

## Astronomy 2801 – Observing the Stars - Fall 2020

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 1028A/B or 1301A/B or 1401A/B or 1501A/B) and (Physics 1029A/B or 1302A/B or 1402A/B or 1502A/B); Calculus 1000A/B or 1100A/B or 1500A/B, and Calculus 1501A/B (or Calculus 1301A/B with a minimum mark of 85%).

#### **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:**

Paul Wiegert

Professor

Room 238, Physics and Astronomy Building (PAB)

You can reach me via e-mail at [pwiegert@uwo.ca](mailto: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 will be held virtually via zoom. You are welcome to drop by at the posted times. The zoom meeting will have a waiting room so you will not immediately connect to me if someone is already in the zoom meeting with me, but you

will be admitted as soon as possible. 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 will take place primarily online through Western's OWL Learning Management System, and primarily 'asynchronously' which means that students can interact with the materials on their own schedule and do not all have to log in at the same time.

Students should check OWL (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance, 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.

There are no fixed lecture times. The 'synchronous' activities will be the tutorials where all students will log in at the same time, every week, via zoom. In tutorials, after some introductory material from the instructor or TAs, students will then break up into small groups in zoom 'breakout rooms' to work on the tutorial worksheets together in real-time.

**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 be 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/>

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.

**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](https://openstax.org) website for an additional fee but are not required.

**Perusall:** The required readings for this course will be from the OpenStax textbook Astronomy which can be accessed via the 'Perusall' button on the left hand side of the course OWL site. A portion of the class marks will be assigned for performing the readings, for posing and answering questions, engaging with other students and making well-thought out comments on the Perusall website on a weekly basis.

Note that Perusall comments must be made by the weekly assignment deadline. Comments made after this date will receive no credit.

**VoiceThread:** In addition to the reading materials, short mini-lectures will be provided to illustrate key concepts. A portion of the class marks will be assigned for engaging with other students and making well-thought out comments via VoiceThread on a weekly basis. . Note that VoiceThread comments must be made by the weekly assignment deadline. Comments made after this date will receive no credit.

**Tutorials (Zoom):** There will be weekly tutorial sessions held synchronously, that is, students, teaching assistants and instructor will all log in at the same time, via Zoom. Students do not need to create a Zoom account. A link will be provided to the Zoom event, which should be clicked on and the zoom app downloaded at the appropriate time. 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 Thursday Sep 17 2020 from 1:30 – 3:30pm (no tutorial will be held the first partial week of class). Attendance at tutorials is mandatory. During the tutorials, you will work together in small groups, randomly assigned each week. Teaching Assistants will also be present to help you complete the weekly tutorial worksheets. If you have any difficulty logging in or lose the connection, please contact your instructor.

**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 no formal lectures. Course content can be accessed from the course OWL website, where a week-by-week break-down of the course materials and requirements will be provided.

**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. Participation in the synchronous tutorials requires a webcam/microphone and a stable internet connection. If you have any concerns about this requirement, please contact your professor as soon as possible.

**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 VoiceThread presentation and a written project with 50% of project marks for each, and which are expected to be due on the last day of classes.

**Grading:**

Required Textbook Readings (Perusall): 25%

VoiceThread Comments: 25%

Tutorial worksheets: 20%

Research project: 30%

Note: in order to pass this course, you must obtain (1) a grade of at least 50% over all course components AND (2) a grade of at least 50% on the Research Project. If you fail to obtain a grade of 50% on either one, this failing grade will be adopted as your final course grade.

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

### **Accommodation Policies**

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at: [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf)

### **Academic Consideration for Student Absence**

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Consideration\\_for\\_absences.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf)

and for the Student Medical Certificate (SMC), see:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

## **Religious Accommodation**

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

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

## **Academic Policies:**

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

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, 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 his/her official university address is attended to in a timely manner.

## **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, all remaining 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 will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

**Recordings:** Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

**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](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

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

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 Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

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/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.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.

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

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

This course outline is subject to change. Last updated Tuesday, September 1, 2020.