

Astronomy 1021 – Secs 01/02
General Astronomy
Course Outline: 2023-2024

*Note: This Course Outline is a living document that is sometimes updated with minor changes. Such updates will be announced in class, and the latest version will be posted on OWL. The version number can be found at the bottom of each page. **It is your responsibility to ensure that you have the most recent version of this document.** The information on this handout is specific to this Section. All registered students are expected to have read this course outline carefully.*

1. Course Information

Course title: Astronomy 1021: General Astronomy

Description: A general survey of astronomy, including: the solar system and its constituents; stars, their basic properties and evolution; systems of stars including clusters, the milky way and other galaxies; the universe, its past, present and future structure; astronomical instruments; topics of current interest including pulsars, quasars, black holes.
 3 lecture hours, 1.0 course

Prerequisites: None

Antirequisites: Astronomy 1011A/B

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) 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.

2. Instructor Information

Instructor	Email	Office	Phone	Office Hours
Dr. Sarah Gallagher (Sec 01, Fall)	sgalla4@uwo.ca		(519) 661-2111 x86707	Posted on OWL
Dr. Martin Zinke-Allmang (Sec 02, Fall)	mzinke@uwo.ca			
Dr. Jan Cami (Secs 1 & 2; Winter)	jcami@uwo.ca		(519) 661-2111 x80978	TBD

Before contacting the instructor, make sure you have carefully read this document. Questions that are addressed in this document will not be answered over e-mail.

E-mail: OWL has an e-mail feature (“Messages”) that you should use to contact the instructors and/or TAs in this course. Allow (and expect) 2-3 business days for a reply. Note that OWL messages will not automatically be forwarded to your Western mail account; therefore you should check your OWL message status for replies. Please do not use the instructor’s personal e-mail for course-related issues.

Office Hours: If the time posted in the Table does not work, you can make an appointment for another day/time. If you prefer an appointment with a TA, contact them through OWL.

3. Course Syllabus, Schedule & Delivery mode

Astronomy 1021 provides a general, non-mathematical introduction to Astronomy. A preliminary list of lecture topics can be found at the end of this document. Specific learning outcomes are listed in a separate document. At the end of this course, students should be able to:

- Know by name, define and characterize the main structural elements of the Universe at all scales.
- Describe the origin and evolution of the Universe and objects within that Universe.
- Have a good sense of relative sizes, distances and characteristic time scales associated with these objects.
- Demonstrate a conceptual understanding of those physical processes that determine the appearance and evolution of astronomical objects and those that are relevant for interpreting astronomical observations.
- Explain the scientific method, and use examples from astronomy in their appropriate cultural context.
- Assess the uniqueness of Earth and life on Earth by comparison with other planets and properties of known planetary systems.

A preliminary list of topics with tentative dates is available at the end of this document.

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will not change. Any assessments affected will be conducted online as determined by the course instructor.

4. Course Materials

Textbook package: From the Western Bookstore:

https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2023&courses%5B0%5D=001_UW/AST1021

“Modified Mastering Astronomy with Pearson e-Text – Standalone Access Card -- for The **Essential Cosmic Perspective**”, by Bennet, Donahue, Schneider & Voit (Pearson) ISBN 9780135208106.

This package contains an **access code** for the online Mastering Astronomy platform that you will need for homework assignments. The e-book version of the textbook comes with the digital resource. You can use an older edition of the textbook if you prefer, as long as you understand that it is your responsibility to figure out which parts may be outdated.

Note that you cannot re-use old Mastering Astronomy access codes.

In-class activities will use the iClicker Cloud audience response system for participation and active learning. You may use any Wi-Fi capable device (smartphone, tablet, laptop). More information about setting up the iClicker Cloud system can be found here: <https://wts.uwo.ca/iclicker/>. Note that for some of the in-class activities, access to a laptop may be required.

Additional course materials may be posted to OWL: <http://owl.uwo.ca/>. Students are responsible for checking the course OWL site on a regular basis for news and updates as well as grades for course components. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL site, 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.

5. Methods of Evaluation

Your final grade in this course is obtained from marks for various course components (explained below) and calculated according to the following scheme:

Course Component	Weight
Tests & Exams	75%
Term Test I	20%
Term Test II	20%
Final Exam	35%
Participation in Class	10%
Mastering Astronomy HW Assignments	15%

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

Requirements: To pass this course, you need to

1. obtain a final mark of at least 50% ***and***
2. obtain a passing mark on the exam component -- i.e. you need to score at least 37.5 out of 75 on the combined exams (two term tests and the final exam).

If you do not meet the second requirement, your final mark for this course will be lowered to a failing grade (e.g., 45% or the computed final mark, whichever is lower), irrespective of your score on other components.

Thus, a student who fails both Term Tests and the final exam automatically fails the course, even if the final mark (including other course components) is higher than 50%. Note though that failing a single exam or even two does not automatically mean a student fails the course. For instance, a student that obtains 40% on Term Test 1, 45% on Term Test 2 and 60% on the final exam has earned 38 of the 75 points represented by the tests and exams, and will thus pass the course despite failing two exams, provided that he or she obtains at least 12 out of the remaining 25 points from the other course components (and thus has a final mark of at least 50%).

Grades for various components will be posted on OWL regularly; it is your responsibility to check these grades regularly. Any errors, or appeals to your scores, **must be reported to your instructor within two weeks** of their initial posting.

6. Tests and Exams

- There will be two two-hour long Term Tests during the year and one Final Exam. There is **no December exam** in this course.
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- The final exam is to be scheduled by the Registrar's Office during the 2024 final examination period (April 11-30); exam times will be posted on the course website when available.
- Students needing to make travel arrangements are advised to book a travel date after the end of the examination period, and avoiding the term test dates. ***No makeup exams will be given to accommodate travel!***
- The tests and exams are meant to test your ***knowledge and understanding*** of the material covered in class, all of the class slides and activities, the corresponding textbook sections and distributed course notes whenever appropriate.
- Term Test I covers all the course material up to the date of the test; Term Test II covers all material since Term Test I. **The final exam is cumulative.**

7. Mastering Astronomy Homework Assignments

On average every two weeks, a homework assignment will be due on Mastering Astronomy. These assignments can be completed at any computer connected to the Internet, including at home. Before you can do the assignments, you must first register on Mastering Astronomy, and then enroll in the course on that platform. Instructions are on OWL. The course ID is **gallagher71088**.

Most of the homework assignments will be in the form of tutorials and are meant to help you process and understand the course material. Due dates will be listed on the Mastering Astronomy platform and are also listed in the detailed course overview at the end of this document. Those dates are “best before” dates, i.e., they will help you most in your learning if you do them before that date. Late assignments are accepted, as long as they are completed before the last day of classes in the semester in which they are due. For example, all assignments with due dates in the Fall must be submitted before Dec. 8, 2023. There will be 12 assignments total, and each assignment will be worth 1.5% of your course grade. Only the best 10 out of 12 assignments will be used toward your final grade. This also means that you can forego two MA assignments without penalty; consequently, there will be no make-up MA assignments.

8. In-class Participation

Every week, there will be hands-on in-class activities about the course material, and the instructor will also ask questions to test your understanding throughout the lectures, using the iClicker Cloud platform. You need to answer at least 75% of the questions each week to earn your participation grade. Each week is worth 0.5%, and only the best 20 scores over the full year will be used for your grade calculations. **There will be no make-up for in-class participation marks.**

9. Student Absences

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

- **Missing a lecture with Participation Activities:** since only the best 20 out of 23 lectures will be used, you can miss up to 3 classes without any impact on your final marks. No other make-up opportunity will be offered for a missed lecture.
- **Missing the deadline for a Mastering Astronomy assignment:** you get an automatic extension to the end of the semester. Note also that the best 10 out of 12 assignments will be used for your final mark, so no other make-up opportunity will be offered for a missed assignment.
- **Missed Term Test:** 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/academic_consideration.pdf.

The Student Medical Certificate is available at

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

Students that have provided valid documentation will be allowed to write a make-up Term Test. Note that make-up tests can be of a different exam format than the regular tests. For excused, long absences that also include the date of the make-up Term Test, the weight of the Term Test will be transferred to the Final Exam.

- **Absence from Final Examination:** 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).

10. 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.

11. 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.

All Tests and Exams in this course are closed book, and no electronic devices (laptops, calculators, smartphones, smart watches, ...) will be allowed during such tests.

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.

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

The use of the iClicker Cloud platform will gather some personal information that is required for identification and for completing class activities. Marks will be based on participation only, but require that the instructor can correctly identify the clicker user. If a student does not setup or use their iClicker Cloud properly, they will not receive participation marks. The course instructors may share the collected information with TAs for evaluation purposes. A student who uses iClicker Cloud with a different username than their own is committing a scholastic offence.

12. 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.

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

13. Classroom Conduct

The instructor will ask for ~5 volunteers the first week of class to become Student Liaisons who will meet with the instructor twice per term to provide feedback on the class. Snacks will be provided!

The lectures in this course are intended to provide students with an opportunity to learn, and we expect you to respect the rights of your classmates to benefit from the lectures by limiting your conversations to those essential to the class. Please arrive on time, switch off your cell phone notifications, and do not leave during the lectures, except during the breaks. Laptops should only be used for taking notes or in-class activities, and not for any other application. Disruptive behavior in class or on OWL will not be tolerated. Students who persist in loud, rude or otherwise disruptive or inappropriate behavior will be asked to leave.

For further information on the Code of Student Conduct, please see:
<http://www.uwo.ca/univsec/pdf/board/code.pdf>

14. Your Grade

You earn your grade for completing course requirements, and for having gained a good knowledge and understanding of the course material. To maximize this grade, you should:

- 1) read the assigned textbook reading before each class;
- 2) attend class regularly, participate actively and ask questions!;
- 3) review past lectures regularly;
- 4) do all of the Mastering Astronomy assignments on time;
- 5) answer all of the summary questions in your textbook;
- 6) seek regular help for material that you do not understand.

On average, this should take up about 6—9 hours per week for this course. Check the Frequently Asked Questions (FAQs) on the course website and follow discussions on the forum. In addition, it pays off to learn how to best approach writing multiple choice exams. Helpful tips are provided on the website of the Student Development Centre <http://www.sdc.uwo.ca/learning/index.html?mcwrit>.

If you find that you are falling behind or are having difficulties with the course material, please contact your instructor or a TA immediately. A lot can be done in November, much less can be done in March.

Marks will be posted to OWL regularly. Any appeals must be made in writing to the instructor within two weeks of marks being posted to OWL.

15. Lecture Topics – Course Content (2023-2024)

Below is a provisional list of lecture topics and course content; actual lectures might differ.

Fall term (2023)

Week	Date	Topic	Read	Events	Activities (<i>in-class</i>)
1		Intro to Astro1021 A Modern View of the Universe	Ch 1	MA #0	<i>Test for misconceptions</i> Register for Mastering Astronomy (MA)
2		Discovering the Universe for Yourself	Ch 2		<i>Moon activity</i> Download and install Stellarium
3		Discovering the Universe for Yourself	Ch 2	MA #1 (Ch 1-2)	<i>Reasons for the seasons/horoscope</i>
4		The Science of Astronomy	Ch 3		<i>Skit: scientific method</i>
5		Making Sense of the Universe	Ch 4	MA #2 (Ch 3-4)	
6		Light: The Cosmic Messenger	Ch 5		<i>Guest lecturer: Prof. Cami</i>
7		Light: The Cosmic Messenger Formation of the Solar System	Ch 5 Ch 6	MA #3 (Ch 5)	
Oct 30 – Nov 3: Reading Week – no classes					
8		Formation of the Solar System	Ch 6	MA # 4 (Ch 6)	
9		Term Test I (20%)			
10		Earth and the Terrestrial planets	Ch 7	MA #5 (Ch 6-7)	
11		Jovian Planet Systems	Ch 8		Nov 30: Drop date
12		Asteroids, Comets and Dwarf Planets	Ch 9	MA #6 (Ch 8-9)	
Break: No December Exam					

Winter term (2024)

Week	Date	Topic	Read	Events	Activities (<i>in-class</i>)
13		Other Planetary Systems	Ch 10		
14		Our Star	Ch 11	MA #7 (Ch 10-11)	
15		Surveying the Stars	Ch 12		
16		Star Stuff	Ch 13	MA #8 (Ch 12-13)	
17		The Bizarre Stellar Graveyard	Ch 14	MA #9 (Ch 14)	
18		Term Test II (20%)			
Feb 17 – 25: Reading Week – no classes					
19		Our Galaxy	Ch 15	MA #10 (Ch 15)	
20		A Universe of Galaxies	Ch 16		
21		A Universe or Galaxies	Ch 16	MA # 11 (Ch 16)	
22		The Birth of the Universe	Ch 17		
23		Dark Matter, Dark Energy, and the Fate of the Universe	Ch 18	MA #12 (Ch 17-18)	
24		Life in the Universe	Ch 19		
Final Exam (35%) - cumulative					