

**University of Calgary
Arts and Science Honours Academy**

ASHA 501 (L01): The Nature of Research

FALL 2020: September 8 to Dec. 8 (excluding Nov. 9-13)

Seminar: Tuesdays 17:00 to 19:45

Room: The course will be delivered in an online format on Zoom® / synchronous (due to COVID-19 Pandemic: <https://news.ucalgary.ca/news/important-covid-19-update-university-will-remain-open-classes-will-resume-monday-remote-learning>) / Recording for students not-in-residence (only lecture parts)

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Web Page:	D2L available through MyUofC portal
Office Hours:	Thursdays 14:00 to 15:00 pm or by appointment.

Course Librarian

Nadine Hoffman (Nadine.Hoffman@ucalgary.ca)

Course Description

The website of the Arts and Science Honours Academy describes this advanced undergraduate course as follows: “This course will consider academic research within the social, historical and political context of its production and use. Questions to be considered include, but are not limited to: the historical development of professions and disciplines; the cultural framework within which research is produced and the cultural uses of research; and the ways in which research creates objects of knowledge and serves to define and categorize human experience and identity.”

This undergraduate course will survey multiple research communities since the Early Modern Period to ask just what research meant at the respective times and to review the differences and similarities in the research endeavour over time. According to the *Oxford English Dictionary*, the mere word ‘research’ derives from the French ‘*recherche*’ and simply meant (in 1577) an “act of searching (closely or carefully) for or after a specified thing or person.” A second meaning, closer to our contemporary usage, appeared in 1639 as a “search or investigation directed to the discovery of some fact by careful consideration or study of a subject; a course of critical or scientific inquiry.” Not surprisingly, the term emerged during what was called in retrospect “The Scientific Revolution” (T.S. Kuhn) – i.e. a period of intense debate and reconsideration of ‘nature,’ beginning in the 16th century among natural philosophers of various *couleurs*. One of the roots of the concept of research stems hereby from the Latin ‘*circare*,’ which referred to “wander hither and thither.” It may come as no surprise that not only the process of doing research but even the individual activities of going to an archive, a research museum, a library, an excavation ground in the

field, the observation of animals or stars often appears and feel exactly like what ancient and early modern philosophers had described.

Contemporary disciplines, including the natural sciences, the social sciences and the humanities, now each have their own traditions of research practices and standards of what counts as good research and what does not. Furthermore, those practices and standards are not stable and are subject to revision and debate, as is the very notion of scientific “objectivity.” Sometimes the related debates become visible, providing us with insights into the production of knowledge in particular disciplines that might otherwise reside out of public sight. We will be examining both standard cases of accepted knowledge production and intricate scientific and philosophical debates, which can help to further our understanding of the “nature of research.” This may include instances of research projects and programs outside of institutionalized university settings, such as in the industry, the military, in hospitals, etc.

For an interdisciplinary class of students, this course addresses related history and philosophy of science issues in a novel way and seeks to examine such topics from wider social, historical, gender, race, and cultural contexts. It particularly includes an exploration of research history matters not with respect to each scientific discipline, but from distinct “ways of knowing.” Primarily, six different research types will be addressed as specific ways of knowing: “ways of world reading,” “natural history,” “analyses,” “syntheses,” “experimentalism,” and “technoscience.” Within each of the usually two-week blocks, there is some information from five centuries from the Renaissance to the modern sciences of our time that will be put in their local historical contexts. Furthermore, this course also introduces some major historiographical and philosophical theories regarding the ‘nature of research,’ interpretations, as put forward by eminent historians of science and medicine, such as by Alexandre Koyré (1892-1964), Ludwik Fleck (1896-1961), George Canguilhem (1904-1995), Thomas S. Kuhn (1922-1996), Paula Findlen, as well as Naomi Oreskes.

Additional Information

The weekly schedule of topics and readings (see also below) can be found on D2L too.

Objectives of the Course

- (1) through lectures, discussions, presentations, and structured research, an academic forum will be provided for the appreciation of differences in the validation, construction, and contestation of forms of research and ways of knowing;
- (2) to analyze important issues and discourses in multiple practices of research as they undergird and intersect conceptions of regionalism, gendered, classed, and ethnic voices, multiculturalism, positivism, religion and secularization, media perceptions, and popular culture and consciousness;
- (3) to help equip students with useful academic tools and background knowledge necessary for a critical, clear, and effective evaluation of the dynamics of research in humanistic, sociological, and natural science settings – past and present;
- (4) to explore the interdisciplinary meanings of research in light of scholarly forms of positioning from the “Scientific Revolution” to the modern-day “Science Wars;”

(5) to critically assess the fluid intellectual axis of time, space, and place on how research is created, shaped, and purveyed;

(6) to encourage curiosity for the importance of elaborate argumentation over personal and public opinion in the wider context of research. The intellectual foundations of this course encourage participants to also critically challenge their own pre-conceived notions, ideas, conceptions, and biases in research;

(7) to enable students to understand more clearly the uses and misuses of research knowledge in policymaking, legal contexts, judicial settings, and public debates at large;

(8) to develop an active, circumscribed research project during the period of the course, which ideally makes use of the available local collections at the University of Calgary, Military Museums, Glenbow Museum, AHS Historical Archival Collection, or at the Memorial Park Library, etc. (depending on their recent Covid-19-related opening policies). While some of these collections are currently open or in the process of reopening during FT2020 (e.g. AHS, Military Museums, and Western Canadian Research Centre), it will also be accommodated that under the current Covid-19-situation students can also access available (national/international) online collections for their research projects (incl., but not limited to, the Osler Library, Wellcome Library, and National Library of Medicine). For further updates, our liaison librarian Nadine Hoffman can be contacted during her office hours and per email as well. The use of these collections will be individual, and the respective research projects position each student to also reflect on her/his active research process over the course of the fall term.

Course Requirements

Having successfully completed ASHA 421 is a program prerequisite of the current course. Please note further that this course is open only to students in the Arts and Science Honours Academy of the University of Calgary's Faculty of Arts.

The assignments in the course are based on three presentations (with handouts) and the leading of the discussion during the respective classes (worth 10% each) in the course. The participation mark includes attendance and regular contributions to discussions. Furthermore, there will be a mid-term paper (worth 30%), and one final research report (also worth 30%) based on the active research project with materials from one local collection. The 7-page essay (of about 2,500 words, excl. endnotes), which students are required to write on a topic related to the course, is due on Tuesday, October 13, 2020. The 8-page research report (of about 3,000 words, excl. collection sources and appendices, is due on the last day of classes during the fall term (Dec-8, 2020). The latest version of the *Chicago Manual of Style* is used for this course. Late assignments will be subject to a 5% penalty per working day late.

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 entails 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 UofC 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. The course textbooks

and required readings are listed below. Further essential readings for this course will be available online from the electronic databases of the UofC Library; more material (such as links to literature, TFDL materials, and ppts) will be offered through Desire2Learn (D2L).

Textbooks and Readings

Purchase the following books (UofC Bookstore: <https://www.calgarybookstore.ca>), which can be received from the bookstore during their (reduced) opening hours for the duration of the Covid-19 pandemic:

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)

Steven Yearley, *Making Sense of Science: Understanding the Social Study of Science* (London, UK: SAGE, 2005)

Additional articles for the classes below are available through “JStor” (<https://www-istor-org.ezproxy.lib.ucalgary.ca>) and the journal holdings of the Taylor Family Digital Library.

Recommended Texts (these are the texts for the reading sessions, which are also in the HSL/TFDL and many are available open access and through the Hathi Trust® as well).

Policy on the use of Electronic Communication Devices

Laptops, tablets, and mobile phones may be used in class and tutorials only for course-related purposes and only if their use is not distracting others or negatively impacting the learning environment. No audio or video recording is allowed in any class without the instructor’s permission (an official recording of the lectures on Zoom® will be provided for students’ reviewing after each session / student presentations will not be recorded).

Assignments and Evaluation

Weight	Assessed Components	Due
20%	Presentation and leading of discussion.	<i>Passim.</i>
20%	Participation mark.	<i>Passim.</i>
30%	Mid-term paper (Chicago style).	Oct-13
30%	Final research report (Chicago style).	Dec-8

Registrar-scheduled Final Examination: No

Note: You must complete all assignments and exams, or a course grade of F may be assigned at the discretion of the instructor. If you miss a required course component, please contact your instructor as soon as possible.

Submission of Assignments

Please include your name and ID number on all assignments and hand in your essays through the D2L site and per email to your instructor (as reconfirmation). **Note:** It is your

responsibility to keep a copy of each submitted assignment and to ensure that you submit the proper version (particularly in courses requiring electronic submission).

Private information related to individual students is treated with the utmost regard by University of Calgary faculty. Student assignments will be accessible only by the authorized course faculty, and personal information is collected in accordance with the ***Freedom of Information and Protection of Privacy (FOIP) Act***. Please note that instructors may use audio or video recorded for lesson capture, assessment of student learning, and self-assessment of teaching practices.

Policy for Late Assignments

Assignments submitted after the deadline may be penalized with the loss of 5% or a partial letter grade (e.g.: A- to B+) for each working day late.

On-Line Instruction Statement:

Instruction occurs via synchronous online lectures and online discussions on Zoom®. PPT slides are used and are individually uploaded to “Desire2Learn” (D2L®) before each class (class times). The dates and times for all synchronous sessions are given below (~ already timetabled for this course).

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

- the course description
- instructions for “assignments” / rubrics
- selected PowerPoint presentations of the lectures and workshops
- students’ presentation handouts
- library resource materials and internet links
- bibliography of additional readings for the individual sessions of the course

Learning Technologies Requirements

UofC access to Zoom® and UofC access to D2L® are required and relied upon. A computer/ laptop with a supported operating system is required, as well as current and updated web browsers with webcam (built-in or external) and a microphone and speaker (built-in or external or headset). Current antivirus and/or firewall software needs to be enabled; broadband internet connection is needed (this speaks against using a cellphone for this course).

Guidelines for Synchronous Sessions

Since the video conferencing tool Zoom® is used during course activities, students are asked to go online 10-15 min. before the beginning of classes and test her video and mike. The personal camera should be on, the mike muted during the lecture parts but unmuted during discussion periods. Students should find a quiet and individual space (room with the door shut) or a working cubicle in a library. Lecture-based sessions (indicated at the beginning of the class) will be recorded to offer access to students not in residence. These recordings will be used to support student learning only and will not be shared or used for any other purpose.

For example: Zoom® is a video conferencing program that will allow us to meet at specific times for “live” and synchronous classes. 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 behaviour in these sessions may affect others. Participants are required to use names officially associated with her UCID (legal or preferred names listed in the Student Centre) when engaging in these activities. Non-compliance may be investigated under relevant University of Calgary conduct policies (e.g. Student Non-Academic Misconduct Policy). If the participants have difficulties complying with this requirement, 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/>. If you are unable to attend a Zoom session, please contact your instructor to arrange an alternative activity for the missed session (e.g., to review a recorded session).

Student Accommodations

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS); SAS will process the request and issue letters of accommodation to instructors. For information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

Students seeking accommodation for transient illnesses (e.g., the “flu”) or another legitimate reason should contact their instructors. Whenever possible, students should provide supporting documentation to support their request; however, instructors may not require that a medical note be presented. For the policy on supporting documentation the use of a statutory declaration, see Section M.1 of the *University Calendar*.

<https://www.ucalgary.ca/pubs/calendar/current/index.html>. Also see FAQs for Students: <https://www.ucalgary.ca/registrar/registration/appeals>

Expectations for Writing

Department policy directs that all written assignments and, to a lesser extent, written exam responses 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 and proper documentation of research sources. For further information, please refer to the *University of Calgary Calendar* section on writing across the curriculum: <http://www.ucalgary.ca/pubs/calendar/current/e-2.html>

Arts and Science Honours Academy Grade Scale

The following table outlines the grade scale percentage equivalents used in for the Arts and Science Honours Academy. Final grades are reported as letter grades. For components graded using percentages or numerical scores, those values will be used directly in calculating the final course grade, while for components graded using letter grades, the letter grades will be converted to the midpoint values in calculating the final course grade.

In this course, each course component will be graded using numerical scores, while a single letter grade will be given for the whole course achievement – based on the partial letter grades for the individual assignments throughout. The following grading scale is used:

	Grading Scale
A+	96-100
A	90-95.99
A -	85-89.99
B+	80-84.99
B	75-79.99
B-	70-74.99
C+	65-69.99
C	60-64.99
C-	55-59.99
D+	53-54.99
D	50-52.99
F	0-49

Plagiarism

Using any source whatsoever without clearly documenting it is a serious academic offense. Consequences include failure on the assignment, failure in the course and possibly suspension or expulsion from the university. These requirements apply to all assignments and sources, including those in non-traditional formats such as Web pages or visual media.

You must document not only direct quotations but also paraphrases and ideas where they appear in your text. A reference list at the end is insufficient by itself. **In-text citations must be provided, and readers must be able to tell exactly where your words and ideas end, and other people's words and ideas begin.** Wording taken directly from a source must be enclosed within quotation marks (or, for long quotations, presented in the format prescribed by the documentation style you are using). Paraphrased information must not follow the original wording and sentence structure with only slight word substitutions here and there.

For information on citation and documentation styles (MLA, APA, Chicago, IEEE, etc.), visit the Student Success Centre resource links at <https://ucalgary.ca/student-services/student-success/writing-support> or the Purdue Online Writing Lab (OWL) Research and Citation Resources at https://owl.purdue.edu/owl/research_and_citation/resources.html

If you need help with your writing or have questions about citing sources, please consult your instructor or visit the Student Success Centre, 3rd floor, Taylor Family Digital Library. To book an appointment, go to <https://www.ucalgary.ca/student-services/student-success>

Instructor Intellectual Property & Copyright Legislation

Course materials created by the instructor (including course outlines, presentations and posted notes, labs, case 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 same course section and term may be allowed under fair dealing. Check with the instructor if you have any questions about sharing materials with classmates.

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (<https://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright-policy.pdf>) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized 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.

Academic Misconduct

For information on academic misconduct and its consequences, please see the *University of Calgary Calendar* at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

Research Ethics

Whenever you perform research with human participants, including surveys, interviews, or observations as part of your university studies, you are responsible for obtaining research ethics approval and for following university research ethics guidelines. In some cases, your instructors may apply for course-based research ethics approval for certain assignments, and in those cases, they must review and approve your research plans and supervise your research. For more information about your research ethics responsibilities, please see <https://arts.ucalgary.ca/research/arts-researchers/resources-researchers-and-instructors/ethics>

Deferrals of Course Work and Requests for Reappraisal

For university regulations and procedures related to deferrals of exams and course work, requests for reappraisals, and other matters, please see the relevant sections in the *University Calendar*: <https://www.ucalgary.ca/pubs/calendar/current/academic-regs.html>

Student Support Services and Resources

Please visit <https://www.ucalgary.ca/registrar/registration/course-outlines> for information about student support services and resources, including Wellness and Mental Health Resources, Student Success programs and services, the Student Ombuds Office, the Student Union, and Safewalk.

For resources on D2L, visit <http://elearn.ucalgary.ca/desire2learn/home/students>. IT support is available at itsupport@ucalgary.ca or by calling 403-220-5555.

Schedule: Course activities are planned as synchronous classes on Zoom®.

Schedule of Lecture Topics and Readings

Aug, 31-Sept, 4: BLOCKWEEK: NO CLASS!!

Tues, 8 Sept: Course Introduction – “The Nature of Research”

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), pp. 1-14.

1. WAYS OF WORLD READING

Tues, 15 Sept: Framing Commitments & Scientific Understanding(s)

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), pp. 17-31; Steven Yearley, *Making Sense of Science: Understanding the Social Study of Science* (London, UK: SAGE, 2005), pp. 21-39; Steven Yearley, *Making Sense of*

Science: Understanding the Social Study of Science (London, UK: SAGE, 2005), pp. 41-54.

Tues, 22 Sept: Meanings, Readings & Revolution(s)

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), pp. 32-46; 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), pp. 119-141; Alexander Bird, "The Structure of Scientific Revolutions' and its Significance: An Essay Review of the Fiftieth Anniversary Edition," *The British Journal for the Philosophy of Science* 63 (2012), pp. 859-883.

2. WAYS OF NATURAL HISTORY

Tues, 29 Sept: "Historia" and Representation

John V. Pickstone, "Ways of Knowing: Towards a Historical Sociology of Science, Technology, and Medicine," *British Journal for the History of Science* 26 (1993), pp. 433-458; 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), pp. 57-87; Lorraine Daston and Peter Galison, "The Image of Objectivity," *Representations* 40 (1992), pp. 81-128.

Tues, 6 Oct: Taming Nature's Variability

Paula Findlen, "Possessing the Past: The Material World of the Italian Renaissance," *The American Historical Review* 103 (1998), pp. 83-114; Thierry Hoquet, "History without Time: Buffon's Natural History as a Nonmathematical Physique," *Isis* 101 (2010), pp. 30-61; Emma C. Spary, "'Peaches which the Patriarchs Lacked': Natural History, Natural Resources and the Natural Resources in France", *History of Political Economy* 35 (2003), pp. 14-45.

3. WAYS OF ANALYSES

Tues, 13 Oct: The Idea of Analysis

John V. Pickstone, "Natural Histories, Analyses and Experimentation: Three Afterwards," *History of Science* 49 (2011), pp. 349-374; John V. Pickstone, "Bureaucracy, Liberalism and the Body in Post-Revolutionary France: Bichat's Physiology and the Paris School of Medicine," *History of Science* 19 (1981), pp. 115-142; Steven Yearley, *Making Sense of Science: Understanding the Social Study of Science* (London, UK: SAGE, 2005), pp. 99-112.

Tues, 20 Oct: "Carving Nature at Its Joints"

Ian Hacking, "A Tradition of Natural Kinds," *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition* 61 (1991), pp. 109-126; 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), pp. 351-374; Steven Yearley, *Making Sense of Science: Understanding the Social Study of Science* (London, UK: SAGE, 2005), pp. 160-173.

4. WAYS OF SYNTHESSES

Tues, 27 Oct: Synthetic Research Programs

Maurice Crosland, "Research Schools of Chemistry from Lavoisier to Wurtz," *The British Journal for the History of Science* 36 (2003), pp. 333-361; John E. Lesch, "Conceptual Change in an Empirical Science: The Discovery of the First Alkaloids," *Historical Studies in the Physical Sciences* 11 (1981), pp. 305-328; Marsha L. Richmond, "'The Domestication' of Heredity: The Familial Organization of Geneticists at Cambridge University, 1895-1910," *Journal of the History of Biology* 39 (2006), pp. 565-605.

Tues, 3 Nov: Emerging Experts, the Management of Risk, and Public Discourse(s)

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), pp. 212-234; Steven Yearley, *Making Sense of Science: Understanding the Social Study of Science* (London, UK: SAGE, 2005), pp. 113-128; Steven Yearley, *Making Sense of Science: Understanding the Social Study of Science* (London, UK: SAGE, 2005), pp. 129-142.

November, 9-13: READING BREAK: NO CLASS!!

5. WAYS OF EXPERIMENTALISM

Tues, 17 Nov: Language, Nature, and Experiment

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), pp. 289-314; 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), pp. 315-350; Ian Hacking, "Philosophers of Experiment," *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* 2 (1988), pp. 147-156.

Tues, 24 Nov: The Place(s) of Experiment

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), pp. 59-88; 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), pp. 89-116; John V. Pickstone, "Working Knowledges Before and After circa 1800: Practices and Disciplines in the History of Science, Technology, and Medicine," *Isis* 98 (2007), pp. 489-516.

6. WAYS OF TECHNOSCIENCE

Tues, 1 Dec: Political Histories of Technoscience

Maxine Berg, "The Genesis of 'Useful Knowledge'," *History of Science* 45 (2007), pp. 123-133; Trevor Pinch, "Science as Golem," *Academe* 82 (1996), pp. 16-18; Simon Schaffer, David Serlin, and Jennifer Tucker, "Editors' Introduction," *Radical History Review* 127 (2017), pp. 1-12.

Tues, 8 Dec: Science, Technology, Medicine, and the Public

Jan Golinski, "A Noble Spectacle: Phosphorus and the Public Cultures of Science in the Early Royal Society," *Isis* 80 (1989), pp.11-39; Naomi Oreskes, "Objectivity or Heroism? On the Invisibility of Women in Science," *Osiris* 11 (1996), pp. 87-113; Steven Yearley, *Making Sense of Science: Understanding the Social Study of Science* (London, UK: SAGE, 2005), pp. 174-187.

Written Assignments:

Mid-term paper (7 pp, 12pt, 1,5-spaced, 2,500 words max., excl. endnotes & bibliography)!

Research report (8 pp, 12pt, 1,5-spaced, 3,000 words max., excl. endnotes & bibliography)!

[Mid-Term Paper on Tuesday, Oct-13 / Research Report: Dec-8, 2020]

Class Policies: During the online session, just like in our in-person classes, please be respectful with other class participants (during class times), and no hate speech is allowed. Consider Zoom® a professional environment and act accordingly. This also pertains to periods when students are asked to type in the chat. Stay on topic, when the chat window is used for questions and comments that are relevant to the class. The chat window is not a place for socializing or posting comments that distract from the course activities. The instructor will need to sort through the information quickly to address students' real questions/concerns about the course.

Fall 2020
