



UNIVERSITY OF
CAMBRIDGE

Institute of Continuing Education

Postgraduate Diploma in Science Communication

2020-2022

Course code: 2022PCB232

COURSE GUIDE

University of Cambridge Institute of Continuing Education, Madingley Hall,
Cambridge, CB23 8AQ

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Welcome to the **Postgraduate Diploma in Science Communication**, a University of Cambridge award offered by the Institute of Continuing Education (ICE). The Diploma is taught and awarded at FHEQ level 7 (i.e. postgraduate level) and attracts 120 credits. It is completed in two academic years. For further information about academic credit please see our website: www.ice.cam.ac.uk/studying-with-us/information-for-students/qualifications-that-we-offer

Science communication is an important part of scientific endeavour. Many scientific institutions and businesses see communicating science as part of their core mission. These missions cover a wide range of activity: in developing countries, for example, science communication not only supports the roll-out of new technologies to make people's lives healthier and easier, but also contributes to campaigns to reduce exploitation and preserve the environment. In the industrialised West, science communication has become part of marketing for big business, fundraising for medical charities, and policymaking in areas such as agriculture, energy and transport. Scientific expertise provides the information for communication professionals; and, often, the experts themselves are being called on to communicate.

This Postgraduate Diploma in Science Communication is designed to support people working in contexts such as these. Students might be:

- Working or training as scientists and looking to extend their skill-set
- Working in science communication and looking for an opportunity to reflect and develop in a supportive environment
- Wanting to study science communication, but alongside their present commitments
- Looking to think about science and society in new ways.

This Diploma embraces and builds on the University's Certificate in Practical Science Communication, developing and enhancing students' skills and understanding of approaches to science communication in particular institutional and policy contexts.

Organised into day-schools, the Diploma course is delivered in six one-term units, the first three of which comprise the existing Postgraduate Certificate. An indicative syllabus, and a reading and resource list, for the six units are included in this course handbook.

There is a substantial literature in science communication, both academic and practical. A full bibliography will be made available in the Virtual Learning Environment (VLE) that will support the course. Further reading will give students a broader range of tools, alert them to a wider group of perspectives, and equip them with a deeper academic appreciation of the subject. Making reference to the literature will be essential for some if not all assessments. Students who are considering further study (Masters or PhD) after their PG Diploma are especially encouraged to read from the recommended lists.

Students will find the online resources useful, both for their own learning and for keeping in touch with classmates and tutors. It is worth spending some time learning how to use these resources early on in the course.

The course aims to:

- enhance the students' systematic knowledge and critical understanding of the importance, relevance and scope of science communication

- increase student understanding of the academic and theoretical knowledge that underpins effective communication and engagement, including fundamental issues and current debates in communication theory, sociology, politics, ethics, psychology and history of science
- develop students' ability to critically evaluate subject matter to identify what is relevant and appropriate for public communication
- enable students to describe and critique key practical techniques and approaches used for science communication, as appropriate for particular sectors
- enhance the students' ability to respond to policy challenges such as a diversity agenda or public health planning
- create an enquiring perspective to enable critical and evaluative discussion that extends students' understanding of key ethical and moral issues in the communication of science
- develop an appropriate understanding of the available methods for communicating with and engaging new audiences with diverse professional, specialist and non-specialist backgrounds, and to understand how and when to apply these methods.
- enable students to recognise and deploy particular kinds of expertise, and to examine critically a variety of authority claims
- provide an understanding of the requirements and importance of science communication in terms of the Impact agenda in Higher Education.

The students shall:

- gain skills for the delivery of a wide range of science communication approaches
- work constructively with others and sensitively in particular social and political contexts
- design, implement and evaluate a science communication activity
- respect audiences and strive for social justice.

General skills for further study and employability

In general, the students will develop:

- the capacity for independent thought and judgement
- the development of independent learning, study skills and time management skills
- the deployment of skills in critical reasoning
- the development of competence in using IT to support one's work
the ability to work with others, productively and equitably
- the capacity to exercise personal responsibility and demonstrate appropriate levels of motivation and commitment through part-time study.

Specifically from studying science communication, the students will develop:

- alertness to the workings, uses and effects of the mass media and other communication channels
- the capacity to use words, numbers and images to communicate meaningfully to a variety of audiences
- the ability to structure, express and deliver particular messages
- the ability to select and combine appropriate media for particular tasks
- the skill of finding stories and background information from professional, mass-media and live sources
- the ability to discern particular kinds of expertise and to evaluate knowledge claims
- the ability to pitch an idea and persuade other agencies to support it

- the competence to plan, schedule and deliver a project, with respect for regulation, practical limitations and cultural sensitivities
- the ability to liaise with a range of professionals and publics, and to recognise different expertises and their role in society.
- the sensitivity to respond to a range of social needs, and to take responsibility for outcomes.

Study hours

The award of academic credit is a means of quantifying and recognising learning, and, within the UK, one credit notionally represents 10 hours of learning¹. Each of the units in this course attracts 20 credits so students should expect to need to study for approximately 200 hours in total to complete each unit successfully. However, it is recognised that students study at different paces and use a variety of approaches, so this is a recommendation, rather than a hard-and-fast requirement.

¹ 'Academic credit in higher education in England – an introduction'. The Quality Assurance Agency for Higher Education, 2009

Teaching staff

Dr Jane Gregory (Programme Director) developed science communication courses for Imperial College in the early 1990s, and since then has set up and taught UG and PG courses at Birkbeck, UCL and Manchester University. She launched Cambridge University's PG Cert in Practical Science Communication in October 2018. She has published research on the role of public science communication in the development of scientific ideas, and on the global political and economic contexts for science communication, and is co-author of the textbook *Science in Public* (1998). Jane has also worked as a book editor in science publishing, and for seven years developed exhibition texts and gallery guides for the Science Museum, London.

Dr Tom Monie is the Academic Director for STEM at ICE and a Fellow of Christ's College, Cambridge. He has previously held a Wellcome Trust Research Career Fellowship and led a University research group studying the innate immune system. He has a long-standing interest in science communication, and has been involved in the design and delivery of numerous courses on science writing, storytelling, audience engagement and effective communication. He has designed and organised a range of activities and events for the Cambridge Science Festival and is, slowly, writing his first popular science book.

Specialist professional tuition is delivered by guest tutors. In 2018-20, these included:

Jack Ashby, Museum of Zoology, University of Cambridge
 Craig Brierley, Research Communication Office, University of Cambridge
 Dr Nicola Buckley, Centre for Science and Policy, University of Cambridge
 Dr Steve Cross, Bright Club/Science Showoff
 Greg Foot, BBC TV and radio
 Dr Eric Jensen, University of Warwick
 Elizabeth Killen, Faculty of Education, University of Cambridge
 Anthony Lewis, *Lancet*
 Dr Simon Lock, University College London
 Dominic McDonald, the Royal Institution
 Helen Pearson, *Nature*
 Dr Chris Smith, the Naked Scientist, University of Cambridge
 Lucinda Spokes, Public Engagement Office, University of Cambridge

Administrative staff

Head of Academic Centre Administration: Ms Gillian Barclay
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Venue

For the Michaelmas term of the 2020-2021 Academic Year, this course is being taught online. The course content will be delivered, and the learning outcomes met, through the use of video-based teaching platforms (usually Zoom) and a dedicated course Virtual Learning Environment. Face-to-face teaching will resume when it is safe and possible to do so.

Madingley Hall is the University's campus dedicated to continuing education for adults. The Hall was built in the sixteenth century and acquired by the University in 1948. It has been home to the Institute of Continuing Education since 1975.

Any face-to-face sessions will be taught in one of 14 classrooms at Madingley Hall and, occasionally, at other venues. Classrooms are arranged and equipped to encourage effective small group learning and peer interaction. Technology-enhanced learning, including lecture capture where appropriate, is used in many classes, and wi-fi is available throughout the site. We also provide a range of social learning spaces that students can use before, or after, class.

Seven acres of superb gardens and grounds designed by Capability Brown provide space to think, reflect and relax. We offer a range of catering including formal dining, sandwiches and snacks, and a full-service bar. Students travelling a long distance may wish to book accommodation in one of the Hall's 62 en-suite bedrooms.

The Hall is situated three miles west of Cambridge with easy access from the M11 and the A14. There is ample free on-site car parking. Central London and Stansted Airport can be reached in under an hour by train from Cambridge railway station. Taxis from the railway station to Madingley Hall typically take around 20-25 minutes. Full directions are given on our website at: <http://www.ice.cam.ac.uk/about-us/how-find-us>.

Contact details of ICE

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Please also refer to the 'information for students' section on ICE's website www.ice.cam.ac.uk/studying-with-us/information-for-students and the 2020/21 Student Handbook for award-bearing courses for further information and guidance relating to all aspects of the course including study skills, assignments, assessment and moderation. The Course Information and Help and Guidance section of the ICE VLE will also contain valuable information specific to your course.

Information correct as of 8 June 2020

NB teaching dates and times for Units 2 & 3 are provisional dependent on the development of the Covid-19 situation.

Unit 1

The fundamentals of practical science communication

Start date	22 September 2020	End date	17 November 2020
Day	22 and 29 September, 6, 20 and 27 October, 3 and 17 November 2020	Time	Evenings
Venue	Remote delivery		
Tutor(s)	Dr Jane Gregory	No of meetings	7 evening sessions

Aims

This unit will prepare the ground for students' later practical work by:

- Providing students with the academic tools to handle the theoretical, historical and practical aspects of science communication.
- Developing knowledge and understanding of science communication, its methods and impacts.
- Instilling the ethical and critical awareness required to identify the importance, the relevance, and the problems of science communication from a professional perspective.

Indicative content

- **The history and politics of science communication:** what is it and whom does it serve? Developing an understanding of what science communication is and why it is important; connections with the Impact agenda in Higher Education.
- **Understanding audiences:** what happens to your message? The psychology and theory of effective engagement and communication.
- **Effective communication:** Identifying, understanding and engaging your audience; the use of storytelling and narrative; key skills for science communication.
- **Science and the media:** roles, responsibilities and interests.

- **Why communicate what science and to whom?** Critical evaluation of science – choosing stories and approaches, and the ethical elements of science communication.
- **Becoming a critical consumer of science communication:** how to see, and what to learn.
- **Effective evaluation: how did it go?** The design, delivery and success measures of science communication.

Presentation of the unit

Across the three days, the course will move from content delivery via lectures and seminars to participation in workshops and performances.

Students are expected to contribute to all types of teaching, including asking questions during lectures and contributing examples from their own experience. Some students embrace this style of learning more readily than some others, who may take their time to settle in.

Participation is essential for each student's learning as well as for learning across the group. One important form of participation is listening: students will listen respectfully to others' contributions and offer constructive criticism when appropriate.

It is usual in science communication studies to consider a range of worldviews, standpoints and understandings. Therefore, disagreement and argument are normal aspects of engagement with this subject, both within the University and beyond. It is important for both students and professional communicators to develop the skills to disagree and argue courteously and constructively.

During this unit students will begin working on small items of science communication (such as short articles, designs, or short recordings) that will be subject to formative assessment and will be credited at the end of the course as part of the Portfolio.

Provisional lecture list

		Tutor	Further reading/preparation
Session 1 7-9pm	Tuesday 22 September Meet the class How the course works	Dr Jane Gregory & Dr Tom Monie	Broks (2006) <i>Understanding Popular Science</i> Hilgartner (1990) The dominant view <i>Public Understanding of Science</i> (2014) Special issue: Public engagement in science, 23(1) C. Thorpe and J. Gregory (2010), Producing the Post-Fordist Public
Session 2 7-9pm	Tuesday 29 September The history and politics of science communication The network society	Dr Jane Gregory	Gregory and Lock (2008) 'The evolution of 'Public Understanding of Science' Gregory and Miller (2000) <i>Science in Public</i> Trench and Bucchi (2008) <i>Handbook</i> Irwin and Wynne (1996) <i>Misunderstanding Science</i> Bell et al. (2008) <i>Science and its Publics</i>
Session 3 7-9pm	Tuesday 6 October Science and the media Newsriting workshop	Dr Jane Gregory	Balnaves et al. (2008) <i>Media Theories and Approaches</i> Allan (2002) <i>Media, Risk and Science</i> Bauer and Bucchi (2007) <i>Journalism, Science and Society</i> Harcup (2015), <i>Journalism: Principles and Practice</i> Holliman, et al. (2009) <i>Investigating Science Communication</i> McNair (2000) <i>Journalism and Democracy</i> Wagner (2008) <i>The New Invisible College</i>
Session 4 7-9pm	Tuesday 20 October Social psychology of science communication: attitudes and representations	Dr Jane Gregory	Howarth in Hook et al. (2011) <i>Social Psychology</i> Turney (1998) <i>Frankenstein's Footsteps</i> Bauer & Gaskell (2002) <i>Biotechnology</i> Nelkin & Lindee (1995) <i>DNA Mystique</i>
Session 5 7-9pm	Tuesday 27 October Metaphors, signs and narratives	Dr Jane Gregory	Lakoff & Johnson (1980) <i>Metaphors</i>

Session 6 7-9pm	Tuesday 3 November What is effective communication? Engaging critically with science communication: examples and tools Introducing effects and evaluation	Dr Jane Gregory and guest tutor	
Session 7 7-9pm	Tuesday 17 November Why do we communicate science? Motives and audiences	Dr Jane Gregory	Gregory in Hook et al. Gregory and Miller (2000) Science in Public Stilgoe, Lock and Wilsdon (2014) Why should we promote public engagement with science?

Student assessment

There are two summative assignments associated with the unit. Note that they are not equally weighted.

The first assignment will be a critical analysis of two items of science communication (1500 – 2000 words / 10 credits).

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Closing date for the submission of assignment 1: Tuesday 22 December 2020 by 12:00 (noon) GMT

The second assignment will be a reflective piece on the student's own learning about science communication during this unit (800 – 1000 words / 5 credits).

Closing date for the submission of assignment 2: Tuesday 12 January 2021 by 12:00 (noon) GMT

Students should submit their assignments online through ICE's Virtual Learning Environment (VLE). Feedback on assignments is delivered online via the VLE.

Learning outcomes

When they have completed the unit, the students should have achieved the following outcomes:

Knowledge and understanding

- Enhanced knowledge and understanding of the role and application of theory to science communication practice
- Increased understanding of the political contexts that frame science communication
- Improved awareness of the academic literature that supports effective communication and engagement
- Improved understanding of how the needs of audiences frame science communication practice
- Insight into potential audiences
- Enhanced systematic knowledge and critical understanding of the significance, relevance and range of science communication in the global community
- Enhanced ability to critically evaluate subject matter to identify what could or should be reported in the public domain

Skills and other attributes

- Improved communication skills across a range of areas as well as in a specific area of interest
- Enhanced ability to match skills to media and audiences

Reading and resource list

- S. Allan (2002) *Media, Risk and Science* (New York: McGraw Hill).
- M. Balnaves, S. Hemelryk Donald and B. Shoesmith (2008) *Media Theories and Approaches: A Global Perspective* (Basingstoke: Palgrave Macmillan).
- M. Bauer and M. Bucchi (2007) *Journalism, Science and Society: Science Communication between News and Public Relations* (London: Routledge).
- M. Bauer and G. Gaskell (eds), (2002) *Biotechnology - the Making of a Global Controversy* (Cambridge University Press).
- A. Bell, S. Davies and F. Mellor (2008) *Science and its Publics* (Cambridge: Cambridge Scholars Press).
- P. Broks (2006) *Understanding Popular Science* (Maidenhead: Open University Press).
- J. Gregory and S.J. Lock (2008), 'The evolution of 'Public Understanding of Science': Public engagement as a policy tool in the UK', *Sociology Compass*, 2/4, 1252 – 1265.
- J. Gregory and S. Miller (2000) *Science in Public: Communication, Culture and Credibility* (London: Plenum Trade).

- J. Gregory (2015) *Science communication. International Encyclopedia of the Social and Behavioural Sciences*, edited by James D. Wright (Oxford: Elsevier).
- T. Harcup (2015), *Journalism: Principles and Practice* (2nd edn) (London: Sage).
- S. Hilgartner (1990) *The dominant view of popularization, Social Studies of Science*, 20(3): 519-39.
- R. Holliman, et al. (2009) *Investigating Science Communication in the Information Age* (Oxford: Oxford University Press.).
- D. Hook, B. Franks and M.W. Bauer (2011) (eds) *Science Communication*, by Jane Gregory, in *Social Psychology of Communication* (Basingstoke: Palgrave Macmillan).
- House of Lords (2000) *Science and Society* (found at www.parliament.the-stationery-office.co.uk/pa/ld199900/ldselect/ldsctech/38/3801.htm).
- A. Irwin and B. Wynne, eds. (1996) *Misunderstanding Science* (Cambridge: Cambridge University Press).
- G. Lakoff and M. Johnson (1980) *Metaphors we Live By* (University of Chicago Press).
- M. Lindauer (2005) What to ask and how to answer: a comparative analysis of methodologies and philosophies of summative exhibit evaluation. *Museum and Society*, 3(3), 137-152.
- B. McNair (2000) *Journalism and Democracy: An Evaluation of the Political Public Sphere* (London: Psychology Press).
- D. Nelkin and S.M. Lindee (1995) *The DNA Mystique* (New York: W.H. Freeman).
- Public Understanding of Science* (2014), Special issue: Public engagement in science, 23(1)
- F. Stalder (2006) *Manuel Castells* (London: Polity).
- S. Sismondo (2009), *An Introduction to Science and Technology Studies* (1st or 2nd edn) (Oxford: Wiley/Blackwell).
- J. Turney (1998) *Frankenstein's Footsteps: Science, Genetics and Popular Culture* (New Haven: Yale U. Press).
- J. Turow (2010) *Playing Doctor: Television, Media, and Medical Power* (University of Michigan Press).
- B. Trench and M. Bucchi (2008, eds.), *Handbook of Public Communication of Science and Technology* (New York: Routledge).
- C. Wagner (2008) *The New Invisible College: Science for Development* (Brookings Institute Press).
- S. Watts <https://www.nature.com/news/society-needs-more-than-wonder-to-respect-science-1.15012>
- J. Gregory and S.J. Lock (2008), 'The evolution of 'Public Understanding of Science': Public engagement as a policy tool in the UK', *Sociology Compass*, 2/4, 1252 – 1265.
- J. Gregory and S. Miller (2000) *Science in Public: Communication, Culture and Credibility* (London: Plenum Trade).
- J. Gregory (2015) *Science communication. International Encyclopedia of the Social and Behavioural Sciences*, edited by James D. Wright (Oxford: Elsevier).
- T. Harcup (2015), *Journalism: Principles and Practice* (2nd edn) (London: Sage).
- S. Hilgartner (1990) *The dominant view of popularization, Social Studies of Science*, 20(3): 519-39.
- R. Holliman, et al. (2009) *Investigating Science Communication in the Information Age* (Oxford: Oxford University Press.).
- D. Hook, B. Franks and M.W. Bauer (2011) (eds) *Science Communication*, by Jane Gregory, in *Social Psychology of Communication* (Basingstoke: Palgrave Macmillan).

- House of Lords (2000) *Science and Society* (found at www.parliament.the-stationery-office.co.uk/pa/ld199900/ldselect/ldsctech/38/3801.htm).
- A. Irwin and B. Wynne, eds. (1996) *Misunderstanding Science* (Cambridge: Cambridge University Press).
- G. Lakoff and M. Johnson (1980) *Metaphors we Live By* (University of Chicago Press).
- M. Lindauer (2005) What to ask and how to answer: a comparative analysis of methodologies and philosophies of summative exhibit evaluation. *Museum and Society*, 3(3), 137-152.
- B. McNair (2000) *Journalism and Democracy: An Evaluation of the Political Public Sphere* (London: Psychology Press).
- D. Nelkin and S.M. Lindee (1995) *The DNA Mystique* (New York: W.H. Freeman).
- Public Understanding of Science* (2014), Special issue: Public engagement in science, 23(1)
- F. Stalder (2006) *Manuel Castells* (London: Polity).
- S. Sismondo (2009), *An Introduction to Science and Technology Studies* (1st or 2nd edn) (Oxford: Wiley/Blackwell).
- J. Turney (1998) *Frankenstein's Footsteps: Science, Genetics and Popular Culture* (New Haven: Yale U. Press).
- J. Turow (2010) *Playing Doctor: Television, Media, and Medical Power* (University of Michigan Press).
- B. Trench and M. Bucchi (2008, eds.), *Handbook of Public Communication of Science and Technology* (New York: Routledge).
- C. Wagner (2008) *The New Invisible College: Science for Development* (Brookings Institute Press).
- S. Watts <https://www.nature.com/news/society-needs-more-than-wonder-to-respect-science-1.15012>

Unit 2

The art of practical science communication

Start date	14 January 2021	End date	12 March 2020
Days	14 and 15 January 2021 4 and 5 February 2021 11 and 12 March 2021	Time	9.30-17.00 each day
Venue	Madingley Hall, Madingley, Cambridge, CB23 8AQ		
Tutors	Dr Jane Gregory & guest tutors	No of meetings	Three 2-day teaching blocks

Aims

This module will develop students' capacity for competent professional practice by:

- Developing students' competence in the core skills of writing and speaking.
- Encouraging adaptability towards a range of new and traditional media.
- Using feedback and dialogue to respond to audience needs and preferences.
- Instilling respect for, and knowledge of, the legal, ethical and policy contexts that frame science communication practice.

Indicative content

- **Core skills of writing and speaking:** developing confidence and technique, and exploring the demands of different media and audiences.
- **Communicating in museums:** display, explaining, interactivity, informal education, visitor studies, hard to reach groups.
- **Public events:** meanings of 'public', communicating in public spaces, understanding festivals.
- **Broadcasting in sound and vision:** television, video, radio, podcasting.
- **Online communication:** visual and written content on the web; the challenge of the hyperlink; adapting to new media, such as YouTube, vlogging and Tweeting; communication in the 'network society'.

- **Science journalism**; forms: news, features, comment; interviewing; public relations.
- **Communicating science for policy**: advice, activism, science for charities and interest groups.

Presentation of the unit

This unit will respond to the range of interests of the cohort. It combines background information and techniques explained by tutors with students' active participation in workshops to develop their skills.

Students will, individually or in small groups, develop projects that illustrate and exhibit their knowledge and understanding of science communication practice. They will take on supporting roles in other students' projects, and also act as 'critical friends' to classmates. A series of 'showcase' sessions will allow students to present their work to the group.

Students will study a range of techniques, media and audiences, although they may choose for assessment to focus on a more specific task or area.

Students will learn from tutors and visiting specialist professionals, and will scrutinise successful examples of science in the public domain to learn about professional standards and good practice.

Organisations that present science in public usually publish documents about their work such as mission statements, planning documents, accounts, visitor feedback and so on. Students are encouraged to read this 'grey' literature, which is usually readily available online.

Provisional lecture list

Time	Thursday 14 January 2021	Tutor	Further reading / preparation
9.30-10.30	Introduction to science museums	Dr Jane Gregory	Visit museums and science centres. Bradburne Dawson MacGregor
10.30 – 13.00	Collection and display: the challenges of natural objects. Site visit to a museum	Guest tutor	
	Lunch		
14.00-16.30	Introduction to research communication: how research becomes news	Guest tutor	Consume mass media; collect press releases for comparison Balnaves, <i>et al.</i> Harcup Bauer and Bucchi
16.30-17.00	Briefing for tomorrow	Guest tutor	
	Friday 15 January 2021		
9.30 – 10.30	Introduction to radio and podcast journalism Making a programme Distributing podcasts	Guest tutor	Cohen Jones
10.30-11.00	Tea		
11.00-12.00	Interviewing	Guest tutor	
12.00 - 13.00	Students work in project groups		
13.00 - 14.00	Lunch		
14.00 – 16.00	Students work on projects		
16.00 - 17.00	Performance and critique		

	Thursday 4 February 2021		
9.30-10.30	Museum showcase	All	
11.00-13.00	Science festivals: challenges and opportunities	Guest tutor	Jensen and Buckley (2014) Why people attend science festivals
13.00-14.00	Lunch		
14.00-17.00	Communicating online: challenges and opportunities	Guest tutor	

	Friday 5 February 2021		
9.30-10.30	Journalism showcase	All	
11.00-17.00	Television and video: forms and professions	Guest tutor	

	Thursday 11 March 2021		
9.30-10.30	Events showcase		
10.30-17.30	Science communication for policy, activism and the third sector	Guest tutor	Wilsdon and Willis (2004). <i>See-through Science</i> Harcup (2015), <i>Journalism: Principles and Practice</i> Bauer and Bucchi (2007) <i>Journalism</i> Current parliamentary Research Briefings, POST Notes, and similar grey literature from other agencies

	Friday 12 March 2021		
9.30-10.30	Online showcase		
11.00-13.00	Multimedia challenges in science communication	Dr Jane Gregory	
13.00-14.00	Lunch		
14.00-15.30	Preparing for assessment: students present informal proposals for unit 3 project for class feedback	Dr Jane Gregory	
16.00-17.00	Perspectives on science communication: where are we now?	All	
Depart			

Student assessment

There are two summative assignments associated with the unit and they are equally weighted.

The first assignment is a written insight or overview into a science communication tool or approach (1200 -1500 /7.5 credits).

The second assignment is a talk or video (featuring a performance by the student) delivered on 19 April 2021 (7.5 credits).

Closing date for the submission of written assignments: Thursday 8 April 2021 by 12:00 (noon) British Summer Time

Students are expected to submit their assignments online through ICE's Virtual Learning Environment (VLE) and feedback on assignments is delivered online.

Learning outcomes

When the students have completed the course, they should have achieved the following outcomes:

Knowledge and understanding

- Improved awareness of the academic literature that supports effective communication and engagement
- Improved understanding of how the needs of audiences frame science communication practice

- Enhanced knowledge and understanding of pitching, proposing and evaluating science communication
- Increased ability to understand and respond to local schedules and regulation
- Awareness of professional and public standards
- Awareness of capacities and limits of given resources
- Insight into potential audiences

Skills and other attributes

- Advanced competence in the core skills of writing and speaking
- Enhanced familiarity with audio-visual and digital technology
- Enhanced capacity to be a critical friend to others' work
- Enhanced ability to match skills to media and audiences
- Enhanced adaptable skills for the delivery of a wide range of science communication approaches to a variety of audiences.

Reading and resource list

G. Anderson (2012) *Reinventing the Museum: The Evolving Conversation on the Paradigm Shift*, 2nd edition. (Lanham: AltaMira).

P.J. Anderson and G. Ward (2007) *The Future of Journalism in Advanced Democracies* (Aldershot: Ashgate).

M. Balnaves, S. Hemelryk Donald and B. Shoesmith (2008) *Media Theories and Approaches: A Global Perspective* (Basingstoke: Palgrave Macmillan).

M. Bauer and Massimiano Bucchi (2007) *Journalism, Science and Society: Science Communication between News and Public Relations* (London: Routledge).

T. Bennett (1995) *The Birth of the Museum: History, Theory, Politics* (London, New York: Routledge).

A. Besley and R. Chadwick (1992/2003), *Ethical Issues in Journalism and the Media* (London: Routledge).

S. Bicknell and G. Farmelo (ed.) (1993) *Museum Visitor Studies in the 90s* (London: Science Museum).

J.M. Bradburne (1998) Dinosaurs and white elephants: the science center in the twenty-first century. *Public Understanding of Science*, 7(3), 237-253.

S. Dudley (ed.) (2009) *Museum Materialities: Objects, Engagements, Interpretations* (London: Routledge).

J.H. Falk, S. Randol and L.D. Dierking (2012) Mapping the informal science education landscape: An exploratory study. *Public Understanding of Science*, 21(7), 865-874.

T. Harcup (2015), *Journalism: Principles and Practice* (3rd edn) (London: Sage)

I. Hargreaves (2003), *Journalism: Truth or Dare?* (Oxford UP).

B.K. Haywood and J.C. Besley (2014) Education, outreach, and inclusive engagement: Towards integrated indicators of successful program outcomes in participatory science. *Public Understanding of Science*, 23(1), 92-106.

P. Hodder (2010) Out of the laboratory and into the knowledge economy: A context for the evolution of New Zealand science centres. *Public Understanding of Science*, 19(3), 335-354.

- Eilean Hooper-Greenhill (2011) *Museums and their Visitors* (London: Routledge).
- Eric Jensen and Nicola Buckley (2014) Why people attend science festivals: Interests, motivations and self-reported benefits of public engagement with research. *Public Understanding of Science*, 23(5), 557-573.
- Margaret Lindauer (2005) What to ask and how to answer: a comparative analysis of methodologies and philosophies of summative exhibit evaluation. *Museum and Society*, 3(3), 137-152.
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Unit 3

Designing and delivering practical science communication

Start date	19 April 2021	End date	21 June 2021
Day	19 April 2021 10 May 2021 7 June 2021 21 June 2021	Time	9.30-17.00 each day
Venue	Madingley Hall, Madingley, Cambridge, CB23 8AQ		
Tutor(s)	Dr Jane Gregory	No of meetings	4 day-schools

Aims

This module will develop and demonstrate students' competence in science communication practice by:

- supporting the students in designing and planning a science communication event or product to the standards of public communication
- encouraging and rewarding adherence to timetables, regulation, custom and practice
- exercising and developing the students' skills in evaluation
- developing competence in teamwork and mutual support

Indicative content

- pitching and proposing science communication activities
- preparation: research, organisation, scheduling and rehearsing
- delivery: performance and supporting materials and equipment
- evaluation: critical responses to one's own and others' work

Presentation of the unit

By this stage of the programme, students will be working on individual projects. They will have access to face-to-face and online tutorials as appropriate while they develop their project. The day-schools will be occasions for sharing problems and trying out strategies with the group, as well as providing an opportunity for charting progress and setting standards. The day-schools will be scheduled in detail once the projects are chosen: they may lend themselves to sub-groups having specialist further training, or reveal gaps in the teaching so far that can now be filled. The tutors will therefore be responsive to student

needs, with the core aim of readying the class for assessment by the end of the unit. Students will be rehearsing in front of classmates, commenting on other students' work, and organising themselves for their final performance.

Provisional lecture list

Monday 19 April 2021			
			Preparation/reading
9.30-10.00	Introduction to the unit		
10.00-13.00	Assessment of talks from Unit 2	Dr Jane Gregory Dr Tom Monie	
14.00-16.00	Assessment of talks from Unit 2	Dr Jane Gregory Dr Tom Monie	
16.00-17.00	Preparing your pitch and proposal	Dr Jane Gregory	Examples of proposal documents/requirements from professional organisations

Monday 10 May 2021			
9.00-17.00	Assessment: Pitching your idea	Dr Jane Gregory, specialist guest tutors	

Monday 7 June 2021			
9.00-10.30	Thorny topics in funding, delivery and evaluation	Guest tutor	Background reading suited to individual projects
11.00-17.00	Rehearsals, teamwork and tutorials	All	

Monday 21 June 2021			
9.30-17.00	Performance: sharing your project with the group	All	

Student assessment

Students will be assessed summatively using a reflective and critical account of the pitching, production, delivery and evaluation of an event or activity. (15 credits)

Closing date for the submission of assignments: Monday 5 July 2021 by 12:00 (noon) British Summer Time

Students are expected to submit their assignments online through ICE's Virtual Learning Environment (VLE) and feedback on assignments is delivered online.

Learning outcomes

When they have completed this unit, the students should have achieved the following outcomes:

Knowledge and understanding

- Improved understanding of how the needs of audiences frame science communication practice
- Enhanced knowledge and understanding of pitching, proposing and evaluating science communication
- Increased ability to understand and respond to local schedules and regulation
- Awareness of professional and public standards
- Awareness of capacities and limits of given resources
- Insight into potential audiences
- Enhanced capacity for critical and evaluative discussion that extends understanding of key ethical and moral issues in science communication
- Improved decision-making about which methods to use for reaching a wider range of audiences, and for which purposes.

Skills and other attributes

- Advanced competence in the core skills of writing and speaking
- Competence in proposing and pitching a science communication project
- Enhanced capacity to be a critical friend to others' work
- Enhanced ability to match skills to media and audiences
- Demonstrated capacity to design, implement and evaluate a science communication activity from start to finish
- Improved ability to plan, organise and deliver on time.

Reading and resource list

Students will compile their own reading list and gather resources as needed, depending on their choice of project.

Portfolio

Student assessment

In addition to the unit assignments, students will be required to submit a portfolio of science communication items (15 credits). These items should not have been submitted for credit elsewhere during the course, but might include, for example, a critical review of an item submitted for credit earlier in the course. Items from the students' workplace are

also eligible, provided due credit is given to any other contributors. The portfolio should show a wide range of skills, and so should include a minimum of two items related to each unit (800-1000 words per unit).

Closing date for the submission of the portfolio: Monday 19 July 2021 by 12:00 (noon) British Summer Time

Students are expected to submit their assignments online through ICE's Virtual Learning Environment (VLE), and feedback on assignments is delivered online via the VLE.

Learning outcomes

The Portfolio contains a selection of the student's own work that is not submitted for assessment elsewhere on the programme. The learning outcomes are therefore particular to each student, and are likely to reflect the learning outcomes across the programme. These outcomes could therefore be any of the following:

Knowledge and understanding

- Enhanced knowledge and understanding of the role and application of theory to science communication practice
- Increased understanding of the political contexts that frame science communication
- Improved awareness of the academic literature that supports effective communication and engagement
- Improved understanding of how the needs of audiences frame science communication practice
- Enhanced knowledge and understanding of pitching, proposing and evaluating science communication
- Increased ability to understand and respond to local schedules and regulation
- Awareness of professional and public standards
- Awareness of capacities and limits of given resources
- Insight into potential audiences
- Enhanced systematic knowledge and critical understanding of the significance, relevance and range of science communication in the global community
- Enhanced ability to critically evaluate subject matter to identify what could or should be reported in the public domain
- Enhanced capacity for critical and evaluative discussion that extends understanding of key ethical and moral issues in science communication
- Improved decision-making about which methods to use for reaching a wider range of audiences, and for which purposes.

Skills and other attributes

- Advanced competence in the core skills of writing and speaking

- Improved communication skills across a range of areas as well as in a specific area of interest
- Enhanced familiarity with audio-visual and digital technology
- Competence in proposing and pitching a science communication project
- Enhanced capacity to be a critical friend to others' work
- Enhanced ability to match skills to media and audiences
- Demonstrated capacity to design, implement and evaluate a science communication activity from start to finish
- Enhanced adaptable skills for the delivery of a wide range of science communication approaches to a variety of audiences.
- Improved ability to plan, organise and deliver on time.

Unit 4, October 2021

Knowledge, Authority and Expertise

Dates	October 2021	Time	9.30-17.00 each day
Venue	Madingley Hall, Madingley, Cambridge, CB23 8AQ		
Tutor(s)	Dr Jane Gregory and guests	No of meetings	One three-day school

Aims

This unit draws on the literature from the sociology of science to explore a range of perspectives on science as a form of knowledge, as a group of methods and as a social institution. In particular, it asks how science commands respect as expertise, and explores what happens if this respect is withheld. Thus the unit explores, at a fundamental level, the relationships between science, politics and publics in terms of authority, trust, and public culture. The unit will alert the students to theory and case studies for:

- understanding the historical emergence of science as a distinct form of knowledge and practice
- responding critically to professional and public claims to expertise from scientists and others who use scientific knowledge
- gaining insight into the use of knowledges as vehicles for, and expressions of ideologies about science, politics and society
- understanding the cultural significance of non-scientific knowledges about nature, the universe and the self
- developing a symmetrical analytical approach to understanding challenges to science as knowledge
- understanding the 'postmodern turn' and its consequences for science and science communication

Indicative content

- The history of scientific knowledge: From the formation of community and the emergence of empiricism in the 17th century, to the campaigns about evidence, testing and reproducibility of the present day.
- Scientists as experts: How science was recognised as a profession and gained authority in society; the tension between objectivity and moral engagement; questions of trust in science.
- Science as politics:

- The role of science communication in putting forward particular ideologies; and the deployment of scientific experts for political ends.
- Other knowledges about nature: How animism, spiritualism, holism, materialism etc. frame lay and scientific ideas about the natural world, and what happens when 'isms' collide.
- Challenges to science: From romanticism to homeopathy: when other knowledge communities react to science; thinking beyond the cognitive
- Science and postmodernity: science is associated with the 'modern era' of history; can it survive postmodernity in its present form?

Presentation of the unit

Across the three days, the unit will present the key literature on scientific and other relevant knowledges, and will reinforce students' learning in seminars looking at case studies. Students will read the key texts in advance of the classes.

Provisional lecture list

		Tutor	Further reading/preparation
	TBC October		
9.30-10.30	Formal welcome, orientation to the Diploma and to the unit	Dr Jane Gregory Dr Tom Monie	
10.30-12.30	The history of science knowledge	Dr Jane Gregory	Sismondo (2004/2009) Shapin and Schaffer (1985) Ziman (1984)
12.30-13.30	Lunch		
13.30-15.30	Scientists as experts	guest tutor	Collins (2014) Shapin (2008) Irwin and Wynne (1996) Gregory and Miller (1998) Giddens (1990)
15.30-16.00	Break		
16.00-17.00	Seminar about early authority dispute	Drs Jane Gregory	Shapin (1994)
	TBC October		
9.30-12.00	Science as politics	guest tutor	Shapin (2008) David (2005) Elzinga and Landstrom (1996)
12.30-13.30	Lunch		
13.30-16.00	Other knowledges about nature	Dr Jane Gregory	Hess (1993) Sheldrake (2009)
16.00-17.00	Seminar: morphic resonance	Dr Jane Gregory	
	TBC October		
9.30-10.30	Introduction to Unit 6, diploma project	Dr Jane Gregory	
10.30-1.00	Challenges to science	Dr Jane Gregory	Labinger and Collins (2001)
14.00-16.30	Science and postmodernity	Guest tutor	Giddens (1990) Beck (1990)
Departure			

Student assessment (20 credits)

There are two summative assignments associated with the unit and they are equally weighted.

The first assignment is an essay on a particular concept from the course, such as anti-science, relativism or empiricism. (1500-2000 words; 10 credits)

Closing date for the submission of assignment 1: TBC by 12:00 (noon) GMT

The second assignment is a critical analysis of the epistemological and/or authority issues raised by an event of the student's own choosing. (1500-2000 words; 10 credits)

Closing date for the submission of assignment 2: TBC by 12:00 (noon) GMT

Learning outcomes

Upon completion of this unit, the students should have achieved the following outcomes:

Knowledge and understanding

- Enhanced knowledge of academic debates about the character and value of scientific knowledge claims
- increased understanding of the ways in which scientific practices produce knowledge
- improved understanding of how knowledge claims are mobilised in professional and public discourse
- enhanced knowledge and understanding of theories of expertise
- Increased ability to consider symmetrically the alternatives to mainstream science
- awareness of the contribution of sociologists of scientific knowledge to science communication theory and practice

Skills and other attributes

- methodological competence with the symmetry principle
- advanced competence in the core skills of academic writing and speaking
- improved ability to weigh competing arguments
- enhanced confidence with a challenging literature

Unit 5, January – March 2022

Contexts and issues in science communication

Dates	TBC January 2022 TBC February 2022 TBC March 2022	Time	9.30-17.00 each day
Venue	Madingley Hall, Madingley, Cambridge, CB23 8AQ		
Tutor(s)	Dr Jane Gregory Specialist professional tutors	No of meetings	Three two-day schools

Aims

This module will develop students' capacity to adjust their practice and skills for particular sectors. It will also alert students to the key contemporary issues in science communication. It will:

- encourage adaptability towards a range of professional and ideological contexts
- alert students to trends, policies and concerns that frame science communication of the day
- develop a reflexive process of communication that students can use to more effectively serve a wide range of audiences and interests.

Indicative content

This module will consider the current preoccupations and challenges of science communication, and assess how these are played out in a range of institutional contexts. These contexts will be chosen for salience but could include:

- the corporate world
- the public sector
- government
- regulation
- NGOs
- charities
- the education sector (informal, formal and life-long learning)
- the scientific community and its critics.

Students will research one or more topics and lead a discussion including guest tutors. Topics will vary depending on contemporary concerns; however, they might include:

- engagement for democracy: is this a real possibility?
- diversity: would science communication for more diverse audiences be different from what we do now, and, if so, in what ways?

- science communication and capitalism: are we compromised by commercialism?
- science and religion: alternatives to the conflict model
- philanthropojournalism: changing the stories or just changing the money?
- cancer charities: what use are fun runs and cake sales in a billion dollar drug market?

Provisional Lecture List

Time		Tutor	Further reading/ preparation
	TBC January 2022		
9.30-10.30	Engagement for democracy – introduction	Dr Jane Gregory	Escobar (2012)
10.45-13.00	Case study: tbc	Student led	
Lunch			
14.00-15.30	Guest lecture: public engagement and policy-making	Guest tutor	Cohen (2018)
16.00-17.30	Discussion: Engagement in young and non-democracies	Student led	
	TBC January 2022		
9.30-10.30	Diversity: should there be science communication for minorities, and what would it be like? – introduction	Dr Jane Gregory	NCCPE (2015)
10.45-13.00	Case study	Student led	
Lunch			
14.00-15.30	Guest lecture	Guest tutor	
16.00-17.30	Discussion: Science communication, postmodernity and the multicultural	Student-led	
	TBC February 2022		
9.30-10.30	Science communication and capitalism: are we compromised by commercialism?	Dr Jane Gregory	
11.00-13.00	Case study	Student-led	
Lunch			
14.00-15.30	Guest lecture	Guest tutor	
16.00-17.30	Discussion: Can science communication from the grass roots reclaim the public sphere?	Student-led	

	TBC February 2022		
9.30-10.30	Science and religion: alternatives to the conflict model – introduction	Dr Jane Gregory	
11.00-13.00	Case study: creationists in America	Student-led	
Lunch			
14.00-15.30	Guest lecture – the new atheism	Guest tutor	
16.00-17.30	Discussion: Science and religious diversity: is a faith-based pluralism possible?	Student-led	
	TBC March 2022		
9.30-10.30	Philanthropojournalism – an introduction	Dr Jane Gregory	
11.00 – 13.00	Case study	Student-led	
lunch			
14.00-15.30	Guest lecture	Guest tutor	
16.00-17.30	Discussion: is any journalism ever free of vested interests?	Student-led	
	TBC March 2022		
9.30-10.30	Cancer research charities: why small scale fundraising in a billion dollar global drug market?	Dr Jane Gregory	
11.00-13.00	Case study	Student-led	
Lunch			
14.00-15.30	Guest lecture	Guest tutor	
16.00-17.00	Discussion: can 'we' beat cancer sooner?	Student-led	
Depart			

Student assessment

There are two summative assignments associated with the unit and they are equally weighted.

The first assignment is an academic essay surveying the literature in one of the areas covered by the course (1500-2000 words; 10 credits)

Closing date for the submission of assignment 1: TBC by 12:00 (noon) GMT

The second assignment is a recorded 10-minute talk suitable for a general audience on the same topic as the essay (1000-1500 words; 10 credits) **delivered on (date TBC)**

Learning outcomes

By the end of this unit, students should have achieved the following outcomes:

Knowledge and understanding

- increased understanding of the political contexts that frame science communication
- improved understanding of how the needs of audiences frame science communication practice
- enhanced systematic knowledge and critical understanding of the significance, relevance and range of science communication styles and genres

- enhanced insight into the relationships between science communication and personal identity and culture
- enhanced capacity for critical and evaluative discussion that extends understanding of key ethical and moral issues in science communication
- more sensitive decision-making about which methods to use for reaching a wider range of audiences, and for which purposes.
- enhanced openness to the scope and potential of science communication

Skills and other attributes

- advanced competence in the core skills of writing and speaking
- improved adaptability to cultures and contexts
- enhanced capacity to explore and debate contemporary issues
- enhanced ability to match skills to media and audiences

Unit 6, April – June 2022

Diploma project proposal

Start date Day	TBC	End date Time	TBC July 2022 9.30 - 17.00
Venue	Madingley Hall, Madingley, Cambridge, CB23 8AQ		
Tutor(s)	Dr Jane Gregory	No of meetings	4 day-schools

Presentation of the unit

Students will be working on individual projects. They will have access to face-to-face and online access to their tutors (Drs Gregory and guests) for guidance as appropriate while they develop their project. Each project should clearly show the student's use of ideas and techniques from across the Diploma programme, and may be relevant to their workplace provided it meets the criteria for assessment.

The day-schools will be occasions for sharing problems and trying out strategies with the group, as well as providing an opportunity for charting progress and setting standards. The day-schools will be scheduled in detail once the projects are chosen: they may lend themselves to sub-groups having specialist further training, or reveal gaps in the teaching so far that can now be filled. The tutors will therefore be responsive to student needs during this unit, with the core aim of readying the class for assessment by the end of the unit.

Students will seek feedback from peers, and comment on other students' work, as the class prepares for the final submission.

After the presentations in the final class, student may adjust their proposal before the final written submission.

Provisional lecture list

TBC April 2022			
			Preparation/reading
9.30-10.00	Introduction to the unit	Dr Jane Gregory	Students will compile their own reading list and gather resources as needed, depending on their choice of project.
10.00-13.00	Revision session for key lessons of the programme	Dr Jane Gregory	
14.00-16.00	Guidance from potential hosts	Guest tutors	Examples of proposal documents/requirements from professional organisations
16.00-17.00	Questions from students		

TBC May 2022			
9.00-17.00	Pitching your idea	Student led	

TBC June 2022			
9.00-12.30	Developing evaluation	Presentation and critique with an evaluation expert	
14.00-17.00	Group 'ethics panel'	Presentation and critique with a guest ethicist	

TBC June 2022			
9.30-17.00	Performance: sharing your project with the group	Dr Jane Gregory	

Student assessment

The summative assignment for this unit is a proposal for an event or activity, accompanied by a reflective and critical account of the pitching, production, delivery and evaluation of the event or activity (20 credits)

Submission will be to pre-arranged deadlines and, where possible, online. For any problems with submission of assessment (such as illness or other personal problem), the procedure is as set out in the Institute's student handbook, at www.ice.cam.ac.uk/info/student-handbook.

Learning outcomes

Upon completion of this unit, the students should have achieved the following outcomes:

Knowledge and understanding

- enhanced knowledge and understanding of pitching, proposing and evaluating science communication
- increased ability to understand and respond to local schedules and regulation
- awareness of professional and public standards
- awareness of capacities and limits of given resources
- insight into potential audiences
- improved decision-making about which methods to use for reaching a wider range of audiences, and for which purposes.

Skills and other attributes

- enhanced dexterity with audio-visual and digital technology
- competence in proposing and pitching a science communication project
- enhanced capacity to be a critical friend to others' work
- demonstrated capacity to design, implement and evaluate a science communication activity from start to finish
- improved ability to plan, organise and deliver on time
- original thinking in developing science communication activity
- performance skills, and awareness of strengths and weaknesses
- sensitivity to the need for teamwork, and in supporting others
- confidence in communicating science to public standards
- ability to work towards criteria for assessment

Reading and resource list

Students will compile their own reading list and gather learning resources as needed, depending on their choice of project and with guidance from the tutors.

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TIMETABLE

2020-2021

Unit 1

Session 1	Tuesday 22 September
Session 2	Tuesday 29 September
Session 3	Tuesday 6 October
Session 4	Tuesday 20 October
Session 5	Tuesday 27 October
Session 6	Tuesday 3 November
Session 7	Tuesday 17 November

Unit 2

Session 4	Thursday 14 January 2021
Session 5	Friday 15 January 2021
Session 6	Thursday 4 February 2021
Session 7	Friday 5 February 2021
Session 8	Thursday 11 March 2021
Session 9	Friday 12 March 2021

Unit 3

Session 10	Monday 19 April 2021
Session 11	Monday 10 May 2021
Session 12	Monday 7 June 2021
Session 13	Monday 21 June 2021

2021-2022

Unit 4

Session 1	TBC
Session 2	TBC
Session 3	TBC

Unit 5

Session 4	TBC
Session 5	TBC
Session 6	TBC
Session 7	TBC
Session 8	TBC
Session 9	TBC

Unit 6

Session 10	TBC
Session 11	TBC
Session 12	TBC
Session 13	TBC

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