PGR Course unit outline 2022/23

Unit code:	BMAN 81170
Title:	Scope and Theory in Science and Technology Policy
Credit value:	15
Semester:	Semester 1 and Semester 2 (both)
Course Coordinator contact details:	Kieron Flanagan, kieron.flanagan@manchester.ac.uk Kate Barker (TBC) kate.barker@manchester.ac.uk
Other staff involved contact details:	N/A
Pre-requisites Co-requisites Dependent course units Restrictions	None

Course unit overview

Introduces, contextualises and critically explores foundational ideas in science, technology and innovation policy

Aims

This unit aims to introduce, contextualise and critically explore foundational concepts and theories in science, technology and innovation policy, drawing from key literatures including innovation studies, science and technology studies and policy studies. We will explore the complementarities and tensions between descriptive or analytical approaches to science, technology and innovation policy studies, on the one hand, and prescriptive approaches, on the other. The course aims to provide the grounding in foundational concepts necessary for a doctoral researcher to be able to situate their own research topic and engage with, and contribute, to the field.

Objectives (Learning outcomes)

On completion of this unit successful students will:

Knowledge and understanding

- Show an understanding of the scale and complexity of the contemporary technoscientific enterprise and its globally distributed nature and comprehension of key theories and concepts relating to knowledge production
- Show an understanding of the nature and complexity of science, technology and innovation processes and comprehension of key theories and concepts
- Show an appreciation of the specificities of science technology and innovation and the policy challenges that stem from these features
- Show an understanding of the nature of policy and implementation and comprehension of key theories of policy processes
- Show an understanding of the wider role played by science in public policy and regulation, and associated political, economic and ethical debates

Intellectual skills

- Recognise, critically evaluate and deploy as appropriate relevant theories and concepts

- Undertake research reflexively and responsibly
- Engage critically with the research of others, as well as respectfully and constructively
- Appreciate the 'bigger' picture of contemporary science, technology and innovation and understand how we have come to this position

Practical skills

- Identify and interrogate the positions taken by actors in debates and discourses around STI policy
- Understanding the interests and motivations that come to play in STI policy debates
- Appreciation of approaches to STI policy analysis

Transferable skills and personal qualities

- Ability to analyse and synthesise theoretical and practical information
- Oral and written communication skills for specialist and generalist audiences

Syllabus content

The first part of the course explores the nature of science, technology and innovation (STI) from social and economic perspectives. We will look at how social science research has shed light on the processes by which knowledge claims produced and validated, on how knowledge production has changed over time, and on the nature of the modern and increasingly globalised 'techno-scientific' enterprise. We will explore the concepts of *science, technology*, and *innovation* and how understandings of STI processes have developed from simple science-led or demand-pull linear models through to the interactive and system models. We will examine theories of science and knowledge development and economic (neoclassical, Schumpeterian, evolutionary/neo-Schumpeterian and 'new growth theory'), sociological, and time and place-based approaches that have shaped and continue to shape STI management and policy thinking.

The second part of the course will explore the nature of science, technology and innovation policy. We will look at how political scientists and policy scientists view the policy process, and consider the role of implementation. We will then look at how the theories and models covered in the first part of the course have influenced 'rationales' for science, technology and innovation policy and what the special features and challenges of making and analysing STI policies might be.

The third part of the course considers wider issues of STI and policy, including the roles - and possible limits - of technical expertise in public policy and regulatory processes, and the broader relationships between the technoscientific enterprise (and its practitioners) and society more broadly, including questions of public engagement, responsible research and innovation, governance, and 'grand challenges' such as sustainable development.

Methods of delivery

Lectures	--
Seminar/Tutorial/Workshop/Lab Hours	30 hours
Independent Study	120 hours
Total Study Hours	150 hours

Reading List

Baumberg JJ. *The Secret Life of Science: How It Really Works and Why It Matters*. Princeton University Press; 2018.

Breznitz D, 2021, *Innovation in Real Places: Strategies for Prosperity in an Unforgiving World*

Bucchi M, 2004, *Science in Society: an introduction to social studies of science* (Routledge).

Cetina, K.K. 1999. *Epistemic Cultures: How the Sciences Make Knowledge*. Cambridge: Harvard Univ.

Collingridge D. *The Social Control of Technology*. Pinter; 1980.

Edgerton, David. (2006) *The shock of the old: technology and global history since 1900.* London: Profile.

Edquist, C. 1997. (ed) Systems of Innovation: Technologies, Institutions, and Organizations.

Gibbons M. *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. (Gibbons M, ed.). Sage; 1994.

Godin B. *The Linear Model of Innovation: The Historical Construction of an Analytical Framework*.

Haraway, D. 1988. *Situated knowledges: The science question in feminism and the privilege of partial perspective.*

Jasanoff, S. 2016. Ethics of Invention. W.W. Norton & Co.

John P. *Analyzing Public Policy*. Vol Routledge textbooks in policy studies. 2nd ed. Routledge; 2012.

Krige J. Critical Reflections on the Science–Technology Relationship. *Transactions of the Newcomen Society*. 2006;76(2):259-269.

Kuhn, T, 1962. *The Structure of Scientific Revolutions*.

Latour, B. 1987. *Science in Action.*

Lerner J, 2009, *Boulevard of broken dreams: why public efforts to boost entrepreneurship and venture capital have failed - and what to do about it.* Princeton University Press.

Mazzucato M. *The Entrepreneurial State : Debunking Public Vs. Private Sector Myths* . Revised edition. Anthem Press; 2015.

Nielsen MA. *Reinventing Discovery: The New Era of Networked Science*. Princeton University Press; 2012.

Perez C, 2002, *Technological Revolutions and Financial Capital: the Dynamics of Bubbles and Golden Ages,* Edward Elgar.

Pielke RA. *The Honest Broker: Making Sense of Science in Policy and Politics*. Cambridge University Press; 2007.

Pinch and Bijker (1987) "The Social Construction of Facts and Artefacts", *The Social Construction of Technological Systems,* Bijker, Hughes and Pinch (eds)

Ritchie S, 2020, *Science Fictions: Exposing Fraud, Bias, Negligence and Hype in Science*

Rogers, E., (1995), Diffusion of Innovations, New York, The Free Press.

Sismondo, Sergio (2010) *An introduction to Science and Technology Studies* Wiley-Blackwell. Second Edition.

Stephan PE. (2012) ed. *How Economics Shapes Science*. Harvard University Press

Stilgoe, J., Guston, D., 2017. Responsible Research and Innovation, The handbook of science and technology studies.

Stokes DE. *Pasteur's Quadrant: Basic Science and Technological Innovation*. Brookings Institution Press; 1997

Vinsel, L., & Russell, A. L. (2020). *The innovation delusion: how our obsession with the new has disrupted the work that matters most*.

Volti, R. (2001) *Society and Technological Change*.

Required weekly readings: will be assigned ahead of each course session.

Assessment

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Mode of Assessment	Length required	Weighting within unit
1. Critical review essay focused on a key body of theory or approach to processes, practices or dynamics of (or related to) science, technology or innovation	3,000 words	80%
2. Individual presentation focused on the relevance of the theory or approach considered in the review essay to science, technology and innovation policy, relating it to existing literature on STI policy or identifying gaps in that literature	Presentation (15 minutes)	20%
Resits: Will by assessed by satisfactory completion of coursework.		

Feedback methods

Students will receive feedback through a series of methods, comprising:

- Written and/or verbal comments on assessed coursework
- Informal advice and discussion during course meetings.
- Informal advice and discussion following presentations.
- Responses to student emails and questions.
- Individual feedback in meetings with instructors (e.g. in office hours or by appointment).
- Specific course related feedback discussion in course sessions.

Feedback for all assessed coursework and formative assessment will be provided within 15 working days of the submission deadline. A working day is defined as Monday to Friday, not including bank holidays and excluding student vacation periods and University examination periods. For submission dates, see section on Assessment.

In addition to the course unit evaluation questionnaire, students are encouraged to give feedback at any time.

Social Responsibility

AMBS aims for our graduates to develop not only academic and professional skills, but also a sense of social, ethical and environmental responsibility towards the societies of which they are part. Please give details of how social responsibility is addressed in your course unit by highlighting any knowledge or skills that support students' social and ethical understanding and conduct.

Science and technology are seen as both causes of, and sources of solutions to, social, ethical and environmental challenges. The course provides a critical grounding in foundational ideas relating to these questions.

Please indicate by ticking the box(es) below, which specific aspect of SR your module is linked to:

[X] A UN SDGs*   [ ] Environmental Sustainability

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☐ Other (please specify)

The issues explored in this course are potentially relevant to all SDGs, but we identify some SDGs of particular relevance below:

SDG 3 Good health and well-being

SDG 6 Clean water and sanitation

SDG 7 Affordable and clean energy

SDG 8 Decent Work and Economic Growth

SDG 9 Industry, Innovation and Infrastructure

SDG 10 Reduced Inequalities

SDG Sustainable cities and communities

SDG 12 Responsible Production and Consumption

SDG13 Climate action

SDG 17 Partnerships for the goals

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* If a UN SDG, please note which one by reviewing the list here

For additional support on how embed SR into your module, please review the resources here:
https://documents.manchester.ac.uk/DocuInfo.aspx?DocID=51837
https://documents.manchester.ac.uk/DocuInfo.aspx?DocID=47017