Astronomy 2801 – Observing the Stars - Fall 2023

Have you ever looked through a telescope and wondered at the Universe? Or seen a beautiful telescopic image and wanted to try your own hand at taking pictures of astronomical objects? In this course, students will learn to control and use research-grade robotic telescopes located around the globe, to take images of deep-sky objects themselves, and then to use modern tools and techniques to make measurements from these images for scientific study. This course will teach students how to take and process images of the night sky the way professional astronomers do.

Note this course has a strong computational component: you will be expected to have access to either a Mac or Windows computer.

Astronomy 2801A/B - Observing the Stars
The properties of stars, the building blocks of the universe, and how we obtain their characteristics. The night sky, coordinates, detectors, telescopes, stellar magnitudes and fluxes, spectra, interaction of light and matter, Hertzsprung-Russell diagram, stellar evolution, and the Sun. Introduction to astrophysics, order of magnitude estimates, astronomical nomenclature and observations.
Antirequisite(s):
Prerequisite(s): (Physics 1202A/B or Physics 1402A/B or Physics 1502A/B, or the former Physics 1029A/B or the former Physics 1302A/B); (Calculus 1000A/B or Calculus 1500A/B or Numerical and Mathematical Methods 1412A/B or the former Applied Mathematics 1412A/B) and (Calculus 1501A/B, or Calculus 1301A/B with a minimum mark of 60% or Numerical and Mathematical Methods 1414A/B or the former Applied Mathematics 1414A/B), or the former Applied Mathematics 1413. Integrated Science 1001X with a minimum mark of 60% can be used in place of Physics 1202A/B and Calculus 1301A/B.
Corequisite(s):
Pre-or Corequisite(s):
Extra Information: 3 lecture hours, 1 tutorial hour, 0.5 course.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Instructor:
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Professor
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You can reach me via e-mail at pwiegert@uwo.ca. When contacting me by e-mail, please use your UWO e-mail account. Other accounts (such as hotmail and yahoo) are often tagged as spam and may not reach me.

Office Hours: My usual office hours will be announced on the OWL website, and are expected to be held in-person. You are welcome to drop by at the posted times. If the usual office hours time is not convenient, you can also send me e-mail if you would like to arrange a meeting.

Teaching Assistants: The TA(s) for this course, their contact info and their office hours will be posted on the course web site.

Format: This course is expected to take place primarily in person, however it may transition to an online format if required.

The online portion will be conducted primarily through Western's OWL Learning Management System. Students should check OWL (http://owl.uwo.ca) on a regular basis for news and updates. If students need assistance with OWL, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

The integrity of the course and the privacy of its participants is expected to be preserved. It is illegal to distribute, share in any public domain, or sell any course materials without prior written consent of the instructor.

Contingency plan for an in-person class pivoting to 100% online learning
In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme may change; any changes will be communicated through the OWL website. Any remaining assessments will also be conducted online as determined by the course instructor.

Course materials:

Textbook: The required textbook is Fraknoi, Morrison & Wolff's Astronomy (OpenStax). This online textbook will be accessed through the course OWL website for a small fee (expected to be $US 9.99). Paper copies of the textbook can be ordered through the openstax.org website for an additional fee but are not required.

Tutorials: There will be weekly tutorial sessions The University scheduling system should have ensured that you do not have a schedule conflict, but if you do find you have one, please contact your instructor as soon as possible. The first tutorial session is expected to be on [*]. Attendance at tutorials is mandatory. Teaching Assistants will also be present to help you complete the weekly tutorial worksheets

Gradescope: Written assignments in the course such as the tutorial worksheets will be submitted via the gradescope.ca website. Students will receive an email when their accounts are set up with login information. The gradescope.ca website cannot be accessed directly from the OWL course website, nor should students attempt to set up their own accounts before receiving an email from Gradescope.

Gradescope will accept scans or photos of handwritten assignment pages. These will be accessed by the TAs to grade, and marks and feedback will be returned to the student via Gradescope.

Lectures: There are weekly lectures held from [*].

Computer: Students are required to have either a Mac or Windows computer. Much of the hands-on component of this class requires computer processing and analysis.

Zoom: At this time lectures and tutorials are expected to be in-person. However, if a change to online learning becomes necessary, participation in online activities will require a webcam/microphone and a stable internet connection. If you anticipate any problems along these lines please contact your professor. A link will be provided to any zoom events, which should be clicked on and the zoom app downloaded at the appropriate time. Students do not need to create a separate Zoom account.

Professionalism and netiquette: It is expected that students will display the same standard of behaviour in all online interactions as they would in the regular classroom. Video interactions will done in respectful language, in a quiet environment, without the presence of non-class members in the background, in appropriate clothing, etc. Failure to abide with these requirements may result in the barring of the student from such interactions and the loss of any associated marks. For a refresher on netiquette see https://www.rasmussen.edu/student-experience/college-life/netiquette-guidelines-every-online-student-needs-to-know/

Methods of Evaluation:

Grading:
Tutorial worksheets [weekly]: 20%
Midterm: 20%
Research project: 20%
Final exam: 40%

Midterm: The midterm is expected to take place during the usual class time on [*]. Details about the midterm and any changes to the time/place (if needed) will be announced in class.

Research project: This course is directed towards teaching you how to use a modern telescope and analyze the results. Your research project will involve planning the observing strategy for a target assigned to you by the professor, programming the required actions into the telescope controls, monitoring the collection of the data as it is being taken, retrieving the final images from the observatory server, analyzing the results, and presenting them. The format of the Research Project presentation will be announced in class, but is expected to include a written project and a poster presentation, with 50% of project marks for each.

Please note: The Department of Physics and Astronomy may, in exceptional cases, adjust the final course marks in order to conform to Departmental policy.

Student Absences:

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Assessments worth less than 10% of the overall course grade:
No late penalties will be applied during the first 48 hours after an assessment due date. In the case of extended illness or other extended serious circumstance, a student's final grade may be computed based on the best *n-1* of these assessments, where *n* is the total number of that assessment. If you feel this case applies to you, please contact your instructor with details.

Assessments worth 10% or more of the overall course grade:

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

The Student Medical Certificate is available at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

The only course components worth 10% or more (except the final) are the Midterm and the Research Project. If you miss the Midterm with a valid medical or other excuse, the marks will be transferred to the Final exam: there will not be a make-up Midterm. If you miss the Poster Presentation due to a serious medical or other issue, the marks from the poster will be transferred to the Written Report. If you miss the deadline for the Written Report due to a serious medical or other issue, the deadline for the report will be extended at the instructor's discretion.

Note that missing a deadline for any of the Research Project components *without* valid medical or supporting documentation will result in a loss of 10% of the total marks for that component per 24 hour period or portion thereof that it is late.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

Accommodation and Accessibility:

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf.

Academic Policies:

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Tests and examinations in this course could, in the effect of a medical lockdown, be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

https://remoteproctoring.uwo.ca.

Support Services:

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Students who are in emotional/mental distress should refer to Mental Health@Western (https://uwo.ca/health/) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (https://learning.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/.

Additional student-run support services are offered by the USC, https://westernusc.ca/services/.

This course is supported by the Science Student Donation Fund. If you are a BSc or BMSc student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of equipment integral to teaching this course. You may opt out of the Fee by the end of September of each academic year by completing the online form linked from the Faculty of Science's Academic Counselling site. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the Chair of the Department or email the Science Students' Council at ssc@uwo.ca.

This course outline is subject to change. Last updated Thursday, August 24, 2023.