SC250 SCIENCE COMMUNICATION

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Office hours: 9:00-9:45 EST / 15:00-15:45 ECT and by appointment

Making sense of scientific information has become an essential part of everyday life. Contemporary news media frequently report on scientific developments, while scientists across various fields must effectively communicate their insights to the public and policymakers. Science communication bridges the gap between science and society, fostering dialogue and mutual understanding—sometimes in pursuit of life-saving solutions. How can this dialogue be effectively facilitated? This course explores strategies for fostering cooperation between science and society. Through case studies spanning from early modernity to contemporary and future challenges, we will examine key issues in science communication related to burgeoning fields such as molecular genetics, AI automation, and space exploration. Students will learn to craft compelling science narratives, produce science podcasts, and collaborate with journalists and artists to enhance public engagement with scientific ideas. These skills are central to the field of science communication, which plays an increasingly important role in public relations. Students will participate in team exercises and develop mini-research projects, working toward potential online publications in science communication.

Requirements

Academic Integrity

Bard College Berlin maintains the highest standards of academic integrity and expects students to adhere to these standards at all times. Instances in which students fail to meet the expected standards of academic integrity will be dealt with under the Code of Student Conduct, Section 14.3 (Academic Misconduct) in the Student Handbook.

Accommodations

Bard College Berlin is committed to inclusion and providing equal access to all students; we uphold and maintain all aspects of Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and the ADA Amendments Act of 2008, and Section

3 of the German Disability Equality Act of April 27, 2002 (Federal Law Gazette I p. 1468). If you have a disability, or think you may have a disability, please contact the Disability Accommodation Coordinator, Atticus Kleen, (accommodations@berlin.bard.edu) to request an official accommodation.

Requests for accommodations should be made as early as possible to ensure adequate time for coordination and planning. Please note that accommodations are not retroactive and may require advance notice to implement.

If you have already been approved for accommodations with the Disability Accommodation Coordinator, please arrange to meet with me outside of class so that we can develop an implementation plan.

Students may face extenuating circumstances related to various personal or external factors, which impact their academic performance. While these circumstances often do not fall within the legal framework of Disability Accommodations, Bard College Berlin is committed to supporting students experiencing such circumstances. A student needing a short extension or a replacement assignment because of an extenuating circumstance is encouraged to make arrangements directly with instructors if possible. If further support is needed, please visit the Bard College Berlin Accessibility page. Questions about this process can be directed to James Harker (j.harker@berlin.bard.edu) or Maria Anderson-Long (m.andersonlong@berlin.bard.edu).

Attendance

Attendance at all classes is a crucial part of the education offered by Bard College Berlin. To account for minor circumstances, two absences from twice-per-week courses or the equivalent (e.g. one absence from a once-per-week course) should not affect the participation grade or require documentation.

Bard College Berlin may not offer credit for any course in which a student has missed more than 30% of classes, regardless of the reasons for the absences. The full Bard College Berlin attendance policy can be found in the Student Handbook, Section 2.8.

Policy on Late Submission of Papers

Essays that are up to 24 hours late can be downgraded up to one full grade (from B+ to C+, for example). Instructors are not obliged to accept essays that are more than 24 hours late. Where a professor agrees to accept a late assignment, it should be submitted by the new deadline agreed upon by both parties. Thereafter, the student will receive a failing grade for the assignment. Grades and comments will be returned to students in a timely fashion. Students are also entitled to make an appointment to discuss essay assignments and feedback during instructors' office hours.

Students receive end-of-semester grades for their seminar work. Students are entitled to make an appointment with an instructor to discuss seminar participation, or may be asked to meet with the instructor at any stage in the semester regarding class progress.

Assessment

Reading

Students are required to complete the essential reading for each session (see below), and are encouraged to take a look at the further reading, which should also be used as the starting point in preparing projects.

Library and Book Purchase Policies

There is no required textbook for this course, and no materials need to be purchased. All essential reading and some sources for further reading will be provided via Google Classroom.

Writing Assignments

Students submit one project proposal, the project's first draft, and the project's final draft.
Word count: Project proposal: 300 words
Project draft: ca. 2,000–3,000 words
Final project: ca. 3,000–4,000 words

Project Deadlines

Deadline for project proposals: 25 October
Deadline for project drafts: 22 November
Deadline for final projects: 12 December (10 December for graduating students)

Grade Breakdown

Students receive mid- and end-of-semester grades for their work. Students are encouraged to make an appointment to discuss assignments and feedback during instructor's office hours. Grades and comments will be returned to students in a timely fashion.

Attendance and active participation: 30%
Project proposal: 20%
Project draft: 20%
Final project: 30%

Grades Submission

Final grades are submitted by 12 December 2025 for graduating students and by 2 January 2026 for non-graduating students. All grades are submitted digitally to the Registrar's Office.

Schedule

Part I. Scientific Language in Communication

<u>**Sessions 1 and 2. Introduction: Science in Intercultural Communication**</u> 4 September

There is no assigned reading for this class, but students should prepare brief statements (ca. 5 min) about their interest in the topic of science communication and their own experience, of any kind, in communicating scientific information to an audience. We will discuss the main course aims and themes, the writing assignments, and the competences to be developed.

<u>Exercises:</u> Mind-Map. As a group, students create a diagram of Science Communication fields.

<u>Further Reading:</u>

James A. Secord, "Knowledge in Transit," *Isis*, Vol. 95, No. 4 (December 2004), 654–672.

Robert Craig, "Communication Theory as a Field," *Communication Theory*, 9 (1999), 119–161.

<u>**Sessions 3 and 4. Scientific Language: Local and Global**</u> 11 September

<u>Essential Assignments:</u>

Michael D. Gordin, *Scientific Babel. How Science Was Done Before and After Global English*, Chicago University Press, 2015, Chapter 11, "Anglophonia," 293–315.

Video lecture on English language in the globalization (ca. 40 min): David Crystal "Full Circle & David Crystal: The Future of Englishes": https://www.youtube.com/watch?v=MqqlSb9uGUQ

<u>Exercises:</u> Science in Many Tonques. Students individually translate short science news pieces between English and their native languages, followed by a discussion on the challenges encountered and culture-specific experiences in communicating scientific information.

<u>Study Questions:</u>
* What happens to a language as it becomes a global language?
* Why aren't local languages always sufficient for science?
* What are the pros and cons of using a global vehicular language in science communication?

Further Reading:

Matthias Dörries, *Experimenting in Tongues: Studies in Science and Language*, Stanford University Press, 2002.

David R. Gruber, Lynda Walsh, *The Routledge Handbook of Language and Science*, New York, NY: Routledge, 2019.

Sessions 5 and 6. Scientific Narratives: Metaphors and Models 18 September

Essential Assignments:

Brigitte Nerlich, "Metaphors in Times of a Global Pandemic," in S. Wuppuluri, A.C. Grayling (eds), *Metaphors and Analogies in Sciences and Humanities*, Springer, 2022, 421−446.

"Metaphors and Linguistic Diversity," Creative Multilingualism video (ca. 10 min), discussing how metaphors are used in various knowledge discourses around the globe: https://www.youtube.com/watch?v=iBp7I9FwR64

Exercises: Mastering the Science Style. Students work in teams in Zoom breakout rooms to create analogies and metaphors for adapting short science news to a young adult audience.

Study Questions:
* How does science make use of metaphors, analogies, and models?
* What are the pros and cons of using various tropes in scientific communication?
* Why do we need to be careful about culture-specific metaphors in sensitive contexts?

Further Reading:

S.F. Martínez, N. Carrillo, "The Metaphoric Sources of Scientific Innovation," in S. Wuppuluri, A.C. Grayling (eds), *Metaphors and Analogies in Sciences and Humanities*, Springer, 2022, 33−47.

Maarten Boudry, Michael Vlerick, Taner Edis, "Demystifying Mysteries. How Metaphors and Analogies Extend the Reach of the Human Mind," in S. Wuppuluri, A.C. Grayling (eds), *Metaphors and Analogies in Sciences and Humanities*, Springer, 2022, 65−83.

Part II. Science Controversies in Public Communication

Sessions 7 and 8: Space Explorations in the Public Eye 25 September

Essential Assignments:

Avi Loeb, *Extraterrestrial: The First Sign of Intelligent Life Beyond Earth*, Chapter 4, "Anomalies," Boston: Mariner Books, 2021, 62−90.

BBC documentary "The Mystery of Oumuamua":
https://www.youtube.com/watch?v=HLFqIlR7zq8

Exercises: Science Wonders. Student teams in Zoom breakout rooms choose contemporary scientific instruments (e.g., the Large Hadron Collider, James Webb Space Telescope) and highlight their most wondrous details for mentioning in a science-themed social media post.

Study Questions:
* Which qualities of the asteroid Oumuamua make it an extraordinary phenomenon?
* How would you characterize the resulting media discussions about Oumuamua?
* What effect did public communications have on the scientific debates about this object?

Further Reading:

Slava Gerovitch, *Soviet Space Mythologies: Public Images, Private Memories, and the Making of a Cultural Identity*, Pittsburgh, PE: University of Pittsburgh Press, 2015.

Sessions 9 and 10: Biotechnology in the Media 2 October

Essential Assignments:

Martin W. Bauer, "Genes, Biotechnology and Genomics," in *Atoms, Bytes & Genes: Public resistance and techno-scientific responses*, New York: Routledge, 2015, 160−182.

Video lecture and discussion, the World Science Festival, Jennifer Doudna, a Nobel Laureate in Chemistry, explains the fundamentals of CRISPR gene-editing and places its discovery in a historical perspective: https://www.youtube.com/watch?v=RNRZchHaKgw

Exercises: Science Makes Headlines. Student teams in Zoom breakout rooms create appropriate titles for science news pieces intended for publication in social media.

Study Questions:
* What are the main advantages of CRISPR and other synthetic biology technologies?
* How would you describe the main ethical and social issues ensuing from their use?
* What measures could be taken to ensure the safe use of these technologies?

Further Reading:

Sandra Braman, *Biotechnology and Communication: The Meta-Technologies of Information*, New York, NY: Routledge, 2013.

Martin W. Bauer, George Gaskell (eds), *Biotechnology: The making of a global controversy*, Cambridge: Cambridge University Press, 2002.

Sessions 11 and 12: Anthropocene: Public Discourses on the Environment 9 October

Essential Assignments:

Christian Schwägerl, Chapter 3 "The End of the Holocene," in *Anthropocene: The Human Era and How It Shapes Our Planet*, EBSCO Publishing, 2014, 31–48.

Nicholas de Pencier, Edward Burtynsky, and Jennifer Baichwal, Online media art project "The Anthropocene": https://theanthropocene.org/

Exercises: Green Digest. Student teams in Zoom breakout rooms craft informative and impactful summaries and hashtags for social media on recent environmental initiatives.

Study Questions:
* What is the Anthropocene? How does it supposedly differ from previous geological epochs?
* How would you describe the main issues resulting from the human impact on nature?
* How could scientific communication contribute to tackling these issues locally and globally?

Further Reading:

Jürgen Renn, *The Evolution of Knowledge: Rethinking Science for the Anthropocene*, Princeton, NJ: Princeton University Press, 2020.

Ignacio Bergillos, "Approaches to the Anthropocene from Communication and Media Studies," *Social Sciences*, Basel Vol. 10, Iss. 10, (2021): 365–377.

Sessions 15 and 16: Science Communication in Science Fiction 16 October

Essential Assignments:

Mary Griffith, "Three Hundred Years Hence," Philadelphia: Carey & Blanchard, 1836, Excerpts.

Ray Bradbury, "The Toynbee Convector," in "The Ray Bradbury Theater" series (1990):
https://www.youtube.com/watch?v=c2-xS_sITcM&authuser=1

Exercises: Nobel Week Highlights. Student teams in Zoom breakout rooms use the official Nobel Prize website, https://www.nobelprize.org/, to process selected Nobel Prize information they find most important or interesting and prepare news blurbs for social media.

Study Questions:
* What are the main improvements pictured by Ray Bradbury in the Utopian United States?
* How would you describe the social and technological progress in Mary Griffith's book?
* How do you see the role of science narratives in promoting cultural changes?

Further Reading:

Louis-Sébastien Mercier, *Memoirs of the year two thousand five hundred*, London, Pr. for G. Robinson, 1772, 1–60.

David A. Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema*, MIT Press, 2011.

Fall break: **October 20 – October 26**

Deadline for project proposals: **25 October**

Reports of concerns: **31 October**

Part III. Science Communication Practices

Sessions 13 and 14: Artificial Intelligence in Science Communication 30 October

Essential Assignments:

Mike S. Schäfer, "The Notorious GPT: Science Communication in the Age of Artificial Intelligence," Journal of Science Communication, Volume 22, Issue 02, 2023.

Geoffrey Hinton, the "Godfather of AI," Interview to "60 Minutes" program:
https://www.youtube.com/watch?v=qrvK_KuleJk&authuser=1

Exercises: Science Makes Images. Student teams in Zoom breakout rooms use the Open Source AI image generator Magic Studio to create headline images for science news pieces on the 2025 Nobel Prizes for publication in social media.

Study Questions:
* What are the main working principles of Machine Learning and Artificial Intelligence?
* How would you describe the ethics of using generative AI in science communication?
* What are the legal (copyright) implications of using generative AI in science communication?

Further Reading:

Alvarez, A., Caliskan, A., Crockett, M.J. et al., "Science communication with generative AI", Nature Human Behavior (2024), https://doi.org/10.1038/s41562-024-01846-3

Sessions 17 and 18: Scientific Facts and Persuasion 6 November

Essential Assignments:

Anthony Burke, Chapter 2 "Scientific Rhetoric," *The War of Words*, DeGruyter, 2019, 169–222.

Video documentary "The War on Science," CBS News, 2020:
https://www.youtube.com/watch?v=Do-3WCKhdl0

Exercises: Fact Puzzle. Student teams in Zoom breakout rooms reconstruct science news pieces by arranging key facts in the appropriate order for effective presentation in news media, considering logical flow, audience engagement, and persuasive framing of scientific facts.

Study Questions:
* What are the challenges of communicating scientific information in global media discourse?
* How do you see the role of persuasion in communicating scientific information?
* How would you describe the similarities and differences between scientific truth claims, beliefs, and opinions? How are these categories used in the media discourse about science?

Further Reading:

Alan G. Gross, *The Rhetoric of Science*, Harvard University Press, 1990.

Jeanne Fahnestock, *Rhetorical Figures in Science*, Oxford: Oxford University Press, 2002.

Sessions 19 and 20: Science Journalism 13 November

Essential Assignments:

Martin W. Angler, *Science Journalism: An Introduction*, Milton Park, UK: Taylor & Francis, 2017, 27–107.

Podcast WIRED, "Computer Scientist Explains Machine Learning in 5 Levels of Difficulty": https://www.youtube.com/watch?v=5q87K1WaoFI

Exercises: Science for Kids. Student teams in Zoom breakout rooms adapt short science news into pieces with headlines, text, and images for a K-12 science education audience.

Study Questions:
* How would you describe the main aims of science journalism?
* What is the difference between critical science journalism and infotainment?
* What techniques can be helpful in presenting scientific news to a general audience?

Further Reading:

Editor: Susanna Priest Martin W. Bauer, Massimiano Bucchi (eds), *Journalism, Science and Society: Science communication between news and public relations*, NY: Routledge, 2007.

Sessions 21 and 22. Visualising Scientific Data 20 November

Essential Assignments:

Sara Brinch, "What we talk about when we talk about beautiful data visualizations," in *Data Visualization in Society*, ed. Martin Engebretsen and Helen Kennedy, Amsterdam University Press, 2020, 259–275.

Video presentation "Science Journalism: Crash Course Statistics" concerning data perception:
https://www.youtube.com/watch?v=ZwqOoD17_LU

Exercises: Making Data Visible. Students in Zoom breakout rooms discuss, analyze, and design various ways to visualize information from short science news articles.

Study Questions:
* What factors must be considered when analyzing data in scientific media communication?
* How would you describe the purposes and challenges of data visualization in science?
* How is data visualization related to the viewer's responses, such as decision-making?

Further Reading:

Lorraine Daston and Peter Galison, *Objectivity*, Princeton University Press, 2010.

Deadline for project drafts: 22 November

Sessions 23 and 24. Science in Oral History 27 November

Essential Assignments:

Mazzocchi F, "Western science and traditional knowledge. Despite their variations, different forms of knowledge can learn from each other," European Molecular Biology Organization Reports, 2006 May, 7(5): 463–466.

Sarah Nickel (University of Saskatchewan), "Revealing Indigenous Histories Through Oral Interviews," presentation at Canada's History Forum, 2016:
https://www.youtube.com/watch?v=62pBYjCVBsM

Exercises: Oral History Interview. Student teams in Zoom breakout rooms prepare questions for an oral history interview that they would conduct with members of "The Role of Indigenous Women in the Transmission of Traditional Knowledge," published by the Convention for Biological Diversity (UN): https://www.cbd.int/article/role-indigenous-women-transmission-traditional-knowledge-IDWIP2022?authuser=1

Study Questions:
* What are the differences between indigenous knowledge and Western knowledge?
* How can you characterize the gender aspects of communicating indigenous knowledge?
* How would you describe the main issues in communicating indigenous knowledge via media?

Further Reading:

Traditional Ecological Knowledge: Concepts and Cases, ed. Julian Inglis, International Program on Traditional Ecological Knowledge, Canada, 1993.

Sessions 25 and 26. Popular Science Education 4 December

Essential Assignments:

Kendra L. Smith, "Expanding citizen science models to enhance open innovation,"
The Conversation, 4 April 2016: https://theconversation.com/expanding-citizen-science-models-to-enhance-open-innovation-61554

Virtual Tour of the London Science Museum:
https://www.sciencemuseum.org.uk/virtual-tour-science-museum
London Science Museum, "Objects and Stories": https://www.sciencemuseum.org.uk/objects-and-stories

Exercises: Science Twits. Student teams in Zoom breakout rooms design, write, and illustrate short posts for X (formerly Twitter) based on current science news of their choice.

Study Questions:
* What are the main principles of presenting scientific knowledge in informal science learning?
* What are the specific techniques of presenting scientific information via different media?
* How to make science communication more inclusive for people with disabilities?

Further Reading:

Bernard Schiele, "Science Museums and Centres: Evolution and Contemporary Trends," in *Routledge Handbook of Public Communication of Science and Technology*, NY: Routledge, 2021, 30–51.

David A. Kirby and Ingrid Ockert, "Science and Technology in Film: Themes and Representations," in *Routledge Handbook of Public Communication of Science and Technology*, NY: Routledge, 2021, 52–74.

Eva-Sabine Zehelein, *Science: Dramatic. Science Plays in America and Great Britain*, 1990–2007, Universitätsverlag Winter-Heidelberg, 2009.

Sessions 27 and 28: Final Discussion 11 December

There is no assigned reading for this class, but students should look back at the primary and secondary sources which they have read during the semester. We will also discuss the final essays and exchange feedback about the final assignments and the course in general.

Further Reading:

Susanna Hornig Priest (ed), *Encyclopedia of Science and Technology Communication*, Thousand Oaks, CA: SAGE Publications, 2010.

Kathleen Hall Jamieson, Dan M. Kahan, and Dietram A. Scheufele (eds), *The Oxford Handbook of the Science of Science Communication*, Oxford: Oxford University Press, 2017.

Dehlia Hannah, Hannah Star Rogers et. al. (eds), *Routledge Handbook of Art, Science, and Technology Studies*, New-York, NY: Routledge, 2021.

Deadline for final projects: 12 December (10 December for graduating students)

Deadline for final grades: 2 January 2026 (12 December 2025 for graduating students)