

INQ 250AS: Astronomy Controversies

Fall 2018

Location: Trex 273

Instructor: Dr. Evan M. Aguirre

Office Hours: TTh 1:30-2:30, MW 2:30-3:30, also by appointment

Time: MWF 1:10-2:10

Email: aguirre@roanoke.edu

Office: Trexler 266B

Required Texts:

Michael A. Seeds; Dana Backman. *Foundations of Astronomy 14th ed.*

Overview

How do the scientific processes of observation, measurement, and theorizing help to create and resolve controversy within the sciences? Is it healthy to maintain controversy regarding theories and models in the sciences; i.e., do the sciences thrive on controversy? How is controversy received and interpreted by the larger society and culture? By examining some well-known controversies within the astronomical sciences, we will explore both the quantitative arguments and the historical contexts in answering the above questions. Since physics is the proper background for astronomical studies, the course will also focus on the physical concepts and processes associated with astronomical objects. You will also take measurements, observe astronomical objects with telescopes, and interpret graphically-presented data through a required weekly night lab. The aspiration is that you will better understand the process of carrying out science and determine what makes good science.

Intended Learning Outcomes

By the end of this course, successful students will be able to:

- Identify underlying foundations that shape right and wrong theories
- Examine data sets that lead to a re-creation of the scientific arguments and a re-calculation of results supporting both sides of the controversy
- Synthesize data analysis and third sources to draw conclusions about a current, unresolved controversy
- Summarize scientific arguments through writing

Attendance

You are expected to attend every class. If you do not attend class or are consistently late you will lose many points and will receive a poor grade. If you are going to be absent from class then please notify

me ahead of time. You are accountable for all work missed because of an absence. According to the college, I am required to take attendance.

Evaluation

This course expects you to spend at least 12 hours of work each week inside and outside of class.

Grading

Daily Quizzes	10%	Participation and Classwork Assignments	10%
Homework	15%	Written Reflections	15%
Observing Lab	15%	Exams	20%
Final Exam	15%		

The grading scale is as follows: **A** 100-90, **B** 90 < 80, **C** 80 < 70, **D** 70 < 60, **F** < 60. I will not be giving pluses and minuses.

Daily Quizzes

Since participation is an essential part of this course, it is critically important that you come to class prepared by reading the required material. As such, most class periods will begin with a brief quiz based on the daily reading assignment. I will throw out your lowest quiz grade. The quizzes will also act as attendance.

Homework

Homework will be assigned weekly. You are encouraged to collaborate with your fellow classmates but you must turn in your own work. Late homework will be accepted up to one class period late but with a 40% deduction.

Exams

There will be 3 exams including the final throughout the semester. Make-up exams will only be allowed as a result of a discussion with me beforehand (with a compelling reason) or in emergency situations (death, hospitalization, court, etc.). **The final exam is Dec. 12th from 2:00-5:00.**

Written Reflections

Throughout the semester I will handout additional material concerning a controversy. You will be asked to read a particular article or story and communicate about it. Your submission will be graded on grammar, structure, and coherence.

Observing Lab

There is a required lab Wed 7:30-10:30 pm for the course that involves telescope observing, taking data, and drawing conclusions supported by those data. The observing lab meets at the Elizabeth campus in Hundley Hall 01. If the weather is poor we may meet in Trexler Hall. Within the lab

component we will explore both astronomical observation and the physical principles supporting astronomical measurements.

A portion of your laboratory grade is based on written reports that you will submit one week after completing a particular experiment. Some of these reports will be collaborative and some will be individually written.

Misc.

Computers will not be allowed for note taking. Cell phones must be put away for exams. You are encouraged to attend one of the MCSP Conversation Series talks throughout the semester. I will award extra credit (1%) if you write up a report of what you learned. The report is due one week after the talk. Although 1% may not seem like much, it can bump you up a letter grade.

Academic Integrity

I subscribe to the college academic integrity (AI) policies linked below. Students are expected to be familiar with these policies. As in real life, failure to learn the rules is not an excuse. Please contact me if you have any questions. Be aware that I am contractually obligated to report students if I suspect that they have engaged in academic dishonesty.

During in-class activities, I encourage you to discuss topics and learn from each other. However, unless specifically stated otherwise, you are expected to individually complete all steps of the activity and to turn in your own work. Homework and other assignments (unless specifically stated otherwise) are to be completed individually. Misrepresentation of your contribution to a group effort will be considered a violation of the academic integrity policy. Copying and pasting directly from a web site and claiming it as your own work is the same as copying and pasting directly from a book—both are violations of the academic integrity policy and will be treated accordingly. The full AI policy can be found online at: <http://roanoke.edu/A-Z Index/Registrar/Policies and Information/Academic Integrity.htm>.

Writing Center

The Writing Center @ Roanoke College is located in the library. Students meet with trained peer writing tutors in informal, one-on-one sessions. Writers may meet with tutors at any point in the writing process, from brainstorming to drafting to editing. Please make use of this resource, and note that you may consult tutors for assistance when preparing your in-class presentations, as well.

Special Services

Accessible Education Services (AES) is located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Dr. Sue Brown, Director of Academic Services and Acting

Coordinator of Accessible Education Services, at 540-375-2247 or by e-mail at sbrown@roanoke.edu to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Dr. Brown at your earliest convenience to schedule an appointment.