violations of these values, students should be familiar with the Judicial Affairs policies in the student handbook, including violations outlined at <http://www.elon.edu/e-web/students/handbook/violations/default.xhtml>. Students with questions about the specific interpretation of these values and violations as they relate to this course should contact this instructor immediately. Violations of the academic-related areas will be documented in an incident report to be maintained in the student's judicial record, and may result in a lowering of the course grade and/or failure of the course with an Honor Code F. Further details specific to this course are outlined in the sections below.

Disabilities

If you are a student with a documented disability who will require accommodations in this course, please register with Disabilities Services in the Duke Building, Room 108 (278-6500), for assistance in developing a plan to address your academic needs.

Grading Policy

Grades are based on the points received for the items listed below. Historically, students perform in similar ways to achieve these point and thus earn their final letter grades.

Students that receive an A are doing truly exceptional work. They often have the highest grade in at least two different areas of the class (e.g. participation and labs, participation and exams). These students usually do the assigned reading at least twice, once to prepare before class and once after class to review the material. They also ask the instructor questions during or after class almost every day to clarify their understanding of a topic. These students typically solidify their own understanding of the topics by tutoring other students in the class.

Students that receive a B are doing very good work. They have above average grades in all areas of the the class. They have completed all of the homework and show up to each class. They will answer a question in class occasionally. These students usually do the assigned reading at least once.

Students that receive a C are doing acceptable work. They may have difficulty in one or two areas of the class (e.g. participation and labs, participation and exams) but are succeeding in other areas. Often, they have not completed one or two of the assignments and may have missed a few classes. They will answer a question in class correctly if called upon, but seldom volunteer a response. These students will do the assigned reading when they have a chance, but have likely skimmed or skipped a few chapters.

Students that receive a D are doing poor work. They may have difficulty in most areas of the class. They have likely missed more than a few classes and forgotten to do a few assignments. The work that they do turn in is below the standards of their peers. These students may have read the first few chapters, but quit preparing for class after that. If a student does so poorly that the total weighted score drops below a 60%, he or she will receive an F.

The MINIMUM percentage points required for each final letter grade are as follows:

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| 93.0% = A | 87.0% = B+ | 77.0% = C+ | 67.0% = D+ | 0% = F |
| 90.0% = A- | 83.0% = B | 73.0% = C | 63.0% = D | |
| | 80.0% = B- | 70.0% = C- | 60.0% = D- | |

The instructor reserves the right to lower the requirements for each grade but not raise them. Points will be given as follows:

Class Participation (20% of final grade)

During nearly every class meeting, students will receive points for their participation. During many lectures, students will be asked to respond to questions based on the required reading and lecture slides. Students will receive partial credit for giving an answer and additional credit for correct answers. Completing the assigned reading and reviewing the lecture notes beforehand will almost certainly improve your score on these quizzes. Class participation points may also be given as rewards for assorted in-class activities throughout the semester. Students that notify the instructor via e-mail or voice mail (336-278-6268) BEFORE missing any given class period may apply to receive the missed points by taking a make-up quiz. Students may receive deductions to their Class Participation grade for instances of inappropriate behavior during class.

MasteringAstronomy Assignments (20% of final grade)

On-line assignments will be given throughout the semester. These assignments are given to encourage you to read the appropriate material for each lecture. Students should print a copy of each completed assignment as receipt of completion. Results deleted due to user or computer error may not receive credit without such receipts. All assignments must be completed by the date indicated on-line to be eligible for full-credit. After the due date, the points awarded decrease continually by 1% per hour until the assignment is worth 0 points. Students registering for the course after the start of classes will be given a short grace period upon request to make up missed assignments. No extensions will be given for the subsequent assignments unless the MasteringAstronomy server itself makes testing unavailable.

Trial of Galileo (20% of Final Grade)

To better understand the rich history and significance of the Copernican revolution, students will adopt the roles of 17th century clergy and scientists in re-enacting the trial of Galileo. This portion of the course, developed as part of Barnard College's "Reacting to the Past" series, includes its own student manual that will be distributed to students early in the semester. Our class will be playing through Phase One. Points will be awarded throughout the game for good performance. The final totals will be normalized and will become 20% of the final class grade. Before the game commences, students may elect to have their Galileo game based on 5% speaking + 15% writing, 10% speaking + 10% writing, or 15% speaking + 5% writing. The papers for this game will be graded using the rubric posted on Blackboard.

Observing Labs (15% of Final Grade)

All students are required to register for one section of the observing lab, PHYL 102. The lab will constitute 15% of the final grade. Further details can be found at the "Introduction to Astronomy Lab" Blackboard site. Please be aware that since this course fulfills the University requirement for a lab science, **to pass Introduction to Astronomy, you must receive a passing grade on the Observing Labs!**

Exams (25% of Final Grade)

Four exams will be given in this course on dates listed in the class schedule. The content of these exams will be largely based on the MasteringAstronomy assignments, the lecture notes, and the assigned reading. The first three exams (each worth 5% of the final grade) will emphasize material from the sections since the previous exam, but may also include limited material from earlier sections. The final exam (worth 10% of the final grade) will be comprehensive. Attempting to access the exam questions before the scheduled exam time will be considered a direct violation of the Elon Honor Code. If circumstances make it such that you are unable to take one of the first three exams on the scheduled dates, you may opt to reschedule as described by the following guidelines:

Rescheduling Due to Illness

If you must reschedule due to an unforeseen illness, you must provide a note from your medical practitioner signed on or before the exam signifying your medical inability to be in the testing area or physically take the exam. You must take the alternate exam during the week after the original testing time.

Rescheduling to Participate in Other Activities

If you must reschedule to participate in some other University-sponsored activity or religious observance, you must provide a signed 200+ word petition describing what you will be doing during the scheduled examination time and how this activity enhances your academic, athletic, or spiritual growth. This petition must be submitted and approved by the instructor before the exam. If you do not receive approval, you will not be permitted to take the exam.

Examples of Petitions Approved for Rescheduling

- "I must observe a religious event forbidding work during the exam."
- "I am participating in an official University sporting event during the exam."
- "I will be hospitalized on the day of the exam."
- "I will be in court on the day of the exam."

Examples of Petitions Denied for Rescheduling

- "I forgot that there was an exam today."
- "My ride leaves for vacation the day before the exam."
- "I have another exam on that day."
- "I slept in and then got caught in traffic."

If circumstances make it such that you are unable to take the final exam the scheduled date, you may opt to reschedule as described by the following guidelines:

If a student has three or more exams scheduled on a given day, permission to change the scheduled time of one of the exams will be granted by processing a form available in the Registrar's Office. Other requests for changing the scheduled time of a final exam must be authorized by either the Department Chair or the dean of the school/college. When a student misses a final examination, permission must be secured from the appropriate Dean of the college/school to make up the examination (Faculty Handbook, II-10).

To summarize, 20% Class Participation points + 20% MasteringAstronomy points + 25% Exam points + 20% Trial of Galileo points + 15% Observing Lab points = 100%. Students can access their scores and estimated letter grades on-line via Blackboard. Students should consult the instructor for an accurate assessment of their current standings in the course.