

Communicating Scientific Research

Ph.D. Course: 2018 Syllabus and Schedule

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Spread over one year, Communicating Scientific Research is a 5-credit course that teaches graduate students in science, engineering, and mathematics at Norwegian universities how to communicate their research in presentations, papers, posters, and films. The course consists of two intensive weeks of training—the first week occurring in the spring and the second week occurring in the fall. In between these weeks, the students work on their individual projects. Designed for graduate students who have begun their research, the course combines lecture, discussion, critiquing workshops, and out-of-class assignments to give the students multiple opportunities to not only speak and write about their research, but also to receive feedback on those efforts.

Based on a graduate course taught by Professor Michael Alley at the University of Wisconsin-Madison, Virginia Tech, and Pennsylvania State University, this course is designed to help graduate students make their research communications more understandable, memorable, and persuasive. The course uses two textbooks, *The Craft of Scientific Presentations* and *The Craft of Scientific Writing*, both of which are authored by Michael Alley, one of the course instructors. These books will be provided for you at the beginning of class. The presentation portion of the course also draws heavily on example scientific presentations given at TED.com.

Schedule with Activities, Course Topics, and Assignments

Preparation Assignment for Spring Class Portion

12 March *Preparation Assignments for Spring Course Portion Sent to Students*

Presentation Assignment: Using an assertion-evidence template, prepare at least 6 or so slides for a 10-minute presentation that presents an overview or slice of your research. For those graduate students just beginning their project, have the talk focus on the importance of the research, your working hypothesis, and an explanation of the approach. You are permitted to make changes to the draft after submission, but you must submit the first draft by 9 April.

Writing Assignment: Write 2 - 3 pages about your research and why it is unique and important. Within this summary, include a hypothesis for the research. Also, include a working title for the research and supporting images. The audience for this assignment is other students in the CSR class. You can assume they have a technical background, but not necessarily in your field.

9 April *Electronic Submission of Preparation Assignments*

16 April *Writing Excerpts Available for Critique Groups*

Spring Class Portion | April 23 - 27

Instructor: Christine Haas (christineaehaas@gmail.com)

Teaching Assistants: Katie Kirsch (kathryn.kirsch@gmail.com) and Jacob Snyder (jacob.snyder@psu.edu)

23 April **Class Day 1**

8:30 – 9:00 Registration of participants

09:00-12:00 Introduction to Research Presentations | Room *Storstua*

Analyzing the Audience, Purpose, and Occasion

Research Presentation: the Beginning

Research Presentation: the Middles

12:00-13:00 Presentation by 2017 CSR Participant

13:00-14:00 Lunch

14:00-17:00 Research Presentations Continued

Research Presentation: the Ending

Delivering a Presentation

Handling Questions, Even the Difficult Ones

Delivery Exercises

| **Breakout rooms *Storstua, Bakrommet + Klasserommet***

17:30 Dinner at Sjøflyhavna Kro (walking distance from Simula)

24 April **Class Day 2**

09:00-13:00 Critique Session Round #1

| **Breakout rooms *Storstua, Bakrommet + Klasserommet***

Participants make a 10-12 minute presentations and receive detailed feedback in different rooms (Three groups of 10 participants)

13:00-14:00 Lunch

14:00-17:00 Develop an Elevator Pitch of Your Research | Room *Storstua*

Participants create a 30-60 second pitch and learn to talk credibly and clearly about their work in a short period of time

| **Breakout Rooms *Storstua, Bakrommet + Klasserommet***

25 April Class Day 3

09:00-13:00 Critique Session Round #2

| **Breakout rooms** *Klasserommet, Bakrommet + Møterommet*

Participants make 12-15-minute presentations on research, answer questions, receive feedback, and presentations are filmed (Three groups of 10 participants)

13:00-14:00 Lunch

14:00-17:00 Introduction to Writing Research Papers | Room *Storstua*

Analyzing the Audience, Purpose, and Occasion

Structure of a Research Paper

Language of a Research Paper

26 April Class Day 4

9:00-12:00 Research Papers Continued | Room *Storstua*

Language of a Research Paper

Illustration for a Research Paper

Time for participants to read/review group papers

12:00-13:00 Lunch

Critique Sessions on Papers | **Rooms** *Møterommet, Hjørnehiet + Bakrommet*

13:00-15:00 Critique sessions on papers: Groups 1- 3 (5 participants each)

Participants provide feedback on each other's excerpts in a discussion guided by an instructor in the course

15:00-17:00 Critique sessions on papers: Groups 4 - 6 (5 participants each)

Participants provide feedback on each other's excerpts in a discussion guided by an instructor in the course

27 April Class Day 5

9:00-13:00 Scientific Posters | Room *Storstua (Breakout room Bakrommet)*

Introduction to scientific posters, participants draft scientific posters of their research and provide feedback on posters

Course Wrap-up

13:00 Lunch

Week 1 Overview

	Monday 23	Tuesday 24	Wednesday 25	Thursday 26	Friday 27
Morning	Research Presentations	Critique session 1	Critique session 2	Research Writing continued and Working Session	Scientific Posters
	Lunch	Lunch	Lunch	Lunch	Lunch
Afternoon	Research Presentations continued	Elevator Pitches	Research Writing	Writing Critique Sessions	

Summer Project

Instructors: Michael Alley, Christine Haas, and Teaching Assistants

18 June *Deadline for Students to Submit Draft 1 of Summer Project for Review*

Each student selects one of three options:

1. Students write a literature review of their research project that shows (1) how their research is supported and motivated by what is in the literature, and (2) how their research differs from what is in the literature (8-12 pages double-spaced)
2. Students write draft of conference or journal paper
3. Students draft Introduction and Literature Review chapters from their dissertation (10-12 pages double-spaced)

16 July *Deadline for Instructor to Return Drafts with Comments*

30 July *Deadline for Students to Submit Draft 2 of Summer Project for Approval*

13 August *Assignment approval/revision request given by instructor*

Preparation Assignment for Fall Class Portion

13 August: *Preparation Assignment 1 for Fall Course Sent to Students*

Writing Assignment: Write a short proposal to the Norwegian Research Council or a similar agency to receive support for your PhD research or a post-doctoral position. For those students just beginning your work, have the proposal focus on what you plan to research. Your proposal will be evaluated on (a) Does the proposed research address an important need? (b) Are the research objectives logical and realistic? (c) Will the proposed methods achieve the research objectives and (d) Is the proposer capable of doing the proposed work?

Proposals should be no more than 2 pages of text in 12-point type, 1 page

of illustrations and 1 page of reference citations. A template will be provided for submissions.

10 September: *Electronic Submission by Students of Preparation Assignment 1*

Preparation Assignment 2 for Fall Course Sent to Students

Using an assertion-evidence template, prepare slides for a 10-12 minute proposal presentation to receive support for your PhD research. For those students just beginning your work, have the presentation focus on what you plan to research. Your presentation will be evaluated on (a) Does the proposed research address an important need? (b) Are the research objectives logical and realistic? (c) Will the proposed methods achieve the research objectives and (d) Is the proposer capable of doing the proposed work?

Bring your presentation slides to the first class on 24 September. Please note that you will have more time during the week to continue work on the talk.

Preparation Assignment 3 for Fall Course

Collect smartphone films or computer animations of scientific data (simulation results, etc.) of aspects of your research. As a team (preferred) or as an individual, you will create a short film on the research group you belong to at your home institution.

17 September: *Writing excerpts of students available for critique groups*

Students prepare critiques of writing excerpts submitted by other participants in critique groups

Fall Class Portion | September 24-28

Instructor: Michael Alley (malley@engr.psu.edu)

Teaching Assistant: Lauren Murphy (murphylauren333@gmail.com) & TBD

24 September **Class Day 6**

9:00-13:00 Writing Research Proposals | **Room Storstua**

13:00-14:00 Lunch

14:00-17:00 Review of Writing and Advanced Presentations
| **Room Storstua**

Review of Research Writing

Advanced Slide Design: The TED-style and Lessig approaches

25 September **Class Day 7**

9:00-12:00 Making a Technical Film about Your Research
| **Room Storstua** (open to all of Simula)

12:00-13:00 Lunch

13:00-15:00 Critique sessions on proposal papers: Groups 1 and 2 (4-5 participants each)

| **Breakout rooms Bakrommet + Hjørnehiet**

Participants provide feedback on each other's excerpts in a discussion guided by an instructor in the course

15:00-17:00 Critique sessions on proposal papers: Group 3 and 4 (4-5 participants each)

| **Breakout rooms Bakrommet + Hjørnehiet**

Participants provide feedback on each other's excerpts in a discussion guided by an instructor in the course

26 September Class Day 8

9:00-11:00 Critique sessions on papers: Groups 5 and 6 (4-5 participants each)

| **Room *Storstua***

| **Breakout rooms Bakrommet + Møterommet**

Participants provide feedback on each other's excerpts in a discussion guided by an instructor in the course

11:00-13:00 One-on-one film consultations with Lauren Murphy, 30 minutes per group | Presentation consultations available
Other participants working on film or proposal presentation

13:00-14:00 Lunch

14:00-17:00 One-on-one film consultations with Lauren Murphy, 30 minutes per group | Presentation consultations available
Other participants working on film or proposal presentation

27 September Class Day 9

9:00-13:00 Communicating Your Research to the Public and Correspondence

| **Room *Storstua***

13:00-14:00 Lunch

14:00-16:00 Film Viewing and Awards
| **Room *Storstua***

28 September Class Day 10

9:00-12:30 Proposal Presentations (Three groups of 8-9 participants)

| **Room *Storstua***

| **Breakout rooms *Bakrommet + Hjørnehiet***

12:30-13:00 Course Wrap-Up

13:00 Lunch

Week 2 Overview

	Monday 9	Tuesday 10	Wednesday 11	Thursday 12	Friday 13
Morning	Writing Research Proposals	Creating a Film about Research	Writing Critique Session Film & Presentation Consultations	Communicating research to the public & Correspondence	Proposal Presentations
	Lunch	Lunch	Lunch	Lunch	Lunch
Afternoon	Advanced Presentations	Writing Critique Session	Film & Presentation Consultations	Film Watch Party	

Requirements and Expectations

1. When you sign up for the course, you are agreeing to participate for week 1 and week 2 of the course, and to complete the summer project assignment.
2. You are expected to attend each of the lectures.
3. You are expected to complete and turn-in each of the preparation assignments for the course.
4. You are expected to give the assigned presentations, as well as participate in the writing critique sessions.

About the Instructors

Michael Alley holds a master of science in electrical engineering and a master of fine arts in writing and is an associate professor of engineering communication at Penn State. He is the author three textbooks: *The Craft of Scientific Presentations* (2003), *The Craft of Editing* (2000), and *The Craft of Scientific Writing* (1996). Both *The Craft of Scientific Presentations* (2003) and *The Craft of Scientific Writing* have been translated to Japanese. Over the past twenty years, he has taught scientific writing and presentations to science and engineering students at Penn State, the University of Texas, the University of

Wisconsin, and Virginia Tech. His professional communication workshops have been held around the world. Sites include Sandia National Laboratories, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, United Technologies, the Army Corps of Engineers, the Environmental Protection Agency, Simula Research Laboratory (Norway), the Institute for Energy Technology (Norway), Kaust (Saudi Arabia), the European Space Agency (Chile), the University of Barcelona, Shanghai Jiao Tong University, Seoul National University, the University of Oslo, and the University of Seville. Alley is the founder and lead editor for the popular website “Writing Guidelines for Engineering and Science Students,” which has a half-million visitors each year and is the first Google.com listing for the topic of *engineering writing*.

Christine Haas brings over 10 years of experience working at the intersection of science and communication. Before launching Christine Haas Consulting, LLC in 2012, Christine held positions as director of marketing at Drexel College of Engineering and director of operations at Worcester Polytechnic Institute Engineering. Since founding Christine Haas Consulting, Christine has traveled around the world teaching courses to scientists and engineers on presentations, slide design, writing, and storytelling. She teaches clients across higher education, industry, and government including Stanford, Netflix, The North Face, Texas Instruments, Medtronic, Center for Disease Control and Prevention, Sandia National Laboratory, and the European Southern Observatory (Chile). Christine received her MBA in marketing and international business from Drexel University and her BA in English and film from Dickinson College.