

# HPSC0087

## Science in the 20th Century and Beyond

### Course Syllabus

2020-21 session | Professor Jon Agar [jonathan.agar@ucl.ac.uk](mailto:jonathan.agar@ucl.ac.uk) | Dr Tiago Mata [t.mata@ucl.ac.uk](mailto:t.mata@ucl.ac.uk)

#### Course Information

This course on history and historiography of twentieth century science is for Masters students. More science was done, and more scientists lived, in the twentieth century than in any other century of human history. Furthermore, there were major changes in the framing ideas and organisation of major disciplines. Physics, for example, grappled with the new ideas of quantum theory and relativity. The life sciences responded to genetics and molecular approaches to life science. Geology uncovered evidence for plate tectonics, while astronomy explored an expanding universe. Social science experimented with new methods to measure society and the individual within it. These intellectual developments were intimately connected to social, economic, political and cultural trends and events, not least global conflicts, ideological clashes and economic transformations. This course introduces and guides the student through accounts of these changes produced by historians and other commentators. The assessment is designed so that the student learns, develops and applies skills to explore primary sources (primarily archives of twentieth century science), relating interpretation to an understanding of context based on secondary sources.

#### Basic course information

Moodle Web site:	<a href="https://moodle.ucl.ac.uk/course/view.php?id=7490">https://moodle.ucl.ac.uk/course/view.php?id=7490</a>
Assessment:	Two essays
Timetable:	See online timetable
Prerequisites:	None
Required texts:	Readings listed below
Course tutor(s):	Professor Jon Agar                      Dr Tiago Mata
Contact:	<a href="mailto:Jonathan.agar@ucl.ac.uk">Jonathan.agar@ucl.ac.uk</a> <a href="mailto:t.mata@ucl.ac.uk">t.mata@ucl.ac.uk</a>
Web:	See STS staff pages
Office location:	Room 2.2, 2 <sup>nd</sup> Floor, 22 Gordon Square

This year, due to the pandemic, all of the lectures and seminars are available online. Many seminar discussions will also be replicated and available (should you wish to take part) as face-to-face sessions (see Timetable). Follow the series of videos, activities (such as essential readings), and forums (which can be participated in EITHER via asynchronous online Moodle forum OR when available face to face seminar discussions, or BOTH), all sequenced on the course Moodle page.

## Schedule

	UCL Wk	Date	Topic	Activity
1	6	30.9	What is History of 20 <sup>th</sup> -century Science? (JA and TM)	Read: Galison (2000)
2	7	7.10	Scale and State (JA and TM)	Read: Capshew and Rader (1992) Read Primary Source: Science, the Endless Frontier (1945) Watch Primary Source: FAST Read (optional): Delbourgo
3	8	14.10	Life (JA)	Read: Kohler (1999) Read: Gordin (2018) Read (optional): Strasser Read (optional): Wright (1986)
4	9	21.10	Humanity (JA and TM)	Read Primary Source: UNESCO statements on race Read: Kevles (2009) Read (optional): Proctor (2000)
5	10	28.10	Cold War (JA)	Watch Primary Source: Eisenhower's farewell address Read: Edwards (1996) Read: van Keuren (2001) Read (optional): Forman (1987)
			<b>Reading Week</b>	<b>no lectures</b>
7	12	11.10	Assessment Advice (JA)	Activity: Identifying collections of primary sources
8	13	18.10	Post-colonial Science (JA)	Read: Arnold (2013) Read: Osseo-Asare (2013) Read (optional): Raj (2013)
9	14	25.10	Social Control (TM)	Read: Bouk (2015) Read: Igo (2007) Read Primary Source: Kinsey Report
10	15	2.12	Social movements, Technology and Environment (TM and JA)	Read: Turner (2006) Read Primary Source: Carson (1962) Read: Barbrook and Cameron (1995)
11	16	9.12	Expertise and Authority (JA and TM)	Read: Nicholson (2011) Read: Oreskes and Conway (2010)

## Assessments

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### Summary

	Description	Deadline	Word limit	Deadline for Tutors to provide Feedback
	Essay 1	16 December 2020 5pm	2,500	As advised in class
	Essay 2	13 January 2021 5pm	2,500	As advised in class

### Assignments

The essays are linked, and are designed so that you learn and demonstrate the skills to explore primary sources related to the history of 20<sup>th</sup> century science, and the knowledge of the broader scientific, social, political and cultural context necessary to interpret and understand such sources.

The first essay will be broad and contextual: a survey of the secondary literature relating to the science and place of the primary sources you have chosen, without yet discussing the primary sources in detail.

The second essay will be a detailed exploration of the primary sources, offering an interpretation based on the context discussed in the first essay.

Guidance about choosing and researching the essays will be given in a whole session (the 7<sup>th</sup> session, just after Reading Week).

### Specific Criteria for Assessment for this Module:

Specific criteria for assessment will be discussed in class.

## **Aims & objectives**

### **Aims:**

Understanding of the history, and historiography, of science in the twentieth century.

### **Objectives:**

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

- Have an overview of main developments and themes of science in the twentieth century
- Possess an understanding of the historiography of science in the twentieth century

## **Reading list**

### **Best General Introductions:**

Agar, Jon (2012) *Science in the Twentieth Century and Beyond*. Cambridge: Polity.

Krige, John and Dominique Pestre (eds) (1997), *Science in the Twentieth Century*, Amsterdam: Harwood Academic Press

The *Cambridge History of Science* volumes, in particular:

Volume 5, *The Modern Physical and Mathematical Sciences*, Edited by Mary Jo Nye

Volume 6, *Modern Life and Earth Sciences*, Edited by Peter J. Bowler, John V. Pickstone

Volume 7, *The Modern Social Sciences*, Edited by Theodore M. Porter, Dorothy Ross

### **Lecture Readings:**

Arnold, David (2013) 'Nehruvian science and postcolonial India', *Isis*, 104, pp. 360–370.

Barbrook, Richard. Andy Cameron. (1996) "The Californian Ideology". *Science as Culture* 6.1: 44-72.

Bouk, Dan (2015) "Valuing Lives in Four Movements" *How Our Days Became Numbered*. Chicago: University of Chicago Press.

Capshew, James H. and Karen A. Rader (1992) 'Big Science: Price to the present', *Osiris*, 2nd Series, 7, pp. 2-25

Carson, Rachel (1962), *Silent Spring*, Boston: Houghton Mifflin (excerpts).

Delbourgo, James (2019) 'The knowing world: a new global history of science', *History of Science* 57(3), pp. 373–399

Edwards, Paul (1996) 'Chapter One: "We defend every place": building the Cold War world', *The Closed World: Computers and the Politics of Discourse in Cold War America*, Cambridge, MA: MIT Press, pp. 1-42.

Forman, Paul (1987) 'Behind quantum electronics: National security as basis for physical research in the United States, 1940-1960', *Historical Studies in the Physical and Biological Sciences*, 18(1), pp. 149-229

Galison, Peter (2000) 'Einstein's clocks: the place of time', *Critical Inquiry*, 26(2), pp. 355-389

Gordin, Michael D. (2018) 'Lysenko unemployed: Soviet genetics after the aftermath', *Isis*, 109, pp. 56-78

Igo, Sarah (2007) "Surveying Normal Selves" and "The Private Lives of the Public", in *Averaged American*, Cambridge MA: Harvard University Press, pp. 191-280.

Kevles, Daniel J. (2009) 'Eugenics, the genome, and human rights', *Medicine Studies* 1(2), pp. 85-93

Kinsey, Alfred, with Wardell Pomeroy and Clyde Martin (1948), *Sexual Behavior in the Human Male* (1948), Philadelphia: W.B. Saunders. Kinsey and Paul Gebhard (1953), *Sexual Behavior in the Human Female*, Philadelphia: W.B. Saunders.

Kohler, Robert (1999) 'Moral economy, material culture, and community in *Drosophila* genetics', in Mario Biagioli (ed), *Science Studies Reader*, London: Routledge, pp. 243-257.

Nicholson, Ian (2011) "'Shocking" masculinity: Stanley Milgram, "obedience to authority," and the "crisis of manhood" in Cold War America', *Isis*, 102, pp. 238–268

Oreskes, Naomi and Erik Conway (2010) "Doubt is our product" "Strategic Defence, Phony Facts, and the creation of the George C. Marshall Institute" *Merchants of Doubt*. New York: Bloomsbury. pp. 10-65.

Osseo-Asare, Abena Dove (2013) 'Scientific equity experiments in laboratory education in Ghana', *Isis*, 104, pp. 713–741.

Proctor, Robert (2000) 'Nazi science and Nazi medical ethics: some myths and misconceptions', *Perspectives in Biology and Medicine* 43(3), pp. 335-346

*Science, the Endless Frontier. A Report to the President by Vannevar Bush, Director of the Office of Scientific Research and Development, July 1945*. Washington: United States Government Printing Office. Copy here: <https://www.nsf.gov/od/lpa/nsf50/vbush1945.htm>

Strasser, Bruno J. (2011), 'The experimenter's museum: GenBank, natural history, and the moral economies of biomedicine', *Isis*, 102, pp. 60-96

van Keuren, David K. (2001) 'Cold War science in black and white: US Intelligence Gathering and its scientific cover at the Naval Research Laboratory, 1948-62', *Social Studies of Science* 31(2), pp. 207-229

Wright, Susan (1986) 'Recombinant DNA technology and its social transformation, 1972-1982', *Osiris* 2, pp. 303-360