

HPSC2023 Sociology of Science

Course Syllabus

2013-14 session | Mr Timothy Nissen | t.nissen@ucl.ac.uk

Course Information

This course examines the complex relationship between science and society. It also takes a sociological look at the process by which knowledge is constructed both through historical and contemporary studies. The module also introduces students to the main currents of thought which have been influential in sociology of science.

Basic course information

Course website:	See Moodle
Moodle Web site:	Search 'HPSC2023'
Assessment:	One Assignment in 2 parts (1,000 words and 2000 words) (50%), One exam (3 hours) (50%)
Timetable:	[insert this link www.ucl.ac.uk/sts/hpsc Do not enter any other info here]
Prerequisites:	Course designed for year 3 students
Required texts:	See below
Course tutor(s):	Mr Timothy Nissen
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Office location:	22 Gordon Square, Room TBC
Office hours:	See Moodle

Schedule

UCL Week	Topic	Date	Activity
6	Introduction: What is Sociology of Science? (Re-cap of Merton)	4 Oct	
7	Interests and the Strong Programme	11 Oct	
8	Laboratory Studies 1: What Are Ethnographic Approaches to science Studies?	18 Oct	
9	Laboratory Studies 2: Case Study of the Experimenter's Regress	25 Oct	
10	Science and Gender	1 Nov	
11	Reading Week	4-8 Nov	
12	e.g. Essay 1 deadline	12 Nov	
12	Actor-Network Theory 1	15 Nov	
13	Actor-Network Theory 2	22 Nov	
14	Boundaries of Science	29 Nov	
15	Experts, Public Science and the Co-Production of Knowledge	6 Dec	
16	Future Science and the Sociology of Expectations	13 Dec	

Assessments

Summary

	Description	Deadline	Word limit
1	Essay – 50%	By 11.59 pm on 12 Nov 2013	3000
2	Exam – 50%	Term 3 – date tba	3 hours

Assignments

See end of this syllabus for assignment instructions.

Essays must be submitted via Moodle

In order to be deemed 'complete' on this module students must attempt both the essay and the exam

Criteria for assessment

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook.

Aims & objectives

The aim of this course is to undertake a detailed examination of the sociological contribution to the analysis of science. It examines the complex relationship between science and society and also takes a sociological look at the process by which knowledge is constructed. The course introduces students to the main currents of thought which have been influential in sociology of science through both historical and contemporary studies.

By the end of this course you should:

- Have an understanding of how science works as a social process i.e. how technical knowledge is produced by communities
- Have a detailed knowledge of the main theories in the sociology of science
- Be aware of the strengths and weaknesses of a range of sociological approaches to the analysis of science
- Begin to see links between sociological analyses of science and broader debates in science policy, history of science and philosophy of science

Although this course will draw on more general arguments and ideas in sociology, you will not be expected to become an expert in all of these wider debates. I have provided some reading for anyone who wishes to place each topic in a broader sociological context.

Reading list

There are several recent introductory textbooks on the sociology of science, and you are strongly recommended to purchase **one**:

- Yearley, Steve (2005), *Making Sense of Science: Understanding the Social Study of Science* (London: Sage) [A good overview, with a leaning towards more contemporary issues] Abbreviated to **SY** on this reading list;
- Bucchi, Massimiano (2002), *Science in Society: An Introduction to Social Studies of Science* (London: Routledge) [Well written, a little too concise in places but particularly good if you are interested in public understanding/ communication of science] Abbreviated to **MB** on this reading list;
- Sismondo, Sergio (2010), *An Introduction to Science and Technology Studies* (Oxford: Blackwell) 2nd Edition [Another good introduction, with a greater leaning towards philosophy of science than the other texts]. Abbreviated to **SS** on this reading list.
- David, Matthew (2005), *Science in Society* (Basingstoke: Palgrave) . Tends to be aimed more at sociology students, but still a good introduction particularly if you're interested in wider links with social theory Abbreviated to **MD** on this reading list.

Two other general readings:

Erickson, Mark (2005), *Science, culture and society : understanding science in the twenty-first century* (Not a bad introductory text, but because of breadth including philosophy, history and popularization of science, less suitable for this particular course)

Hackett, EJ (et al) (2008), *The Handbook of science and technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed) (Comprehensive overview of state of the art for the field; also the 1995 2nd edition still has good, relevant overviews of topics)

The reading list:

- The reading list is divided into required and optional reading - you are **not** expected to read all of the material.
- You will be expected to read **all** of the required reading - which amounts to one piece each week, where possible from one of the assigned textbooks.
- The optional readings are intended as additional material. You will certainly need to read more than the required reading for your essays or exam revision.
- If you cannot get hold of the required reading, then you should read an item from the optional list instead.

Where to find the reading material

Most of the required and optional reading material is kept in the DMS Watson science library and many of the journal articles are available electronically.

A number of readings have been made available on Moodle.

Some of the key readings have been submitted to the library for digitization and should be available electronically – I have marked these [D] on the reading list.

You are also encouraged to use the Wellcome Library (210 Euston Road). This is a reference library with a large collection of science policy/sociology of science material - including some of the material on this course.

Topic 1: Sociology as Social Knowledge about Society...

Does it make sense to talk about social scientific knowledge as different from natural scientific knowledge? What should social scientific knowledge about natural science be like?

The lecture contains a re-cap of some material on Mertonian approaches to sociology of science covered in HPSC1004. Although you will not be assessed on this material, it is worth revising:

Essential Reading:

Either

SY – Chapter 1 *OR*

MB – Chapters 1-2 (**most recommended**) *OR*

SS – Chapter 3 (and 4) *OR*

MD – Chapter 1

Additional Reading

Erickson, Mark (2005), *Science, culture and society : understanding science in the twenty-first century* (Chapter 5 – Scientists and scientific communities)

Topic 2: Interests and the Strong Programme

The publication of T.S. Kuhn's *Structure of Scientific Revolutions* in the 1960s opened the door to a sociology of scientific *knowledge*. Although Kuhn himself eschewed this approach, his theory implied that scientific change of a revolutionary order (the paradigm shift) is rooted in the characteristics of the scientific community. Sociologists began to look at knowledge itself as socially conditioned.

Essential Reading:

Either

SY – Chapters 2-3 (**most recommended**) *OR*

MB – Chapters 2-3 *OR*

SS – Chapter 5 *OR*

MD – Chapter 4

Seminar Reading – see seminar instruction on Moodle

Bloor, D (1991 [1976]), *Knowledge and Social Imagery* (Routledge) esp. Chapter 1 'The Strong Programme in the Sociology of Knowledge' [D] (for the classic statement of the tenets of the strong programme and the argument against a 'sociology of error') and also see Afterword in 2nd Edition for response to critics.

AND

Laudan, L (1981), 'The Pseudo-Science of Science', *Philosophy of the Social Sciences.*, Vol.11 pp.173-98. (Scathing critique of the strong programme)

[You can get this electronically and remotely from Senate House Library if you have a Senate House Library Card – which UCL students are entitled to]

For more detail:

Chalmers, A (1990), *Science and its Fabrication* (chapters 6-8) (a critical overview of the strong programme)

Bloor, D (1981), 'The Strengths of the Strong Programme', *Phil. Soc. Sci.*, Vol.11 pp.199-213.
(Scathing defence of the strong programme)
[Response to Laudan's article above]
[You can get this electronically and remotely from Senate House Library if you have a Senate House Library Card – which UCL students are entitled to]

Case Studies:

Gillespie B *et al* (1982), 'Carcinogenic Risk Assessment in the United States and Great Britain: The Case of Aldrin/Dieldrin', in *Science in Context: Readings in the Sociology of Science* (Eds Barnes B and Edge D. Milton Keynes: Open University Press) (Good, policy-relevant case-study). [D]

Webster, A (1991), *Science, Technology and Society* (Chapter 2) (Overview, includes discussion of the botanical classification study mentioned in lecture)

Collins, H and Pinch, T (1993), 'The Germs of Dissent: Louis Pasteur and the Origins of Life', in *The Golem: What Everyone Should Know About Science* (Chapter 4) [D]

Shapin S (1979), 'The Politics of Observation: Cerebral Anatomy and Social Interests in the Edinburgh Phrenology Disputes', in R. Wallis (ed), *On the Margins of Science: The Social Construction of Rejected Knowledge* (Keele. University of Keele. Sociological Review Monograph No.27) pp139-178. [TC 4700]
(Also discussed in Yearley, S (1988), *Science, Technology and Social Change* (London: Unwin Hyman), Chapter 2).

Topic 3: Laboratory Studies and The Micro-social Approach

2 weeks

The 'strong programme' argued that broad social and political conditions could influence the content of scientific knowledge. Towards the end of the 1970s sociology of science took a distinctly micro-social (and linguistic) turn. Detailed studies of scientists, in laboratories or making claims in papers, became the preferred methodology of 'lab anthropologists'. The complex negotiations, contingencies and skills involved in creating 'a fact' (and the way that these were all erased from the final product) became the focus of attention.

Essential Readings:

Week 1

Either

SY – Chapter 6 *OR*

MB – Chapter 4 *OR*

SS – Chapters 6, 9 *OR*

MD – Chapter 5

Week 2

Collins, H (1985), 'Detecting Gravitational Radiation: The Experimenters' Regress', Chapter 4 in *Changing Order: Replication and Induction in Scientific Practice* (Chicago: Univ Chicago Press) [D]

Additional Reading:

Starting Point for further reading:

SS – Chapter 6 'The Social Construction of Scientific and Technical Entities'

Overviews

Woolgar, S (1988), *Science: The Very Idea* (Chichester: Ellis Harwood) Chapter 6. (A good overview of some of the main claims of pioneering ethnographic works) [D]

Erickson, Mark (2005), *Science, culture and society : understanding science in the twenty-first century* (Chapters 2-3 – case study of one lab + wide-ranging theoretical chapter on scientific knowledge)

Knorr-Cetina, K (1995), 'Laboratory Studies: The Cultural Approach to the Study of Science' in Jasanoff S *et al* (eds) *Handbook of Science and Technology Studies*, (London: Sage) (2nd ed) pp140-166 (Not an easy read, but very succinct overview of the approach).

Doing, P (2008), 'Give me a Laboratory and I will Raise a Discipline: The Past, Present and Future Politics of Laboratory Studies in STS', in Hackett, EJ (et al) (2008), *The Handbook of Science and Technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed)

SY – Chapter 7 'Reflection, Explanation and Reflexivity in Science Studies' (an overview of reflexive claims that the findings of STS about epistemology, should also apply to the knowledge claims of STS practitioners...)

Examples of Ethnographies of Science (try to read at least one):

Traweek, Sharon. 1988. *Beamtimes and Lifetimes: The World of High Energy Physics*. Cambridge, Mass.: Harvard University Press. (On Moodle website)(pp1-17)

Latour B & Woolgar S (1986), *Laboratory Life: The Construction of Scientific Facts* (Princeton University Press) Chapter 2 and skim chapter 3 [ch.3 in TC 1701]. [Read the Doing chapter 'Give me a laboratory...' above first]

Knorr-Cetina, K (1999), *Epistemic Cultures: How The Sciences Make Knowledge* (Chapters 1, 2 and either 3 or 4).

Collins, H and Pinch, T (1993), 'A new window on the universe: the non-detection of gravitational radiation', in *The Golem: What Everyone Should Know About Science* (Chapter 5). (not written up as an ethnography, but based on Collin's ethnographic work described in H. Collins' *Changing Order*)

Mol, A (2002), 'Cutting Surgeons, Walking Patients: Some Complexities Involved in Comparing', in Law, J and Mol, A (eds) *Complexities: Social Studies of Knowledge Practices* (Durham: Duke University Press)

Topic 4: Gender, 'Race' and Minorities in Science

Feminist critiques of science have tended to develop outside of mainstream sociology of science, despite the overlap in perspectives. Studies range from institutional questions (why so few women in science?) to epistemological questions (is there a distinctly feminist science?). Feminist analyses of science form a burgeoning literature. Other inequalities in science remain relatively under-researched.

Essential Reading

Either

SY – Chapter 5 OR

SS – Chapter 13 OR

MD – Chapter 5

If you read one piece of extra reading, read this:

Haraway, D. (1997), 'Modest_Witness@Second_Millennium', in *Modest_Witness@Second_Millennium.FemaleMan[©]_Meets_OncoMouseTM* (London: Routledge) (Chapter 1 – a tough but rewarding read) [D]

Additional Reading

Etzkowitz, H *et al* (2008), 'The Coming Gender Revolution in Science' in Hackett, EJ (et al), *The Handbook of Science and Technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed)

Oudshoorn, N (2004), "Astronauts in the Sperm World" : The Renegotiation of Masculine Identities in Discourses on Male Contraceptives , *Men and Masculinities*, Vol. 6, No. 4, 349-367

Schiebinger, L (1999), *Has Feminism Changed Science?* (Harvard Univ. Press) (esp. Sections II and III)

Lederman, M and Bartsch, I (2001), *The Gender and Science Reader* (London: Routledge) (Esp. sections 4 and 5)

Haraway, D (1999), 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in Biagioli, M (ed) *The Science Studies Reader* (Routledge) and also in Lederman, M and Bartsch, I (2001), *The Gender and Science Reader* (London: Routledge).

Anderson, W and Adams, V (2008), 'Pramoedya's Chickens: Postcolonial Studies of Technoscience' in Hackett, EJ (et al), *The Handbook of Science and Technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed)

Haraway, D (1989), 'The Bio-Politics of A Multi-Cultural Field', in *Primate Visions: Gender, Race and Nature in the World of Modern Science* (London: Verso) pp244-258 only.
also in

Harding, S (1993), *The "Racial" Economy of Science: Toward a Democratic Future* (University of Indiana Press) pp377-397.

And in

Lederman, M and Bartsch, I (2001), *The Gender and Science Reader* (London: Routledge)

Topic 5: Actor-network theory (2 weeks)

One of the most influential schools of thought since the 1980s and 1990s has been 'actor-network theory'. The central idea is that 'facts' are created when 'heterogeneous' assemblages of actors and objects are mobilized into a 'network'. Science and society are *both* co-created as the laboratory is used as a focal point for assembling knowledge and redefining social interests. Science becomes 'politics by other means'.

Essential Readings (2 weeks)

Week 1

Either

SY – Chapter 4 *OR*

SS – Chapter 7

Week 2

Latour, B (1983), 'Give Me a Laboratory and I will Raise the World', in *Science Observed: Perspectives on the Social Study of Science* (London: Sage) pp141-170. or extract in Biagioli, M (1999), *The Science Studies Reader* (Ch.18)). [D]

AND

O, Amsterdamska (1990), 'Surely you are joking, Monsieur Latour!', *Science, Technology and Human Values* Vol.15, Fall, pp495-504.

[Alternative to the Latour reading above: Latour, B (1987), *Science in Action* (Harvard University Press) (especially introduction and chapters 1 & 2) (A classic overview of Latour's theories) (Chapter 2 is [D])

Additional Reading:

If you read one piece of extra reading, read this:

Latour, B (1999), *Pandora's Hope: Essays on the Reality of Science Studies* (Chapter 2) (Includes a good, relatively clear, illustrative case study of Amazonian soil science in the making) [D]

Further reading:

Callon, M (1986), 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay', in Biaglio, M (1999), *The Science Studies Reader* (London Routledge) (Ch.5) (Some key ANT jargon explained through a case study of molluscs in Brittany)

Shapin, S (1988), 'Following Scientists Around', *Social Studies of Science*, Vol.18 pp.533-50 (Review of 'Science in Action').

Golinski, J (1998), *Making Natural Knowledge: Constructivism and the History of Science* (Cambridge University Press) Chapter 1, esp. pp.27-46 (Helpful summary of the key points of actor-network theory).

Scott, P (1991), 'Levers and Counterweights: A Laboratory that Failed to Raise the World', *Social Studies of Science* Vol.21 pp7-37 (empirically based critique of Latour)

Collins, HM and Yearley, S (1992), 'Epistemological Chicken' in A. Pickering (ed) *Science as Practice and Culture* (Chicago: University of Chicago Press) pp301-26 (attacks the notion that non-humans can be treated as if they were the same as intentional actors)

See also:

Callon M and Latour B (1992), "Don't Throw the Baby Out with the Bath School! A Reply to Collins and Yearley" in *Science as Practice and Culture* (Ed. Pickering A. Chicago and London: University of Chicago Press) pp343-368.

Law, J and Hassard, J (1999), *Actor-Network Theory and After* (Oxford: Blackwell) (More advanced reading – including Latour claiming that all the terms in actor-network theory, including the hyphen, are problematic).

Topic 6: Boundaries: Science and Non-Science

Drawing boundaries is an eminently social process. Boundaries are routinely drawn between, for instance, science and non-science, experts and lay persons, science and politics and the social and natural. The way in which boundaries are drawn and the purposes served by the resulting distinctions are an important topic within social studies of science.

Essential Reading

Either

Gieryn TF (1983), "Boundary Work and the Demarcation of Science from Non-Science: Strains and Interests in the Professional Ideologies of Scientists", *American Sociological Review* Vol.48 pp781-795 [TC 3315].

Or:

Gieryn T (1995), 'Boundaries of Science' in Jasanoff S *et al* (eds) *Handbook of Science and Technology Studies*, (London: Sage) pp393-443 (Long but useful overview of the practical problem of demarcating the inside from the outside of science)

Additional Reading:

Lynch, M (2004), 'Circumscribing Expertise: Membership Categories in Courtroom Testimony' in Jasanoff, S (ed) *States of Knowledge* (London: Routledge) – (contains some criticisms of 'boundary-work')

Gieryn, T (1999), *Cultural Boundaries of Science: Credibility on the Line* (Chicago) (Esp. Introduction)

Yearley S (1988), *Science, Technology and Social Change* (London: Unwin Hyman). Chapter 2.

Jasanoff, S (1987), 'Contested Boundaries in Policy-Relevant Science', *Social Studies of Science* Vol.17 pp195-230 (Complex but excellent argument on the shifting and negotiable boundary between science and politics)

Golinski, J (1998), *Making Natural Knowledge: Constructivism and the History of Science* (Chapter 2 - on historical uses of the boundary problem).

SS – Chapter 1 pp31-32.

Two Case Studies that Use Boundary-Work

Amsterdamska, O (2005), 'Demarcating Epidemiology', *Science, Technology & Human Values* Vol.30(1): 17-51. (Historical case study of disciplinary boundary setting)

Bal, R (2005), 'How to Kill with a Ballpoint: Credibility in Dutch Forensic Science', *Science, Technology & Human Values* Vol.30(1): 52-75. (Case study of boundaries in law)

Topic 7: Experts, Risk and the Co-production of Knowledge

Essential Reading

Either

SY – Chapter 8 OR

Irwin, A (2001), *Sociology and the Environment* (Cambridge: Polity) Chapters 5 and 7.

Additional Reading:

If you read one piece of extra reading, read this:

Irwin, A (2007), 'STS Perspectives on Scientific Governance', in Hackett, EJ (et al), *The Handbook of Science and Technology studies* (Cambridge, Mass. ; London : MIT Press) (3rd ed)

Further Reading

Gillespie B *et al* (1982), 'Carcinogenic Risk Assessment in the United States and Great Britain: The Case of Aldrin/Dieldrin', in *Science in Context: Readings in the Sociology of Science* (Eds Barnes B and Edge D. Milton Keynes: Open University Press). (Classic case-study on role of expertise, also summarised in Irwin book ref above). [D]

Ravetz, J (2006), *The No-Nonsense Guide to Science* (New Internationalist), Chapters 5 and 6 (Scientific Objectivity; Uncertainty)

Stilgoe, J (2005), 'Controlling mobile phone health risks in the UK: a fragile discourse of compliance', *Science and Public Policy* Vol. 32(1): 55-64. (Case study involving the public face of science)

Jasanoff, S (1987), 'Contested Boundaries in Policy-Relevant Science', *Social Studies of Science* Vol.17 pp195-230 (Complex but excellent argument on the shifting and negotiable boundary between science and politics)

Stirling, A (2007), 'Risk, Precaution and Science: Towards a More Constructive Debate', *EMBO Reports* 8(4):309-315

SY – Chapter 9

MD – Chapter 3

Lupton, D (1999), *Risk* (Routledge). Chapter 2 'Theorizing Risk' (Short and excellent introduction to risk in social science) [D]

Specific Reading on co-production

Jasanoff, S (ed) (2004), *States of knowledge : the co-production of science and social order* (London : Routledge, 2004) (Esp. Chapter: 'Ordering Knowledge, Ordering Society')

Reardon, J (2001), 'The Human Genome Diversity Project: A Case Study in Coproduction',

Social Studies of Science, Vol.31 No.3 pp.357-388 (On the simultaneous production of social and natural categories, together with the boundary between them).

Topic 8 Sociology of expectations

The course finishes with a session on hope and promise. Recent STS studies of emerging technologies have emphasized the role of expectations in shaping the development of novel science and technology. This new 'sociology of expectations' moves away from ideas of promise as 'mere' hype and looking at how promises about future utopias and dystopias actively shape the innovation process.

Essential Reading

Borup, M *et al* (2006), 'The sociology of expectations in science and technology'. *Technology Analysis & Strategic Management* 18:285-298

On the geography of knowledge see: www.ucl.ac.uk/sts/locating-technoscience for key readings.

Additional Readings

Adam Hedgecoe, Paul Martin (2003), 'The Drugs Don't Work: Expectations and the Shaping of Pharmacogenetics', *Social Studies of Science*, Vol. 33, No. 3, 327-364

Brown, N and Michael, M (2003), 'A Sociology of Expectations: Retrospecting Prospects and Prospecting Retrospects', *Technology Analysis & Strategic Management* 15: 3-18

Brown, N *et al* (eds) (2000) *Contested futures : a sociology of prospective techno-science* (Aldershot : Ashgate)

Horst, Maja (2007) 'Public Expectations of Gene Therapy: Scientific Futures and Their Performative Effects on Scientific Citizenship' *Science Technology Human Values*, Vol. 32, No. 2. (1 March 2007), pp. 150-171

Busby, Helen, Martin, Paul (2006) 'Biobanks, national identity and imagined communities: The case of UK biobank' *Science as Culture*, Volume 15, Number 3, September 2006 , pp. 237-251(15)

Geesink, I *et al* (2008) 'Stem Cell Stories 1998-2008', *Science as Culture* 17:1-11

Course expectations

Each week the class will be divided into a lecture (approx. 1 hour) and discussion session

(approx. 1 hour). *You will be expected to read a set piece for the seminars and to contribute fully to seminar discussions.*

You must attempt the assignment and sit the exam in order to complete this course.

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.
