

School of Graduate Studies, Rutgers University

“Communicating Science”

Spring 2025, Wednesdays 4:00 – 7:00 PM
V14 RWJMS Research Tower

Course Numbers:

School of Graduate Studies –16:718:560 or 6718 5600S, 3 credits

Who is eligible to take this course – This course is designed for pre-doctoral students in the sciences. Permission by the course director is also required.

Course Director:

Janet Alder, Associate Professor and Assistant Dean, School of Graduate Studies, New Brunswick/Piscataway Division; 732-235-5392; janet.alder@rutgers.edu

Instructors:

- Holly Hilton, Senior Director Companion Diagnostics, Daiichi Sankyo
- David Dannenfelser, Lecturer, Rutgers BA Theater Program
- Nick Linardopoulos, Associate Teaching Professor & Public Speaking Coordinator; Rutgers University School of Communication and Information
- Alison Bernstein, Assistant Professor, Department of Pharmacology and Toxicology, Ernest Mario School of Pharmacy
- Bill Hallman, Professor and Chair Department of Human Ecology, SEBS

Course Description: We envision our Ph.D. graduates able to speak and write about their research accurately and clearly to scientific colleagues, as well as non-scientists. Unfortunately, time spent learning to communicate their research pales in comparison to time spent learning how to design and conduct their research. A major goal of *Communicating Science* is to instill in students an advanced ability to not only to communicate clearly, accurately, and vividly about their research, but also to emphasize its significance. This course provides methods of instruction and improvisation to reinforce communication skills obtained in basic courses. It provides our trainees with new ways to communicate more effectively so they can apply these skills to diverse audiences and in different career settings. The course brings together a multidisciplinary faculty of scientists, educators, communication experts, and theater arts professionals from academe and industry to teach, improve, and assess advanced communication skills in our Ph.D. trainees. The course includes elements of didactic and improvisation content with built in opportunities to create and practice written and oral presentations for diverse audiences.

Aims of the Course The overarching aims of *Communicating Science* are to:

- complement and enhance skills obtained by students from their basic courses, using methods involving classroom instruction, improvisational techniques, practice sessions for oral presentations, writing assignments, and real-life simulations.

- help Ph.D. trainees learn and practice new methods to communicate more effectively with colleagues and collaborators in other disciplines, as well as the public (including potential employers, policymakers, donors, students, and media representatives).

Course Content By taking the course, students will:

- learn techniques that focus on communicating science clearly and vividly and develop skills that are central to oral and written communication on any subject.
- practice delivering written and oral scientific messages effectively for different audiences, including defining goals, identifying main points, speaking and writing without jargon, explaining meaning and context, responding to questions, using storytelling techniques and multimedia elements.
- be videotaped during the semester as part of the learning process. As a culminating activity, students will develop and deliver an engaging short oral presentation on a scientific topic.
- actively participate not only as writers and speakers, but also as active peer listeners and constructive peer critics of each other's work in a rigorous but supportive environment.
- choose a science communication related topic and work with a professional in that field to develop a capstone project. Examples include:
 - Prepare a job talk for an academic or industry position
 - Make a pitch to a venture capital group for a start-up company
 - Write a press release, newspaper article, op-ed column, or letter to the editor of a newspaper on a contemporary topic
 - Prepare lesson objectives, a lecture, or exam questions for a biology or chemistry class of college students
 - Prepare a slide deck on a new drug for physicians as part of a medical communications team

Course Policies and Evaluation: This course is about the importance of communication. Students will prepare both written and oral communication assignments that will be evaluated by their peers and faculty instructors. Specific assignments will be handed out and discussed in class at least one week prior to their due date. A major assignment in the course will be to develop a three-minute thesis (3MT) based on an abstract of their thesis research project. This oral presentation will be videotaped, critiqued by peers and faculty, and further revised for improvement. Students will receive feedback on their capstone communication project from the professional with whom they work and from faculty involved in the course.

Attendance – The class meets once per week, and attendance at all class meetings is expected, including the first session.

Grading and Evaluation – Grading will be Pass/Fail. Students will be evaluated on their understanding of information as evidenced by their performance in class discussions, oral presentations, and writing assignments. Those missing more than 2 sessions and/or more than 2 written assignments will receive a grade of Incomplete (“IN”). Incomplete grades must be remediated. Failure to remediate results in grades of IN will be changed to F.

Academic Integrity – All students are responsible for locating, reading, and abiding by the University Policy on Academic Integrity for Graduate Students. The policy is available on-line at <https://grad.rutgers.edu/sites/default/files/2021-07/10.2.13%20-%20current.pdf> and is outlined on the SGS website. <https://grad.rutgers.edu/sites/default/files/2021-07/academic-integrity.pdf>

All work that carries your name on it is considered yours unless specifically stated otherwise by properly citing the research and ideas of others. The use of Artificial Intelligence is not allowed in this class unless specifically requested to course director. **Failure to read and understand the policy is not an acceptable excuse for violating the policy.**

Students with Disabilities: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate Office of Disability Services (ODS) at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Readings & Media: There are no required books for this course. Audios/videos may be drawn from online sources such as Science Friday, TED talks, Story Collider, Radio Lab, and Stony Brook University's Alan Alda Center for Communicating Science. Readings may be drawn from scientific journals, popular science publications (e.g., *The Science Times*), and science blogs. Students are encouraged to consult other sources such as the following books, for example:

- Dannenfels, David, *The Art of Effective Science Communication (A Performer's Guide to Public Speaking)*, Switzerland AG: Springer Nature, 2024. eBook ISBN: 978-3-031-57030-8 Print ISBN: 978-3-031-57029-2
- Alda, Alan. (2017). *If I Understood You, Would I Have This Look on My Face?: My Adventures in the Art and Science of Relating and Communicating*. New York: Random House
- Baron, Nancy. (2010). *Escape from the Ivory Tower: A Guide to Making Your Science Matter*. Washington, DC: Island Press. [Developed by [COMPASS](#) lead trainer]
- Dean, C. (2009). *Am I Making Myself Clear? A Scientist's Guide to Talking to the Public*. Cambridge: Harvard University Press.
- Heath, C. and Heath, D. (2008). *Made to Stick: Why Some Ideas Survive and Others Die*. New York: Random House.
- Kosslyn, S.M. (2007). *Clear and to the Point: 8 Psychological Principles for Compelling PowerPoint Presentations*. New York: Oxford University Press.
- Meredith, D. (2010). *Explaining Research: How to Reach Key Audiences to Advance Your Work*. New York: Oxford University Press. [Additional material is on [Meredith's website](#) (http://dennismeredith.com/explaining-research_397.html)]

- Morgan, S. and Whitener, B. (2006). *Speaking about Science: A Manual for Creating Clear Presentations*. New York: Cambridge University Press.
- Olson, Randy. (2009). *Don't be such a scientist: talking substance in an age of style*. Washington, DC: Island Press.
- Olsen, R., Barton, D. and Palermo, B. (2013). *Connection: Hollywood Storytelling Meets Critical Thinking*. Los Angeles, CA: Prairie Starfish Productions.
- Ponzio NM, Alder J, Nucci M, Dannenfelser D, Hilton H, Linardopoulos N, Lutz C: Learning science communication skills using improvisation, video recordings, and practice, practice, practice. *Journal of Microbiology & Biology Education*. 19(1):1-8, 2018. DOI: <https://doi.org/10.1128/jmbe.v19i1.1433>
- <http://www.scholarsstrategynetwork.org/>
- <http://www.nasonline.org/programs/sackler-colloquia/?referrer=https://www.google.com/>
- <https://www.aaas.org/programs/center-public-engagement-science-and-technology>
- <http://nyspha.roundtablelive.org/Resources/Documents/2013%20APHA%20Affiliate%20Mtg/Policy%20Framework%20and%20Tools/APHA%20Media%20Advocacy%20Manual.pdf>

Date	Topics	Homework
Class 1 Jan 22	Lecture: Course overview and description of the capstone project Lecture: Building confidence in public speaking Activity: Ice breakers and improv exercises	Practice just one time a 3 minute oral presentation about your research = 3 minute thesis (3MT) (Due date: Class 2) Write a short description of the plan for your capstone project and upload to Canvas (Due date: Class 2)
Class 2 Jan 29	Activity: Baseline 3MT videotaping Lecture: Why communicating science in everyday language is important Activity: Using everyday language	
Class 3 Feb 5	Lecture: Scientific storytelling Activity: Storytelling exercise Lecture: Preparing speeches (handout) Activity: Picture exercise	Write a First Draft of your 3MT (Due date: Class 7)
Class 4 Feb 12	Lecture: Know your audience, using analogies, and delivering key messages Activity: Audience exercise Activity: Analogies and metaphors Activity: Distilling your message in an elevator pitch	Work on capstone project Practice 3MT
Class 5 Feb 19	Lecture: The Rehearsal Process (handout) Activity: Improv exercises	Work on capstone project Find a file of power point slides that you would use for a 10 min talk based on your abstract (Due date: Class 6)
Class 6 Feb 26	Lecture: Slide presentations Activity: Peer editing slides	Practice 3MT Reminder: First Draft of 3MT (Due date: Class 7)
Class 7 March 5	Lecture: Text analysis (handout) Activity: Tablework rehearsal for 3MT	Submit first draft of capstone to mentor and upload to Canvas. (Due date: Class 8) Bring to the next class a digital version of a poster from a meeting you or someone from your lab has been to. (Due date: Class 8)

		Practice 3MT Start to familiarize yourself with the story of your speech working towards Off-Book Write a second draft of your 3MT (Due date: Class 10)
Class 8 March 12	Lecture: Scientific papers and how to structure a written story Activity: Writing exercises Lecture: Scientific posters Activity: Peer editing posters	Write a 250 word Abstract about your research and upload to Canvas. You will peer review two of your classmates' abstracts. (Due date: Class 9) Have resume or CV ready for a mock job interview (Due date: class 9)
Date	Lecture	Homework
March 19	Spring Break – No class	
Class 9 March 26	Lecture: Interviewing for a job Activity: Mock job interviews	Work on capstone project Practice 3MT
Class 10 April 2	Lecture: Performance (handout) Activity: Blocking/Off-Book rehearsal for 3MT	Submit the second draft of your capstone project to your mentor and upload to Canvas. (Due date: Class 11) Social media and infographics pre-work (Due date: Class 11) Make adjustments and refine your second draft for 3MT
Class 11 April 9	Lecture: Social Media and Infographics Activity: Visual Abstract	Tweet or post on LinkedIn about something related to your research (Due date: Class 12) Come prepared for Dress Rehearsal (Due date: Class 13)
Class 12 April 16	Lecture: Risk Communication	Work on capstone Come prepared for performance of 3MT; Off-Book, Dressed for Performance (Due date: Class 13)
Class 13 April 23	Activity: Working/ Dress rehearsals for final 3MT	Finalize capstone (Due date: Class 14) Practice 3MT

Class 14 April 30	Activity: Presentation of capstone projects Mentors join in person or by Zoom	Practice your final 3MT (Due date: Class 15)
Class 15 May 7	Final: Performance of 3MT with videotaping	