

HPSC0080 Early Modern Science

Course Syllabus

2023-2024 session | Simon Werrett | s.werrett@ucl.ac.uk

The early modern period, from c.1400 to 1800, experienced a radical transformation in ideas and engagements with the natural world. The module explores these changes through the works of a variety of men and women interested in the making of natural knowledge. Through a range of primary and secondary literature the module considers key elements of early modern science through critical perspectives developed in recent years in STS. The module provides participants with the opportunity to develop an extended research essay, and provides historical perspective on themes and issues explored in other MSc modules.

Course Information

Basic course information

Moodle Web site:	https://moodle.ucl.ac.uk/course/view.php?id=7483
Assessment:	Coursework (4000 words) – 100%
Timetable:	Go to the common timetable: https://timetable.ucl.ac.uk/tt/homePage.do
Prerequisites:	No prerequisites
Required texts:	None
Course tutor(s):	Simon Werrett
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Office hours:	Online: please contact me

Schedule

UCL Week	Topic	Discussion Date	Activity
6	Introduction	OCT 4	No reading required
7	African Healers in the Eighteenth Century	OCT 11	Read essential reading
8	Recipes for Experiment	OCT 18	Read essential reading
9	Research and Writing Session	OCT 25	Bring draft proposal to discuss
10	Natural Knowledge in Late Ming China (Online lecture)	NOV 1	Submit essay proposal
11	Reading Week	NOV 7	
12	Science and Exploration in Russia	NOV 15	Read essential reading
13	Newton, Science and Religion	NOV 22	Read essential reading
14	Exchanging the Americas in the Eighteenth Century	NOV 29	Read essential reading
15	The East India Company and Science in India	DEC 6	Read essential reading
16	Material Histories of Science	DEC 13	Read essential reading

Classes

The class consists of one hour of lecture and one hour of group discussion. Classes are all in person, but the class on November 1 will consist of an online lecture only. Please read the required readings ahead of class and be ready to discuss them. Questions to support your reading are provided on the Moodle site.

Assessments

Summary

	Description	Deadline	Word limit
Essay proposal	You are encouraged to submit a proposal for feedback from the course tutor on your research plans	25 Oct, 2023	1 page

Essay	Essay of original research on a topic relating to early modern science	January 04, 2024 at 5pm	4000
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Assignments

Students are expected to write an essay, in formal historical style, on a topic of their choosing. The topic should be approved by the class tutor before you commence research. We will discuss your plans in the class on October 25, so please have something ready to talk about. You should submit a one-page proposal on November 1 online, which the tutor will read and write back to you about, with suggestions. The proposal is not marked.

All essays should clearly relate to themes discussed in the class. It is a good idea to start by finding a suitable primary source to work with. Essays must be submitted via Moodle. In order to be deemed 'complete' on this module students must attempt the essay. The deadline for submission is provided above.

Criteria for assessment

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook. In addition to the criteria indicated in the STS Student Handbook, the following are the main criteria on which your essay will be marked. There are no set numbers/ percentages associated with these criteria but we will give you qualitative feedback based on them.

Choice of research question

You must choose a clear, focused, and practical question to research in your essays, examining some particular issue in the history of early modern science, technology or medicine. If you are unsure about this, speak to the module tutor.

Reading/ use of sources

What range of sources have been used (primary, secondary, archival)? How well have these been made use of? You are expected to make use of the literature on the syllabus and engage with the arguments explored in the course. An essay that does not do this in a substantial way will receive a failing grade.

Independent critique?

Does the essay offer independent critique or thought on the question or does it merely report what is in the literature? Make clear in your essay what is original about your work.

Use your own words

Do not paraphrase sources closely. We wish to see evidence that you can understand texts and articulate their arguments in your own words. Copying texts and changing a few words amounts to academic misconduct, so make sure you do not do this.

Referencing

Essays must be fully referenced, including page numbers for all quotations. Pick one system for referencing and stick to it. Refer to individual page numbers, not just whole texts, whenever possible. A style guide will be provided.

Bibliography

Essays need to include a bibliography of all works referenced. This must supply author, title, date, place of publication and publisher. There must be acknowledgment of AI-use or non-use.

Organisation

Is the essay organized into an introduction, main body and conclusion? Does each part flow naturally into the next one? Is the evidence in a logical order?

Introduction

Essays should include an introduction in no more than one or two pages. Introduce your topic and your line of argument, indicate what has been written about it previously, and how your argument will be original and distinctive. Indicate briefly how the argument will be organized.

Clarity

We place great emphasis on clarity of argument and expression. Avoid ambiguity and vagueness. Do not assume your reader already knows what you are talking about. Try to keep your line of argument clear. It often helps clarity to divide the main body of the essay into sections (typically three or four for a 4000 word essay). Accurate spelling, grammar, and punctuation also improve clarity.

Argumentation

Is the main argument of the essay clear, coherent and persuasive? Is it properly supported by the evidence available? The argument should engage with issues or approaches raised in the module.

Conclusion

Essays should have a conclusion which is clearly marked as such (new paragraph, 'In conclusion...'). It should be substantial in summing up what you have argued and exploring the implications of what you have argued.

Historiography?

How aware is the essay of assumptions and methods used to construct a history or to evaluate it? Does the essay discuss what historians have said about the topic and offer some critique of them?

Use of AI/ Chat GPT

Please read UCL's guidance on using AI at this link: <https://www.ucl.ac.uk/students/exams-and-assessments/assessment-success-guide/engaging-ai-your-education-and-assessment>

This module is category 2: AI tools can be used in an assistive role

Students are permitted to use AI tools for specific defined processes within the assessment.

Students can leverage AI for tasks such as data analysis, pattern recognition, or generating insights.

Examples of where AI might be used in an assistive category include:

- drafting and structure content;
- supporting the writing process in a limited manner;
- as a support tutor;
- supporting a particular process such as testing code or translating content;
- giving feedback on content, or proofreading content.

You are not permitted to use AI simply to generate the content that you submit. This amounts to academic misconduct. But you may use it as a research and writing tool, in the manner above. You MUST acknowledge use of AI if you have used it. At the end of the essay, include the following:

- Name and version of the generative AI system used; e.g. ChatGPT-3.5
- Publisher (company that made the AI system); e.g. OpenAI
- URL of the AI system.
- Brief description (single sentence) of how the tool was used.

For example:

I acknowledge the use of ChatGPT 3.5 (Open AI, <https://chat.openai.com>) to summarise my initial notes and to proofread my final draft.

Aims and objectives of the course

aims

- provide knowledge of key episodes in the history of early modern natural knowledge
- identify key themes in the historiography of early modern natural knowledge
- make use of contemporary research when interpreting historical cases.
- develop research skills that make use of archives, museum collections, and digital resources

objectives

By the end of this module students should be able to:

- demonstrate knowledge of key themes in the history of early modern natural knowledge
- provide a critical analysis of key themes in the historiography of early modern natural knowledge
- relate issues in the history of early modern natural knowledge to key approaches in contemporary science and technology studies
- demonstrate professional-level research skills

Schedule of Classes

All classes will be taught in person, except for the class on November 1, which will consist of an online lecture. Please read the essential readings ahead of class and be prepared to discuss them in class. There are questions on Moodle to help with your preparation.

October 4. Introduction

Essential –

Lissa Roberts (ed.), “Situating Science in Global History: Local Exchanges and Networks of Circulation,” *Itinerario* 33 (2009): 9-30.

Fa-ti Fan, “The Global Turn in the History of Science,” *East Asian Science, Technology and Society: An International Journal* 6 (2012): 249–58.

Optional – these are more general texts on the current state of the field:

Clapperton Mavhunga, “Introduction,” to Clapperton Mavhunga, (ed.), *What Do Science, Technology, and Innovation Mean from Africa?* (Cambridge, MA: The MIT Press, 2017), 1-29.

Shadreck Chirikure, “The Metalworker, the Potter, and the Pre-European African “Laboratory,”” in Clapperton Mavhunga, (ed.), *What Do Science, Technology, and Innovation Mean from Africa?* (Cambridge, MA: The MIT Press, 2017), 63-78.

J. B. Shank, “After the Scientific Revolution: Thinking Globally about the Histories of the Modern Sciences,” *Journal of Early Modern History* 21 (2017): 377-393.

Steven Shapin and Simon Schaffer, *Leviathan and the Air-pump: Hobbes, Boyle, and the Experimental Life*. Revised ed. 2017 (Princeton Classics. Web)

Kapil Raj, “Beyond Postcolonialism... and Postpositivism: Circulation and the Global History of Science,” *Isis* 104, no. 2 (2013): 337-47.

Peter Dear, *Revolutionizing the sciences: European knowledge and its ambitions, 1500-1700* (Princeton, N.J.: Princeton University Press, 2001).

October 11. African Healers in the Eighteenth Century

Essential

Jonathan Roberts, “Medical Exchange on the Gold Coast during the Seventeenth and Eighteenth Centuries,” *Canadian Journal of African Studies* 45 (2011): 480-523.

Kalle Kananoja, “Infected by the Devil, Cured by *Calundu* : African Healers in Eighteenth-century Minas Gerais, Brazil,” *Social History of Medicine* 29 (2016): 490–511.

Optional

Clapperton Chakanetsa Mavhunga, *Transient workspaces: technologies of everyday innovation in Zimbabwe* (Cambridge, MA: MIT Press, 2014), introduction and chapter 2 "The Professoriate of the Hunt."

Philip J. Havik. "Hybridising Medicine: Illness, Healing and the Dynamics of Reciprocal Exchange on the Upper Guinea Coast," *Medical History* 60 (2016): 181-205.

Helen Tilley, "Global Histories, Vernacular Science, and African Genealogies," *Isis* 101 (2010)

October 18. Recipes for ExperimentEssential

Elaine Leong, "Making Medicines in the Early Modern Household," *Bulletin of the History of Medicine* 82, no. 1 (2008): 145-68.

Find three recipes, one medical, one culinary, and one other, from the digitized recipe books in the Wellcome Collection (see link on reading list)

Who were the authors of these recipes? Can you find out anything about them?

How do these differ from modern recipes?

Can you find any recipes with evidence they were tried or tested?

Optional

Sara Pennell, and Michelle DiMeo, "Introduction." In *Reading and Writing Recipe Books, 1550–1800*, edited by DiMeo Michelle and Pennell Sara, 1-22. (Manchester: Manchester University Press, 2013).

Alisha Rankin. "Empirics, Physicians, and Wonder Drugs in Early Modern Germany: The Case of the "Panacea Amwaldina"." *Early Science and Medicine* 14, no. 6 (2009): 680-710.

Sara Pennell, "Making Livings, Lives and Archives: Tales of Four Eighteenth-century Recipe Books." In *Reading and Writing Recipe Books, 1550–1800*, edited by DiMeo Michelle and Pennell Sara, 225-46 (Manchester: Manchester University Press, 2013).

Sara Pennell, "Perfecting Practice? Women, Manuscript Recipes and Knowledge in Early Modern England," in *Early Modern Women's Manuscript Writing*, eds. Victoria E. Burke and Jonathan Gibson (Aldershot: Ashgate, 2004), 237-258.

Steven Shapin, "The House of Experiment in Seventeenth-Century England" *Isis* 79 (1988): 373-404.

Pamela H. Smith, "Laboratories," in *The Cambridge History of Science Vol. 3 Early Modern Science*

Elaine Leong, "Collecting Knowledge for the Family: Recipes, Gender and Practical Knowledge in the Early Modern English Household," *Centaurus* 55 (2013): 81-103.

Wendy Wall, *Recipes for Thought: Knowledge and Taste in the Early Modern Kitchen* (Philadelphia: University of Pennsylvania Press, 2015).

Lynette Hunter and Sarah Hutton, eds. *Women, Science, and Medicine, 1500–1700: Mothers and Sisters of the Royal Society* (Stroud: Sutton Publishing, 1997).

October 25. Essay writing guidance session

Essential – bring a one-page draft research proposal with you to class, and be prepared to discuss your ideas.

November 1. Craft Knowledge and Natural Knowledge in Late Ming China (online lecture)

Essential

Simon Schaffer, "Instruments as Cargo in the China Trade," *History of Science* 44 (2006): 217–46.

Optional

Benjamin A. Elman, *A Cultural History of Modern Science in China* (Harvard University Press, 2006), chapter 1 "The Jesuit Legacy".

Toby Huff, *The Rise of Early Modern Science: Islam, China and the West* (Cambridge: Cambridge University Press, 1993), chapters 7 and 8.

Laura Hostetler, "Global or Local? Exploring Connections between Chinese and European Geographical Knowledge During the Early Modern Period," *East Asian Science, Technology, and Medicine* 26 (2007): 117-135.

Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000).

Qiong Zhang, *Making the New World Their Own Chinese Encounters with Jesuit Science in the Age of Discovery* (Leiden: Brill, 2015).

Jami, Catherine, and Han Qi. "The Reconstruction of Imperial Mathematics in China during the Kangxi Reign (1662-1722)," *Early Science and Medicine* 8, no. 2 (2003): 88-110.

Jami, Catherine, "Revisiting the Calendar Case (1664-1669): Science, Religion, and Politics in Early Qing Beijing," *Korean Journal of History of Science* 27 (2015): 459-477.

He Bian, "Introduction," *Know Your Remedies: Pharmacy and Culture in Early Modern China* (Princeton University Press, 2020), 1-19.

Dagmar Schäfer, "Things (Wu) and Their Transformations (Zaowu) in the Late Ming Dynasty: Song Yingxing's and Huang Cheng's Approaches to Mobilizing Craft Knowledge," In *Entangled Itineraries: Materials, Practices, and Knowledges across Eurasia*, edited by Pamela H. Smith (Pittsburgh: University of Pittsburgh Press, 2019), 63-78.

Nathan Sivin, "Why the Scientific Revolution Did Not Take Place in China – or Did it?" *Environmentalist* 5 (1985): 39–50.

November 8. READING WEEK

November 15. Science and Exploration in Russia

Essential

"Ekaterina Romanova Dashkova (1744–1810): An extract from *Memoirs of the Princess Daschkaw, Lady of Honour to Catherine II* (1840)," in *Women in the History of Science: A Sourcebook*, eds. Hannah Wills, Sadie Harrison, Erika Jones, Farrah Lawrence-Mackey and Rebecca Martin (London: UCL Press, 2023), 161-166.

Optional

Clare Griffin, "Bureaucracy and Knowledge Creation: The Apothecary Chancery," In *Information and Empire: Mechanisms of Communication in Russia, 1600-1854*, edited by Franklin Simon and Bowers Katherine (Cambridge, UK: Open Book Publishers, 2017), 255-86.

Rachel Koroloff, "Juniper: From Medicine to Poison and Back Again in 17th-Century Muscovy," *Kritika* 19 (2018): 697-716.

Michael D. Gordin, "The Importation of Being Earnest: The Early St. Petersburg Academy of Sciences," *Isis* 91, no. 1 (2000): 1-31.

Simon Werrett, "The Schumacher Affair: Reconfiguring Academic Expertise across Dynasties in Eighteenth-Century Russia," *Osiris* 25, no. 1 (2010): 104-26.

Yuri Slezkine, 'Naturalists versus Nations: Eighteenth-Century Russian Scholars Confront Ethnic Diversity,' in *Russia's Orient: Imperial Borderlands and Peoples, 1700-1917*, eds. Daniel R. Brower and Edward J. Lazzerini (Bloomington, Indiana: Indiana University Press, 1997), pp. 27-57.

Yuri Slezkine, *Arctic mirrors: Russia and the small peoples of the North* (Cornell University Press, 1994), Introduction and Chapter 2 “The Unenlightened”.

Robert Collis, *The Petrine Instauration: Religion, Esotericism and Science at the Court of Peter the Great, 1689-1725* (Leiden: Brill, 2012).

Valerie A. Kivelson, “Unclean Spirits Unleashed: Flying Bricks, Demonic Possession, and Blackmail in Russia, 1636,” *Russian History* 40, no. 3/4 (2013): 315-30.

Simon Werrett, “Technology on Display: Instruments and Identities on Russian Voyages of Exploration,” *Russian Review*, Vol. 70, no. 2 (July 2011): 380-396.

Matthew Romaniello, “Could Siberian ‘Natural Curiosities’ Be Replaced? Bioprospecting in the Eighteenth-Century,” *Early Science and Medicine* 27 (2022): 257-77.

November 22. Newton, Science and Religion

Essential

Rob Iliffe, “The Religion of Isaac Newton,” in *The Cambridge Companion to Newton*, eds. Rob Iliffe and George E. Smith, second edition (Cambridge, 2016)

Isaac Newton, “General Scholium” from *Principia*.

Optional

Rob Iliffe and George Smith, eds., *The Cambridge Companion to Newton* (Cambridge, 2018).

Betty Jo Teeter Dobbs, “Newton’s Alchemy and his Theory of Matter” *Isis* 73 (1982).

David Kubrin, “Newton and the Cyclical Cosmos” (1967) *Journal of the History of Ideas* 28 (1967): 325-346.

Simon Schaffer, “Newton on the Beach: The Information Order of *Principia Mathematica*,” *History of Science* 47 (2009): 243-276.

Cohen, I. Bernard, “The Newtonian Achievement,” in *The Scientific Revolution: Essential Readings*, ed. Marcus Hellyer (Oxford, 2008), 178-193.

Dear, Peter, *Revolutionizing The Sciences: European Knowledge and its Ambitions* (Princeton University Press, 2009), chapter 8, on Descartes and Newton.

Brooke, J.H., “The God of Isaac Newton,” in Fauvel, J., R. Flood, M. Shortland, and R. Wilson, eds., *Let Newton Be!* (Oxford: Oxford University Press, 1989), 169-183.

Shapin, S., “Of gods and kings: Natural philosophy and politics in the Leibniz–Clarke disputes,” *Isis* 72 (1981): 187–215.

Fara, P., *Newton: The Making of Genius* (London: Macmillan, 2002).

Mandelbrote, S., "Newton and Eighteenth-century Christianity," in I. B. Cohen, & G. E. Smith (eds.), *The Cambridge Companion to Newton* (Cambridge: Cambridge University Press) 409–430.

Snobelen, S. D., "God of gods, and Lord of lords': The Theology of Isaac Newton's General Scholium to the *Principia*," *Osiris* 16 (2001): 169–208.

November 29. Exchanging the Americas in the Eighteenth Century

Essential

Londa Schiebinger, "Scientific Exchange in the Eighteenth-Century Atlantic World," in *Soundings in Atlantic History*, edited by Bernard Bailyn and Patricia L. Denault (Cambridge, MA: Harvard University Press, 2009), 294–328.

Iris Montero Sobrevilla, "The Slow Science of Swift Nature: Hummingbirds and Humans in New Spain," in *Global Scientific Practice in an Age of Revolutions, 1750-1850*, eds. Patrick Manning and Daniel Rood (Pittsburgh: University of Pittsburgh Press, 2016), 127–146.

Optional

M. Achim, "From rustics to savants: Indigenous materia medica in eighteenth-century Mexico," *Studies in History and Philosophy of Biological & Biomedical Sciences* 42 (2011): 275-284.

Maria Portuondo, "Constructing a Narrative: The History of Science and Technology in Latin America," *History Compass* 7/2 (2009): 500-522.

Emily Walcott Emmart, "An Aztec medical Treatise: The Badianus Manuscript," *Bulletin of the Institute of the History of Medicine* 3, no. 6 (1935): 483-506.

Juan Pimentel, "Stars & Stones: Astronomy and Archaeology in the Works of the Mexican Polymath Antonio León y Gama, 1735–1802," *Itinerario* 33 (2009): 61-77.

Antonio Barrera-Osorio, "Communities of Experts: Artisans and Innovation in the New World," in Antonio Barrera-Osorio, *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution* (Austin, TX: University of Texas Press, 2010), 56-80.

Martha Few, "Medical Mestizaje and the Politics of Pregnancy in Colonial Guatemala, 1660–1730," In *Science in the Spanish and Portuguese Empires, 1500–1800*, edited by Bleichmar Daniela, De Vos Paula, Huffine Kristin, and Sheehan Kevin (Stanford, CA: Stanford University Press, 2009), 132-46.

Daniela Bleichmar, "A Visible and Useful Empire: Visual Culture and Colonial Natural History in the Eighteenth-Century Spanish World," In *Science in the Spanish and Portuguese Empires, 1500–1800*, edited by Daniela Bleichmar, Paula De Vos, Kristin Huffine, and Kevin Sheehan (Stanford: Stanford University Press, 2009), 290-310.

Mary Norton, "The Chicken or the legue: Human-Animal Relationships and the Columbian Exchange" *American Historical Review* (Feb 2015): 28-60.

Daniela Bleichmar, *Visible Empire: Botanical Expeditions and Visual Culture in the Hispanic Enlightenment* (Chicago: The University of Chicago Press, 2012).

Alain Schnapp, "Ancient Europe and Native Americans: A Comparative Reflection on the Roots of Antiquarianism," in Daniela Bleichmar and Peter C. Mancall, eds. *Collecting Across Cultures : Material exchanges in the early modern Atlantic world* (Philadelphia: University of Pennsylvania Press: 2011), 58-80.

Hugh Cagle, *Assembling the Tropics: Science and Medicine in Portugal's Empire, 1450-1700* (Cambridge: Cambridge University Press, 2018).

Pablo Gómez, *The Experiential Caribbean: Creating Knowledge and Healing in the Early Modern Atlantic* (Chapel Hill: University of North Carolina Press, 2017).

December 6. The East India Company and Science in india

Essential

David Arnold, "Science under the Company," in David Arnold, *Science, Technology and Medicine in Colonial India* (The New Cambridge History of India) (Cambridge: Cambridge University Press, 2000), 19-56.

Optional

Kapil Raj, "Mapping Knowledge: Go-Betweens in Calcutta 1770-1820," in Simon Schaffer et al. (eds.), *The Brokered World: Go-betweenes and Global Intelligence, 1770-1820* (Sagamore Beach, MA: Science History Publications, 2009), pp. 105-150.

Kapil Raj, "Colonial Encounters and the Forging of New Knowledge and National Identities: Great Britain and India, 1760-1850." *Osiris* 15 (2000): 119–134.

Deepak Kumar, *Science and the Raj: A Study of British India* (Oxford, 2006).

Deepak Kumar, "India," in Roy Porter, ed., *The Cambridge History of Science vol. 4: The Eighteenth Century* (Cambridge: Cambridge University Press, 2003), 669-687.

Projit Bihari Mukharji, "Historicizing "Indian Systems of Knowledge": Ayurveda, Exotic Foods, and Contemporary Antihistorical Holisms," *Osiris: A Research Journal Devoted to the History of Science and Its Cultural Influences* (2020): 228-248.

Barry Perlus, *Celestial Mirror: The Astronomical Observatories of Jai Singh II* (Yale University Press, 2020)

Seema Alavi, "Medical Culture in Transition: Mughal Gentleman Physician and the Native Doctor in Early Colonial India," *Modern Asian Studies* 42, no. 5 (2008): 853-97.

Jessica Ratcliff, "The East India Company, the Company's Museum, and the Political Economy of Natural History in the Early Nineteenth Century," *Isis* 107 (2016): 495-517.

December 13. Material Histories of Science

Essential

Lucy J. Havard, "Preserve or perish: Food preservation practices in the early modern kitchen," *Notes and Records of the Royal Society* 74 (2020): 5–33.

Optional

Anita Guerrini, "The Material Turn in the History of Life Science," *Literature Compass* 13/7 (2016): 469-80.

Lissa Roberts and Simon Werrett, eds., *Compound Histories: Materials, Production, Governance, 1760-1840* (Brill, 2017) (Open Access online), Introduction.

M.M.A. Hendriksen and R.E. Verwaal, "Boerhaave's Furnace. Exploring Early Modern Chemistry through Working Models," *Berichte zur Wissenschaftsgeschichte* 43 (2020): 385-411.

Simon Schaffer and Adriana Craciun, eds., *The Material Cultures of Enlightenment Arts and Sciences* (London: Palgrave Macmillan 2016).

Lucia Dacome, *Malleable Anatomies: Models, Makers, and Material Culture in Eighteenth-Century Italy* (Oxford: Oxford University Press, 2017).

Lissa Roberts, "The Death of the Sensuous Chemist" *Studies In History and Philosophy of Science Part A* 26 (1995): 503-529.

Simon Werrett, "The Sociomateriality of Waste and Scrap Paper in Eighteenth-Century England," in Carla Bittel, Elaine Leong, and Von Oertzen, eds., *Working with Paper: Gendered Practices in the History of Knowledge* (Pittsburgh: Univ. Pittsburgh Press, 2019), 46-59.

Simon Werrett, "Matter and Facts: Material Culture and the History of Science." In Alison Wylie and Robert Chapman, eds., *Material Evidence: Learning from Archaeological Practice* (London: Routledge, 2015).

Viktoria Tkaczyk and Christine von Oertzen, eds., "Supplied Knowledge: Resource Regimes, Materials, and Epistemic Tools," Focus Section of *Isis* 114 (2023): 359-412.

Harold J. Cook, Pamela H. Smith, Amy Meyers, eds., *Ways of Making and Knowing: The Material Culture of Empirical Knowledge* (University of Michigan Press, 2011).

Rina Knoeff, "Touching anatomy: On the handling of preparations in the anatomical cabinets of Frederik Ruysch (1638–1731)," *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 49 (2015): 32-44.

Course expectations

Students are expected to attend all classes, and to be prepared to discuss the readings which they should bring to class either in hard copy or electronic format. Students should read and make notes on essential texts, thinking of questions to ask about them in class. If a student cannot attend, please let the module tutor know beforehand.

Important policy information

Details of college and departmental policies relating to modules and assessments can be found in the STS Student Handbook www.ucl.ac.uk/sts/handbook

All students taking modules in the STS department are expected to read these policies.