**BGE**

### Genetics

**BGE 500: Introduction to News Media Concepts and Institutions**

In any age when scientific, medical and environmental issues often make news, this course is designed to familiarize students with how the U.S. news media work. Students will learn how the industry is organized, and why it is undergoing fundamental change; how decisions are made about which stories to cover and how prominently to cover them; how the press weighs such values as freedom, privacy and national security; and how the press attempts to deal with issues of scientific uncertainty and conflicting information.

In exploring the culture and practices of American journalism, the course will focus on recent coverage of science, health and environmental developments. This course is intended for graduate students in health and science who seek a better understanding of the media context in which they will work, as well as for journalism M.S. students who do not have a background in journalism.

Offered

Fall, Spring, and Summer, 3 credits, Letter graded (A, A-, B+, etc.)

**BGE 501: Communicating Science: Distilling Your Message**

Current and future scientists and health professionals will learn to communicate clearly and engagingly with different kinds of audiences, at different levels of complexity, using different forms. We'll examine the basics of clear, two-way communication, including knowing and being responsive to your audience, overcoming "the curse of knowledge," having a point, avoiding jargon, using storytelling techniques, being personal, asking questions, and introducing complexity in stages. Students will start by crafting a short, controversial statement about their work and why it matters. We'll expand that to a longer statement, convert it into a brief piece of writing, such as a letter to the editor or a blog post, practice answering questions about it from the public and from the media, plan a public presentation, and learn to apply these skills in the classroom. Skills learned in this course can help scientists and health professionals communicate more effectively with students, potential employers or funders, public officials, family and friends, the press, colleagues in other disciplines. JRN501, JRN502, and JRN503 are 1-credit modules, each lasting four or five weeks. Students may take all three consecutively in one semester or may take only one or two. Offered

Fall, Spring, and Summer, 1 credit, Letter graded (A, A-, B+, etc.)

### Fall, Spring, and Summer, 1 credit, Letter graded (A, A-, B+, etc.)

**BGE 502: Communicating Science: Writing for the Public**

Students will practice writing about specific and health material clearly and vividly, in ways not-scientists can understand. They will learn to use analogies, examples and metaphors to illuminate unfamiliar concepts, practice using numbers clearly and translating statistics into conversational English, learn about scientific terms and concepts that are commonly misunderstood by the public. They will learn to introduce complexity gradually, to avoid overwhelming the reader while not "dumbing down" their material. Students will learn to write for different formats, including blogs, letters to the editor or to funders, and op-eds or commentary pieces.

JRN501, JRN502, and JRN503 are 1-credit modules, each lasting four or five weeks. Students may take all three consecutively in one semester or may take only one or two. Fall, Spring, and Summer, 1 credit, Letter graded (A, A-, B+, etc.)

**BGE 503: Communicating Science: Improvisation for Scientists.**

This innovative course uses improvisational theater techniques to help students speak more spontaneously and connect more directly and responsively with their audience and with each other. After warm-up exercises, emphasizing physical freedom and verbal spontaneity, students will participate in two- and three-person exercises and situational improvisations that focus on communicating their work directly to newcomers or laypersons, and altering your approach to meet their needs. At the beginning and end of this course, students will deliver a short oral statement about their research or a scientific topic that interests them, so they can measure their progress. This course is not about acting; it's about helping current and future scientists and health professionals connect with their audiences. Science graduate students who had several sessions of improvisation training in a pilot session reported communicating better as scientists and health professionals. This course is designed to familiarize students with how the U.S. news media work. Students will learn how the industry is organized, and why it is undergoing fundamental change; how decisions are made about which stories to cover and how prominently to cover them; how the press weighs such values as freedom, privacy and national security; and how the press attempts to deal with issues of scientific uncertainty and conflicting information.

In exploring the culture and practices of American journalism, the course will focus on recent coverage of science, health and environmental developments. This course is intended for graduate students in health and science who seek a better understanding of the media context in which they will work, as well as for journalism M.S. students who do not have a background in journalism.

Offered

Fall, Spring, and Summer, 3 credits, Letter graded (A, A-, B+, etc.)

**BGE 504: Communicating Science: Using Digital Media**

Science and health information increasingly travels by digital media, as new ways emerge for scientists to communicate directly with the public, without the intermediaries of press or public relations. Students will learn how to use blogs, podcasts, Twitter and other forms of social media for two-way communication with different segments of the public, including colleagues in other disciplines. The course will include hands-on instruction in working with digital media, tailored to students' interests and levels of experience.

Offered

Fall, Spring, and Summer, 1 credit, S/U grading

May be repeated 2 times FOR credit.

**BGE 505: Communicating Science: Connecting with the Community**

Students will learn how to use communication techniques, cultural competency, and health literacy concepts to reach and mobilize the community and key stakeholders on health- and science-related issues related to their research, outreach or community education objectives. The course will incorporate role-playing and community networking skills to help students make connections with key people and groups relevant to their current interests and work. This will require contact with the instructor before the start of the course to discuss students' projects, plans or interests.

Offered

Fall, Spring, and Summer, 1 credit, Letter graded (A, A-, B+, etc.)

May be repeated 2 times FOR credit.

**BGE 506: Communicating Science: Advanced Writing for the Public**

This course is for graduate students in the sciences who have taken JRN 502, Communicating Science: Writing To Be Understood, and want to continue developing and practicing their ability to write about science clearly and vividly for non-expert readers.

Offered

Spring, 1 credit, S/U grading

May be repeated for credit.

**BGE 510: Graduate Genetics**

This course investigates fundamental aspects of the transmission and expression of genetic information in prokaryotic and eukaryotic systems. The course is organized in a way that allows the students to appreciate the breadth of genetics research, while also gaining an in-depth understanding of selected important
topics. Students explore the use of both classical and molecular genetic approaches to understand biological processes in genetics model systems including yeast, flies, worms, mouse, and man.

Spring, 3 credits, Letter graded (A, A-, B+, etc.)

**BGE 530: Laboratory Rotation**

The student rotates through laboratories of four different genetics program faculty members during the first year. The selection of the laboratories is made by the student, in conjunction with individual faculty, and with the approval of the program director. By taking part in ongoing projects, the student will learn experimental procedures and techniques and become acquainted with research opportunities in the participating programs. Prerequisite: Permission of instructor

Fall and Spring, 1-4 credits, Letter graded (A, A-, B+, etc.)

**BGE 531: Graduate Student Seminar in Genetics**

Students have the opportunity to present their research to other students and faculty on an annual basis. Students in the first or second year will present brief seminars as part of a one-day symposium with all of their classmates. Advanced students present research seminars as part of a weekly research seminar series that is attended by faculty and students. Although the first and second year students do not present in this weekly seminar series, they should attend these seminars as it provides an excellent mechanism for learning about current areas of research interest.

Fall and Spring, 0-1 credits, S/U grading

May be repeated 2 times FOR credit.

**BGE 534: Introduction to Systems Biology**

This course is geared towards teaching essential concepts and computational skills in Systems Biology. The course is centered upon two key programming languages: Matlab for modeling applications and the R language for statistical analysis and sequence manipulation.

Spring, 3 credits, Letter graded (A, A-, B+, etc.)

**BGE 550: Genetics Outside Seminar**

Outside seminars and special topics courses in areas relating to genetic studies.

1-4 credits, Letter graded (A, A-, B+, etc.)

May be repeated for credit.

**BGE 599: Graduate Research**

Original investigation undertaken with the supervision of a member of the program.

Fall and Spring, 1-9 credits, S/U grading

May be repeated for credit.

**BGE 657: Principles of Development**

This course deals with developing systems at all levels from the morphological to the molecular. Illustrative material from both animal and plant kingdoms is used. Special attention is given to gametogenesis, genetic control of early development, transcriptional and translational control of protein synthesis, the role of cell division and cell movements, and cell-to-cell interactions in defining developing systems.

Prerequisite: MCB 656, matriculation in graduate program or permission of instructor.

Fall, 3 credits, Letter graded (A, A-, B+, etc.)

**BGE 691: Readings in Genetics**

Journal Club on thematic topics in different areas of current genetics research

Prerequisite: Permission of instructor

Fall and Spring, 1 credit, Letter graded (A, A-, B+, etc.)

May be repeated for credit.

**BGE 693: Research Proposal Preparation in Genetics**

A course, based upon literature in the broad field of Genetics, to instruct in scientific writing and the preparation of research proposals. The course will be organized in three parts. In the first section of the course, students will become familiar with the components of the research proposal and will read and evaluate proposals written by the training faculty. Lectures given by the course co-directors will cover the basics of scientific writing, research proposal preparation and the problems and concerns commonly voiced by reviewers of research proposals. In the second section, students will develop two short proposals for the study of genetics which are unrelated to their graduate research. One of these short proposals will be selected for development into a full proposal. In the third section, students will develop and write the full proposal. The students' skills in proposal preparation will be enhanced by critiquing the short and full proposals presented by other students in the second and third sections of the course. Offered:

Spring, 3 credits, Letter graded (A, A-, B+, etc.)

**BGE 699: Dissertation Research on Campus**

Prerequisite: Advancement to candidacy (G5). Major portion of research must take place on-campus. Students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor.

Fall, Spring, and Summer, 1-9 credits, S/U grading

May be repeated for credit.