

HPSC1008 Fundamentals of Science Communication

Course Syllabus

2012-13 session | Dr Simon J Lock | simon.lock@ucl.ac.uk

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Course Information

This course introduces the public dimension of science and technology. It explores the relationship between the professional world of science and the social, cultural and personal spaces in which science contributes to the shaping of society. It also provides students with skills in communicating science in different public contexts including the news media, and online. The first half of the course outlines some of the key concepts underlying science communication, some implicit, some explicit. The second half looks at more specific outlets - news, books, television, museums and the new media – through which science is communicated and how.

A note of definition: for the purposes of this course “science” is taken to mean all the components of STEM – Science, Technology, Engineering and Medicine.

Basic course information

Moodle Web site:	search 'HPSC1008'
Assessment:	Two pieces of coursework (3,000 words) 50% each.
Timetable:	www.ucl.ac.uk/sts/hpsc
Prerequisites:	No prerequisites
Required texts:	Jane Gregory and Steve Miller (1998 / 2001). <i>Science in Public: communication, culture and credibility</i> (Perseus, New York). Available in the library and at Waterstones etc.
Course tutors:	Dr Simon J Lock and Prof Steve Miller
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Office hours:	Simon Lock: Mondays, 2-4pm . Steve Miller: Tuesdays, 2-4pm.

Schedule

UCL Week	Topic	Date	Activity
20	Introduction to Science in Public (SL/SM)	Lecture: 7 th Jan Seminar: 10 th Jan	
21	Science, Communication and Culture (SM)	Lecture: 14 th Jan Seminar: 17 th Jan	
22	The Public Understanding of Science (SL)	Lecture: 21 th Jan Seminar: 24 th Jan	
23	The Public for Science (SM)	Lecture: 28 th Jan Seminar: 31 st Jan	
24	From PUS to PEST (SL)	Lecture: 4 th Feb Seminar: 7 th Feb	
25	Reading Week	No classes	
26	Science in the News (SL)	Lecture: 18 th Feb Seminar: 21 st Feb	Essay One due
27	Reviewing Science Communication (SM)	Lecture: 25 th Feb Seminar: 28 th Feb	
28	Science on Television – a narrative (SM)	Lecture: 4 th Mar Seminar: 7 th Mar	
29	Science in Museums (SL)	Lecture: 11 th Mar Seminar: 14 th Mar	
30	Science and New Media (KB)	Lecture: 18 th Mar Seminar: 21 st Mar	
		3 rd Apr	Essay Two due

Assessments

Summary

	Description	Deadline	Word limit
Essay 1	Write a 3000 word essay chosen from the titles below	11.59 pm Mon 18-Feb	3,000
Essay 2	Critical science communication review	11.59pm Wed 03-Apr	3,000

Assignments

This module is assessed by 100% coursework. There is no exam. Essays must be submitted anonymously via Moodle.

In order to be deemed 'complete' on this module, students must attempt both assignments.

Essay One:

Due 18th February, 23:59

Word limit: 3000 words

Contribution to final mark: 50%

Choose one of the following essays. Essays must be properly referenced and contain a bibliography.

1. The problem with the public understanding of science is the words “public”, “science” and “understanding”. Discuss.
2. Outline the concept of the ‘Two Cultures’. Is it still relevant today?

Essay Two:

Due 3 April, 23:59

Word limit: 3000 words

Contribution to final mark: 50%

Using material collected for one of your research task as a starting point, write a critical review of an area of science communication covered on the module. Note: you are expected to do further research and go beyond the discussion in class.

You might, for example, compare two pieces of popular science writing, a variety of newspaper articles, two museum exhibits.

Guidance on writing a critical review

You should be addressing some or all of the following aspects in your review:

Where did your materials come from? Why might this be relevant to the content and how might the same message be different in a different context?

Who might read/watch it? (what is the intended audience?)

What sort of model of science communication is implied here?

How does what you are looking at fit with the historical trends in science, communication and culture that have been discussed in class?

Whose interests are being served here?

How does this piece of communication fit with models of public understanding of science?

How does this medium of science communication compare to others you have looked at?

To answer these sorts of questions you need to provide evidence. Your evidence in this case will be the content and/or specific features of the piece of science communication. So try to point to the relevant sections/sentences/features of the piece when answering the question.

It is worth bearing in mind that this is a course about science communication, the theory, its practice and its implications. Thus your approach, and work, should focus on this as the main area of analysis. You should never be simply providing a descriptive account of the content of the science communication studied. The content of a piece of science communication is only relevant insofar as it allows you to answer more interesting questions about it (not just what did it say, anyone can read/watch something to answer that!)

Bear in mind also the difference between the research literature and your own experience. This is particularly important when dealing with popular culture or media, subjects which we are all familiar with and have experiences of in our every day lives.

You may experience the mass media and popular culture in one way, and thus form your own opinions about them but this does not mean that your experiences and opinions are representative of everyone else's. Sociology is about society not individuals. So be very wary of making statements like, "the public will think this...", "this won't make sense to the public..." or "this will make everyone think x". You may feel that way, but unless you have concrete evidence backing up such claims, these are simply unsubstantiated assertions based upon one person's experience.

You are at university to study these things in an academic and critical manner, so you should always ground your arguments and observations within the academic literature you have read. You should therefore justify your arguments through such mechanisms as sourcing, citing data, referencing, providing logical justification etc. There is nothing wrong with having personal opinions concerning an issue, but we want to see that you have engaged with the context and issues rather than simply writing a polemic, one-sided and unsubstantiated editorial on the topic! If you want to bring your own opinions or values to bear on your research, you need to make sure that you reflect on how these articulate with other viewpoints or values from within the literature.

Criteria for assessment

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

Aims & objectives

The course aims to impart knowledge and understanding, at an introductory level, of:

- Public spaces for science, including the mass media, science museums and everyday life
- Media and processes for science communication
- The history, and role, of science communication in the professionalisation of science
- Concepts in public understanding of, and engagement with, science
- How science becomes newsworthy
- How science is represented in museums

- How science is used in the political arena

By the end of this course, you should have:

- Knowledge and understanding of the basic concepts and scope of science communication
- A broad understanding of the social and political contexts and functions of science in public
- Skills in written and spoken communication
- Skills in relating personal experience to the ideas, tools and values of academic research
- Skills in the recognition, collection and analysis of research materials
- Skills in argumentation, listening and constructive dialogue
- Confidence in contributing in class

Reading list

The core text for this course is the book *Science in Public: Communication, Culture & Credibility* (New York: Plenum/Perseus/Basic Books, depending on the date) by Jane Gregory and Steve Miller (£11.99 from Waterstones). This is a secondary text – that is, it collects and comments on the work of many different scholars – and it will prepare you for the often challenging primary literature – the work of those scholars themselves – that you will meet if you go on to study science communication at higher levels. For some classes, you will be required to read parts of *Science in Public* before class.

Three other very useful books are *Science, Culture and Society: Understanding Science in the 21st Century* (Polity Press), by Mark Erikson, *Investigating science communication in the information age: implications for public engagement and popular media* edited by Richard Holliman et al. (Oxford University Press), and *Introducing science communication* edited by Mark Brake and Emma Weitkamp (Palgrave Macmillan).

You are also encouraged to use the internet for research. However make sure you reference the full web address, the site title and date visited. Be critical of what you read and be careful of / avoid purely descriptive sites such as Wikipedia – We will be looking for evidence of some hard thinking and argument in your essays, not simple regurgitation of basic information. **Also note that plagiarism, particularly involving internet sources, will be treated as a severe exam irregularity.**

The notes that you take in lectures will not be detailed enough for you to fully understand a topic or to write an essay on that topic. It is therefore essential that you make use of the reading list.

- The reading list is divided into essential and additional reading - you are **not** expected to read all of the material.

- You will be expected to read all of the required reading (although not necessarily all in the same amount of detail). This amounts to one or two pieces each week.
- If you cannot get hold of the *required* reading, then you should read an item from the key reading list instead.

All of the readings, web resources, and Library listings are listed, and many can be directly accessed on the course Moodle pages. You will have access to the Moodle pages once you have been registered for the course on PORTICO.

Week 1: Introduction to science in public

This week's class will explore the many contexts and means by which science is experienced in the world outside of its professional community. These spaces will be explored in more detail as the course progresses.

Required reading for this class is *Science in Public*, Chapters 1 and 2

Further reading:

Mark Brake (2010) 'The History and Development of Science and Its Communication' in Brake and Weitkamp (eds), Chapter 1

Karen Bultitude's forthcoming chapter on the whys and how's of science communication (provided for you as a pdf on Moodle).

B. Trench and M. Bucchi, *Science communication, an emerging discipline*, *Jcom* 09(03) (2010) pp. 1-3.

This week's tutorial will discuss the many ways in which different media and forums are used for communicating science.

Research Task

Your assignment is to collect and report on two experiences from everyday life where scientific information is made available to non-experts. Only one of these can involve the mass media (newspapers, tv, internet).

By the end of this week you should understand:

- That science communication is carried out by a wide range of people;
- That they have a variety of motivations for doing this;
- That they may play a variety of roles, from educator to entertainer, to which they are more or less well suited;
- That the process of communication requires making assumptions about the audience ...
... that may or may not be justified.

Week 2: Science, communication and culture

This class will develop the idea that science communication does not take place in a vacuum, but in a context formed of the many other forms of knowledge and communications with which it co-exists in science-based societies. It will look briefly at the way the cultural context for science has developed historically, and whether or not there is a divide between science, on the one hand, and general culture, on the other.

Required reading for this class is: Science in Public; chapter 2.

Further reading:

- Stefan Collini's Introduction to, and C.P. Snow's *The Two Cultures* (Canto: 1993);
- Hook & Brake's chapter on "Science in Popular Culture" in Brake and Weitkamp (2009)
- A recent(ish) discussion of the two cultures
<http://www.guardian.co.uk/science/2007/jul/01/art>;
- Mark Erikson, *Science, Culture and Society: Understanding Science in the 21st Century*, Chapter 6: Popular Science
- Geoffrey Cantor's piece on science and religion in *Nature*, 403, 831 (24 February 2000)
<http://www.nature.com/nature/journal/v403/n6772/full/403831a0.html> and the ensuing correspondence which you can find through an online search.
- *Nature*, 459, 10 (7 May 2009), Doing good, 50 years on, editorial and three essays

All online sources available on Moodle.

For this week's tutorial you will discuss how different understandings of science leads to differing relationships between science and other aspects of culture, such as religion.

Research Task

Undertake an online search to find recent discussions about the "two cultures" you'll be surprised where this conversation pops up. You might, for example find it in discussions about science and religion, science and art, science and humanities. Be prepared to summarise the arguments in what you find, and develop your own opinion on this issue.

By the end of this week you should understand:

- That science communication does not take place in a cultural vacuum;
- That the cultural environment for science communication has developed historically (and is still doing so);
- That the issue of a cultural divide is one that is still debated.

Week 3: What is “The Public Understanding of Science”?

This class will look at an area that – until recently – was known as “The Public Understanding of Science” (PUS). It will discuss notions of PUS as a “mission” or as “social engineering”, and models of science communication that accompany these notions. These will be contrasted with other approaches that see PUS as a means of empowering individuals and groups within society, a topic that will get further attention in Course Week 10.

Required reading for this class is: Simon J Lock, (2011), ‘Deficits and dialogues: science communication and the public understanding of science in the UK’, in David Bennett and Richard Jennings, eds, *Communicating Science For Scientists* (Cambridge: Cambridge University Press).

Further reading:

- *Science in Public*; chapter 4
- Clare Wilkinson’s chapter in Brake & Weitekmap (2010) ‘Science and the Citizen’.
- The original report from the Royal Society on The Public Understanding of Science, 1985 (Royal Society).
- Sergio Sismondo's chapter on Expertise and Public Understanding (Chapter 16) in *An introduction to science and technology studies* (2004), (Malden, MA ; Oxford: Blackwell)
- Peter Brok's chapter's 5 and 6 in *Understanding Popular Science* (2006, Open University Press), cover the development of Public Understanding of Science
- Brian Wynne’s essay on public understanding of science in *Handbook of Science & Technology Studies*, edited by Jasanoff *et al.* (Sage: 1995), pp. 361-388

All online sources available on Moodle.

For this week’s tutorial you will discuss approaches to PUS and the features that accompany them. The discussion will bring out the strengths and weaknesses of these approaches.

Research Task

Your assignment will be to read one of the following articles from the launch issue (Vol. 1 no. 1) of the journal *Public Understanding of Science*. The journal is available online in College. The articles are by Bodmer, Leblond, Fayard and Miller. Choose two, read them and make notes so that you can discuss the approaches to PUS that are being manifested in the articles, as well as any other features that you think are worthy of discussion. For some interesting contrasts choose one of Bodmer or Miller and one of Leblond or Fayard.

By the end of this week you should understand:

- The basic concepts underlying the area of PUS;
- The various approaches to this area;
- Their strengths and weaknesses;
- That approaches to PUS have developed over a period of time.

Week 4: The Public for Science

This class will investigate the way that “the public” may be conceptualised, and how that may affect how science is communicated. It will look at models, surveys and other social studies of the public for science.

Required reading for this class is:

Jane Gregory (2004) ‘Who is the man on the street?’, *RSA journal* July 2004 – available on Moodle
Science in Public Chapters 4 and 10.

There will also be reference to Jurgen Habermas’ 1991 book *The structural transformation of the public sphere*.

Further reading (All online sources available on Moodle):

- Jon D. Miller (1992) “Towards a scientific understanding of the public understanding of science and technology”, *Public Understanding of Science* **1**, 23-26.
- Chapters 1-3 in Hannay, Alistair, (2005) *On the Public*, (Routledge) – available on Moodle.
- Dan Hind (2011) *The Return of the Public*, Chapters 1 – 2 (hard copies available from Simon)

This week’s tutorial will discuss what audiences are being targeted by the various science communication activities discussed in the lecture, and what implicit and/or explicit assumptions are being made about those audiences.

Research Task

Your assignment is to find the same piece of science communicated in two different places for different audiences. Compare and contrast the context, context and style of the two pieces and think about who each piece is aimed at and to what end. Try not to pick two pieces from different newspapers.

By the end of this week you should have some understanding of the different notions of the public and you should be alert to some of the underlying assumptions that science communications and communicators may be making.

Week 5: Science, engagement and policy

This class will discuss the way in which “official” approaches to science communication – from the scientific community and governmental agencies and spokespersons – have developed over the past decade or so, and why. It will look at the issue of authority in science communication, and questions of how greater public participation may be facilitated. It will point to the distinctions between promotion and information in motivations for science communication.

Required reading for this class is: [Gregory, J and Lock, SJ \(2008\), "'Public Understanding of Science': Public Engagement as a Tool of Science Policy in the UK", *Sociology Compass*, 2: 4](#)

Further Reading:

- Jack Stilgoe and James Wilsdon, ‘The new politics of public engagement with science’, in Holliman et al. (eds) *Investigating Science Communication in the Information Age*, 2009, Chapter 1.2
- Alan Irwin, ‘Moving forward or moving in circles? Science communication and scientific governance in an age of innovation’ in Holliman et al. (eds) *Investigating Science Communication in the Information Age*, 2009, Chapter 1.1

Reports from the Parliamentary Office of Science and Technology on science communication and public engagement:

[POSTnote, No. 153](#)

[POSTnote, No. 189](#)

Research Task

Your assignment is to look at the content of at least two government department websites (e.g. BIS, GOScience, DEFRA) to see what sort of information it provides on a contemporary scientific issue such as climate change, synthetic biology, or nanotechnology and at whom it might be aimed. Consider especially the contrast between the differing communications strategies, e.g. the promotion of the new technology and attempts to facilitate public engagement or consultation.

By the end of this week you should understand:

- That a variety of official bodies are involved in science communication, as part of their duties and as part of their efforts to promote themselves and their activities;
- That in doing so, they have “authority”;
- That this then requires measures to allow for public involvement, particularly in the area of policy making.

Week 6: Science in the News Media

This week's class explores the place of science in reporting in news media. It asks: what kinds of information are communicated; which agencies and professionals contribute to the news process, and whose interests are served?

Required reading for this class is ***Science in Public, Chapter 5***. This chapter will give you some factual knowledge about media terms, processes and practices.

Further reading:

- Stuart Allan's chapter in Holliman et al. (eds) *Investigating Science Communication in the Information Age*, 2009, Chapter 4.1
- Bruce Lewenstein's essay on science and the media in *Handbook of Science & Technology Studies*, edited by Jasanoff et al. (Sage: 1995), pp. 343-360
- Ben Goldacre's book *Bad Science* contains lots of examples of scientists and science in the media. Notice that many of the same normative judgements about what the media should be doing with science discussed in the lecture are present here.

This week's tutorial is about what science stories get covered in the press, and why.

Research Task

Your assignment is to buy two newspapers on the same day: one you know well, and one you never read. Compare the science coverage in the two papers. Think about: why a particular story made the news; why some stories are in one newspaper but not others; how other news events shape the news space for science.

By the end of this week you should have some understanding of basic terms in media studies and be aware of the basic processes and professions involved. You should also have a sense of the challenges of media research.

Week 7: Reviewing science communication

This week will “review” science communication in both senses of the word. The first part of the lecture will look at the idea that the popularisation of science is part of a process of writing the autobiography of science. The lecture will also try to explain how popular science explains science. Finally, we will look at how to review a popular science book or film.

Required reading for this class is:

Baudouin Jurdant (1993). “The popularisation of science as the autobiography of science”, *Public Understanding of Science* **2**, 365-373.

Jon Turney (2004). “Accounting for explanation in popular science texts – an analysis of popularised accounts of superstring theory”, *Public Understanding of Science* **13**, 331-346.

All online sources available on Moodle.

To test out Jurdant’s idea, students may also like to take a look at: Steve Miller (2011) *The Chemical Cosmos: a guided tour*, (Springer, New York) which is available in the library or at Waterstones.

This week’s tutorial is about reviewing science, and how to do it. But there will be opportunities to discuss all of the issues raised in the lecture.

Research Task

You will be expected to read a review of a popular science book, film or documentary in a newspaper or magazine such as *New Scientist*. Look in particular at the way the reviewer analyses the book and the way it carries out its task of popularisation. Pay much less attention to the likes and dislikes of the reviewer, except insofar as they contribute to the analysis.

By the end of this week you should understand some of the reasons for, and techniques of popularising science, explaining terms and concepts that are far from everyday. You should also be able to look at the construction of a piece of science popularisation and recognise some of the techniques being used.

Week 8: Science on the television – a narrative

If the popularisation of science is in part “(auto)biography”, then surely (auto)biography tells a story. Story-telling is one of the oldest forms of communication and there are strategies for doing so. This lecture will make use of the work carried out by Roger Silverstone in analysing the narrative strategies used in a t.v. documentary. Parts of the documentary will be shown, as time allows, so that Silverstone’s points may be exemplified. T.v. science will be compared with radio and radio science communication so that the effect of the communication medium can be explored .

Required reading for this class:

Roger Silverstone (1984). “Narrative strategies in television science”.

Copies of this reading will be handed out in class.

This week’s tutorial is about techniques in telling the story of science

Research Task

You should listen to or view a popular science broadcast. Suggestions will be made in class, depending on what broadcast schedules have available.

By the end of this week you should understand some of the general strategies in telling the story of science. In particular, you should be aware of the techniques available to television, compared with other media.

Week 9: Science in Museums

This week's class will explore the history and theory of science museums. It will discuss the purpose of collections of scientific artefacts and natural objects, and consider how science/society relations are reflected in the changing style of science museums through the twentieth century.

Required reading for this class is *Science in Public* Chapter 8.

Further reading:

- Bernard Schiele, 'Science Museums and Science Centres' in Bucchi and Trench (eds), 2008, *Handbook of Public Communication of Science and Technology*, (Routledge), pp. 27 – 40.
- Alison Boyle's chapter in Brake & Weitkamp (2010)
- John Durant's introduction to Durant, J (ed) (1992) *Museums and the Public Understanding of Science* (Science Museum: London)
- Frank Oppenheimer's essay on his rationale for science centres, <http://www.exploratorium.edu/frank/rationale/rationale.pdf>
- An excellent essay by Sharon MacDonald on Exhibitions and the Public Understanding of Science - <http://www.pantaneto.co.uk/issue13/macdonald.htm>

All online sources available on Moodle.

This week's tutorial will be a discussion of your experiences as museum visitors.

Research Task

Your assignment is to visit the Science Museum in South Kensington, where you should look at one traditional gallery in the main building and one of the newer exhibitions in the Wellcome Wing. Think about: what it is that you are being shown; what media are used; what choices have been made and why in the assembling and exhibiting; and what messages you felt were communicated to you.

By the end of this week you should know something of the history of science museums and be able to take a critical view of museums and exhibitions.

Week 10: Science and New Media

This week's class explores the ways in which new media may be used to communicate about scientific topics. Interactive social media such as Facebook and Twitter will be considered, as well as more 'broadcast' mechanisms such as podcasting, blogging and open notebooks. Audience demographics for each of the different media will be considered in light of ensuring that the medium is best suited to the target recipients.

Required reading for this class:

Research Information Network (2011) "Social media: A guide for researchers". Available from http://www.rin.ac.uk/system/files/attachments/social_media_guide_for_screen.pdf

Further reading:

- Trench, B. (2008) "Internet: Turning Science Communication Inside-Out" in Bucchi and Trench (Eds) *Handbook of Public Communication of Science and Technology*. (Routledge).
- Various chapters in Holliman et al. (eds) *Practising Science Communication in the Information Age Theorising Professional Practices*, 2009, Oxford University Press, e.g.:
 - Chapter 2.2: Matthew Chalmers: Communicating physics in the information age
 - Chapter 3.1: Scott L. Montgomery: Science and the online world: realities and issues for discussion
 - Chapter 3.2: Richard Gartner: From print to online: developments in access to scientific information

All online sources available on Moodle.

This week's tutorial will involve group critiques of specific examples of science communication using new media.

Research Task

Your assignment is to identify and briefly review one example of each of the following mechanisms for communicating scientific topics using new media:

- Podcast
- Blog
- Twitter or Facebook

If you are unsure what examples you should select please contact Karen Bultitude in advance of the tutorial. Consider each of the examples you have chosen in light of the following issues: how have the scientists been presented (e.g. personal vs professional personas); how does the medium encourage or detract from collaboration and dissemination of scientific results; and what audiences are best served by the different media types. Remember, you are expected to conduct a **critical analysis** of this topic, **not just describe** each of the examples you have found.

By the end of this week you should: comprehend different types of new media and how it is used to communicate science; understand the motivations and barriers that affect scientists' use of these new media; be aware of the importance of audience targeting when selecting new media.

Course expectations

Students are expected to attend the lecture and their allocated seminar on Thursday each week.

You will bring to the tutorial an item of research material that illustrates an aspect of that week's topic (such as a news cutting, a poem, items from an advertising campaign or an activist pamphlet). You should annotate or review your research material and be prepared to discuss it in class. Please ensure that you give yourself some time between the lecture and the seminar on the Thursday for finding this material.

Tutorial groups will be assigned in the first week. **Please note that these tutorials are a compulsory part of the course, failure to attend less than 70% of the course will result in you being deemed incomplete for the module.**

Important policy information

Please refer to the HPSC Syllabus Supplement available in Moodle.