ASTR 329: Introduction to Observational Astronomy
Fall 2023

Instructor: Dr. Erica Franzmann
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Office Hours: By appointment
How to Contact: Please contact me via email for questions outside of class or office hours. Please note that unless your message is time-sensitive it is not likely that you will receive a reply after 9 pm. Office hours are, of course, drop-in. If you need to see me outside of office hours please contact me via email first.

Lecture Hours: 1:00 - 2:15 PM, Thursdays
Location: Clearihue Building A221
Lab Hours: 1:00 - 5:30 PM, Mondays
Lab Location: Bob Wright Centre A107
Course Credit: 1.5
Course Website: https://bright.uvic.ca/d2l/home/288923

Masking is optional but strongly recommended. Lectures and labs are in fairly close proximity, which makes transmitting illness more likely. **Please do not come to class if you are ill.** In the event you need to miss the lecture, content will be available on Brightspace within an hour of the end of class. Lab exercises will be available on Brightspace Friday the week prior. For labs, I recommend getting set up to access the lab server from your personal computer; you can find the guide under the "Content" tab of the course's Brightspace page.

Please see **https://www.uvic.ca/covid19/index.php** for information on UVic's policies about COVID-19.

Course Information

Introduction to observational and data analysis techniques in Astronomy. Observational and practical work, directed reading.
Prerequisite: Completion of ASTR 250 - Introduction to Astrophysics.

Supplementary Readings

TBA - I will list on Brightspace

Course Materials

Lecture slides and notes will be posted to the Content tab of Brightspace within an hour of the end of class. This will include links to any additional resources discussed in class.

Course Technology

Brightspace & Student Email

This course will use Brightspace for coordinating and distributing course materials and resources, viewing grades, and as a general hub for communication with classmates. It is your responsibility to check Brightspace and your @uvic.ca email address regularly.

Computing

Actual computing will be done on the lab's internal server, which can be accessed via VNC from one of the computers in the lab, or from a personal computer. Instructions on how to set this up are provided on Brightspace.

Personal Recordings

You may record the lectures for personal use or as needed for disability accommodations. Do not share any recordings outside of class or post to the internet.

Course Outline

The course will consist of 13 1.5-hour lectures (Thursdays), and 10 4.5-hour lab sessions (Mondays). Lectures will cover topics and theory relevant to observational astronomy, while labs will provide practical hands-on data processing and analysis based on concepts learned in class. Each lab will have a certain number of in-class lab sessions allocated to it before the report is due.

Lecture Topics Covered

Probability Distributions & Photon Statistics
Error Propagation, Observing Limits, QE, DQE, and Signal-to-Noise
Detectors
Integration & Photon-Counting Modes
Spectrographs
Atmospheric Turbulence & Adaptive Optics
Fourier Transform and Time Series Analysis

Lab Exercises

Lab 1: Introduction to IRAF and CCD Preprocessing
Lab 2: Properties of CCDs
Lab 3: Noise Regimes and the Point Spread Function
Lab 4: Spectroscopy (Precise Radial Velocity)

Evaluation

There will be four laboratory exercises assigned throughout the term, with accompanying lab reports. Grades are based 80% on lab work, with 20% on a one-on-one oral examination during the exam period. Questions will be given beforehand and students can prepare their answers.

Grading Breakdown

Labs: 80%
- Lab 1: 10%
- Lab 2: 20%
- Lab 3: 25%
- Lab 4: 25%

Final Oral Exam: 20%

Lab reports: As some labs will take multiple in-class sessions, lab reports will be due at 12 pm on the day we start a new lab exercise (ie. the report for Lab 2 will be due the day we begin Lab 3). You will be given at least 1 week notice of the deadline. Late lab reports will be deducted 5% per day overdue to a maximum of 50%. If you foresee needing some extra time, contact me at least 24 hours before the deadline and we can discuss an extension.

Letter Grades

Final letter grades will follow the standard university scale (subject to scaling if necessary).

90-100% A+
85-89% A
80-84% A-
77-79% B+
73-76% B
70-72% B-
65-69% C+
60-64% C
50-59% D
<50% F

Important Dates

Date	Event
September 19	Last date to DROP Fall term and Fall/Winter term spanning courses with complete refunds
September 22	Last date to ADD a course for Fall term and Fall/Winter term spanning courses
September 30	Fall fee payment deadline
October 2	University Closed (National Day for Truth & Reconciliation)
October 9	University Closed (Thanksgiving)
October 31	Last date to DROP Fall Term courses without academic penalty
November 13-15	Fall term break
November 22	Voluntary Withdrawal (VW) deadline for fall-term classes
December 4	Last day of classes
December 7-20	Final Examination period