

## GEN 800 Sec 001: Genetics Applications for Improving Food Security

Fall 2017, 1 credit

Thursdays 3:00-4:45PM, 208 Biochemistry

As the world population is projected to reach 9 billion people by the year 2050, issues of food security are increasingly pressing. In this course, students will be introduced to ways in which genetics and genomics tools are used to enhance crop and livestock production in a changing world. We plan to investigate how -omics and other “big data” studies in particular can provide solutions to relevant issues such as climate change, antibiotic resistance, animal welfare concerns, and human malnutrition. Throughout the semester, students will be asked to present scientific papers related to these topics, prepare questions, and moderate class discussion. In addition, a component of this seminar will be focused on improving students’ science communication skills to the general public and understanding how genetic research has manifested in science policy.

Organizers: Ryan Corbett ([corbet35@msu.edu](mailto:corbet35@msu.edu)), Amanda Koenig ([koenigam@msu.edu](mailto:koenigam@msu.edu)), and Katerina Lay ([laykater@msu.edu](mailto:laykater@msu.edu))

Faculty facilitators: Cathy Ernst, Susanne Hoffmann-Benning, Shinhan Shiu

### **Class Expectations**

1. Students will present on a paper of their choosing related to their assigned day’s topic. Besides covering the most important points of the paper in a journal-club format, we also ask that the presenter share some aspect of public policy (at either the local, state, or federal level) pertinent to the technology utilized or the issue addressed.
  - **The chosen paper should be uploaded to D2L at least a week in advance (Thursday prior to their presentation)** so that the rest of the class has sufficient time to read and submit their questions.
2. Students who are not presenting will submit 3 questions each to the presenter **by the Tuesday before class**.
3. Each presenter will also submit a one-page summary of the paper presented, written with the public (i.e. non-scientists) as the intended audience. **Summaries should be submitted by midnight the Tuesday following their presentation**. Summaries should include:
  - An overview of the major problem the current study seeks to address (why should we care?)
  - A brief summary of the study’s findings
  - An explanation of the broader impacts of this study (how will this work potentially contribute to solving the problem addressed earlier?)
4. All students are expected to provide meaningful and thoughtful critiques of the paper summaries to help improve science communication skills.
5. Students will have the opportunity to participate in the planning of the 2018 Genetics Mini-Symposium, the theme of which will be closely related to the seminar course.

## Semester Schedule

| <b>Date</b>  | <b>Topic</b>                    | <b>Presenter</b>           |
|--|---------------------------------|----------------------------|
| August 31  | Class Introduction              | Katerina, Ryan, Amanda     |
| <i>Part One: Combatting Stressors in a Fluctuating Climate</i> |                                 |                            |
| September 7  | Plant Disease                   | Jeff Schachterle           |
| September 14   | Temperature Stress              | Donghee Hoh                |
| September 21   | Drought Stress                  | Amanda Koenig              |
| September 28   | Writing Critique                |                            |
| <i>Part Two: Assessing the Impacts of Modern Agriculture</i>   |                                 |                            |
| October 5  | Antibiotic Resistance           | Reid Blanchett             |
| October 12   | Ag Runoff/Environmental Impacts | Katerina Lay               |
| October 19   | Food Safety                     | Davis Mathieu              |
| October 26   | Animal Welfare                  | Agustin Gonzalez-Reymundez |
| November 2   | Writing Critique                |                            |
| <i>Part Three: Improving Growth and Nutrition</i>              |                                 |                            |
| November 9   | Livestock Production            | Ryan Corbett               |
| November 16  | Livestock Reproduction          | Kaitlin Karl               |
| November 23  | THANKSGIVING                    | NO CLASS                   |
| November 30  | Enhanced Nutrition              | Mitch Roth                 |
| December 7   | Writing Critique & Wrap-Up      |                            |