

Department of History

HTST 372

Ways of Knowing: Science, Technology, and Medicine in Historical Perspectives

Summer 2022

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Office Hours and Method: Wednesday, 11:00AM – 1:00PM, via Zoom® in D2L, June 29

- August 3, 2021.

Course Delivery: in person, room ES 54.

Class Times: Tuesday & Thursday, 12:00PM – 2:45PM, June 28 – August 9, 2022.

Description

This course surveys the history of science, technology, and medicine from the perspective of "ways of knowing" between 1500 and the present. We examine how the layers of knowledge and its generation changed, how they intersected and grew over the centuries. A transnational examination of the relationships among these ways of knowing in their historical and cultural contexts will be provided, together with an introduction into major theories in the historiography of the field of Science, Technology, and Medicine studies. The course addresses inter-related history of science issues of interest to students from wide interdisciplinary backgrounds. It explores and discusses the history of Science, Technology, and Medicine not with respect to each scientific discipline, but from distinct "ways of knowing" that shall be put into their respective historical and cultural contexts. Six different ways of knowing will be covered: ways of world reading, natural history, analyses, syntheses, experimentalism, and technoscience. From the Renaissance to the modern sciences of our time, students will explore historical contexts through their often *longue durée* unravelling. Furthermore, this course will introduce major historiographical interpretations, as put forward by eminent historians of science and medicine, such as Ludwik Fleck (1896-1961), Michel Foucault (1926-1984), Jacalyn Duffin (born in 1950), and Thomas S. Kuhn (1922-1996), among others. The objective is to assess the impact of knowledge creation in the transformation of contemporary culture in the West.

Learning Outcomes

- Appraise the ways historical contexts with their particular cultural, political, and economic factors shape our perceptions of science, technology, and medicine in society.
- Interpret scientific texts from a historical perspective by using different approaches historians have taken toward topics under study. This involves assessing authors' arguments, asking questions of the texts, and comparing/contrasting evidence.
- Appreciate the historian as a creator of evidence-based interpretations rather than as a transmitter of facts or "fixed" knowledge.
- Critically evaluate and effectively use primary and secondary historical sources.
- Consider how decisions in the past influenced and continue to impact on choices we face today by undertaking a small research project resulting in a short evidence-based group presentation.
- Demonstrate knowledge of the research behind historical analysis and the importance of narrative in presenting historical research.
- Practice and improve historical research skills by developing reasoned arguments about the past to organize and write an original paper.

Reading Material

Required Book:

Andrew Ede and Lesley B. Cormack, *A History of Science in Society: From Philosophy to Utility* Fourth Edition (Toronto: University of Toronto Press, 2022), 488 pages. Available at: https://www.calgarybookstore.ca/buy textbooks.asp and also from various online dealers.

Additional required readings as described in the schedule below will be available electronically through D2L.

Optional Readings for Background:

Andrew Ede and Lesley B. Cormack, *A History of Science in Society: A Reader* (Peterborough: Broadview Press, 2007);

Barry Barnes, David Bloor, and John Henry, *Scientific Knowledge: A Sociological Analysis* (Chicago: University of Chicago Press, 1996);

Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2010);

Jacalyn Duffin, *History of Medicine: A Scandalously Short Introduction*. Third edition (Toronto: University of Toronto Press, 2021);

Ludwik Fleck, *Genesis and Development of a Scientific Fact* (Chicago: University of Chicago Press, 1979; Basel, Switzerland: Benno Schwabe & Co., 1935);

Michel Foucault, *The Order of Things* (New York: Routledge Classics, 2009; Paris: Gallimard, 1966);

- John V. Pickstone, Ways of Knowing A New History of Science, Technology, and Medicine (Chicago: University of Chicago Press, 2001);
- Sergio Sismondo, *An Introduction to Science and Technology Studies*, 2nd ed. (Chichester: Wiley-Blackwell, 2009);
- Steven Shapin, Never Pure: Historical Studies of Science as if It Was Produced by People with Bodies, Situated in Time, Space, Culture and Society, and Struggling for Credibility and Authority (Baltimore: Johns Hopkins University Press, 2010).

Assessment

Method	Due Date	Weight
Lecture/seminar participation,	Weekly	
including reading cards	June 30 th – August 9 th	20%
Outline of the research paper	July 21st	10%
Group-based project presentation	July 28 th	30%
Research paper	August 12 th	40%

Grading Policies

All grades are awarded as percentages and the final calculation will be translated to a letter grade for submission to the Registrar as defined in the table below.

All written assignments are due at the end of the day (23:59PM) indicated above, to the D2L dropbox. Late assignments will be penalized 5% per day (including weekends). Late assignments will not be accepted if they are submitted more than 7 days after the due date. It is your responsibility to ensure that your work is properly backed up. Computer problems are not an acceptable excuse for late submissions. Students who require accommodations and have received a permission from the Student Accessibility Services (see below) are allowed certain flexibility in meeting deadlines and participating in this course.

Details on Methods of Assessment

□ Lecture/seminar participation (June 30 – August 9). Participation extends well beyond attendance at this level. No lecture-seminar can function effectively if students do not read the material and come prepared to discuss it. Regular attendance and active participation are mandatory. Students are expected to read all the assignments, reflect on them, be prepared to discuss them critically, and to <u>submit at least one "reading card" based on assigned materials weekly.</u> Each week students will receive a grade out of 20% for their reading card, discussion, and comments in class.

Students are required to turn in their reading cards either on Tuesday or on Thursday at the beginning of class (maximum 2 cards per week). The instructor will return your cards during the following class. Students should keep their collected cards in their class notebook for future reference and study. On the cards, students should write at least 3 discussion questions,

comments, or connections related to that week's required reading. These can be:

- points prompting class discussion;
- questions about material you do not understand;
- opinion statements about the historical content of the material;
- connections to course themes, other readings, lecture material, etc.

Rules for weekly reading cards:

- students must use a 5x8-inch card or half of a letter-size page;
- first and last name and the date must be written on the top;
- one card per person per week; write on the back if necessary, but this is not required;
- at least 3 questions, points, or comments are required;
- complete sentences and correct grammar, punctuation, and spelling are important;
- writing must be legible and neat;
- cards must be submitted in class; no late submissions will be accepted;
- be prepared to present your questions or comments to the whole class; if you do not want everyone to hear it, do not write it.

Contributions to class discussions will be assessed based on their quality and substance rather than quantity.

□ Outline of the research paper (July 21) consists of a working thesis and an outline for an essay on a topic falling within the range of themes discussed in this class. Submitted theses and outlines should integrate material from the lectures, assigned readings, and optional readings. Your working thesis must provide a *clear and concise argument* based on the primary and secondary sources under consideration. Material drawn from *Wikipedia* or other outside sources will carry minimal weight for this assignment. Submissions should follow standard outline formatting. An example of the outline assignment will be provided in the D2L for illustrative purposes.

☐ Group-based project presentation (July 28, and August 2-9)

All students are required to make a short collaborative presentation on their topic of research interest within the scope of this course. These presentations will last 12 minutes and will focus on one aspect of "ways of knowing". A group of three or four students in cooperation must communicate a major argument of one or two selected historical figures, not necessarily from the same period and research field (e.g. Johannes Kepler, Albert Einstein) by explaining their reasoning, contexts, and how their interpretation challenges, or not, our understanding of the issues in question. These group presentations provide an opportunity not only to discuss the specifics of each historic project but also to discuss more broadly the methodology that went into choosing the sources used and the role of the historian in interpreting evidence. One of the major aims of these presentations is to enable collaboration in groups of students. Thus, every student

should find groupmates through the expression of their research interests posted on the discussion board in a separate forum named "Presentations". If some students are not able to find groupmates, the instructor will put them into groups of three or four at random. Slides of final collaborative presentations must be uploaded under "Assessments" > Dropbox > Presentations in D2L on July 28th. Students will present their group project in class, between 2-9 August.

Presentations will be marked equally on:

- 1. <u>Quality of presentation</u>: interaction, timing (how closely you stay to the time limit), ability to engage the audience, and clearly laid-out structure.
- 2. <u>Content</u>: clarity of thought, use of evidence, and argumentation. Presentations should give the audience an idea of what sources you are using, what your argument is, and how it relates to issues raised during the course.
- 3. <u>PowerPoint slides</u> are expected not to exceed 15 and relate key information supporting your oral presentation. Visuals and other illustrative items should be preferred to the text (which should be mainly in bullet points).

☐ Research Paper (August 12). Choose your own topic within the scope of this course and write a minimum 1500-word essay (max. 2500 words), excluding footnotes and bibliography. Use a formal writing style and correct Chicago Style footnotes, which include page numbers and a bibliography. The essay must critically analyze an aspect of the "ways of knowing" in science, technology, and medicine in society. You are strongly encouraged to discuss with me in advance (preferably during office hours) to approve your topic. You should pose an analytical question that will frame the essay (how or why something happened as opposed to what or when). You are encouraged to examine a topic that interests you. If you are uncertain about whether the subject is appropriate, consult with me. It is your responsibility to design an appropriate question (argument/thesis statement). Your sources should match the research question, and therefore a wide variety of perspectives should be consulted, obtained from at least three peer-reviewed historical journal articles and two published books. The guiding questions for this assignment are expected to be along the following lines: What are the historical circumstances that led to the event or development? Who are the major players? What are the long-term consequences? How did power relations impact the end result? This assignment will be assessed based on completeness, depth of analysis, and writing style.

Submission Guidelines for Assignments

- 1. Your research paper and its outline must be typed (Times New Roman, double spaced, 12-point font, 1-inch margins or similar) and submitted as a paper copy in class and electronically to the assignments folder in D2L. They must include page numbers, bibliography, footnotes, and a title page (name, course code, title, and date).
- 2. Your formal written work must include footnotes and a bibliography utilizing the Chicago Manual of Style's citation format.

- 3. Faculty policy directs that all written assignments will be assessed at least partly on writing skills. Writing skills include not only surface correctness (grammar, punctuation, sentence structure, etc.) but also general clarity and organization.
- 4. Electronic files must contain your surname, course number, and the assignment title as part of the file name (e.g. Razumenko_HIST372_Outline of paper)

Electronic Communication

E-mail communication is one of my primary ways of relaying messages to the class. It is required that you regularly check your UCalgary email account. If you wish to contact me by email, please send the message from your university account and include your full name, course/section, and a clear subject line. Please also double check that your question cannot be easily answered by this outline or other readily available resources.

Academic Integrity Statement

For advice and guidance in writing essays, students are encouraged to read "The History Student's Handbook" (https://arts.ucalgary.ca/history/current-students/undergraduate/student-handbook) which has very useful general directions, tips, citation and formatting suggestions. Be sure to read the section on plagiarism carefully and observe that you give proper credit to the sources of your work. The policy at the University of Calgary is that all allegations of plagiarism will be reported to the Associate Dean of Students who will rule on the allegations and apply the penalties in the course calendar. Academic dishonesty is a serious offence that can lead to a failing grade and/or expulsion from the University of Calgary.

Learning Technologies Requirements

In order to successfully engage in their learning experiences at the University of Calgary, students in this course will need reliable access to the following: a computer or other electronic device with a supported operating system; a current and updated web browser; a webcam (built-in or external); a microphone and speaker (built-in or external); broadband internet connection. The Top Hat software will be used in class.

On-Line Office Hours and Instructional Materials

The Zoom® session links for the dates and times will be found in the "Desire2Learn" (D2L®) course shell under "Communications". Some outlines and articles used in the course will be uploaded to D2L® as well.

Students will find the following materials on D2L (https://d21.ucalgary.ca):
☐ this course syllabus;
☐ discussion handouts;
☐ library resource materials and internet links;
assigned readings (except for those from Ede and Cormack's book of 2022) for the individual

sessions of the course.

Inclusiveness, Accommodation, and Classroom Conduct

I am committed to creating an inclusive learning environment for all registered students. If you have conditions or circumstances that require accommodations, you are encouraged to contact Student Accessibility Services and to contact me by email or during office hours to discuss reasonable measures that will ensure your success in this course. Such accommodation may include disability (physical or mental wellness, whether visible or not), the need to nurse a child, the wish to be called a different name or pronoun, assistance with writing, or adjusting deadlines because of personal circumstances.

Part of creating an inclusive learning environment involves respecting your fellow classmates. In meeting any university's mandate of encouraging free and open inquiry, we will occasionally discuss topics about which you might be uncomfortable or have a set viewpoint. In such situations, it is essential that we understand that others share different experiences and perspectives, and that listening respectfully to and showing tolerance toward opposing viewpoints is part of the process of emerging as active, engaged citizens.

To protect the privacy of others, students may not record in any format any activity that occurs within the classroom or online. As outlined in the University Calendar, permission to sound-record lectures will only be given to students registered with Student Accessibility Services. All materials in this course, including but not limited to lectures, quizzes, handouts, and the textbook, are under the protection of copyright and may not be distributed to third parties under any circumstances.

Schedule

Date	Topic & Reading	Important Details		
Tuesday	Course Introduction – WAYS OF KNOWING			
June 28	1. Andrew Ede and Lesley Cormack, <i>A History of</i> Complete these			
	Science in Society: From Philosophy to Utility (2022),	assignments before		
	pp. xii – xv.	class.		
	2. O'Brien Institute for Public Health seminar, 9 April			
	2021, "Is airborne transmission an important and			
	mitigable aspect of the COVID-19 pandemic?"			
	https://www.youtube.com/watch?v=2mh0BXX2Gr8			
Thursday	WAYS OF WORLD READING	Complete readings and		
June 30	Meanings and Readings reading cards be			
	1. John Pickstone, Ways of Knowing (2001), pp. 33-45. class.			

	2. Barry Barnes, David Bloor, and John Henry, Scientific Knowledge (1996), 1-17.			
Tuesday July 5	Revolution, Respectability, and Dis-Enchantment 1. A. Ede and L. Cormack, A History of Science in Society: From Philosophy to Utility (2022), 103-141. 2. John Pickstone, Ways of Knowing (2001), pp. 45-59. Complete reading cards be class.			
Thursday July 7	Objectivity: doubts about its possibility and its desirability 1. A. Ede and L. Cormack, A History of Science in Society: From Philosophy to Utility (2022), 142-179. Complete reading and reading cards before class.			
Tuesday July 12	WAYS OF NATURAL HISTORY <u>Deep Roots of Modern Science</u> 1. Michel Foucault, Ch. 5 "Classifying," in <i>The Order of Things</i> , pp. 136-179. 2. Carolus Linnaeus, <i>The System of Nature</i> (1735), in <i>Scientific Revolutions</i> , ed. Brian S. Baigrie, 151-156. 3. Lorraine Daston and Peter Galison, <i>Objectivity</i> (2010), pp. 55-62	Complete readings and reading cards before class.		
Thursday July 14	Organization of Science in the 18th Century 1. A. Ede and L. Cormack, A History of Science in Society: From Philosophy to Utility (2022), 180-219. Complete reading care class.			
Tuesday July 19	WAYS OF ANALYSES Enlightenment and Industry 1. Larry Stewart, "Measure for Measure: Projectors and the Manufacture of Enlightenment, 1770-1820," in <i>The Age of Projects</i> (2008): 370-389. 2. A. Ede and L. Cormack, <i>A History of Science in Society: From Philosophy to Utility</i> (2022), 220-259.			
Thursday *July 21	WAYS OF SYNTHESIS <u>Evolution and Evidence</u> 1. Peter J. Bowler, "Darwin's Originality" (2009), pp. 18-21. 2. Jean B. Lamarck, "Directed Variation" (1809), in <i>Scientific Revolutions</i> , ed. Brian S. Baigrie, 216-225.	Outline of paper DUE to D2L Dropbox by 11:59PM Complete readings and reading cards before class.		

Tuesday	WAYS OF EXPERIMENTALISM		
July 26	Experimental Medicine and Technology Complete reading		
	1. William Osler "The Evolution of the Idea of	reading cards before	
	Experiment in Medicine" (1907), pp. 1-8.	class.	
	2. Jacalyn Duffin, "Technology and Disease:		
	Stethoscopes, Hospitals, and Other Gadgets," in		
	History of Medicine (2010), pp. 221-244.		
Thursday	Statistical Knowledge and "Normal" Science	Group presentation	
*July 28	1. Ian Hacking "Was There a Probabilistic Revolution	slides DUE to D2L	
	1800-1930?" in The Probabilistic Revolution (1987),	Dropbox by 11:59PM	
	pp. 45-55.		
	2. Sergio Sismondo "The Kuhnian Revolution," in <i>An</i>	Complete readings and	
	Introduction to Science and Technology Studies (2010),	reading cards before	
	pp. 12-22.	class.	
Tuesday	WAYS OF TECHNOSCIENCE		
August 2	Radioactivity, Clinical Trials, and Social Construction	Complete readings and	
	of Science	reading cards before	
	1. Abraham Flexner, "The Usefulness of Useless	class.	
	Knowledge" (1939): 544-552.		
	2. A. Ede and L. Cormack, A History of Science in	Group presentations	
	Society: From Philosophy to Utility (2022), 260-291.	session 1	
Thursday	Contemporary Challenges to Medical History		
August 4	1. Katherine Zwicker "Experimenting with Radium	Complete readings and	
	Therapy: In the Laboratory & the Clinic," in <i>The Uses</i>	reading cards before	
	of Humans in Experiment: Perspectives from the 17th	class.	
	to the 20th Century (2016), pp. 194-214.		
	2. Fedir Razumenko, "From the Great Influenza to	Group presentations	
	COVID-19: epidemics of scale through historical lens"	session 2	
	(2022): 10-21.		
Tuesday	Science and War: Lessons from History	Complete reading cards	
August 9	1. A. Ede and L. Cormack, A History of Science in	before class.	
	Society: From Philosophy to Utility (2022), 292-315.	Group presentations session 3	
*Friday			
August 12	Research Paper DUE to D2L Dropbox by	11:59PM	

There is no registrar-scheduled final exam.

Departmental Grading System

The following percentage-to-letter grade conversion scheme is used in all Canadian Studies, History, and Latin American Studies courses, except for HTST 200.

Percentage	Letter	Grade Point	Description	
	Grade	Value		
90-100	A+	4.00	Outstanding performance	
85-89	A	4.00	0 Excellent performance	
80-84	A-	3.70	Approaching excellent performance	
77-79	B+	3.30	Exceeding good performance	
73-76	В	3.00	Good performance	
70-72	B-	2.70	Approaching good performance	
67-69	C+	2.30	Exceeding satisfactory performance	
63-66	C	2.00	Satisfactory performance	
60-62	C-	1.70	Approaching satisfactory performance.	
56-59	D+	1.30	Marginal pass. Insufficient preparation for	
			subsequent courses in the same subject	
50-55	D	1.00	Minimal Pass. Insufficient preparation for	
			subsequent courses in the same subject.	
0-49	F	0	Failure. Did not meet course requirements.	

Please Note: Students are expected to reach the grade range to receive that letter grade (ie. to receive an A- a student will have earned an 80 or 3.7 in the course). Assume that there will be no rounding up unless a faculty member announces otherwise.

Program Advising and Student Information Resources

- For program advising in the Faculty of Arts, contact the Arts Students Centre (ASC).
- For questions about admissions, student awards, common registration issues, financial aid and student fees, contact Enrolment Services
- Sometimes unexpected circumstances may affect your schedule. You can change your registration during the course change period. Please see the <u>Registration Changes and Exemption Requests</u> page.

Attention history majors: History 300 is a required course for all history majors. You should normally take this course in your second year.

Writing

All written assignments and written exam responses are assessed partly on writing skills. Writing skills include surface correctness (grammar, punctuation, sentence structure, etc.) and general clarity and organization. Research papers must be properly documented according to the format described in *The History Student's Handbook*.

Academic Misconduct

Academic Misconduct refers to student behavior which compromises proper assessment of a student's academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

For more information, please see the University of Calgary <u>Student Academic Misconduct</u> Policy documents, and visit the Academic Integrity Website.

Plagiarism

Plagiarism occurs when students submit or present the ideas and/or writing of others as if they were their own or when they submit their own work to two different classes. Please see <u>The History Student's Handbook</u> for more details, but to summarize, plagiarism may take several forms:

- Failing to cite sources properly
- Submitting borrowed, purchased, and/or ghostwritten papers
- Submitting one's own work for more than one course without the permission of the instructor(s) involved
- Extensive paraphrasing of one or a few sources, even when referenced properly, unless the essay is a critical analysis of those works

Plagiarism is a serious academic offence, and written work that appears to contain plagiarized passages will not be graded. All such work will be reported to the Faculty of Art's associate deans of students who will apply the penalties specified in the university calendar.

Academic Accommodation

It is the student's responsibility to request academic accommodations according to the <u>Student Accommodations policy</u>. Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the <u>Procedure for Accommodations for Students with Disabilities</u>. Students who require an accommodation in relation to their coursework based on a protected ground other than Disability should communicate this need in writing to their Instructor.

SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit Student Accessibility Services.

Research Ethics

Students are advised that any research with human subjects – including any interviewing (even with friends and family), opinion polling, or unobtrusive observation – must have the approval of the <u>Conjoint Faculties Research Ethics Board</u>. In completing course requirements, students must not undertake any human subjects research without discussing their plans with the instructor, to determine if ethics approval is required.

Instructor Intellectual Property

Course materials created by instructors (including presentations and posted notes, labs, case Page 11 of 13

studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

Copyright Legislation

All students are required to read the University of Calgary policy on <u>Acceptable Use of Material Protected by Copyright</u> and requirements of <u>the Copyright Act</u> to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

Copyright of Educational Materials

The University of Calgary has opted out of the Access Copyright Interim Tariff proposed by the Copyright Board. Therefore, instructors in all University of Calgary courses will strictly adhere to Copyright Act regulations and the educational exceptions permitted by the Act for both print and digital course material. No copyrighted material may be placed on course D2L or web sites without the prior permission of the copyright holders. In some cases, this may mean that instructors will require you to purchase a print course pack from the University of Calgary bookstore or consult books on reserve at the library. Please see the <u>University of Calgary copyright page</u>.

Freedom of Information and Protection of Privacy

Student information will be collected in accordance with usual classroom practice. Students' assignments will be accessible only by the authorized course faculty and teaching assistants. Private information related to the individual student is treated with the utmost regard.

Media Recording

The instructor may use media recordings to record the delivery of a lecture for various reasons, including lecture capture and self-assessment. Students will be informed of media recordings in advance and the recording device will be fixed on the instructor. In the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent from identifiable students, before making a recording available to the class.

Media Recording for the Assessment of Student Learning

The instructor may use media recordings as part of the assessment of students, by prior arrangement. This may include but is not limited to classroom discussions, presentations, clinical practice, or skills testing that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.

Sexual Violence Policy

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment,

discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the sexual and gender-based violence policy.

Other Useful Information

Please see the Registrar's <u>Course Outline Student Support and Resources</u> page for information on:

- Wellness and Mental Health
- Student Success
- Student Ombuds Office
- Student Union (SU) Information
- Graduate Students' Association (GSA) Information
- Emergency Evacuation/Assembly Points
- Safewalk

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