

HPSC0008 Science Communication and Public Engagement

Course Syllabus

2022-23 session | Dr. Carina Fearnley | c.fearnley@ucl.ac.uk

Course Information

This interdisciplinary course introduces the public dimensions of science and technology. Drawing on sociology, history, cultural, media and communication studies 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 develops students' critical analysis skills with respect to the communication of science in different public contexts including the news media, museums, fiction and online. Ultimately it aims to develop students' skills in academically interrogating science communication and engagement.

Basic course information

Moodle:	https://moodle.ucl.ac.uk/course/view.php?id=7417
Assessment:	Writing assignment (35%), Essay (65%)
Timetable:	www.ucl.ac.uk/timetable Lectures: Tuesday 13:00-14:00 – Foster Court, Room 114 Seminars: Wednesday 11:00-12:00 – 20 Gordon Square, Room 102 Sem 3 Wednesday 12:00-13:00 – 20 Gordon Square, Room 102 Sem 3
Course tutor:	Dr Carina Fearnley
Course Teaching assistant	Xiaoyu Liu Email: xiaoyu.liu.18@ucl.ac.uk Email to arrange meeting
Contact:	c.fearnley@ucl.ac.uk
Web:	https://www.ucl.ac.uk/sts/people/dr-carina-fearnley
Office location:	2.1a, 22 Gordon Square
Office hours:	Tuesdays 10:00-12:00

Schedule

UCL Week	Lecture	Lecture Date	Lecture Topic	Activity*
6	1	4/10/22	Communicating Science through the ages: from the Greeks to the geeks (Carina Fearnley)	Seminar: Experiences of science communication (CF/XL)
7	2	11/10/22	The political landscape: experiments with democracy (Jack Stilgoe)	Seminar: Designing a public engagement exercise (JS/XL)
8	3	18/10/22	Who is the expert: truth, scepticism, and conspiracy (Carina Fearnley)	Seminar: Is this Bad Science? (CF/XL)
9	4	25/10/22	Who is Jo(e) Public? (Charlotte Sleight)	Seminar: Who are the public anyway? (CS/CF/XL)
10	5	1/11/22	Science Communication in Writing (Carina Fearnley)	Seminar: Analysis of scientific writings and prep for Assignment 1 (CF/XL)
11		8/11/22	Reading Week	
12	6	15/11/22	The Citizen's Science: Communicating with the Public (Carina Fearnley)	Seminar: Citizen Science in Action (CF/XL)
Deadline for Assignment 1: Short Writing Exercise 16/11/22				
13	7	22/11/22	Science in Television and Film (Jean-Baptiste Gouyon)	Seminar: Science TV & Film (JB/CF/XL)
14	8	29/11/22	Science in museums (Scott Keir)	Seminar: Science Museums (SK/CF/XL)
15	9	6/12/22	Communicating risk and uncertainty in Science (Carina Fearnley)	Seminar: Volcanic warning systems (CF/XL)
16	10	13/12/22	Communicating science in the future: Sci-Fi, the internet, and AI (Carina Fearnley)	Seminar: Imagining the future of Sci Com (CF/XL)
Deadline for Assignment 2: Essay 19/12/22				

* Specific instructions relating to each week's activity will be available on Moodle

Assessments

Summary

Proportion of module	Description	Deadline	Word limit
35%	Short Writing Exercise	16 November 2022, 17:00	1,000
65%	Essay	19 December 2022, 17:00	2,000

Assignment 1: Short Writing Exercise

Due 16 November 2022, 17:00

Word limit: 1,000 words

Contribution to final mark: 35%

See assignment brief for further details on Moodle

Either: Writing the Life Scientific

Choose one episode from the BBC podcasts [The Life Scientific](#). Write it up as a magazine profile. 100 of your words should state what magazine you are writing for and how your content is angled towards its editorial policy, as well as its targeted audience. You can focus on explaining the science itself, or on the life story of the scientist, or a hybrid of the two. If you are writing about the science itself, make sure you explain how the science was done, not just the 'facts'. If you are writing a life story, avoid writing a straight, chronologically linear biography. There is no need for formal footnotes though you can hyperlink sources as relevant to the audience. Make it interesting and lively.

Or: Defining Moments of Science

Write a blogpost about a defining moment of science (perhaps from global media, or national relevance, or personal). What message(s) about science was conveyed? How did 'the public' respond to it at the time? What is your reflection on it now? What is its significance for your reader? How do you want to use it to challenge what the reader thinks about science? Make sure your blogpost touches on the themes of power and audience as we have discussed them in the course. There is no need for formal footnotes though you can hyperlink sources as relevant to the audience. Make it interesting and lively.

Whichever version of the writing exercise you do, the aim is to provide evidence that you have understood the issues of power that have informed the first half of the module. You should demonstrate a nuanced understanding of dialogue and/or participation, and avoid 'labsplaining' at all costs!

Assignment 2: Essay

Due 19 December 2022, 17:00

Word limit: 2,000 words

Contribution to final mark: 65%

See assignment brief for further details on Moodle

Choose one of the following:

1. Analyse example/s of **either** flat-earth, climate sceptic or anti-vaxx activity and characterize participants' engagement with science. Do they present themselves as denying science or as practising science? Why and how?
2. Using an example of a specific museum and/or exhibition as a case-study, discuss what message about science is communicated, and its impact.
3. Using example(s) of a specific factual film or TV show, discuss what message about science is communicated, and its impact.
4. Trace a specific piece of scientific research through stages of research, announcement, publication and media response. How does the message change through the process? Which of the three elements of scientific literacy are treated in the media, and how/how well? (You can emphasise one or other of these sub-questions as appropriate to the story.)
5. Using example(s) of a specific health-based website or social media, discuss what kinds of knowledge and community are created.
6. Is citizen science real participation in science, or is it just free labour/just pretend? Choose one example that supports a positive and one that supports a negative response to the value of citizen science.

Your essay should draw upon **science communication theory** and **academic publications** to support your argument. Themes and topics from the first five weeks should be included in any of these essays. The following questions will help you to develop your answer:

- Whose voices are heard (whether directly or indirectly)?
- What narrative is used to present the science? What effects does this have?
- Which of the three elements of scientific literacy (subject knowledge, knowledge creation, and disciplinary policing) are treated, and how?
- Who is the communication aimed at? (and what evidence do you have to support this?), and who might be excluded from the communication and why?
- How is the audience encouraged to relate to the science?
- In what way(s) is science itself (re)presented?

Note: these questions are merely guides to help you structure your essay. The essay should be structured with an appropriate introduction, middle sections and conclusion. We will discuss this issue during the tutorials in the module.

Please attach an appendix containing a copy of your chosen examples (or a weblink to where they are accessible). This appendix does NOT count towards your word count.

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 everyday 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. Further module specific criteria for assessment can be found on the module Moodle pages.

The marking rubrics are available for both assignments on the module Moodle pages.

Module aims & objectives

Aims

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

- Concepts in public understanding of, and engagement with, science
- Public spaces for science, including the mass media, science museums and everyday life
- Cultural, social and political issues around science communication

Objectives

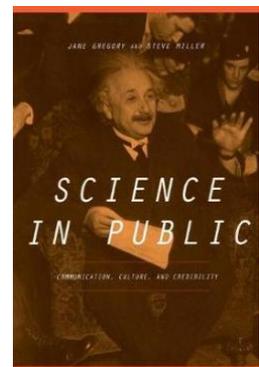
By the end of this module students should have:

- Knowledge and understanding of the basic concepts and scope of science communication
- A broad understanding of the cultural, social and political issues around 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

There is no one book that covers this course.

Science in Public: Communication, Culture And Credibility (New York: Plenum/Perseus/Basic Books, depending on the date) by Jane Gregory and Steve Miller, 1998 provides some useful background: it is a *secondary* text – that is, it collects and comments on the work of many different scholars – and is a guide to the primary literature that you will meet if you go on to study science communication at higher levels. It is also now quite old, so doesn't provide a great picture of contemporary developments, not least the shift to online communication. It is still, however, a great introductory book to help us understand the historical and Western cultural dimensions of science communication.



Another key book is:

- Gascoigne, T., Schiele, B., Leach, J., Riedlinger, M., Lewenstein, B. V., Massarani, L., & Broks, P. (Eds.). (2020). *Communicating Science: A Global Perspective*. Acton: ANU Press. <https://doi.org/10.22459/CS.2020> [Open access - free to download]

This offers a global perspective on Science Communication and features work by members of the STS Department. This may be a rich source for weekly class tasks, and for ideas for the term-essay – and it's free to download.

Other useful book references:

- Bennett, D.J. and Jennings, R.C. eds., 2011. *Successful Science Communication: Telling It Like It Is*. Cambridge University Press.
- Brake, M.L. and Weitkamp, E. eds., 2009. *Introducing science communication: A practical guide*. Palgrave Macmillan
- Holliman, R., Whitelegg, L., Scanlon, E., Smidt, S. and Thomas, J., 2009. *Investigating science communication in the information age: Implications for public engagement and popular media*. Oxford University Press.
- Irwin, A., 1995. *Citizen science: A study of people, expertise and sustainable development*. Psychology Press.
- Public Understanding of Science, Special issue. See <http://pus.sagepub.com/content/23/1.toc> especially Stilgoe, J., Lock, S.J. and Wilsdon, J., 2014. Why should we promote public engagement with science? *Public Understanding of Science*, 23(1), pp.4-15.

Additionally, Stella Cottrell has published an excellent text that will help you develop your critical thinking skills and essay writing, including worked examples to help you practice these skills. We strongly advise that you do so in preparation for your assessments on this course:

- Cottrell, S. (2017). *Critical thinking skills: Effective analysis, argument and reflection*. Bloomsbury Publishing.

Finally, **essential weekly readings** are available on Moodle. You are expected to have read the relevant texts in following your viewing of each lecture at the start of each week. We have also compiled an extensive set of additional readings which will be provided to complement each lecture – these will allow you to delve more deeply into specific areas of interest and assist you in your critical review assessment. See each set of lecture slides for details.

Other Resources:

You are encouraged to start your own research to find readings and sources that relate to the module materials, and to take a general interest in key public engagement debates, controversies, and breakthroughs throughout the module. Here are some useful sources to start with:

Online Journals, freely accessible through the UCL Library Explore website:

Public Understanding of Science: <http://pus.sagepub.com>

Science, Technology, & Human Values: <http://sth.sagepub.com>

Science Communication: <http://scx.sagepub.com>

Journal of Science Communication <http://jcom.sissa.it>

Useful websites:

- Sciencewise: <https://sciencewise.org.uk/>
- UKRI Public Engagement: <https://www.ukri.org/what-we-offer/public-engagement/>
- National Coordinating Centre for Public Engagement
<https://www.publicengagement.ac.uk/>
- The UCL Public Engagement Unit: <https://www.ucl.ac.uk/public-engagement>
- UCL Culture: <https://www.ucl.ac.uk/culture>
- British Science Association: <http://www.britishtscienceassociation.org>
- The Royal Institution: <https://www.rigb.org/about-us>
- Science Grrl: <http://sciencegrrl.co.uk>
- Zooniverse: <https://www.zooniverse.org>
- Center for Public Engagement with Science & Technology: <http://www.aaas.org/pes>
- Network for the Public Communication of Science and Technology (PCST Network)
<https://www.pcst.network/>
- EUSEA European Science Engagement Association <https://eusea.info/>
- red-pop Caribbean and Latin American network <https://redpop.lat/>
- PSCI-COM science communication mailing list <http://www.jiscmail.ac.uk/lists/psci-com.html>
- UK Association for Science and Discovery Centres <https://www.sciencecentres.org.uk/>
- [UK Science Festivals Network https://sciencefestivals.uk/](https://sciencefestivals.uk/)

Do not forget to read and follow relevant blogs, news stories, and twitter feeds of relevant institutions and scientific figures in the public domain (such as Brian Cox and UCL's own Hannah Fry), and relevant TV and Radio programmes.

Course expectations

Students are expected to view each weekly lecture package (with resources, links, and videos available on Moodle) and carry out associated assigned tasks (including reading all assigned texts). These tasks are set each week for discussion to tie in with the lecture content and further develop your communication skills and understanding.

Should the instructions present any difficulties in completing the tasks, please contact Carina Fearnley as soon as possible.

Outline of lectures:

This section provides additional details of the materials addressed each week.

1. Communicating Science through the ages: from the Greeks to the Geeks – Dr Carina Fearnley

An introductory lecture providing an overview of what public engagement is, and why should we do it. The evolution of mediating and communicating science is examined including the public understanding of science (PUS), to Public Engagement in/with Science and Technology (PEST), to science democracy, outlining various models and programmes used to frame the process of science communication and public engagement.

Essential Reading

Gregory, J., & Miller, S. (1998). *Science in public: Communication, culture, and credibility*. Plenum Press – see chapter 1.

Sleigh, C. (2017). “Communicating Science” pp.378-410 in Morus, I. R. (Ed.). (2017). *The Oxford illustrated history of science*. Oxford University Press (chapter 12)

Lock, S.J., 2011. “Deficits and dialogues: science communication and public understanding of science in the UK” in Bennett, D.J. and Jennings, R.C., 2011. *Successful science communication*. Cambridge University Press, pp.17-30

Wynne, B., 2006. “Public engagement as a means of restoring public trust in science - hitting the notes, but missing the music?” *Public Health Genomics*, 9(3), pp.211-220.

2. The political landscape: experiments with democracy – Prof Jack Stilgoe

What is the role of politics in science communication and public engagement, and what is the dialogue and agenda involved? This lecture explores the framing of upstream engagement and dialogue, along with the tools used in developing policy and the problems of representation. This session focuses on the role of collaboration in public engagement and involves a seminar to design a public engagement exercise.

Essential Reading

Stilgoe, J., Lock, S.J. and Wilsdon, J., 2014. “Why should we promote public engagement with science?” *Public Understanding of Science*, 23(1), pp.4-15.

Wilsdon, J. and Willis, R., 2004. *See-through science: why public engagement needs to move upstream*. Demos.

3. Who is the expert: truth, scepticism, and conspiracy - Dr Carina Fearnley

What is the role of the expert in science communication, and is this the scientists? How is expert knowledge used and integrated by scientists? We explore the dynamics between truth, scepticism, and conspiracy.

Essential Reading

Goldacre, B. (2009). *Bad Science*. HarperPerennial.

Fearnley, C. J., & Beaven, S. (2018). "Volcano alert level systems: managing the challenges of effective volcanic crisis communication." *Bulletin of Volcanology*, 80(5), pp.1-18.

Buckley, N., and Hordijkeno, S., "Science festivals" in Bennett, D.J. and Jennings, R.C., 2011. *Successful science communication*. Cambridge University Press, pp.17-30.

Riise, J., 2008. "Bringing science to the public." In *Communicating Science in Social Contexts* pp. 301-309. Springer Netherlands.

4. Who is Jo(e) Public? – Prof Charlotte Sleigh

In this lecture and seminar we will think critically about the notion that there is a singular 'public' for science. We will think about the different reasons for the ways in which groups of people engage with science, and the different ways in which they do so. Opening up the notion of publics as a plural concept even begins to suggest that science itself may not be a singular thing.

Essential Reading

Read before class - Einsiedel, E. F. (2014). Publics and their participation in science and technology. *Routledge handbook of public communication of science and technology*, pp.25-139. **Underline or note three sentences that you think are important to Einsiedel's argument. Be ready to explain in class what they mean (e.g. be ready to give an example) and why they are important.**

Skim-read before class

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/914924/s0649-public-health-messaging-bame-communities.pdf *Who is this written by? What's it for? How does it think about 'the public' or publics? How else could it have been written?*

Jane Gregory, "Who is 'the man in the street'?" *RSA journal*, 2004, Vol.151 (5512), pp.28-31

Mike S. Schäfer, et al. "The different audiences of science communication: A segmentation analysis of the Swiss population's perceptions of science and their information and media use

patterns." *Public understanding of science* 27.7 (2018): pp.836-856 (Note that this is being given as an example of poor scholarship on the topic!)

5. Science Communication in Writing – Dr Carina Fearnley

Communicating complex scientific ideas without misleading or overwhelming the public is challenging. This lecture explores why writing still matters and how to do it well, with a special focus on the role of storytelling. This lecture links to first assessment (writing assignment) and explore the role of writing in communicating and engaging with the public, as well as how to do it well.

Essential Reading

Read two excerpts from:

- i. Suzanne Simard, 'Finding the Mother Tree' (Allen Lane, 2021) pp. 127-136
- ii. Edward O. Wilson, 'Ants' excerpt from *Naturalist* (Penguin, 1995), pp. 299-306

6. The Citizen's Science: Communicating with the Public – Dr Carina Fearnley

Citizens are at the core of contemporary public engagement. In this lecture we examine the various approaches used in which the public are involved in the development of contemporary engagement and policy. This ranges from citizens juries, to consensus conferences, to patient engagement, to citizen science in the traditional sense (e.g. Zooniverse), right through to how the public get their voice into policy and decision-making issues involving science and technology (e.g. Sciencewise). Therefore, this lecture provides an overview of the various approaches, both top-down, and bottom-up that a citizen can be engaged in science and technology. This session is focused on the role of receiving in public engagement.

Essential Reading

Bonney, R., Phillips, T. B., Ballard, H. L., & Enck, J. W. (2016). Can citizen science enhance public understanding of science? *Public understanding of science*, 25(1), 2-16.

Jasanoff, S., 2004. Science and citizenship: a new synergy. *Science and public policy*, 31(2), pp.90-94.

Stilgoe, J., 2009. *Citizen Scientists: reconnecting science with civil society*. London: Demos.

Halkier, B. (2017). Mundane science use in a practice theoretical perspective: Different understandings of the relations between citizen-consumers and public communication initiatives build on scientific claims. *Public Understanding of Science*, 26(1), 40-54.

7. Science in Television and Film – Dr Jean-Baptiste Gouyon

According to recent surveys of public attitude to science, a majority of people in society still get most of their science information from audio-visual media, TV, digital media platforms, etc. In this session we look at audio-visual media's relationship to science, and we reflect on how film and TV participate in making science part of culture. Communication scholars have shown that TV and film audiences are not passive in front of media but actively produce meaning out of audio-visual contents. We'll ask how this translates in terms of communicating science.

Essential Reading

Gouyon, J. B. (2016). Science and film-making. *Public Understanding of Science*, 25(1), pp.17-30.

Hall, S. (2001). Encoding/decoding. In M. G. Durham and D. M. Kellner (Eds). *Media and cultural studies Key Works*. Blackwell Publishing, pp.163-173.

Halpern, M. K., & Rogers, H. S. (2021). Art–science collaborations, complexities and challenges. In M. Bucchi and B. Trench (Eds) *Routledge Handbook of Public Communication of Science and Technology*, Routledge, pp.214-237.

Vidal, F. (2018). Introduction: from “the popularization of science through film” to “the public understanding of science”. *Science in Context*, 31(1), pp.1-14

8. Science in museums - Scott Keir

Science centres and museums are visible and physical form of public interaction with science. Science museums, science centres, galleries and exhibitions don't just display science - they make it: through their content, through their narrative, and through the visitors they draw in. We will draw on historical perspectives to investigate how these media developed and their role in shaping ideas about the natural world; the similarities and differences between museums and science centres; who attends (and who doesn't); and the current debates around decolonisation and inclusion.

Essential Reading

Schiele, B. 2021. Science museums and centres. In Bucchi, M. and Trench, B., eds. *Handbook of Public Communication of Science and Technology: Third Edition* pp 53-76. Abingdon, UK: Routledge

Das, S. and Lowe, M., 2018. Nature Read in Black and White: decolonial approaches to interpreting natural history collections. *Journal of Natural Science Collections*, 6, pp.4-14. Available from <https://www.natsca.org/article/2509>

9. Communicating risk and uncertainty in Science – Dr Carina Fearnley

Using two volcanoes that erupted 100 years apart we will explore the challenges of uncertainty and risk in science, and the importance of communication, differing stakeholder perceptions, and the need and challenges of moving beyond 'normal' science. What will you do when lives are at stake – find out in a simulation of a volcanic eruption.

Essential Reading

Ravetz, J. (1999). What is Post-Normal Science, *Futures*, Vol.31(7), pp.647-653

Stirling, A. (2007). Risk, precaution and science: towards a more constructive policy debate. *EMBO reports*, 8(4), pp.309-315.

Spiegelhalter, D. J., & Riesch, H. (2011). Don't know, can't know: embracing deeper uncertainties when analysing risks. *Phil. Trans. R. Soc. A*, 369(1956), pp.4730-4750.

10. Communicating science in the future: Sci-Fi, the internet, and AI – Dr Carina Fearnley

This final session will investigate the cultures of science and science fiction. Using different media from literature such as *Frankenstein*, to radio, TV and film, we will explore the evolving agendas in scientific framing and the manner in which science and fiction can be mutually constituted. Finally, we will consider what tomorrow's world might be.

Essential Reading

Erickson, M. (2005). *Science, culture and society: understanding science in the twenty-first century*. Polity Press [please see Chapter 7]

Please watch a suitable science fiction film in preparation.

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.