HPSC0003: History of Science, Antiquity to Enlightenment

Course Syllabus

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

Course Information

Surveys the origins and development of science from the ancient Greeks to 1800. Main themes are the origins of science in the ancient world, the nature of the Scientific Revolution and the spread of science during the Enlightenment. Lectures are online and Discussion groups in person.

Basic course information

Assessment:	2 x 1500-word essays
Timetable:	Go to the common timetable: www.ucl.ac.uk/sts/hpsc
Prerequisites:	No prerequisites
Required texts:	None
Course tutor(s):	Simon Werrett, Jenny Bulstrode, Catherine Lucas
Contact:	s.werrett@ucl.ac.uk
Web:	www.ucl.ac.uk/silva/sts/staff/werrett
Office location:	Room 1.2, 22 Gordon Sq.
Office hours:	Online: please contact tutor

Schedule

	Topics	Date
	PART 1: History	
	Introduction: The Beginnings of Science	OCT 4
	Ancient Science and Medicine	OCT 11
	Science in the Middle Ages	OCT 18
	The Scientific Renaissance	OCT 25
	The Scientific Revolution 1	NOV 1
	Reading Week	NOV 8
	The Scientific Revolution 2	NOV 15
	PART 2: Perspectives	
	Gender and Spirit in 17th-Century Science	NOV 22
	The Age of Revolutions	NOV 29
	Science and the Enlightenment	DEC 6
	Science and Art	DEC 13

Assessments

Summary

	Description	Deadline	Word limit	Feedback returned by
Essay 1	50% of final mark	December 6 at 5pm	1500	December 29
Essay 2	50% of final mark	January 8 at 5pm	1500	January 26

CLASSES

Students have a two-hour slot each week for lectures, plus one hour for a discussion seminar. Students are expected to attend lectures and seminars in person. The discussion seminars consist

of a conversation about the week's essential reading. Please make sure you have read the essential reading before the class and bring a copy to class with you. You should be ready to answer questions similar to those below (see Assessment: Essay 1) relating to each reading. Note that registration is taken in each class and you are expected to attend.

ASSESSMENT: ESSAY 1

Write a critical analysis of one of the essential readings from weeks 1 to 5. This should take the form of an essay of approximately and no more than 1500 words.

What do you need to do? People often think that history books give us "the facts" – unassailable information about the past. But historical texts are a *representation* of events that inevitably include some things and leave out others. A critical analysis of a text will identify the arguments being made by an author and consider their merits. Questions to be explored may include:

- Who is the author of this text?
- What information can you glean from the title?
- What is the geographical and temporal scope of this text?
- For what purpose is the author writing this text?
- Who is the intended audience of this text?
- What is the topic of the text?/what themes does it explore?
- What sections does it have? What does each section argue?
- What is the author's overall argument?
- Do you think the author is successful in making their argument?/have they presented a convincing case?
- What evidence does the author use to support their claims? (source material, evidence, examples?) Is the evidence sufficient to establish the argument?
- What have other authors on the syllabus said about this topic? What are the possible contrary arguments?
- Is there anything which the author has overlooked? (missing evidence, not considering someone else's point of view, etc)
- What avenues are there for further research?

Essays that are mainly descriptive will score much lower than those offering more critique. When answering, avoid speculation – a speculative answer is one that does not have any evidence to support it. Answers should always be based on evidence – what you can infer from the text directly, or from reading about the text in secondary sources. You should always be able to point to a word or passage in the text that supports your interpretations, so the use of brief quotations to support your points is encouraged.

Please read the STS Student Handbook for advice on word counts and late penalties. *Essays should only make use of the assigned literature*.

ASSESSMENT: ESSAY 2

You are required to write an essay of approximately and no more than 1500 words. This should be another critical analysis of an essential reading, this time from weeks 6 to 11 of the module. The same terms apply to this essay as the essay in assessment 1.

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 research essay will be marked. There are no set numbers/ percentages associated with these criteria but we will give you qualitative feedback based on them.

Referencing
You must reference all quotes and all references/ summaries of books, etc. Pick one system for referencing and stick to it. Refer to individual page numbers, not just whole texts, whenever possible. Make sure you are clear what plagiarism means and do not plagiarize in the essay.

Bibliography
You need to supply a bibliography of all works referenced. You must supply author, title, date, place of publication and publisher. Essays should only make use of the readings given in the syllabus.

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
You should give an introduction to your essay in no more than one or two paragraphs. Introduce your topic and your line of argument, no more. Good introductions are concise and precise.

Clarity
We place great emphasis on clarity of argument and expression. Avoid ambiguity and vagueness. Explain anything that might not be obvious. Do not assume your reader already knows what you are talking about. Try to keep your line of argument clear. 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?

Conclusion
Your essay 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.

Reading/ use of sources
How well have the readings and other resources been used? Does the essay reflect them accurately? Is the essay overly dependent on one source?

Independent critique?
Does the essay offer some independent critique or thought on the question or does it merely report what is in the literature?

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.

Aim of the course

The general aim of the course is to present an overview of the History of Science from its ancient beginnings up to the end of the eighteenth century and to begin to offer critical perspectives on this history. The course does not require any technical knowledge of current science. Students will become familiar with the history of science from antiquity to 1800 in Europe and other parts of the world. The course offers critical appraisal of the ways historians have told this history. The course provides a

foundation for further modules in the second and third years of the degree which explore issues around the history of science in more depth.

Objectives of the course

By the end of the course, it is hoped that you will have acquired :
* a working knowledge of the history of science up to 1800
* an in-depth knowledge of elements of this history, demonstrated in essay assessments.
* key critical writing skills; the ability to select the most important facts, to marshal those in argument and an awareness of the strengths and weaknesses of that argument.
* some basic historiographical skills; an awareness of anachronism and the basic methods of writing the history of science.

Lectures and Readings

Part 1: HISTORY

This section of the course explores traditional histories of the development of the sciences between antiquity and the close of the eighteenth century.

Wed October 4

Lecture 1. Introduction: The Beginnings of Science

Discussion Group 1 – Discuss Essential Reading (FRIDAY OCT 6)

> Fara, P. *Science: A Four Thousand-Year History* (Oxford: Oxford University Press, 2009), part 1, chapter 2.

Optional Readings:

> Krauss, R. "Egyptian Calendars and Astronomy," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 131-143.
>
> Escobar, Eduardo A. "Tappūtī-bēlet-ekalle (fl. 1200 BCE): A cuneiform tablet on Middle Assyrian perfumery (c. 1200 BCE)," 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), 15-22.
>
> Rochberg, F. "Science and Ancient Mesopotamia," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 7-28.
>
> Rochberg, F. "Astral Sciences of Ancient Mesopotamia," in Paul T. Keyser and John Scarborough, eds., *The Oxford Handbook of Science and Medicine in the Classical World* (New York: Oxford University Press, 2018), chapter A1B.

Høyrup, J. "Mesopotamian Mathematics," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 58-72.

Steele, J. "Babylonian and Assyrian Astral Science," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 73-98.

Lindberg, D. C. *The Beginnings of Western Science* (University of Chicago Press, 2007), chapter 1.

Wed October 11

Lecture 2. Ancient Science and Medicine. In this class we cover Plato and Aristotle's cosmology and natural philosophy and medicine in ancient Greece and Rome.

Discussion Group 2 – Discuss Essential Reading (FRIDAY OCT 13)

Gregory, A. "Circe: An extract from Homer's Odyssey (c. 900–800 BCE)," 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), 23-34.

Optional readings:

Hippocrates, "On the Sacred Disease." (Online reading)

Craik, E. "Hippocrates and Early Greek Medicine," in Paul T. Keyser and John Scarborough, eds., *The Oxford Handbook of Science and Medicine in the Classical World* (New York: Oxford University Press, 2018), chapter B4.

Plato, *Timaeus and Critias*, ed. Andrew Gregory (Oxford: Oxford University Press, 2019).

Gregory, Andrew, *Eureka! The Birth of Science* (Icon, 2001).

Graham, Daniel W. "Physical and Cosmological Thought Before Aristotle," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 163-180.

Osborne, C. *Pre-Socratic Philosophy: A Very Short Introduction* (Oxford, Oxford University Press: 2004).

Falcon, A. "Aristotle: An Overview," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 181-195.

Lewis, E. "Aristotle's Physical Theory," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 196-214.

Van der Eijk, P. "Medicine in Early and Classical Greece," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 293-315

Nutton, V. "Hellenistic and Roman Medicine," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 316-344.

Lindberg, D. C. *The Beginnings of Western Science* (University of Chicago Press, 2007), chapters 2-3, and 6.

Fara, P. *Science: A Four Thousand-Year History* (Oxford: Oxford University Press, 2009), part 1, chapter 4-6.

Nutton, V. *Ancient Medicine* (Oxford: Routledge, 2013)

David, R. "Egyptian Medicine" in Paul T. Keyser and John Scarborough, eds., *The Oxford Handbook of Science and Medicine in the Classical World* (New York: Oxford University Press, 2018), chapter A2C.

Irby, Georgia L., *A Companion to Science, Technology and Medicine in Ancient Greece and Rome, volume 1* (Chichester: Wiley-Blackwell, 2016), Part V : Healing and the Human Body.

Hankinson, R. J. ed., *The Cambridge Companion to Galen* (Cambridge: Cambridge University Press, 2008).

Pormann, Peter E. ed., *The Cambridge Companion to Hippocrates* (Cambridge: Cambridge University Press, 2018).

Wed October 18

Lecture 3. Science in the Middle Ages. In this class we examine Chinese, Islamic and European Christian science up to the end of the fifteenth century, and the emergence of 'Scholasticism' in Europe.

Discussion Group 3 – Discuss Reading (FRIDAY OCT 20)

Lo, V. "Medicine and Healing in Han China," In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 574-594.

Optional readings:

Huang Ti Nei, Ching Su Wen, *The Yellow Emperor's Classic of Internal Medicine* (University of California Press, 1975), book 2, pp. 115-132.

Veith, Ilza, "Introduction: Analysis of the Huang Ti Nei Ching Su Wên." *The Yellow Emperor's Classic of Internal Medicine* (Berkeley: University of California Press, 1975), pp. 1–76 (available on JSTOR).

Cullen, C. “Chinese Astronomy in the Early Imperial Age: A Brief Outline,” In *The Cambridge History of Science Volume 1: Ancient Science*, eds. A. Jones & L. Taub (Cambridge: Cambridge University Press, 2018), 595-616.

Ragep, F. “Islamic Culture and the Natural Sciences.” In *The Cambridge History of Science Volume 2: Medieval Science*, eds. D. Lindberg & M. Shank (Cambridge: Cambridge University Press, 2013), 27-61.

George Saliba, *Islamic Science and the Making of the European Renaissance* (Cambridge, MA: MIT Press, 2007).

Hobson, John M. *The Eastern Origins of Western Civilisation* (Cambridge: Cambridge University Press, 2004), 173-189.

Jagot, S. “Ku‘ayba bt. Sa‘d al-Aslamiyya (fl. 620 CE): An extract from *Kitab al-tabaqat al-kubra* (Book of the Great Generations) (c. 600–900 CE),” 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), 57-60.

Bower, H. “Josian: Extracts from the Middle English romance Bevis of Hampton (c. 1300 CE),” 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), 66-70.

Dear, P. “What Was Worth Knowing in 1500?” in P. Dear, *Revolutionizing the Sciences* (Princeton, NJ: Princeton University Press, 2009), chapter 1.

Shank, M. “Schools and Universities in Medieval Latin Science,” In *The Cambridge History of Science Volume 2: Medieval Science*, eds. D. Lindberg & M. Shank (Cambridge: Cambridge University Press, 2013), 207-239.

Lindberg, D. “Science and the Medieval Church,” In *The Cambridge History of Science Volume 2: Medieval Science*, eds. D. Lindberg & M. Shank (Cambridge: Cambridge University Press, 2013), 268-285.

Grant, E. “Cosmology,” In *The Cambridge History of Science Volume 2: Medieval Science*, eds. D. Lindberg & M. Shank (Cambridge: Cambridge University Press, 2013), 436-455.

Lindberg, D. C. *The Beginnings of Western Science* (University of Chicago Press, 2007), chapters 8 to 12.

Fara, P. *Science: A Four Thousand-Year History* (Oxford: Oxford University Press, 2009), part 2, chapters 2-6.

Wed October 25

Lecture 4. The Scientific Renaissance. We examine the new Copernican astronomy of the sixteenth century and the work of Galileo and Kepler.

Discussion Group 4 – Discuss Reading (FRIDAY OCT 27)

Dear, P. "Humanism and Ancient Wisdom: How to Learn Things in the Sixteenth Century," in P. Dear, *Revolutionizing the Sciences* (Princeton, NJ: Princeton University Press, 2009), chapter 2.

Optional Readings:

Donahue, W. "Astronomy," In *The Cambridge History of Science Volume 3: Early Modern Science*, eds. L. Daston & K. Park (Cambridge: Cambridge University Press, 2006), 562-595.

Westman, R. "Competing Disciplines: The Copernicans and the Church," in *The Scientific Revolution: The Essential Readings*, ed. Marcus Hellyer (Oxford: Blackwell, 2003), 44-71.

Galileo, *The Starry Messenger* (Florence, 1610).

Cohen, I. B., *The Birth of a New Physics* (Harmondsworth: Penguin, 1992).

Debus, A. *Man and Nature in the Renaissance* (Cambridge: Cambridge University Press, 1978)

Johns, Adrian, *The Nature of the Book* (Chicago, 1998), Introduction.

Machamer, P. *The Cambridge Companion to Galileo* (Cambridge: Cambridge University Press, 1998)

Wilding, Nick, "The Printing Press," in *A Companion To The History Of Science*, ed. Bernard Lightman (Oxford, 2016), 179-195.

Swerdlow, Noel M., "Galileo's discoveries with the telescope and their evidence for the Copernican theory", in *The Cambridge Companion to Galileo*, ed. Peter Machamer (Cambridge, 1998), 244-270.

Dear P., "Mathematics Challenges Philosophy: Galileo, Kepler, and the Mathematical Practitioners," in P. Dear, *Revolutionizing the Sciences* (Princeton, NJ: Princeton University Press, 2009), chapter 4.

Fara, P. *Science: A Four Thousand-Year History* (Oxford: Oxford University Press, 2009), part 3, chapters 3-4.

Wed November 1 (Bulstrode)

Lecture 5. The Scientific Revolution 1: A radical transformation took place in Europe in the period 1500-1700. What was this transformation? And what factors drove it?

Discussion Group 5 – Discuss Reading (FRIDAY NOV 3)

James Poskett, 'Introduction' and 'New Worlds' in *Horizons: A Global History of Science* (2022), pages 1-7 and pages 11-45.

Optional readings (further optional readings may be added to the Moodle page):

Codex Borgia, https://en.wikipedia.org/wiki/Codex_Borgia

Florentine Codex https://www.loc.gov/item/2021667837

Davíd Carrasco and Scott Sessions, Daily Life of the Aztecs, https://archive.org/details/dailylifeofaztec0000carr

Berdan, F.F. "Aztec Science". In: Selin, H. (ed) *Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures* (Dordrecht: Springer, 2008)

Sobrevilla, I. "Indigenous naturalists." In H. Curry, N. Jardine, J. Secord, & E. Spary (Eds.), *Worlds of Natural History* (2018), pp. 112-130

Wed November 8 - Reading Week – no classes, but make sure you're up to date with readings

Wed November 15 (Bulstrode)

Lecture 6. The Scientific Revolution 2: In this class we explore how early modern practitioners used experience to make new knowledge and the techniques they used to extend their individual experience to audiences and fellow practitioners in forms of collective witnessing.

Discussion Group 6 – Discuss Reading (FRIDAY NOV 17)

Gómez, P. 'Introduction' and "Astounding Creativity." *The Experiential Caribbean: Creating Knowledge and Healing in the Early Modern Atlantic*, University of North Carolina Press, 2017, pp. 1-16 and 145– 165.

Optional Readings (further optional readings may be added to the Moodle page):

Shapin, S., and Schaffer, S., "Seeing and Believing: The Experimental Production of Pneumatic Facts," in *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (1985), 22-79.

Alpers, S., "Chapter 3: "With a Sincere Hand and Faithful Eye": The Craft of Representation," in *The Art of Describing* (1984), pp.72-118.

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

Murphy, K. S. "Translating the vernacular: Indigenous and African knowledge in the eighteenth-century British Atlantic," *Atlantic Studies*, 8:1 (2011): 29-48.

Part 2: PERSPECTIVES

In the second part of the course we consider some alternative ways of understanding the history of science through the perspectives of e.g. gender, empire, and representation.

Wed November 22

Lecture 7. Matter and Spirit in Seventeenth-Century Science. We explore the material culture of early modern science, and the relationship of science to religion, through an exploration of Isaac Newton's natural philosophy.

Discussion Group 7 – Discuss Reading (FRIDAY NOV 25)

Kubrin, D. "Newton and the Cyclical Cosmos: Providence and the Mechanical Philosophy," *Journal of the History of Ideas* 28, no. 3 (1967): 325-46.

Optional Readings:

Warner, D. J. "What Is a Scientific Instrument, When Did It Become One, and Why?" *British Journal for the History of Science* 23 (1990): 83-93.

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

Schaffer, S., "Easily Cracked: Scientific Instruments in States of Disrepair," *Isis* 102 (2011): 706–717.

Werrett, S. *Thrifty Science: Making the Most of Materials in the History of Experiment* (Chicago: University of Chicago Press, 2019).

Dear, P. "Cartesians and Newtonians," in P. Dear, *Revolutionizing the Sciences* (Princeton, NJ: Princeton University Press, 2009), chapter 8.

Cohen, I. B. "The Newtonian Achievement: The Newtonian Revolution," in *The Scientific Revolution: The Essential Readings*, ed. Marcus Hellyer (Oxford: Blackwell, 2003), 178-193.

Iliffe, R., "The Religion of Isaac Newton," in *The Cambridge Companion to Newton*, eds. Rob Iliffe and George E. Smith, second edition (Cambridge: Cambridge University Press, 2016).

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.

Wed November 29 (Bulstrode)

Lecture 8. Age of Revolutions: In this class we introduce the eighteenth century industrial and political revolutions that shaped European 'Enlightenment'.

Discussion Group 8 (FRIDAY DECEMBER 8)

Bulstrode, J. "Black metallurgists and the making of the industrial revolution," *History and Technology*, 39 (2023): 1-41.

Optional Readings (further optional readings may be added to the Moodle page):

DuBois, L. "Chapter 5: The Arrival of Emancipation," *A Colony of Citizens: Revolution & Slave Emancipation in the French Caribbean, 1787-1804* (Chapel Hill: North Carolina, 2004) 155-168.

Ken Alder, 1995, 'Chapter two - A Revolution to Measure' in Wise, M. Norton, ed., *The Values of Precision* (Princeton: Princeton University Press, 1995), pp.39-71.

Shilliam, R. "Race and Revolution at Bwa Kayiman," *Millennium*, *45*(2017): 269–292.

Berg, M., and P. Hudson. "Slavery, Atlantic Trade and Skills: a Response to Mokyr's Holy Land of Industrialism." *Journal of the British Academy* 9 (2021): 259–281.

Eric Williams, 1944, *Capitalism and Slavery*, Chapel Hill: The University of North Carolina Press.

Wed December 6

Lecture 9. Science and the Enlightenment. In this class we explore the idea of 'Enlightenment' and consider how science became 'public' in the eighteenth century. We ask how women contributed to the enlightenment, and how gender-dependent opportunities and constraints operated in science.

Discussion Group 9 – Discuss Reading (FRIDAY DEC 8)

Riskin, J. "Amusing Physics," in Bernadette Bensaude-Vincent, ed., *Science and Spectacle in the European Enlightenment* (Ashgate, 2007), chapter 3.

Optional Readings:

Johns, A. "Coffee Houses and Print Shops," In *The Cambridge History of Science Volume 3: Early Modern Science*, eds. L. Daston & K. Park (Cambridge: Cambridge University Press, 2006), 320-340.

Stewart, L. "Public Lectures and Private Patronage in Newtonian England," *Isis* 77 (1986): 47-58.

Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge: Cambridge University Press, 1992).

Lynn, M. R. "The Fashion for Physics: Public Lecture Courses in Enlightenment France," *The Historian* 64 (2002): 335-350.

Hoskin, M. "Caroline Herschel as an Observer," *Journal of the History of Astronomy* 36: 4 (2005): 373-406.

Schiebinger, L. "The Philosopher's Beard: Women and Gender in Science," In R. Porter, ed., *The Cambridge History of Science* (Cambridge, 2003), 184-210.

Shteir, A. B. *Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England, 1760-1860* (Baltimore, 1996), chapter 2 "Women in the Polite Culture of Botany".

Maerker, A., E. Serrano, S. Werrett, eds., "Enlightened Female Networks: Gendered Ways of Producing Knowledge (1720–1830)," special issue of *Notes and Records of the Royal Society* (2022).

Serrano, E. *Ladies of Honor & Merit: Gender, Useful Knowledge, & Politics in Enlightened Spain* (University of Pittsburgh Press, 2022).

Wed December 13

Lecture 10. Science and Art. We conclude by thinking about the way science forged new relationships to art in the eighteenth century, establishing relationships between society and nature that would become characteristic in the modern world.

Discussion Group 10 – Discuss Reading (FRIDAY DEC 16)

Antonelli, F. "Marie-Anne Paulze-Lavoisier (1758–1836): illustration in a scientific text (c. 1790)," 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), 142-148.

Optional readings:

Long, P. *Artisan/practitioners and the Rise of the New Sciences, 1400-1600* (Oregon State University Press, 2011).

Smith, Pamela H. *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004).

Schaffer, S. “Enlightened Automata,” in William Clark, Jan Golinski, and Simon Schaffer, eds., *The Sciences in Enlightened Europe* (Chicago: University of Chicago Press, 1999), pp. 126-165.

Pannabecker, J. R. “Representing Mechanical Arts in Diderot’s *Encyclopédie*,” *Technology and Culture* 39 (1998): 33-73.

Roberts L., S. Schaffer, and P. Dear, eds. *The Mindful Hand: Inquiry and Invention From the Late Renaissance to Early Industrialisation* (Royal Netherlands Academy of Arts and Sciences, 2007).

Ashworth, W. J. “'System of Terror': Samuel Bentham, Accountability and Dockyard Reform during the Napoleonic Wars,” *Social History* 23, No. 1 (Jan. 1998): 63-79 .

Rossi, P. *Philosophy, Technology, and the Arts in the Early Modern Era*, trans. Salvator Attanasio (New York: Harper & Row, 1970).

Werrett, S. *Fireworks: Pyrotechnic Arts and Sciences in European History* (Chicago: University of Chicago Press, 2010).

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.