INQ 250: Astronomy Controversies Lab Spring-2023

Instructor: Dr. Truong Le (he,him,his)
Office: Trexler 266B
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Credits for the course: 0.5
Lectures Time: Th 2:50-5:50 pm
Lectures Room: Trexler 273

Class Environment: I consider this classroom to be a place where we will treat one another with respect, creating an environment that welcomes individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability and other visible and nonvisible differences. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. To minimize distraction, please put your cell phone to silent mode before any lecture. The instructor has the right and the authority to expel anyone who disrupts the lecture or behaves inappropriately at any time. **This syllabus will continue to change with students' notice.**

Office Hours: MWF (10-12 pm), and by appointment.

Course Description: This is a laboratory class accompanying INQ250. This laboratory is required to receive credit for INQ205.

Textbook and Materials: Lab instructions will be handed out at the start of each lab meeting. Please bring pencil and calculator to each lab meeting.

Learning Outcomes: After the successful completion of this class, the students will be able to

- Design and carry out measurements based on the directions given by the lab instructor and in the experimental manual.
- Collect data and tabulate it with appropriate units and significant figures.
- Draw sketches, graphs, etc. and use them to analyze data.
- Estimate uncertainties associated with the measurements.
- Discuss results and compare with available accepted values.
- Use computer software (Microsoft Word, Microsoft Excel, DataStudio, etc.) to collect data and create graphs, report observations, and tabulate results.
- Apply appropriate methods of safely handling equipment and performing laboratory procedures.
- Learn the origin and applications of celestial coordinate systems and understand the use of these coordinate systems for the location of objects on star charts and in the sky.
- Use celestial globe to understand the apparent motion of the stars and Sun, and the coordinate system used to describe the positions of stellar objects.
- Setup, align, and operate an 8" reflecting telescope.
- Setup and operate remotely a 20-meter radio telescope at the Green Bank Observatory.

Lab Partners: Group (team) study will be arranged to develop skills/strategies to cary out the experiments. Each team has the right to expel a member from the team if that individual does not contribute in any effort of the work. It is up to the team to except that individual back into their team. Otherwise, that individual will be by himself or herself until the next new arrangement. New team arrangement may occur after every four labs. Working on an experiment by yourself is extremely difficult.

Quizzes & Worksheets: A quiz will be given after every lab (sometime as group and sometime as individual). There will be no make-up for these quizzes. The quizzes will be graded for correctness. The worksheet grades will be determined by the clarity and accuracy of your responses to the questions on the worksheet you will complete in lab. Note that your lab data does not need to be perfect for you to earn a high lab grade. (In fact, if it is too perfect, I may be suspicious of the data.) However, you must account for any irregularities in your data with clear and plausible explanations. Unless otherwise instructed, each worksheet question must be answered in complete sentences. In addition, all numerical values should have the correct physical units (if applicable) and an appropriate number of significant digits. Everyone will need to turn in their worksheet.

Grading: LabReport (Group)/Quiz(Individual)- 100%

Attendance/Participation in Discussion: Attendance is mandatory. NO make-up labs will be offered at the end of the semester; one lab will be dropped. This is intended to cover all possible reasons you might need to make up a lab, including absences or poor grades. If you miss more than one lab your grade will almost inevitably suffer. Please be polite to your team by being on time. If you are 30 minutes tardy to class, I will deduct one letter grade from your lab's report. If it happens twice two letter grade will be deducted from your lab's report. If it happens three times, I will ask you to leave the class and you will receive a 0 for that lab.

Laboratory Behaviors: The lab will start promptly on the hour. You are requested to show up on time for the start of the lab. Please set cell phones to vibrate before the lab. Eating and drinking in classroom are NOT ALLOWED. Please eat outside of class. The instructor has the right and the authority to expel anyone who disrupts the class or behaves inappropriately at any time.

Accessible Education Services (AES): 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 Becky Harman, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@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 Becky Harman at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester.

Academic Integrity: Your learning and integrity are at the core of your RC education. For this reason, you must follow the rules outline in the College AI policies. See https://www.roanoke.edu/inside/az index/academic _ affairs/academic integrity. **If I become aware of a possible violation of these guidelines, I am contractually obligated to report it to the Academic Integrity committee.**

Preliminary Schedule :

Date	**Lab**
Jan 19	**No lab first week**
26	Lab1: Angular Size & Field of View
Feb 2	Lab2: Outdoor/Telescope
9	Lab3: Kepler Laws
16	Lab4: Night Observation
23	Lab5: Extrasolar Planets
Mar. 2	Lab6: Planck Radiation
16	Lab7: Black Hole
23	Lab8: Hubble Deep Field
30	Lab9: Variable Stars

Apr 6	Lab10: Dark Matter
13	Lab11: Andromeda Galaxy
20	Lab12: The Hubble's Law

I have read and understood this syllabus. Sign, date, and submit this page for 10 points toward your lab's grade on your first day of clas.

Student's signature: **Date:**