

Graduate Certificate in Science Communication

Summary

In August, the Graduate College and the College Academic Administrators Council gave their approval for a “Science Communication Graduate Certificate” and interdisciplinary minor available to all Ph.D. students in the College of Science. The certificate requires three electives to be taken before graduation. The goal of the certificate is to give future science professionals the skills to communicate effectively with public audiences. This new program is also available to postdoctoral fellows who, as UA employees, can use Qualified Tuition Reduction (QTR) to take the electives at a discounted tuition rate.

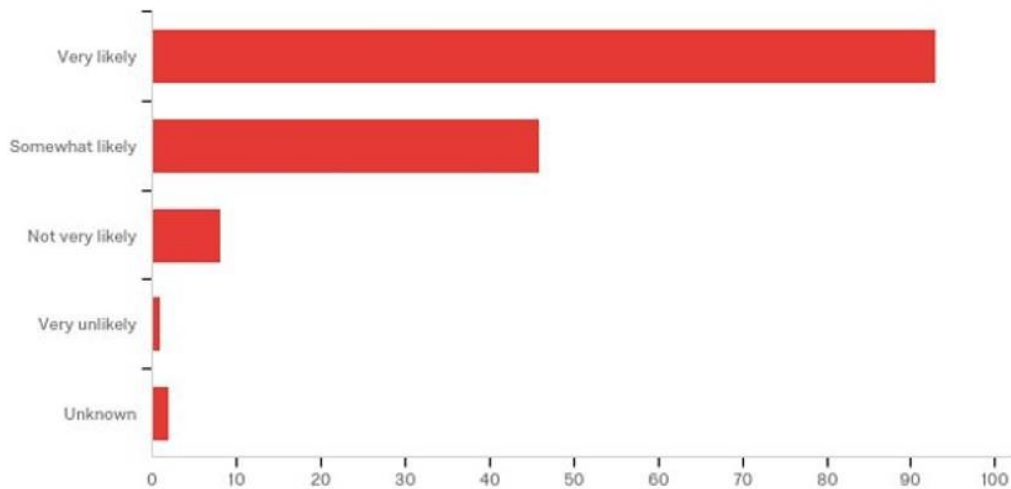
Description and Purpose

The proposed graduate certificate addresses a clear and growing need among STEM (Science, Technology, Engineering, and Mathematics) professionals. Graduate students in the College of Science get excellent technical training through rigorous coursework in their chosen subject, but they have no training in how to communicate science to public audiences or non-scientists. Surveys by the National Science Foundation consistently show that only 15% of American adults are scientifically literate, meaning they correctly answer 2/3 of a set of basic questions about science and can describe in words what it means to study something scientifically. In a society increasingly dependent on science and technology, citizens are disenfranchised from meaningful discussion of issues like climate change, genetic engineering, and the space program. All professional scientists bear a societal obligation to help address this situation by communicating the results of their work to general audiences.

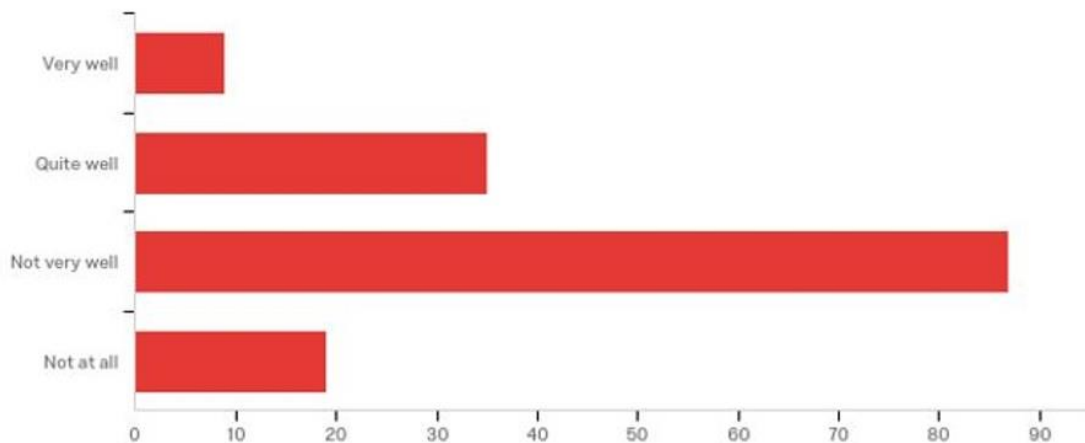
For more than a decade, the National Science Foundation has required proposals to address “broader impacts” of the research being funded. Broader impacts is a second and equal criterion of the peer review process, on an equal footing with the intellectual merit of the research proposal. There is a dissemination requirement for NASA, NIH, other federal agencies, and many foundations. It can be viewed as a return to taxpayers who supported the research to convey the results to a broader audience. A substantial fraction of the University of Arizona’s \$600 million in research support is subject to the broader impacts requirement. Training science Ph.D. students to operate successfully within this funding environment suggests they need courses in science communication. Moreover, a significant fraction of these students do not go into academia or industry when they graduate, and their employment landscape includes sectors such as print and television journalism, informal education in museums and science centers, and science content providers on the Internet.

As preparation for launching this certificate, graduate students in the College of Science were asked to complete an online survey. The response rate was 20%, or 150 out of 760 students. Responses to the two questions most relevant to the certificate program and interdisciplinary minor are shown below:

How likely is it that your career path will at some point require you to have good skills for writing and communicating to non-technical audiences?



How well has does your current graduate program prepare you for communicating science effectively to non-technical audiences?



Bearing in mind that this is a self-selected audience, where respondents are most likely to be interested in the proposed program, the data provided strong motivation for a new graduate program. Over 90% say that they are likely to need the skill of communicating science to broad audiences after they graduate. Yet 70% say that their current graduate program is inadequate in preparing them for that task. This suggests a need for science communication training for College of Science graduate students. There are very few programs like this nationwide. The new certificate program is an excellent opportunity for graduate students in the College of Science to gain valuable career skills that serve an important societal need.

Certificate Requirements

The certificate requirement (also conveying a multidisciplinary minor) is 9 credit hours, comprising three classes of 3 credit hours each. Students select three classes from the following list, with at least two from the first group of three, which are classes suitable for all science disciplines, and the third class from the second group of seven. Most of the classes are offered once per year.

Students must choose three courses from the following list:

ENGL 514	Advanced Scientific Writing
ENGL 586H	The Art of Scientific Storytelling
ENVS 508	Scientific Writing for Environmental, Agricultural & Life Sciences
ENVS 515	Translating Environmental Science
FTV 550	Documentary Filmmaking and Science Communication
GEOG 596	Making the Connection between Science and Decision Making
INFO 578	Science Information and its Presentation
JOUR 506	Introductory/Advanced Reporting
JOUR 507	Reporting with Multimedia
JOUR 555	Environmental Journalism
JOUR 565	Issues in Covering Science and the Environment
JOUR 572	Science Journalism
MCB 575	Scientific Communication
SCI 501	Science Communication
SLHS 649	Skills and Ethics

In their plan of studies, and with the approval of the Director of Graduate Studies or the Graduate Advisor of their Department, students taking the certificate path use three of the classes listed above as electives. If substitution is not permitted by the Department or if the students have already completed their plan of studies and progressed to Ph.D. candidacy, they may complete the requirements for the certificate as a class overload.

Advising and Completion

Admission requirements are satisfied by students in their home department. Concurrent enrollment in a degree program is allowed but is not required. Due to core requirements in the disciplines in most College of Science Ph.D. programs, it is unlikely that students will take more than one class for the certificate in any semester. Typically, students will take one certificate class in 3 of their first 4 semesters and complete the requirement in two years. However, it is possible to complete the elective requirement after the first two years, at any time up until the semester a student graduates. Students may use up to 6 units taken in graduate non-degree status as counting towards the certificate.

A maximum of 3 units of transfer credit may be applied towards the certificate. However, it is unlikely in practice that many students will have taken an appropriate or equivalent graduate level science communication course at another institution before coming to the UA. Advising for students in the certificate program falls to instructors of the classes that contribute to the certificate, along with faculty with science communication expertise in

the home department. Since students will automatically complete the interdisciplinary minor in Science Communication alongside the certificate, a member of their prelim or Ph.D. committee will serve as an advisor for the minor. Typically, this faculty member will be an instructor for one of the classes counting towards the certificate.

Student Outcomes

After completing the coursework for the certificate in Science Communication, students will be able to: (1) explain their research topic to an academic working in an unrelated field, (2) provide the context and motivation for their research in terms of their overall discipline, (3) give a short talk on their research suitable for a public audience, (4) write a short popular article or press release on a recent discovery or innovation in their field, (5) write a jargon-free summary of a major research paper in their field, (6) write both a short and a longer science article in a classic journalistic style, and (7) explain to a non-scientist a significant, recent discovery in an unfamiliar scientific field.

Skills taught and evaluated in the elective classes used for the certificate

ENGL 514	Training in clear expression of complex information, long papers written
ENVS 508	Practical writing experience in environmental science and the life sciences
ENVS 515	Training in translating environmental science to diverse public audiences
JOUR 555	Principles of journalism and reporting, reading, discussion, and workshops
JOUR 572	Science journalism case studies, with professional-quality articles written
JOUR 506	Introduction to reporting for grad students, with iterative writing assignments
JOUR 507	Hands-on introduction to multimedia reporting, with video, audio, graphics
MCB 575	Communication skills, with written grant proposal, and an oral presentation
SCI 501	Seminar-style, with storytelling, discussions, and writing a UA News story
SLHS 649	Covers “survival” skills of speaking and writing with an emphasis on ethics

In terms of outcomes, the most marketable skills from the certificate program are the ability to translate complex, technical information into plain language and the confidence to carry out the outreach function of a faculty member or a research scientist. Students completing the graduate certificate will gain an identifiable credential speaking to their inclination and ability to carry out the “broader impact” aspect of sponsored research.

Contacts and Administration

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