

**HPSC0094**

## **Political Economy of Science**

### **Course Syllabus**

2020-21 session | Dr Tiago Mata | t.mata@ucl.ac.uk

#### **Course Information**

Science is integral to the production of value and wealth in contemporary capitalism. In this module we will explore this relationship drawing from literatures from economic history, political sociology and the economics of research. We will examine how transformations in the political economy such as the rise of the corporation, the building up of national government bureaucracies and the expansion of financial markets have transformed how science is administered and commodified.

#### **Basic course information**

Course website:	See moodle.
Moodle Web site:	<a href="https://moodle.ucl.ac.uk/course/view.php?id=7497">https://moodle.ucl.ac.uk/course/view.php?id=7497</a>
Assessment:	One 2000 word essay and one 3000 word essay
Timetable:	<to be advised>
Prerequisites:	None
Required texts:	Readings listed below
Course tutor(s):	Dr. Tiago Mata
Contact:	t.mata@ucl.ac.uk
Web:	<a href="http://www.ucl.ac.uk/sts/staff/mata">http://www.ucl.ac.uk/sts/staff/mata</a>
Office location:	Meetings with tutor to be arranged via Microsoft Bookings

## Schedule

<b>UCL Week</b>	<b>Topic</b>	<b>Date</b>	<b>Activity</b>
20	Why STS needs political economy	12 Jan	-
21	Classical Political Economy and its waves	19 Jan	Read Freeman and Louçã
22	Corporate labs	26 Jan	Read Griffard
23	The academic-military industrial complex	2 Feb	Read Leslie
24	Technology and growthmanship	9 Feb	Read Godin
25	Reading week		
26	Intellectual property	23 Feb	Read Mirowski
27	Entrepreneurs	2 Mar	Read Slaughter and Mazzucato
28	Neoliberal drugs	9 Mar	Read Nik-Khah
29	Venture capitalism	16 Mar	Read Stross
30	Future of capitalism (and science)	23 Mar	Read Scott

## Assessments

### Summary

	<b>Description</b>	<b>Deadline</b>	<b>Word limit</b>	<b>Deadline for Tutors to provide Feedback</b>
<b>1</b>	Essay on perspective of industry	24 Feb, 5pm	2,000	As advised in class
<b>2</b>	Essay on perspective of public policy	25 Mar, 5 pm	3,000	As advised in class

## **Assignments**

The module is assessed by two pieces of coursework submitted via the “Turnitin” function of the module’s moodle page.

Both assignments are individually written essays on the intermingling of science and economy.

### **Assignment 1.**

**The perspective of industry.**

**Answer the question of “why does industry need science and technology,” by looking at one industrial branch and analysing that role of science and technology plays in it.**

The student may wish to follow the steps.

The background research:

- the lecturer will provide a list of industrial classifications in the UK and EU and a few hints of where to find more information, begin by looking through those;
- make a list of a few *candidate industries*, looking up business organisations of that industry, labour organisations, think tanks, then decide which industry gives you most material to work with and is most interesting to you;
- search for *reports, journals and magazines* by the organisations noted above, and search google scholar and other databases for any history of the industry or recent reports on it;
- select from the various sources individual *reports, commentaries, PR material* that speak to the matter of high tech and science, building a corpus of materials to work with;
- make *notes* of what is said and by whom, noting what is description of fact, what is interpretation and what is aspiration;
- compare and contrast your notes and observations *against the analysis provided in the module’s lectures and discussions*.

The essay:

- introduce the essay defining and describing the industry and in one sentence posing a question or making the essay’s key claim (<500 words);
- offer 2-4 arguments noting your sources (c.1000 words);
- conclude by answering the question or laying out in further detail your key claim (c.500 words).

The essay should not exceed 2000 words (without references).

### **Assignment 2.**

**The perspective of public policy.**

**Answer the question “What is the character of contemporary innovation policy in the UK?” you should give particular attention to the *sources of funding*, how that funding is *distributed*,**

**how incentives for innovation are formulated and implemented, what advice is sought, and who manages these processes.**

Students may ask to focus on another country after consultation with the lecturer.

This essay is easier to source than the previous one. You may wish to do the following:

- identify the government departments/ministries that shape public policy on innovation;
- look at their latest flagship policies, collecting also working papers, white papers, etc, linked to the conception and implementation of those policies;
- look up criticisms, by opposition parties, by media pundits, by research organisations and think tanks, by business and labour organisations;
- (- you do not need to compare it with other countries, but you can if you wish)
- after making notes of what you find, contrast those findings with the discussions in the module in terms of the key themes of: sources of funding, allocation of funds, management practices, priorities, and expertise

The essay should not exceed 3,000 words (without references). It should:

- have a clear introduction and conclusion laying out the themes and how those themes will be pursued;
- have a robust description along the key components described above and which will be further discussed in class;
- go beyond the discussion, and there are several opportunities on how to do that: one could critique the current direction of innovation policy; one could unpack its language to show that it is not what it says it is; show where that policy fits within a larger landscape of other countries or the history of the nation; make predictions of what will happen to this policy direction in the near future.
- show appreciation for the specific sources chosen for the essay but also draw on literature of the module.

A coursework extension of up to one week may be approved by a Programme Director (or equivalent), Departmental Tutor or Chair of a Programme Board of Examiners. (Requests for extensions of more than one week must be forwarded to the Faculty EC Panel. Other members of teaching staff, including Module Tutors, are not permitted to grant an extension (see regulation <http://www.ucl.ac.uk/srs/academic-manual/c4/extenuating-circumstances/coursework-extensions>).

## **Aims & objectives**

### **Aims:**

The aim of this course is to introduce students to literatures on the political economy of science. Students should complete the course with a repertoire of concepts and modes of analysis that allow them to examine the ways in which science is marshaled for the creation of economic value. They should be able to demonstrate how many of the discourses underlying the governance of research are underpinned by economic models and idealizations.

## **Objectives:**

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

- Use key concepts from political economy;
- Analyze the intermingling of scientific research, economy and politics;
- Describe the evolution of the relationship between scientific research and corporate capitalism;
- Demonstrate effective researching and critical reading skills;
- Be able to conduct a critical analysis and report such analyses persuasively and coherently;
- Create relevant and critical bibliographies for research projects on the subject;
- Present their work effectively in oral and written formats.

## **Reading list**

Below is a simple abstract detailing the subject of the week's meeting and a list of core readings, only the essential and recommended ones, students must read and answer guiding questions on the readings identified in the schedule on page 2, for ease of reference these items are \* below. Further optional readings will be noted in the Moodle/Library Reading List for the module.

### **Session 1. Why STS needs political economy, 12 January**

A dominant approach in science studies is to conceive the meanings and values of “science” as ultimately flexible, subject to continuous negotiation. According to this view, to claim that science is a source of wealth is an act of “boundary work,” no more true than the support it gathers from its social allies. This module is setting a different course. In our first week we define “political economy” to be our aid in tracing the work of science in contemporary capitalism. That definition must acknowledge that science is a driver in the production of economic value, and that science is therefore rooted to practices of commercial and financial valuation.

Edgerton, D (2017) “The Political Economy of Science: Prospects and Retrospects” in *Handbook of Political Economy of Science*.

Edgerton, D. (2012) “Time, Money, and History” *Isis*, 103(2): 316-327.

Calvert, J (2004) 'The idea of 'basic research' in language and practice' *Minerva*, Vol.42, Issue 3, pp.251-268.

### **Session 2. Classical Political Economy and its waves, 19 January**

In the interwar period, the Austrian economist and statesman Joseph Schumpeter sketched a powerful explanation for the convulsive character of capitalism. He noted that the boom and bust of economic activity, also known as the business cycle, was bound to the birth and maturity of classes of technologies. Schumpeter was developing themes that can be traced back to Karl Marx. But Schumpeter put Marx on its head, he held that for science and technology to function as pacemakers of economic activity a crucial actor was needed, the entrepreneur. Schumpeter invented the entrepreneur as a visionary risk taker that was able to translate the insights of science into economic opportunity and “super profits.”

\* Freeman, Christopher and Louçã, Francisco (2001) *As Time Goes By: From Industrial*

*Revolutions to the Information Revolution*. Oxford: Oxford University Press, 257-335.  
MacKenzie, Donald (1984) "Marx and the Machine" *Technology and Culture*, Vol. 25, No. 3: 473-502.

### **Session 3. Corporate Research, 26 January**

For a time the corporate labs of the early twentieth century were legend. In the USA and in Germany, large-scale investment in mechanical, electrical engineering and biochemistry were seen as the backbone of those nations' sudden rise to global hegemony and world war antagonism. After World War II the reputation of those labs diminished partly because national governments took on a greater role in funding and managing science. Before we look at more contemporary patterns we review what we know of the history of corporate research paying particular attention to how it set priorities and how it evaluated its own success.

Reich, Leonard S., (2002) *The Making of American Industrial Research : Science and Business at GE and Bell, 1876-1926*. Cambridge: Cambridge University Press, 2002. chapters 2, 5, 8, 10.

\*Giffard, Hermione (2016) *Making Jet Engines in World War II : Britain, Germany, and the United States*. Chicago: University of Chicago Press, chapter

### **Session 4. The academic-military-industrial complex, 2 February**

In 1961 in his farewell speech as President of the United States, the former General, former President of Columbia University, Dwight Eisenhower, warned of collusion between the military and industry gaining unwarranted influence upon the American government. The relationship between science and war is an old one, and in Cold War America that relationship was institutionalized through industry. We examine how by promising relative autonomy and abundant resources military industry came to set the research priorities of many eminent American universities.

Ferrary, M., & Granovetter, M. (2009). The role of venture capital firms in Silicon Valley's complex innovation network. *Economy and Society*, 38(2), 326–359.

\* Leslie, Stuart W. (1993) *The Cold War and American science: the military-industrial-academic complex at MIT and Stanford*. New York: Columbia University Press, chapters 1, 2, 3.

### **Session 5. Growthmanship, 9 February**

In the wake of the mass destruction of the Second World War and facing the threat of socialist revolution, western polities reworked a new social contract. Their promise of expanding welfare provision and moderate income distribution rested on assumptions of continued economic growth. The expansion of gross domestic product (a metric that came into existence postwar) through gains in productivity became the fundamental aim of policy. The key contributor to productivity growth, so explained the economists, was not labour, nor capital, it was technology. Thus the state took increasing responsibility in incentivizing innovation. We review what regime of technological management emerged from this post-1945 social settlement.

Collins, Robert M. (2000) *More : The Politics of Economic Growth in Postwar America*. Oxford University Press, chapter 1 and 2.

\* Godin, Benoît, 'The Emergence of S&T Indicators: Why Did Governments Supplement Statistics with Indicators?', *Research Policy*, 32 (2003), 679–91.

Schmelzer, Matthias (2016), *The Hegemony of Growth: The OECD and the Making of the Economic Growth Paradigm*. Cambridge University Press, chapter 5.

### **Session 6. Intellectual property, 23 February**

The Bayh-Dole Act of 1980 triggered a transformation in how University research was valued and imagined. With the Act research institutions funded by federal funds were no longer required to relinquish intellectual property to the government. Individual scientists and universities, sometimes competitively and litigiously, could now appropriate the economic gains from knowledge funded by the public purse. The new legislative framing, together with unrelated but coincidental changes to University management, and the financialization of western economies, made intellectual property into a crucial arbiter in decisions to allocate funds and in the career ideals of scientists. The current intellectual property regime has fused together the quest for knowledge with the quest for personal fortune.

\* Mirowski, Philip (2011) *Science Mart: Privatizing American Science*. Cambridge: Harvard University Press. chapter 4.

Stiglitz, Joseph (1999) "Knowledge as a Global Public Good" *Global Public Goods: International Cooperation in the 21st Century* (ed.) Inge Kaul, Isabelle Grunberg, and Marc Stern. Oxford: Oxford University Press.

### **Session 7. Ubiquitous entrepreneurs, 2 March**

The classic view of the entrepreneur was of a capitalist, an individual, who seized an opportunity. In the past half century entrepreneurship has become a more ample concept that marks out an attitude. Individuals of all classes and collectives and institutions such as universities, can be deemed entrepreneurial if they seize opportunities to expand their commercial activity and their profit margins. Under the icon of entrepreneurship, corporate ideas have permeated the University administrations and transformed the ways they have framed research and education. As a result, a managerial culture of audit and economic valuation has taken root.

Bok, Derek (2003) *Universities in the Marketplace: The Commercialization of Higher Education*. Princeton: Princeton University Press, chapter 4.

Kleinman, D. L., and S. P. Vallas (2001) "Science, Capitalism, and the Rise of the "Knowledge Worker": The Changing Structure of Knowledge Production in the United States." *Theory and Society* 30:451-92.

\*Mazzucato, Mariana (2011) *The Entrepreneurial State*. London: Demos, chapters 5 (find online at: [http://oro.open.ac.uk/30159/1/Entrepreneurial\\_State\\_-\\_web.pdf](http://oro.open.ac.uk/30159/1/Entrepreneurial_State_-_web.pdf))

\* Slaughter, Sheila and Gary Rhoades (2004) *Academic Capitalism and the New Economy: markets, state and higher education*. Baltimore: Johns Hopkins Press, chapter 1.

### **Session 8. Neoliberal drugs, 9 March**

Neoliberalism identifies a movement of intellectuals that distinguished themselves from classic liberals by rejecting the belief that markets arise unaided from human nature. For these academics and policy-makers markets are superior information processors that must be

designed and brought into being through state action. Because of their superior regulatory powers markets are welcomed into all spheres of social activity. In the medical and pharmaceutical sciences this intellectual program has been extraordinarily influential, and the global marketplace has come to replace, and undermine, national regulatory oversight. We examine how greater efficiency and profitability for pharmaceutical firms has been accompanied by perverse effects on the production of medical knowledge.

\*Nik-Khah, Edward (2014) "Neoliberal pharmaceutical science and the Chicago School of Economics" *Social Studies of Science*, 44(4), 489-517.

Sismondo, Sergio (2009) "Ghosts in the Machine: Publication Planning in the Medical Sciences" *Social Studies of Science*, 39(2), 171-198.

### **Session 9. Venture capitalism, 16 March**

The rise of finance is the defining feature of contemporary capitalism. In this meeting we look at two features of finance, and of London finance. Since the 1970s growth in institutional investors - mutual funds, pension funds, hedge funds and lately sovereign wealth funds - has meant an expanding clientele for exciting bets in "start-ups". Empowered by immense wealth and the demand of high returns venture capitalists have impelled to success the corporate giants of our age. We review how VCs changed our understanding of innovation and technological progress and how they have narrowed the expectation of how long it should take for a technology to come to profitable fruition.

Lerner, Josh; Pierrakis, Yannis; Collins, Liam and Bravo Biosca, Albert (2011) *Atlantic Drift: Venture capital performance in the UK and the US*. NESTA research report.

Powell, Walter W. and Kaisa Snellman (2004) "The Knowledge Economy" *Annual Review of Sociology* 30, 199-220.

\* Stross, Randall (2000) *E-boys, The First Inside Account on Venture Capitalists Work*. Crown Business, chapters tbc.

### **Session 10. The age of austerity, 23 March**

The final meeting is dedicated to looking ahead. We will review contemporary debates about the precarious status of the global economy, the likely impact of Brexit and a shifting policy consensus that wants to join austerity to industrial promotion and protectionism. Alongside this review we consider the human and cultural dimensions of high tech capitalism. We see how information technologies are changing work patterns, how AI promises to fully automate much of industry, and how finance is becoming peer to peer.

Sundararajan, Arun. *The Sharing Economy: The End of Employment and the Rise of Crowd-Based Capitalism*. MIT Press, 2016, chapter 4.

\* Brett Scott. *Heretic's Guide to Global Finance: Hacking the Future of Money*. Pluto Press, chapter 6, "DIY Finance."

### Useful links

UCL Study Skills pages: <http://www.ucl.ac.uk/transition/study-skills-resources>

UCL Library electronic resources: <http://www.ucl.ac.uk/library/eresources.shtml>

UCL Plagiarism Guidelines: <http://www.ucl.ac.uk/current-students/guidelines/plagiarism>

UCL Guide to References, Citations and Avoiding Plagiarism:

<http://www.ucl.ac.uk/library/training/guides/webguides/refscitesplag>

Using Moodle: <https://wiki.ucl.ac.uk/display/ELearningStudentSupport/Moodle>