

HSTC1201.03 / HSTC 2211.03 / SCIE2001.03 / HIST2075.03

Introduction to the History of Science I:
From the Ancients to the Birth of the Modern
Online section

History of Science and Technology, University of King's College – Fall 2021

Territorial Acknowledgement

The University of King's College sits on ancestral and unceded Mi'kmaw territory, subject to the Peace and Friendship Treaties that are the basis for peaceful co-existence and good relations among all who live in Mi'kma'ki.

Course description:

This course covers the historical foundations of what we now call modern science: its theoretical developments, conceptual puzzles and shifting social contexts. Open to first year students and above (whether pursuing a BA or BSc degree), it serves as the indispensable preparation for its modern counterpart, Introduction to the History of Science II

Course objectives:

Upon completing this course, students should be able to:

- explain the major developments in the study of nature from antiquity to the 18th century
- analyze the historical relationship between science and society
- describe the contributions of major figures in the history of science
- identify intellectual and social factors that cause scientific knowledge to change
- synthesize material from different topics to make arguments about particular subjects and about the history of science in general
- write a cogent essay about the development of science
- engage in analysis and debate about the history of science in a tutorial setting

Course structure:

For the most part, this course is designed to let you proceed through the week's materials at your own pace. The weekly tutorial is the only live hour of class each week. Course materials are divided into weekly modules that can be accessed through Brightspace. Each module will begin with a checklist of tasks to complete. These tasks will usually consist of a brief introductory video, assigned readings, and a short "focus" video on a specific aspect of the weekly topic. During some weeks, there will be other activities or assignments that are due, so please check the schedule or checklist each week. Generally, you can complete the tasks when you want, but assigned readings should be completed *prior to tutorial on Thursday*.

Location and time:

online; synchronous tutorial section via Collaborate: Thursday, 1535–1625 Atlantic Time

Instructor: Adam Richter, PhD – richtera@dal.ca

Virtual office hours: Wednesday, 1530–1630 – or by appointment

Prerequisites: None

Course texts:

During most weeks, you will be assigned the following readings:

- 1) A selection from Andrew Ede and Lesley B. Cormack, *A History of Science in Society: from Philosophy to Utility*, 3rd ed. (University of Toronto Press, 2017)
- 2) A scholarly article or book chapter posted on Brightspace
- 3) One or more primary sources posted on Brightspace

Variations from this format will be noted on the schedule below and in the weekly checklist. The Ede and Cormack book is available in the King’s library. Online versions are also available, including through the Dal and King’s library systems, but these versions limit the number of users at a given time. If you find a copy of the book elsewhere, please ensure that it is the **third edition**. Also note that some online versions (but not the one available through the library system) may have different pagination, so note the section headings listed in the schedule and checklist. **Please complete the readings prior to the scheduled tutorial on Thursday and be prepared to discuss them in class.**

Grade breakdown

- 3 written assignments – **due Oct. 2, Oct. 30, Nov. 27** – 20% each
- Take-home exam – **due Dec. 7** – 25%
- Tutorial participation – 15%

Weekly Schedule

Week 1: Introduction to the course – September 7–11 (short week)

Introductory tutorial: Thursday, September 9

Note: this tutorial will mainly be an information session for you to learn and ask questions about the course. Attendance is expected, but participation will not be assessed. All you need to do is come prepared with any questions you’d like to ask.

Readings and Focus video: none

Week 2: Astronomy in ancient civilizations – September 12–18

Readings

- 1) Ede and Cormack, Chapter 2: pp. 57–63 (section entitled “On the Heavens and Number around the Globe”)
- 2) Francesca Rochberg-Halton, “Babylonian Horoscopes and Their Sources”, *Orientalia* 58 (1989): 102–132
- 3) Rita Watson and Wayne Horowitz, “Chapter 1” and parts of “Appendix 1” in *Writing Science before the Greeks: A Naturalistic Analysis of the Babylonian Astronomical Treatise MUL.APIN*, pp. 1–14, 187–194

Focus video: Chinese astronomy

Tutorial: Thursday, September 16

Week 3: Greek (natural) philosophy – September 19–25

Readings

- 1) Ede and Cormack, Chapter 1: pp. 1–22 (stop at “Euclid and the Alexandrians”)
- 2) Daryn Lehoux, “Why Does Aristotle Think Bees are Divine? Proportion, Triplicity, and Order in the Natural World,” *British Journal for the History of Science* 52 (2019): 383–403
- 3) Aristotle, *Physics*, Book II

Focus video

The cosmological systems of Plato and Aristotle

Tutorial: Thursday, September 23

Week 4: Hellenistic and Roman science – September 26–October 2

Readings

- 1) Ede and Cormack, Chapter 1: pp. 22–28 (read to end of chapter), Chapter 2: pp. 29–41 (stop at “Early Christianity and Natural Philosophy”)
- 2) Serafina Cuomo, “Rewarding Science in Ancient Greece and Rome” and Liba Taub, “Celebrating Science in Ancient Greece and Rome,” *Nuncius* 32 (2019): 236–257
- 3) Ptolemy, selections from *Almagest*, Book I (pp. 35–45) and Book V (pp. 217–219)

Focus video

Ancient technology and engineering

Tutorial: none

Note: There will be no tutorial on September 30, the National Day for Truth and Reconciliation

Assignment:

Assignment 1 due on Saturday, October 2 at 11:59 p.m.

Week 5: Medieval science 1: the Byzantine and Islamic worlds – October 3–9

Readings

- 1) Ede and Cormack, Chapter 2: pp. 41–56 (stop at “On the Heavens and Number around the Globe”), 63–66 (read to end of chapter)
- 2) A. I. Sabra, “The Appropriation and Subsequent Naturalization of Greek Science in Medieval Islam: A Preliminary Statement,” *History of Science* 25 (1987): 223–243
- 3) Ibn al-Haytham, *Optics*, pp. 1–20 (Chapters 1, 2, and part of 3)
- 4) Watch TED talk by Tom Wujec on the astrolabe

Focus video

The “medieval gap” in the historiography of science

Tutorial: Thursday, October 7

Week 6: Medieval science 2: The Latin West – October 10–16

Readings

- 1) Ede and Cormack, Chapter 3: pp. 67–94 (entire chapter)
- 2) Seb Falk, selections from “Prologue” and “Chapter 1” in *The Light Ages: The Surprising Story of Medieval Science*, pp. 2–9, 15–42
- 3) Albertus Magnus, selections from “On the Material, Hardness, and Fissility of Stones,” pp. 93–97
- 4) Look through images of Leonardo da Vinci’s notebooks

Focus video

Art, science, and engineering in the Renaissance

Tutorial: Thursday, October 14

Week 7: The Copernican “Revolution” – October 17–23

Readings

- 1) Ede and Cormack, Chapter 4: pp. 95–106 (stop at “The Age of Exploration”), 112–128 (start at “Patronage & the Study of Nature”, end at “Education & the Study of Nature”)
- 2) F. Jamil Ragep, “Copernicus and His Islamic Predecessors,” *History of Science* 45 (2007): 65–81.
- 3) Georg Rheticus, *Narratio Prima*, 142–151

Focus video

Who was Galileo?

Tutorial: Thursday, October 21

Week 8: Mechanical and experimental philosophies – October 24–30

Readings

- 1) Ede and Cormack, Chapter 5: pp. 133–139 (stop at “New Models of the Universe”), 146–155 (start at “Mechanical Philosophy”, end at “Newton and the Experimental Method”), 158–162 (section entitled “New Scientific Organizations”)
- 2) Steven Shapin, “Who Was Robert Hooke?” in *Robert Hooke: New Studies*, eds. Michael Hunter and Simon Schaffer (Woodbridge: Boydell Press, 1989), 253–285
- 3) Francis Bacon, selections from *The New Atlantis*, 157–162
- 4) Margaret Lucas Cavendish, selections from *Grounds of Natural Philosophy*, 172–175
- 5) Look through the images from Hooke’s *Micrographia* at the link provided

Focus video

John Wallis vs. Thomas Hobbes: experiments, algebra, and religion

Tutorial: Thursday, October 28

Assignment 2 due on Saturday, October 30 at 11:59 p.m.

Week 9: Early modern anatomy and medicine – October 31–November 6

Readings

- 1) Ede and Cormack, Chapter 4: pp. 110–112 (section entitled “Paracelsus, Medicine, and Alchemy”), 129–131 (section entitled “Andreas Vesalius”)
- 2) Laura J. McGough, “Demons, Nature, or God? Witchcraft Accusations and the French Disease in Early Modern Venice,” *Bulletin of the History of Medicine* 80 (2006): 219–246
- 3) Andreas Vesalius, selection from *De humani corporis fabrica*, 40–49
- 4) Look through the images from the original *Fabrica* at the link provided

Focus video

Paracelsus, alchemy, and chemistry

Tutorial: Thursday, November 4

FALL STUDY BREAK – NOVEMBER 7–13 – NO CLASS ACTIVITIES

Week 10: Newton and Newtonianism – November 14–20

Readings

- 1) Ede and Cormack, Chapter 5: pp. 139–146 (sections entitled “Isaac Newton: The Great Polymath” and “Newton and Alchemy”), 155–157 (section entitled, “Newton and the Experimental Method”)
- 2) Paul Greenham, “Clarifying Divine Discourse in Early Modern Science: Divinity, Physico-Theology, and Divine Metaphysics in Isaac Newton’s Chymistry,” *The Seventeenth Century* 32 (2017): 191–215
- 3) Isaac Newton, “General Scholium” to the 2nd edition of *Principia mathematica*

Focus video

Interpretations of Newton’s physics

Tutorial: Thursday, November 18

Week 11: Global history of science – November 21–27

Readings

- 1) Ede and Cormack, Chapter 4: pp. 106–110 (section entitled “The Age of Exploration”), Chapter 7: pp. 207–210 (stop at “Catastrophe or Uniformity: The Geological Record”)
- 2) Antonio Barrera-Osorio, “Knowledge and Empiricism in the Sixteenth-Century Spanish Atlantic World” in *Science in the Spanish and Portuguese Empires, 1500–1800*, eds. Daniela Bleichmar et al. (Stanford: Stanford University Press, 2009), 219–232
- 3) Athanasius Kircher, *China illustrata*, Book IV, Chapters 1, 4, 7–10, pp. 159–160, 165–168, 184–197

Focus video: the Jesuit mission to China

Tutorial: Thursday, November 25

Assignment 3 due on Thursday, November 27 at 11:59 p.m.

Week 12: Enlightenment science – November 28–December 7 (long week)

Readings

- 1) Ede and Cormack, Chapter 6: 169–206 (entire chapter)
- 2) Lisbet Koerner, “Carl Linnaeus in His Time and Place” in *Cultures of Natural History*, eds. Nicholas Jardine, James A. Secord, and Emma C. Spary (Cambridge: Cambridge University Press, 1995), 145–162.
- 3) Immanuel Kant, *Universal Natural History and Theory of the Heavens*, Part 1

Focus video

The Herschels and the rise of stellar astronomy

Tutorial: Thursday, December 2

Assignment:

Take-home exam due on Tuesday, December 7 at 11:59 p.m.

Please also consult the King’s “Important Dates” page for information about the university’s calendar, including add/drop dates: <https://ukings.ca/current-students/important-dates/>.

Assignments

Written assignments: There are three written assignments in this course. If you are taking it as a first-year course, the assignments will be 800–1000 words each; if you are taking it as a second-year course, they will be 1000–1200 words each. **Assignment 1, due October 2**, will be a document analysis of a primary source related to ancient science. **Assignment 2, due October 30**, will be an essay on the importance of the Middle Ages in the history of science. **Assignment 3** will be a creative assignment. You will have two options for this assignment:

- **Option 1:** Create a fictional primary source related to a period in the history of science that we have covered in the course.
- **Option 2:** Create an online presence for a historical figure covered in the course (e.g., social media profiles, website, YouTube channel, DeviantArt page... whatever you think makes sense for the figure!)

The word limit does not apply to Option 2, but you should put as much work into it as you would put into an essay; it will be judged according to the same standard.

More details about each assignment will be provided as we get closer to the deadline.

Take-home exam: For the final exam, will be asked to pick two essay questions from a series of options. The questions will ask you to synthesize material from multiple lectures. The main goals will be to demonstrate knowledge of lecture material and to formulate an argument about a trend or historical development that we will have traced throughout the course. **The exam will be posted on December 5 and will be due at 11:59 p.m. on December 7.** Late exams will only be accepted for medical reasons, as described in the policy for missed assignments below.

Tutorial participation: This grade will not be based on mere attendance of the weekly tutorials. To get a high grade, you must engage in a meaningful and respectful dialogue with other students related to the week’s materials, especially the assigned readings. Each week, you should come to tutorial having completed the readings and taken notes that you can refer to during our discussion. Our collaborative goals during the tutorials are to analyze the texts with a critical eye and to make connections with other material from the course. But if you’re not sure how to approach the material, start by making a note of whatever you found interesting and bring that up in class. That’s a great way to get the discussion going!

COVID contingency plan: Because we are already meeting remotely, there is no need for a specific contingency plan related to COVID. However, please consult the University of King College’s Central COVID Safety Plan ([here](#)) and our course’s policy for missed assignments and tutorials below,

Missed assignments and tutorials:

Students experiencing short-term absences of three consecutive days or fewer resulting in missed or late academic requirements must:

- a) contact the instructor by phone or email before the academic requirement deadline or scheduled time and;
- b) complete a Student Declaration of Absence form or provide alternate verification of the absence to the instructor, on-line through Brightspace, or via instructor e-mail within three calendar days following the last day of absence

To access the declaration form, click [here](#). For more information, visit [this site](#).

The penalty for late submission of assignments is a **3% deduction in the final mark per calendar day** that the work is late, to a maximum of 15%, with one day considered to have elapsed at 12:01 a.m. at the end of the day when the essay is due. If an assignment is more than five days late, it will not be accepted, and a mark of **zero (0%)** will be assigned, unless a request for special consideration is made and granted by the instructor.

Grading: The University of King’s College uses the following scale for defining and correlating letter grades, number grades, and grade point values:

Grade	Percentage Grade Value	Grade Point Value	Definition	
A+	90-100	4.3	Excellent	Considerable evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
A	85-89	4.0		
A-	80-84	3.7		
B+	77-79	3.3	Good	Evidence of grasp of subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
B	73-76	3.0		
B-	70-72	2.7		
C+	65-69	2.3	Satisfactory	Evidence of some understanding of the subject matter; ability to develop solutions to simple
C	60-64	2.0		

C-	55-59	1.7		problems; benefitting from the university experience.
D	50-54	1.0	Marginal Pass	Evidence of minimally acceptable familiarity with subject matter, critical and analytical skills (except in programs where a minimum grade of 'C' or 'C+' is required).
F	0-49	0	Inadequate	Insufficient evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.
INC		0	Incomplete	
W		Neutral and no credit obtained	Withdrew after deadline	
ILL		Neutral and no credit obtained	Compassionate reasons, illness	

Urkund: Digital copies of the assignments handed in through Brightspace will be randomly checked by the Urkund tool, a plagiarism detector. You are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of your work. You must inform me no later than **September 26** of your intent to choose an alternate method.

Videoconferencing Rules:

1. Using Collaborate: We will be using the Collaborate conferencing platform, which is built into Brightspace. The meetings are secure: only students enrolled in the class will be able to join. In an unlikely event of outside interference, I will shut the meeting down immediately. Please click on the link again and I will readmit you one by one. If technical difficulties occur, we will switch to a password-protected Zoom conference.

A few simple rules are: a) mute your mic and only unmute yourself when it is your turn to speak; b) use the raise-hand button if you wish to speak; c) please refrain from using the chat function: use it only when you think it is necessary (e.g., you are unable to unmute yourself or you prefer not to speak into the microphone) d) dress with decorum; turn off your camera if you need to get up, yawn, or grab a bite to eat....

As a rule, the Collaborate sessions will NOT be recorded for reasons of privacy and consent, but some exceptions may apply if we have a guest lecture (in which case you will be notified ahead of time).

2. Copyright and privacy: Recorded lectures remain the intellectual property of the instructor and guest lecturers. Reposting, sharing, further distributing or otherwise misusing them violates their privacy and copyright interests and is expressly prohibited without explicit permission. Strict privacy protections also apply. Provincial and federal laws restrict the dissemination of personal information about academic staff and students—including email addresses, phone numbers, residential information, images and videos. In light of all this, tutorials should not be recorded by students or screenshots taken without express permission.

3. Netiquette: When you post comments on discussion boards and engage with other students and the instructor during virtual meetings, it is important to understand how to interact with one another online. We will work together to create the environment of constructive dialogue, inclusiveness, and mutual respect. You can read more about the rules of netiquette [here](#).

Academic Rules and Regulations

This course is governed by the academic rules and regulations set forth in the University of King's College [Calendar](#).

Academic Integrity

At the University of King's College and Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. Dalhousie University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity (Read more [here](#)).

Academic integrity issues involving King's courses are normally dealt with by the Academic Integrity Officer (AIO) of the University of King's College. Instructors may at their discretion check digital copies with the Urkund tool on Brightspace, a plagiarism detector. In this case, students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work. Students must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method.

Keeping academic term

Examination dates cannot be changed to accommodate travel plans, work arrangements and personal activities. It is the obligation of each student to ensure that his or her travel arrangements or other activities do not conflict with in-class activities or the end-of-term examinations. The keeping of academic term is the responsibility of every student.

Students' responsibilities on evaluations

It is the student's responsibility to keep his or her assignments and evaluations to protect themselves against possible lost grades or in case of grade revision (the original marked copy of the assignment will be required in such a case).

Accessibility and Accommodations

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (NS, NB, PEI, NFLD).

If there are aspects of the design, instruction, and/or experiences of this course that result in barriers to your inclusion, please contact the [Student Accessibility Centre](#).

Please note that our classroom may contain accessible furniture and equipment. It is important that these items remain in the classroom, undisturbed, so that students who require their use will be able to fully participate.

Codes of conduct

Two Codes of Conduct are relevant to students enrolled in Joint Dalhousie/King's classes:

- (1) The University of King's College Code of Conduct as contained in the *Yellow Book* (read more [here](#)).
- (2) Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution (read more [here](#)).

Disputes over academic performance and assessment will be dealt with according to the Academic Regulations of University of King's College. For more information, see the King's [calendar](#).

Diversity and Inclusion—Culture of Respect

The University of King's College is committed to a welcoming and respectful working and learning environment that is free from harassment and discrimination. We encourage open dialogue; however, members of the class are expected to refrain from speaking or behaving in ways that are harmful to others, through racism, homophobia, sexism, or other derogatory treatment based on characteristics protected under the Nova Scotia Human Rights Act. The King's College Code of Conduct (*Yellow Book*) provides specifics. Students are also directed to Dalhousie's [Strategy on Diversity and Inclusiveness](#).

The full list of characteristics protected under the Nova Scotia Human Rights Act can be found [here](#).

Sexualized Violence

King's College has its own Sexualized Violence Awareness, Prevention and Response Policy, and its own Sexualized Violence Prevention and Response Officer (SVPRO), [Jordan Roberts](#). The SVPRO can provide support around experiences of sexualized violence to all members of the King's community. This support is confidential and can include informal discussion, academic accommodations, and undergoing an internal reporting process. All decisions on where a disclosure of sexualized violence goes are in the hands of the individual disclosing. Academic accommodations may be available to those who do not wish to make a formal report. If you are supporting someone who has experienced sexualized violence the SVPRO is also available as a support to you. More information about the SVPRO and the [Sexualized Violence Awareness, Prevention and Response Policy](#) can be found online.

The SVPRO's contact information is: jordan.roberts@ukings.ca, 902-229-6123, Office: 077 Lower Link.

Confidential voicemail and text option. Calls and messages responded to Monday–Friday 9–5.

Equity

King's College Equity Officer [Rhema Ferguson](#) provides resources, education and confidential support for faculty, staff and students at King's College. The Equity Officer's principal role is to support under-represented and otherwise marginalised members of the King's community. The Equity Officer provides information, takes proactive measures and is available for consultation to all members of the university community on issues concerning equity, inclusivity, discrimination and harassment. The Equity Officer works closely with equity and accessibility committees and the Sexual Violence Prevention and Response Officer. The Equity Officer assists in the implementation of the Policies and Procedures for Prevention of Discrimination and Harassment. All complaints or information seeking around this policy from those who have been affected will remain confidential and decisions are led by the individual disclosing. The policy and procedures can be found in the [Yellow Book](#).

The EO's contact information is: rhema.ferguson@uking.ca, 902-226-5103, Office: Lower Link Confidential voicemail and text option. Calls and messages responded to Monday–Friday 9–5.

University Policies and Programs

[Important Dates in the Academic Year](#) (including add/drop dates)

[Dalhousie Grading Practices Policy](#)

[Grade Appeal Process](#)

[Scent-Free Program](#)

Learning and support resources

Academic Support and Advising

[King's](#)

[Dalhousie](#)

Health and Wellness

[Student Health & Wellness Centre](#)

On Track (helps you transition into university, and supports you through your first year at King's and Dalhousie and beyond): www.dal.ca/campus_life/academic-support/On-track.html

[Dalhousie Multifaith Services](#) is a non-threatening space where Dalhousie and King's students, staff, and faculty can address the basic questions of meaning and purpose in their lives—no matter what their faith, philosophy or doubt may be. Dalhousie Multifaith Services provides chaplains for Buddhist, Anglican, Baptist, Lutheran, Pentecostal, United Church of Canada, Baha'i, Hindu, Jewish, Roman Catholic, Sunni Muslim and Unitarian Universalist faith traditions. The University of King's College chaplain, Fr Ranall Ingalls, whose office is in the King's A&A Building, is a Christian priest in the Anglican tradition, but he is at King's for everyone and not merely Anglicans or Christians. Read about the King's Chapel [here](#).

Student Support, Advising and Advocacy

[Indigenous Student Centre](#)

Elders-in-Residence. The [Elders-in-Residence](#) program provides students with access to First Nations elders for guidance, counsel and support. Visit the office in the Indigenous Student Centre or contact the program at elders@dal.ca or 902-494-6803.

[Black Student Advising](#)

[International Centre and academic advising for International Students](#)
[South House Sexual and Gender Resource Centre](#)
[LGBTQ2SIA+ Collaborative](#)
Dalhousie Student Advocacy Service ([DSAS](#))
[Dalhousie Ombudsperson](#)
[Human Rights and Equity Services](#)

Writing Centre and Study Skills:

If you need extra help with your writing, you can contact the [Writing Centre in the Killam Library](#). A Study Skills Programme is offered by Academic Support (Killam Library: 494-3077).
Study Skills/Tutoring: www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Fair Dealing and Copyright Guidelines:

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at King's College and Dalhousie. See [here](#):
and [Copyright Office](#).

Libraries:

[King's library](#)
[Dalhousie libraries](#)

Technical issues: To get support for course or university technologies (Brightspace, Collaborate Ultra, email, Microsoft products), contact Information Technology Services (ITS) at support@dal.ca.