

We recognize and acknowledge that McMaster University meets and learns on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the "[Dish With One Spoon](#)" wampum, an agreement amongst all allied Nations to peaceably share and care for the resources around the Great Lakes.

Astronomy 2B03: The Big Questions

Winter 2024 Term (v2; 20 Nov 2023)

Instructor: Dr. Robert Cockcroft		E-mail: cockcroft@mcmaster.ca
Instructional Assistant: Dr. Maryam Tabeshian		Email: tabeshim@mcmaster.ca
Head TA: Kate Hartman		Email: hartmk2@mcmaster.ca

Office Hours: scheduled before midterms and final and posted on Avenue

Course Description

Astronomy 2B03 tackles the ultimate questions in modern science, with an emphasis on questions in the physical sciences: space-time, the Big Bang, black holes, formation of elements, structure in the cosmos (stars, planets, galaxies). Topics are presented in a concept-based style.

Prerequisite(s): Open to any student in level II or above, regardless of program or home faculty.

Course and Learning Objectives

Learning Objectives

By the end of this course, students should have an understanding of answers to big questions, like: Where did everything come from? What makes up the Universe? Did it have a beginning, and will it have an end? How would you look for life in the Universe?

We present the topics in a concept-oriented, non-mathematical style. As well as a regular slate of specially designed lectures, we will also make extensive use of small tutorial periods to give everyone plenty of time for discussion and reflection on big questions in science and questions related to diversity and inclusion in science. The goal of this elective course is to build an appreciation for big questions as well as the process of how science works.



Course Expectations

The course is organized as follows:

- 3 lectures a week (note: there are no classes on Friday 29th March or Monday 8th April – ECLIPSE DAY!)
- 1 tutorial session per week (with participation marks and reflection marks): ~30 students and your TA
- 2 midterm tests
- In-lecture quiz questions
- 1 final exam

Materials & Fees

Required Materials/ Resources

- None

Virtual Course Delivery

Classes and tutorials will be in person, but in the event of the need to pivot to virtual classes: to follow and participate in virtual classes it is expected that you have reliable access to the following:

- A computer that meets performance requirements [found here](#).
- An internet connection that is fast enough to stream video.
- Computer accessories that enable class participation, such as a microphone, speakers and webcam when needed.

If you think that you will not be able to meet these requirements, please contact uts@mcmaster.ca as soon as you can. Please visit the [Technology Resources for Students page](#) for detailed requirements. If you use assistive technology or believe that our platforms might be a barrier to participating, please contact [Student Accessibility Services](#), sas@mcmaster.ca, for support.



Assessment

Your final mark will be taken as the best of the two marking schemes:

Marking scheme option 1:

Assessment	Due Date	Weight
Midterm #1	7th February	20%
Midterm #2	13th March	20%
Participation + Reflections	Throughout the term	25%
Lecture Quizzes	Throughout the term	5%
Final Exam	April	30%
		100%

Marking scheme option 2:

Assessment	Due Date	Weight
Midterm #1	7th February	20%
Midterm #2	13th March	20%
Participation + Reflections	Throughout the term	25%
Lecture Quizzes	Throughout the term	0%
Final Exam	April	35%
		100%

Requests for Relief for Missed Academic Term Work

[McMaster Student Absence Form \(MSAF\)](#): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

Policy Regarding Missed Work

Requests for missed academic work worth less than 25% of the final grade resulting from personal or medical situations, lasting up to 3 calendar days, can be reported, once per term, without documentation, using the McMaster Student Absence Form (MSAF). Relief for missed work for a longer duration or for other reasons must be reported to your Faculty office, and relief from term work may not necessarily be granted. When using the MSAF, report your absence to the course instructor or designate. You must then contact the Instructor/Instructional Assistant/other immediately (normally within 2 working days) by e-mail.

Please refer to the contact list on the first page of this outline for appropriate e-mail addresses. The Instructor/Instructional assistant will indicate what relief may be granted for the work you have missed, and relevant details such as revised deadlines, or time and location of a make-up exam/quiz/test. Please note that the MSAF may not be used for final deliverables, nor can it be used for a final examination or its equivalent. Please [review and follow the Academic Regulation in the Undergraduate Calendar under "Requests for Relief for Missed Academic Term Work" here.](#)

Specific MSAF details for this course:

- If you file an MSAF for a midterm the marks will be moved to the other midterm and the final exam (there are no re-writes).
- **No MSAFs for tutorial participation** (we have designed the course so that they are not needed- there are 11 weeks of tutorials, and we will count the top 9).
- **No MSAFs for in-class quizzes questions.**

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact [Student Accessibility Services \(SAS\)](#) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's [Academic Accommodation of Students with Disabilities](#) policy.

Academic Accommodation for Religious, Indigenous Or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](#) policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Courses with an On-Line Element

In this course we may be using Avenue to Learn, TopHat, Echo360, Turnitin.com, Diet and Wellness Plus (Nelson). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

Online Proctoring

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins. If you have questions or concerns about the use of the proctoring software, please contact the Instructor.

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

It is your responsibility to understand what constitutes academic dishonesty.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy, located here.](#)

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism Detection

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster’s use of Turnitin.com [please go to the office of Academic Integrity website.](#)

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all our living, learning and working communities. These expectations are described in the [Code of Student Rights & Responsibilities \(the “Code”\).](#) All students

share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Senate Student Policies

[Students can view full policies here on the University Secretariat website.](#) Senate Policy Statements are also available from the Senate Secretariat Office, Room 104, and Gilmour Hall.

Student Code of Conduct

You acknowledge that your behavior in all aspects of this course should meet the standards of the McMaster University Student Code of Conduct. You understand that any inappropriate behavior directed against any of your colleagues, teaching assistants, or the instructional team will not be tolerated. Disruptive behavior during any session (e.g. lecture, seminar, lab, tutorial) such as talking, sleeping or non-class computing while an individual presents information, or constantly being late, will also not be tolerated. Abuse, ridicule, slander, inappropriate language, and discrimination towards instructors teaching staff, teaching assistants and other students will not be tolerated in any capacity. Shared spaces including e-spaces such as the Avenue to Learn course discussion board are to be considered inclusive and safe. [For more information, please follow this link.](#)

Inclusivity and Academic Integrity

The University values integrity, inclusiveness and teamwork, and strives to support the personal and collective growth of the McMaster student community. These values are foundational to ensuring campus environments – both in-person and virtual – are conducive to personal wellbeing and academic success.

Inclusive Learning

McMaster University aims to foster a supportive and inclusive learning environment that encourages both individual and collective growth. Students are invited to speak with the Instructor immediately if they encounter any challenges related to accessing or using the technological requirements expected for successful participation in this course.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course.

Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Additional Copyright Information

In this course students will have access to material that is subject to copyright laws. This includes (but is not limited to) textbooks and all resources developed by the Instructor such as lab manuals, demonstration videos, quizzes, assignments, tests, class notes and class slides.

Students are not allowed to share or redistribute this material in any printed or electronic form without the explicit written consent of the copyright holder. This includes posting any course material on Internet bulletin boards, course repositories, social networks, etc.

Research Ethics

NA



Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.