

Faculty of Science



Division of Natural Science

<http://natsci.info.yorku.ca/>

Course Outline

NATS1745 M, History of Astronomy

Winter, 2018

M R, 14:30 -17:30, YK SLH F

Course Instructor(s) and Contact Information

Alireza Rafiee
Room 318, Chemistry Building

Course Email: arafiee@yorku.ca
Course website: <https://moodle.yorku.ca>
Office hours: TBD (or by appointment)

Email Policies and Etiquette

- When composing email to the course email, you MUST include the phrase "NATS1745M" in the subject line of the email. Email without this phrase will be filtered as spam and may never reach the course mailbox.
- Your full information; name, last name and student ID,
- MUST be included in the body of the email. I keep the right to avoid emails without full information composed from a random and unidentified email address.
- Emails will be responded to within the next 48 hours. If you did not receive any response after 48 hours, please check the first two criteria namely, the subject line "NATS1745M" and full name and ID in the body of the email. If you missed any of the two, then follow the email policies and etiquette and send it again.

NOTE: Before sending an email to the course mailbox, please take a moment to refer to the Course Outline, as the Course Outline contains the answers to most questions that students have. By checking the Course Outline first, you're likely to get a faster answer!

Expanded Course Description

This course follows the chronological evolution of discoveries and theories about Astronomy from pre-historic times up to the present. We will begin this course by defining what science is and how science processes knowledge. Then we create a fact sheet based on the most recent and reliable theories in Astronomy to have a solid base to compare with. We are now ready to study the pre-historic theories in Astronomy and evaluate them with respect to the true picture of the Universe. We begin by looking at sites like Stonehenge, where we find evidence that the motions of the Sun and stars were understood in prehistoric times. We then look at the astronomical knowledge amassed by ancient civilizations such as the Mayans, Babylonians and Egyptians, followed by the Greek explanations for the cosmos and the beginnings of Astronomy as a science. The first half of the course concludes with the early history of

modern astronomy and covers figures like Copernicus, Brahe, Kepler, Galileo and Newton. The 2nd half of the course covers discoveries about our solar system, the stars, galaxies and the universe from the 19th century up to the present day. This includes the history of cosmology, recent discoveries about the birth and evolution of the universe, discoveries of new planets beyond our solar system, and theories about black holes, dark matter and dark energy and eventually the possibility of multiverse or parallel universes and the plausible faith of our Universe.

Course Learning Outcomes

Upon successful completion of this course students should be able to:

- Describe and appreciate a broad range of scientific achievements in prehistoric, ancient, medieval, renaissance, and contemporary Astronomy
- Explain and predict the various cycles of the sky
- Understand a variety of simple methods for making astronomical measurements
- Appreciate the most recent scientific theories/hypotheses about the birth of the universe

Evaluation

Final grades are calculating according to the weighting scheme below.

Weighting scheme:

- 20% - Homework assignments. (best 4 out of 5, 5% each)
- 16% - Term Projects. (2 projects, 8% each)
- 6% - in-class activities/pop quizzes (best 6 out of 8, 1% each)
- 25% - Midterm Exam. (up to 100 multiple choice questions)
- 33% - Final Exam. (up to 100 multiple choice questions)

Course Materials

REQUIRED TEXTBOOK: Text book is called "*Cosmos: An Illustrated History of Astronomy and Cosmology*" by *John North*. This book presents, an enjoyable and non-scientific way, the history behind the most important and relevant discoveries in Astronomy. The textbook material is supplemented by the lectures, which present the scientific details of each discovery. It is recommended that students read each chapter before the relevant lectures for that chapter. Students are expected to read the entire book. This book is available for purchase in York bookstore.

OTHER REQUIREMENTS

Star Chart SC001 Equatorial Region

- (Charts can be downloaded for free from <http://www.midnightkite.com/>)

Optional Readings (not required):

Online free books on history of Astronomy:

- 1- A History of Astronomy by Walter William Bryant
 - a. <https://archive.org/stream/ahistoryastrono00bryagoog#page/n12/mode/2up>

- 2- The History of Astronomy by Giorgio Abetti:
 - a. <https://archive.org/details/TheHistoryOfAstronomy>
- 3- History of Astronomy by Michael Perryman:
 - a. <http://arxiv.org/pdf/1209.3563v1.pdf>
- 4- Great Astronomers by Robert S. Ball:
 - a. <http://www.e-booksdirectory.com/details.php?ebook=8587>
- 5- Short History of Astronomy by Arthur Berry:
 - a. <https://ia600302.us.archive.org/9/items/shorthistoryofas025511mbp/shorthistoryofas025511mbp.pdf>

Make your own Astrolabe:

http://cse.ssl.berkeley.edu/AtHomeAstronomy/activity_07.html

or <http://www.astrolabes.org/index.htm>

Laboratory/Tutorial

This course does not have a laboratory or tutorial component.

Course Content and Format

This course is a lecture course. All course materials are provided on the course Moodle site. You should buy the textbook from York bookstore.

The Moodle site is divided into several sections covering a series of lessons on different epochs. The videos and additional materials added for you to improve your understanding.

Math Content

The math in this course does not exceed a grade 10 level. Mathematical concepts are restricted to simple arithmetic, numerical comparisons, understanding graphs and basic statistical concepts. All math is done in the Astronomy Exercises only, for which students can obtain help from each other, the Course Instructor, or a tutor from NATS-Aid or MATH-Aid (refer to the Natural Science Resources section below). There is no math on the exams.

Course Policies

- **MISSED DEADLINES:** Late homework assignments or projects are penalized 10% per day, including weekends. If a deadline is missed due to medical circumstances, the late penalty will be waived if the Course Director is notified by email no later than 24 hours after the due date. An [APS](#) (see Missed Exams above) must be provided within 48 hours of the missed deadline. If the assignment or project is not submitted the day after the time period specified on the APS, the late penalty will commence. Note that one homework assignment can be missed without penalty.
- **Exam conflicts:** If you know in advance that you have a conflict with an exam date, the Course Director must be notified at least 3 weeks before the exam so that an alternate exam date can be schedule. For exam conflicts with other courses or for religious accommodations, go to <https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/curexam> and click on the relevant link on the left side of the page.

- **Missed midterm exam:** The Course Director must be notified by email no later than 24 hours after the missed exam. To make up the exam, a statement from a health provider must be provided within 48 hours of the missed exam. The only acceptable medical documentation is the University's Attending Physician's Statement (APS), which can be downloaded from www.registrar.yorku.ca/pdf/attend_physician_statement.pdf.

No other form of doctor's note will be accepted. A make-up exam will be scheduled immediately following the time period specified on the APS.

- **Missed final exam:** The same regulations apply as for a missed midterm exam, with the exception that if a student misses the original dates for both the midterm and final exam, or if a student misses the final exam as well as the make-up exam, the student must petition their home faculty for an exam deferral. Information & deadlines for this petition can be found at www.registrar.yorku.ca/exams/deferred/
- **DISABILITY SERVICES:** Students with physical, learning or psychiatric disabilities that may interfere with the successful completion of the course requirements are encouraged to discuss their concerns with a councillor at the Office for Persons with Disabilities (www.yorku.ca/cds/). Any special accommodations that are required by the student should be brought to the attention of the Course Director as soon as possible so that appropriate arrangements can be made.

Note: Petitions for an exam deferral may not be successful, in which case the student will receive a zero for the exam.

Copyright and Intellectual Property

Most of the images and graphs presented in the lecture notes, assignments, and projects are protected by copyright law. Educators are allowed to share short extract of copyright material for educational purposes. However, it is illegal for students to share or distribute copyright materials. Students who violate copyright law are at risk of being sued by the owners of the material. Some examples of illegal distribution include:

- Sharing photographs of slide presentations, either online or in the classroom.
- Copying lecture videos and posting them on a web site
- Posting photographs or screen captures of lecture videos on a web site
- Printing out photographs or screen captures of lecture videos and making the printouts available for distribution

The best way to ensure that you are not in violation of copyright law is to use the course material as it was intended –namely, watch the videos at their existing locations and do not download or copy them. If you come across an image or diagram that you'd like to share with someone outside of the class, you can contact the Course Instructor to obtain a link to the image at its original location.

University Policies

Important Sessional Dates

Includes sessional start and end dates, drop deadlines, and withdrawal dates.

See the Office of the Registrar website at <http://www.registrar.yorku.ca/enrol/dates/>

Academic Honesty and Integrity

Academic honesty requires that persons do not falsely claim credit for the ideas, writing or other intellectual property of others, either by presenting such works as their own or through impersonation. Similarly, academic honesty requires that persons do not cheat (attempt to gain an improper advantage in an academic evaluation), nor attempt or actually alter, suppress, falsify or fabricate any research data or results, official academic record, application or document. Finally, academic honesty requires that persons do not aid or abet others to commit an offence of academic dishonesty, including intentional acts to disrupt academic activities.

Suspected breaches of academic honesty will be investigated and charges shall be laid if reasonable and probable grounds exist.

Academic Honesty and electronic devices during assessments (e.g. exams)

- Internet capable and personal storage devices of all kinds must be turned off, including vibrate. These and any other unauthorized material must be placed under the student's chair and should not be accessed at any point during the exam. Failure to comply with directive may be considered a break of academic honesty.
- See <http://registrar.yorku.ca/exams/tipsheet>

Please familiarize yourself with the full Senate Policy on Academic Honesty, found at <http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>

Please also familiarize yourself with the SPARK Academic Honesty tutorial found at <https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>

Academic Accommodation for Students with Disabilities

York University shall make reasonable and appropriate accommodations and adaptations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs.

The nature and extent of accommodations shall be consistent with and supportive of the integrity of the curriculum and of the academic standards of programs or courses.

Please familiarize yourself with the full Senate Policy on Academic Accommodations for Students with Disabilities, found at <http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/>

Note: Students should submit accommodation letters from Counseling and Disability Services (CDS) to the course instructor within the first two weeks of the course or as soon as issued.

Counseling and Disability Services - <http://cds.info.yorku.ca/>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Note: A student registered with CDS, and choosing to write with Alternate Exams, is responsible for making the appropriate writing arrangements within the timeframes outlined by Alternate Exams.

Alternate Exams - <http://altexams.students.yorku.ca/>

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents.

<https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/15/wo/kmHGekTpzKLX6XYKBXYc8M/0.3.4.62.0>

Note: Students who will have an academic conflict as a result of a religious observance, at any point in the term, should make the instructor aware of such at least three weeks prior to the

conflict.

For conflicts occurring during an official examination period, please complete the Examination Accommodation Form available at http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf and submit to your instructor at least three weeks prior to the final exam.

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect and to refrain from actions disruptive to such a relationship. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. A statement of the policy and procedures regarding disruptive and/or harassing behaviour by students in academic situations is available on the website of the University Secretariat (<http://secretariat.info.yorku.ca/>).

Division of Natural Science Resources**NATS-AID**

Free peer tutoring for students enrolled in Natural Science Courses.

See <http://natsci.info.yorku.ca/nats-aid/>

M-AID in NATS (Math Aid)

Free math help for students enrolled in Natural Science Courses (TA tutors)

See <http://natsci.info.yorku.ca/m-aid-in-nats/>

Other Resources**Learning Commons**

The Learning Commons brings together key supports for your learning: writing, research, learning skills and career services. <http://www.library.yorku.ca/cms/learning-commons/>

goSAFE

goSAFE is a complimentary service provided to the York Community. At the Keele campus, goSAFE has two routes: North Route & South Route which will safely transport community members by vehicle from one specified hub to another on campus. goSAFE operates seven days a week, all year round, including University closures (with the exception at Glendon during the Christmas holiday closure).

Call the goSAFE office at 416-736-5454 or extension 55454 during hours of operation. Please give your name, location and destination. <http://www.yorku.ca/goSAFE/>

Mental Health and Wellness at York University

Outlines a variety of resources available to support mental health and wellness

<http://mhw.info.yorku.ca/resources/resources-at-york/students/>

Good2Talk

Post-Secondary Student 24 hour Helpline

<http://www.good2talk.ca/> 1-866-925-5454