

**Integrating Science Communication Modules Into Graduate-Level Agricultural and  
Natural Resource Science Courses**

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### **Introduction**

Preparing scientists to have robust conversations about their work is important in the current environment, especially for those at land grant institutions and who are working in the food, agricultural, and natural resource sciences (Swenson & Marson, 2024; McLeod-Morin et al., 2021). Funding, policy support, behavior change, and adoption of new technologies often depend upon clear communication of research and impacts to diverse audiences (Bennett et al., 2019).

Science communication curricula can help graduate students use appropriate skills, media, activities, and dialogue to shape awareness, interest, understanding, and opinions about scientific topics and issues (Dudo et al., 2021). Despite growing interest in science communication among universities, scientific societies, and professional organizations, many graduate programs in the agricultural sciences do not address science communication skills within their disciplinary curriculum requirements (Brownell et al., 2013). Despite discipline, McLeod-Morin and colleagues (2024) encourage instructors to include “more instruction in the classroom related to science communication, particularly including skills related to underlying theories of science communication” (p. 11).

### **How It Works/Methods/Program Phases/Steps**

We have developed a new, comprehensive set of science communication modules for graduate students in food, agricultural, natural and human science programs, as part of a Higher Education Challenge grant project funded by the United States Department of Agriculture (USDA). These modules can be used by faculty across disciplines who want to integrate graduate and professional level science communication education into their curriculum. Faculty have the flexibility to integrate full modules or select individual learning components to meet their students’ needs. The full set of 18 modules covers key communication frameworks, approaches for effective and ethical science communication, critical thinking and decision-making skills, how to direct science communication efforts, how to evaluate impact, and a wide range of skills-based modules for producing content that communicates complex agricultural information across different audiences.

Each of the 18 modules comes with a curriculum guide, one or more sets of lecture slides, a set of readings, and one or more assignments/activities with rubrics and instruction guides included. These modules may be incorporated into your curriculum as synchronous or asynchronous content - allowing for flexibility of course delivery.

### **Results To Date/Implications**

Throughout 2024 and 2025, modules were piloted within graduate courses across four departments at three universities. Modules have been integrated into courses across agricultural and natural resource communication as well as agricultural and applied economics. Modules were included in currently existing courses within programs across three institutions and served as building blocks for new curriculum development at another institution.

One instructor who piloted the curriculum in their course said “I really enjoy that I can use the modules as the core content for that week when I’m teaching live or I can use the module content as a compliment to our live class lectures/discussions on our class Canvas site.” They went on to say, “while I haven’t used any of the included assignments/activities for graded course material, they have been helpful for engaging students online since I teach this course in a hybrid format.”

One student who enrolled in a course that utilized the modules said, “The asynchronous module was a good mix of readings and videos, which was strengthened by a student leading discussion on the material each week.” Another student said, “Modules and readings provided before class were not only helpful to introduce the topic, but also great resources to look back on after the course is completed.

Finally, an instructor outside the field of agricultural and natural resource communication who used the modules shared:

The module included key aspects of data visualization I should be covering in class. It was compiled in a way that saved me time from organizing content from scratch or looking around to confirm whether I was missing something. A broader roadmap of how we should achieve effective communication using data was something I was not taught in my disciplinary training, which I found to be useful.

#### **Future Plans/Advice to Others**

Future plans include further formal evaluation of each module to ensure relevant content is delivered at the appropriate level for the graduate student audience. Once this is achieved, all modules with resources will be made available online free of charge for any instructor to incorporate into their classroom.

One institution additionally plans to leverage these modules as a framework for a graduate-level minor or certificate program in science communication.

#### **Costs/Resources Needed**

There was substantial funding required to initiate this project and it would not be possible without external funding via the USDA Higher Education Challenge grant program. However, because of this initial funding, these modules will be available online to instructors to utilize in their classrooms free of charge.

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