AGRO 5999: International Crop Research Field Course
Fall 2016

Instructor
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Tentative Time and Location
Field Trip to CIMMYT: August 4-11 (1 credit)
Discussion Sessions: Tuesday 4:00-6:00 (7/26, 9/6, 9/13, 9/20, 9/27) (1 credit)

Course Description
Global food security, human health and nutrition, and sustainable agricultural practices are currently major issues worldwide. This course will consider the role of international crop research to address these issues in terms of breeding for biotic and abiotic stress conditions, breeding for improved nutrient content, and international policies relating to these topics. The course will also discuss new research methods aimed to increase the efficiency of breeding, such as genomic selection, in the context of international agriculture. This course will consist of a 1-week trip to CIMMYT, an international agricultural research center located in Mexico, and discussion sessions reflecting on the trip and topics that were introduced. Such topics may include utility of genetic resources for crop improvement, international agriculture policy, and impacts of international crop research on developing countries. The breeding and research efforts at CIMMYT are focused on maize and wheat. Mexico is the center of diversity of maize and maize is extensive intertwined into the Mexican culture and diet. As such, this course will focus primarily on the maize research and breeding efforts at CIMMYT.

This course will deepen students’ knowledge of international agriculture, plant breeding, health and nutrition, quantitative genetics, plant sciences, and environmental sciences. This course will also provide students with an international experience that will broaden their world-view.

Prerequisites
An introductory biology and/or genetics course is suggested for this course.

General and Specific Learning Goals/Outcomes
• Exposure to international crop research, international crop breeding, and maintenance/utilization of plant genetic resources
• Demonstrate the complexity of achieving global food security
• Gain understanding of plant genetic resources, the relationship between genotypic and phenotypic diversity, and utilization for crop improvement
• International experience for students that will expand their world-view
Assessment
Field Trip (1 credit S-N)
S - Actively engaged in daily activities and evening reflection discussions
N – Highly unengaged and/or disruptive/disrespectful during daily activities or evening reflection discussions or physically absent from field trip

Discussion Section (1 credit A-F)
Reflection Oral Presentation – 50%
Participation – 50%

Grading Scale
A 93.34-100.00
A- 90.00-93.33
B+ 86.67-89.99
B 83.34-86.66
B- 80.00-83.33
C+ 76.67-79.99
C 73.34-76.66
C- 70.00-73.33
D+ 66.67-69.99
D 60.00-66.66
F 59.99 and below

Final Presentations
Students will give an approximate 20 minute presentation (exact presentation time will depend on enrollment numbers) reflecting on their experience at CIMMYT. Presentations should include both new academic and new cultural knowledge gained through the experience.

Tentative CIMMYT Trip Content
Day 1 (Thursday): Travel day and cultural experience (i.e. visit market)
Day 2 (Friday): Presentations by CIMMYT scientists (i.e. introduction to agriculture research, CGIAR and CIMMYT, breeding for improved nutrition (QPM and Harvest Plus), CIMMYT maize and wheat breeding programs, CIMMYT Gene Bank, etc.)
Day 3 (Saturday): Utilization of wild relatives - Tlaltizapan Station to see Tripsacum ex-situ conservation garden and National Institute of Public Health (lectures from nutritionists on macro vs. micro nutrients, socioeconomic status, diabetes, etc.)
Day 4 (Sunday): Cultural experiences*
Day 5 (Monday): Visit Toluca research station (breeding for disease resistance)
Day 6 (Tuesday): Presentations and hands-on activities relating to the Seeds of Discovery project and applications of genomic selection at CIMMYT and visit to local farmer fields
Day 7 (Wednesday): Visit Teotihuacan Pyramids and other cultural experiences
Day 8 (Thursday): Travel day
*Other possible activities of interest include on-farm trials, additional breeding topics such as breeding for abiotic stress resistance (DTMA, etc), additional station visit, generation and use of doubled haploids in the breeding program

**Discussion Topics and Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>7/26/2016</td>
<td>Pre-reflection and preparation session</td>
</tr>
<tr>
<td>9/6/2016</td>
<td>Student reflection oral presentations</td>
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<tr>
<td>9/13/2016</td>
<td>Student reflection oral presentations</td>
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<tr>
<td>9/20/2016</td>
<td>Guest Lecturer: International agriculture policy</td>
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<tr>
<td>9/27/2016</td>
<td>Guest Lecturer: Impact of international crop research in developing countries</td>
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**Academic Dishonesty and Scholastic Misconduct**

Students are expected to do their own work and submit their own assignments. There is a zero tolerance policy for plagiarism in this course. If a student plagiarizes published works or is found to be copying work from other students they will receive a zero for the assignment or exam. Additional details about the University of Minnesota student honor code can be found at http://www1.umn.edu/regents/policies/academic/StudentConduct.pdf

**Students with Disabilities**

Students with any type of disability will be accommodated. Please inform the instructor of any special needs within the first week of the semester. For assistance, please contact the University Disability Services (https://diversity.umn.edu/disability/) at 612-626-1333 or ds@umn.edu.