



UNIVERSITY OF
CALGARY

Department of History

HTST 372

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

Summer 2021

Instructor: Dr. Fedir Razumenko, Ph.D.

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Office Hours and Method: Wednesday, 11:00AM – 1:00PM, via Zoom® in D2L, June 30
– August 4, 2021.

Course Delivery: Online

Synchronous Class Times: Tuesday & Thursday, 9:00AM - 11:45AM, via Zoom® in D2L,
June 29 – August 10, 2021.

Teaching Assistant: Devon Vadnai, devon.vadnai@ucalgary.ca

Description

This undergraduate 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. Primarily, 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 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

- 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.
- Appraise the ways historical contexts with their particular cultural, political, and economic factors shape our perceptions of science, technology, and medicine in society.
- Appreciate the historian as a creator of evidence-based interpretations rather than as a transmitter of facts or "fixed" knowledge.
- Practice and improve historical research skills by developing reasoned arguments about the past to organize and write an original paper.
- Critically evaluate and effectively use primary and secondary historical sources.
- Demonstrate knowledge of the research behind historical analysis and the importance of narrative in presenting historical research.
- 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.

Reading Material

Required Book:

Andrew Ede and Lesley B. Cormack, *A History of Science in Society: A Reader* (Peterborough: Broadview Press, 2007) Available at https://www.calgarybookstore.ca/buy_book_detail.asp?pf_id=13604394 and also from various online dealers.

Optional Readings for Background:

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*, 2nd rev. ed. (Toronto: University of Toronto Press, 2010);
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

<i>Method</i>	<i>Due Date</i>	<i>Weight</i>
Lecture/seminar participation, including discussion board posts	Twice-Weekly, July 6 th – Aug. 10 th	20%
Outline of the research paper	July 27 th	10%
Pre-recorded presentation	August 3 rd	30%
Research paper	August 10 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 (23:59 p.m.) indicated above. 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 (July 6 – Aug. 10).** 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 of the readings, reflect on them, be prepared to discuss them critically, and to submit at least one “discussion” based on assigned materials weekly. Each week students will receive a grade out of 20% for their posted discussion and comments on the discussions of other students (20% - excellent; 15% - good; 10% – satisfactory).

Students are required to post a weekly discussion for Tuesday or Thursday assigned readings a day before the class meeting [<https://d2l.ucalgary.ca/d2l/le/384660/discussions/List>]. Students

should also thoughtfully comment on the already posted discussions by other students. It is expected that students write at least 2 discussion questions, comments, or connections related to that week's required reading (e.g. one discussion point + one comment on other points, or one discussion point + one connection). These can be:

- questions designed to prompt 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.

Students should be prepared to present their questions or comments to the whole class; if you do not want everyone to hear it, do not write it. Contributions to online discussions will be assessed based on their quality rather than quantity. You should not post 20 times a week, thinking that more is better, if there is little substance in your contributions (e.g. posting "I agree/disagree," without providing an explanation or a clarification).

□ **Outline of the research paper (July 27th)** 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.

□ **Pre-recorded presentation (Aug. 3rd)**

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 10-12 minutes and will focus on one aspect of "ways of knowing" elaborated on in Chapters 5-11 of Ede and Cormack's *A History of Science in Society*. Two 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 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 two students. Thus, every student should find a groupmate 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 a groupmate, the instructor will put them into groups of two at random. Final collaborative presentations must be recorded and posted under "Assessments" > Dropbox > Presentations in D2L.

Presentations will be marked equally on:

1. Quality of presentation: interaction, timing (how closely you stay to the time limit), ability to engage the audience, and clearly laid-out structure.
2. Content: 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. PowerPoint slides 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 (Aug. 10)**. 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. All written works must be typed (Times New Roman, double spaced, 12-point font, 1-inch margins or similar) and submitted 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 e-mail, 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 syllabus 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 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 or headset); broadband internet connection.

On-Line Instruction Statement

Instruction occurs via synchronous online lectures, including seminar discussions, on Zoom®, and asynchronously, when students complete on their own time discussion board posts, watch videos, etc.. Some outlines are used and will be uploaded to “Desire2Learn” (D2L®). The dates and times for all synchronous sessions are given above (already scheduled for this course). The Zoom® session links will be found in the D2L course shell under “Communications,” together with all respective links to the online office hours.

Students will find the following materials on D2L (<https://d2l.ucalgary.ca>):

- the course syllabus;
- discussion handouts for seminars;
- library resource materials and internet links;
- assigned readings (except for those from Ede and Cormack) for the individual sessions of the course.

Guidelines for Synchronous Sessions

Since the video conferencing tool Zoom® is used during course activities, students are asked to go online 10 min. before the beginning of classes and test their video and audio. The personal camera use is encouraged to enhance communication and discussions, the microphone muted during the lecture parts but unmuted during discussion periods. Students should find a quiet and individual space. Lecture-based sessions (indicated at the beginning of the class) will be recorded to offer access to students registered with Student Accessibility Services. These recordings will be used to support student learning only and will not be shared or used for any other purpose. To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission. The use of video conferencing programs relies on participants to act ethically, honestly, and with integrity; and in accordance with the principles of fairness, good faith, and respect (as per the [Code of Conduct](#)). When entering Zoom, you play a role in helping create an effective, safe, and respectful learning environment. Please be mindful of how your behavior in these sessions may affect others. Students whose D2L and Zoom usernames do not reflect their preferred name or identity can contact the IT Support Centre to have a display name changed in the Active Directory. This will change the name that shows in all online systems, including Zoom and D2L. It will take about 24 hours for the Support Centre to complete the request.

Non-compliance with online ground rules may be investigated under relevant University of Calgary conduct policies (e.g. [Student Non-Academic Misconduct Policy](#)). If participants have difficulties complying with online requirements, they should email the instructor of the class explaining why, so the instructor may consider whether to grant an exception, and on what terms. For more information on how to get the most out of your Zoom sessions visit: <https://elearn.ucalgary.ca/guidelines-for-zoom/>

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 or occasionally bring a child to class, 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 online. Permission to record class meetings will only be given to students registered with Student Accessibility Services. All material in this course, including but not limited to lectures, quizzes, worksheets, 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 June 29	<u>Course Introduction – WAYS OF KNOWING</u> 1. 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 2. Barry Barnes, David Bloor, and John Henry, <i>Scientific Knowledge</i> (1996), pp.1-17.	Complete these activities on your own time (asynchronously) <u>before our online class</u>
Tuesday July 6	WAYS OF WORLD READING <u>Meanings and Readings</u> 1. Andrew Ede and Lesley Cormack, <i>A History of Science in Society</i> (2007), pp. 127-150. 2. John Pickstone, <i>Ways of Knowing</i> (2001), pp. 33-45.	Complete readings and discussion posts before class.
Thursday July 8	<u>Revolution, Respectability, and Dis-Enchantment</u> 1. Andrew Ede and Lesley Cormack, <i>A History of Science in Society</i> (2007), pp. 150-156. 2. John Pickstone, <i>Ways of Knowing</i> (2001), pp. 45-59.	Complete readings and discussion posts before class.
Tuesday July 13	<u>Objectivity: doubts about its possibility and its desirability</u> 1. Lorraine Daston and Peter Galison, <i>Objectivity</i> (2010), pp. 55-62 2. Andrew Ede and Lesley Cormack, <i>A History of Science in Society</i> (2007), pp. 157-172.	Complete readings and discussion posts before class.
Thursday July 15	WAYS OF NATURAL HISTORY <u>Deep Roots of Modern Science</u> 1. Andrew Ede and Lesley Cormack, <i>A History of Science in Society</i> (2007), pp. 175-186, and 198-204. 2. Carolus Linnaeus, <i>The System of Nature</i> (1735), in <i>Scientific Revolutions</i> , ed. Brian S. Baigrie, pp.151-156.	Complete readings and discussion posts before class.

Tuesday July 20	<p><u>Organization of Science in the 18th Century</u></p> <ol style="list-style-type: none"> 1. Michel Foucault, Ch. 5 “Classifying,” in <i>The Order of Things</i>, pp. 136-179. 2. Larry Stewart, “Measure for Measure: Projectors and the Manufacture of Enlightenment, 1770-1820,” in <i>The Age of Projects</i> (2008): 370-389. 	Complete readings and discussion posts before class.
Thursday July 22	<p>WAYS OF ANALYSES <u>Enlightenment and Industry</u></p> <ol style="list-style-type: none"> 1. Andrew Ede and Lesley Cormack, <i>A History of Science in Society</i> (2007), pp. 208-215. 2. Robert M. Young, “Malthus and the Evolutionists: The Common Context of Biological and Social Theory,” <i>Past and Present</i>, 43 (1969), pp. 109-145 	Complete readings and discussion posts before class.
Tuesday July 27	<p>*Outline of the research paper DUE to D2L Dropbox by 11:59 p.m.</p> <p>WAYS OF SYNTHESIS <u>Evolution and Evidence</u></p> <ol style="list-style-type: none"> 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, pp. 216-225. 	Complete readings and discussion posts before class.
Thursday July 29	<p>WAYS OF EXPERIMENTALISM <u>Experimental Medicine and Technology</u></p> <ol style="list-style-type: none"> 1. William Osler “The Evolution of the Idea of Experiment in Medicine” (1907), pp. 1-8. 2. Jacalyn Duffin, “Technology and Disease: Stethoscopes, Hospitals, and Other Gadgets,” in <i>History of Medicine</i> (2010), pp. 221-244. 	Complete readings and discussion posts before class.
Tuesday August 3	<p>**Pre-recorded presentation DUE to D2L Dropbox by 11:59 p.m.</p> <p><u>Statistical Knowledge and “Normal” Science</u></p> <ol style="list-style-type: none"> 1. Ian Hacking “Was There a Probabilistic Revolution 1800-1930?” in <i>The Probabilistic Revolution</i> (1987), pp. 45-55. 2. Sergio Sismondo “The Kuhnian Revolution,” in <i>An Introduction to Science and Technology Studies</i> (2010), pp. 12-22. 	Complete readings and discussion posts before class.
Thursday Aug. 5	<p>WAYS OF TECHNOSCIENCE <u>Radioactivity, Clinical Trials, and Social Construction</u></p>	Complete readings and discussion posts

	<u>of Science</u> 1. Andrew Ede and Lesley Cormack, <i>A History of Science in Society</i> (2007), pp. 319-333. 2. Katherine Zwicker “Experimenting with Radium Therapy: In the Laboratory & the Clinic,” in <i>The Uses of Humans in Experiment: Perspectives from the 17th to the 20th Century</i> (2016), pp. 194-214	before class.
Tuesday Aug. 10	***Research Paper DUE to D2L Dropbox by 11:59PM <u>Contemporary Challenges and Lessons from History</u> 1. Abraham Flexner, “The Usefulness of Useless Knowledge” (1939): pp. 544-552 2. Andrew Jenks, “The Techno-Politics of Disaster: Chernobyl and the Collapse of the Soviet Union,” (2011), pp. 106-135 & 154-155.	Complete readings and discussion posts before class.

There is no registrar-scheduled final exam.

THE FOLLOWING INFORMATION APPEARS ON ALL DEPARTMENT OF HISTORY COURSE OUTLINES

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	Grade Point Value	Description
90-100	A+	4.00	Outstanding performance
85-89	A	4.00	Excellent performance
80-84	A-	3.70	Approaching excellent performance
77-79	B+	3.30	Exceeding good performance
73-76	B	3.00	Good performance
70-72	B-	2.70	Approaching good performance

Percentage	Letter Grade	Grade Point Value	Description
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.

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 time table. You can change your registration during the course change period. Please see the [Registration Changes and Exemption Requests](#) page.

Attention history majors: History 300 is a required course for all history majors. You should normally take it 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](#).

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 [The History Student's Handbook](#) 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 of Calgary Calendar*, [Section K: Integrity and Conduct](#).

Academic Accommodations

Students needing an accommodation because of a disability or medical condition should contact [Student Accessibility Services](#) in accordance with the Procedure for Accommodations for Students with Disabilities in the [Student Accommodation Policy](#).

Students needing an accommodation based on a protected ground other than disability should contact, preferably in writing, the course instructor.

Copyright

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 [University of Calgary copyright page](#).

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 violence policy](#).

Other Useful Information

Please see the Registrar's [Course Outline Student Support and Resources](#) 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
- Campus Security (403-220-5333)

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