

# **Horticulture 376: Tropical Horticultural Systems**

## **Course Syllabus for Fall 2016**

**1 credit**

### **Instructor:**

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### **Description:**

This course will highlight the **interactions between tropical plants and society**. How plants are obtained, the systems used to raise the crops, the specific plants that are used in the context of local and global markets, have a profound implication on food security, the resilience of the farming systems and the conservation of natural habitats. Class discussions will include interdisciplinary reflections on the origins of the tropical crops, the roles of plants in our daily lives, and the effects of our daily choices on the environment, climate change, human health, water access, conflicts, poverty, and development. We will do an overview of tropical horticulture and survey some of the social, scientific and environmental problems associated with the utilization of plants for subsistence, health, and cultural practices.

**Course format:** Class will meet on Mondays, from 2:30-3:45 PM, in room 128 Moore Hall. Partial time from each class session will be used for lecture, group discussion, as well as to address the assignments, and questions that may have arisen.

### **Study Abroad Opportunity**

In addition to Hort 376, students may enroll in a two-week “Tropical Horticultural Systems UW Study Abroad Program” (Hort 378) during the first two weeks of January, to contextualize what students learned during the fall semester course with experiential learning abroad. For students interested in the study abroad program, we will meet two sessions outside the normal class schedule for an orientation about the country to visit and to set expectations of the program.

This course if taken in conjunction with the two-week field study (Hort 378) will count for one of the requirements for the **horticulture capstone**. Check the other requirements for counting a course as a capstone experience and make sure to meet all the criteria.

**Course Learning Objectives:**

- 1) Cultivate interdisciplinary skills, intercultural knowledge, and global competencies through the understanding of the relationships between plants and human communities
- 2) Practice written and public speaking skills
- 3) Gain an understanding of the global challenge of feeding the world while also protecting our environment and communities.
- 4) Introduce key tropical horticulture literature and foster respectful transdisciplinary discussions around those papers using scientific criteria
- 5) Identify opportunities and limitations of tropical plant production systems and how it relates to nutrition, health, sustainable cropping practices, and community development
- 6) Develop a critical perspective and creative thinking regarding the production and consumption of horticultural products, and how it can shape the livelihoods of small and large scale producers in different part of the world, particularly in the tropics
- 7) Discuss the importance of conservation of germplasm, traditional knowledge, intellectual property rights, and equitable sharing of benefits derived from the use of these resources
- 8) Identify aspects of tropical horticultural that affect global health

**Course schedule**

<b>COURSE UNIT</b>	<b>TOPICS</b>	<b>DATES</b>
Introduction to Hort 376	<ul style="list-style-type: none"> <li>• Introductions and overview of the course (structure and expectations)</li> </ul>	<ul style="list-style-type: none"> <li>• September 12</li> </ul>
Research and writing skills	<ul style="list-style-type: none"> <li>• Research skills</li> <li>• Writing skills</li> </ul>	<ul style="list-style-type: none"> <li>• September 19</li> </ul>
Basics of horticulture	<ul style="list-style-type: none"> <li>• Introduction to plants and ecosystems.</li> <li>• What is horticulture? Growth requirements, controlled environments.</li> </ul>	<ul style="list-style-type: none"> <li>• September 26</li> <li>•</li> </ul>
Production systems	<ul style="list-style-type: none"> <li>• Peasant, family and commercial farming (Pineapple case study)</li> <li>• Agroecological practices and other cropping systems in the tropics</li> </ul>	<ul style="list-style-type: none"> <li>• October 3</li> <li>• October 10</li> </ul>

	<ul style="list-style-type: none"> <li>• Sustainability and ecological footprint (Banana case study)</li> <li>• Organic and conventional plant production (Coffee case study)</li> </ul>	<ul style="list-style-type: none"> <li>• October 17</li> <li>• October 24</li> </ul>
Mid-semester assessment		<ul style="list-style-type: none"> <li>• October 24</li> </ul>
Plant breeding, food security, and nutrition	<ul style="list-style-type: none"> <li>• Feeding a hungry world</li> <li>• “Beyond yield” breeding programs</li> <li>• Biotechnology and food safety</li> </ul>	<ul style="list-style-type: none"> <li>• October 31</li> <li>• November 7</li> <li>• November 14</li> </ul>
Biodiversity and sustainability	<ul style="list-style-type: none"> <li>• Traditional knowledge, intellectual property rights, and open source biology</li> <li>• Germplasm banks, conservation of crops and crop wild relatives</li> <li>• Artificial selection. Case study on domestication</li> <li>• Agricultural and natural ecosystems frontiers</li> </ul>	<ul style="list-style-type: none"> <li>• November 21</li> <li>• November 28</li> <li>• December 5</li> <li>• December 12</li> </ul>

Important: For those students interested in the study abroad field trip associated with this course (Hort 378), we will meet **twice** during the semester for two orientation sessions.

Please reserve the following date **October 17 right after class**.

Choose one of the following dates for the second orientation session:

Tuesday, **November 1<sup>st</sup>** from 4:15-6:45 PM **or**

Wednesday, **November 9** from 5:30-8:00 PM.

**Class structure:**

The course will include interactive lectures, guest speakers, group work, and discussions of key literature that will highlight different aspects of tropical horticulture.

A vast amount of evidence indicates that courses implementing in-class discussions, active learning, and inquiry-based activities into their curricula achieve higher learning gains and better conceptual understanding by the students than traditional lecture-based courses.

In this course, students will be required to apply conceptual knowledge to problem solving and will be asked to work as members of a team in interdisciplinary problem-solving sessions. To do so, students will be placed in small groups and asked to work on a set of questions from societal, environmental, economic, and health perspectives.

In order to fully engage in these conversations, students will need to gather arguments in favor or against a particular horticultural system by reading assigned material, accessing library resources, and contacting experts on campus or from other institutions.

A lot of this research work will occur out of class and will prepare the students for the in-class problem-solving sessions (blended learning). Students will present their arguments to their peers during in-class discussions in a respectful manner.

The instructor will give opportunities at specific points in the course for students to provide constructive feedback on their learning experience. Students are encouraged to engage actively in their learning, and to develop individualized learning plans for their professional goals.

### **Course details:**

Students will be assessed on their research paper, out-of-class assignments, group work, attendance and active participation in class discussions. The following behaviors will demonstrate active participation:

- a) Being engaged
- b) Good preparation for in-class discussion
- c) Wide participation in group work
- d) Respect for different opinions
- e) Posing of thought provoking questions
- f) Being thoughtful listeners

#### a) Research paper:

The **focus** of this assignment is for you to produce a thoughtful exploration of an **important problem or challenge** relevant to tropical horticulture. Topics can include but are not limited to: the social context of production, environmental impact of the cropping system, resilience to climate change, nutritional and health benefits, or marketing of a tropical crop. In your paper, discuss generalities about the origin, domestication, uses, and economic aspects of the selected crop. You will imagine that you are presenting your paper at an undergraduate research conference where attendees will choose sessions based on the topics (importance of a clear and concise title). The challenge of the assignment will be to demonstrate that you have synthesized ideas from different sources appropriately referenced, and have developed a deep understanding of your topic. Please check the rubric uploaded on CANVAS.

The paper should be written in double space, 12pt Times New Roman font, 1-inch margins. Length of paper: 5-7 pages.

More details on the structure of the paper and a grading rubric can be found on the course website. Feedback for the paper will include a peer-editing exercise that will mimic the process by which researchers peer-review scientific publications.

Plagiarism is taken very seriously in this class. We recommend familiarizing yourself with what plagiarism is in this link: [http://writing.wisc.edu/Handbook/QPA\\_plagiarism.html](http://writing.wisc.edu/Handbook/QPA_plagiarism.html).

*Due dates for the research paper (more information on Canvas)*

- Sep 19: Submit title of your paper (choose a topic)
- Sep 26: Submit an annotated bibliography in APA format listing five sources relevant to the topic. For each reference, provide 1-2 sentences articulating the relevance of the paper to the topic you chose.
- Oct. 3: Write a research statement for your paper (your argument)
- Oct. 10: Submit an outline of your paper.
- Oct. 17: Submit first draft of your paper and print two copies to give to two peer-reviewers
- Oct 31: Submit peer review of the two papers you were assigned
- Nov. 7: Submit second draft of your paper, instructor will provide feedback within 1-2 weeks
- Nov. 28: Submit final paper (includes a reflection on the assignment)

b) Out-of-class assignments: to be an active learner you will need to come prepared to class with discussion points and questions to enrich the classroom experience. You will be asked to read short scientific papers, write 50 word commentaries, watch short videos, or visit a grocery store/market near you.

c) Group-work (class participation):  
 The instructor will provide scenarios (real or hypothetical) focusing on different aspects of horticultural systems that will be used to engage in debates, group discussions, and problem-solving sessions. These experiences will provide the opportunity to think, reflect and practice analytical skills.

**Grading:**

	<b>Point values</b>
Overall class participation	
- Attendance	5
- Class participation	10
- Group work	10
Out-of-class assignments	10
Research paper:	
- Title (topic)	5
- Annotated bibliography	5
- Research statement	5
- Outline	5
- First draft	10
- Peer-reviews	10
- Second draft	10
- Final paper	15
<b>Total</b>	<b>100 points</b>

- ❖ *Grading of the group work will be based on the following criteria:*
  - *Strength of the arguments*
  - *Logic, clarity and originality of the ideas*
  - *Participation and ability to work in groups under short term pressure**Individual grades will reflect the group's grade weighted by a peer and self-assessment.*
  
- ❖ *Late assignments will be penalized by 10% for each day it is late. Assignments turned in more than five days late will not be accepted.*

**Grade scale:**

A	100-94%
AB	93-88%
B	87-84%
BC	83-78%
C	77-70%
D	69-60%
F	59-0%

- ❖ *Any student who has a disability and is in need of classroom accommodations should contact the McBurney Disability Resource Center and the instructor at the beginning of the semester.*

**Respect**

All students are welcome regardless of age, race, gender, background, political affiliation, or sexual orientation. This course is based on mutual respect and any disrespect will not be tolerated. We are all, including the instructor, both learners and teachers in this class. Your ideas will be received with the utmost respect even when in conflict with other's opinions. We want you to feel comfortable in sharing your thoughts, comments, and questions. If you ever feel you are not being treated fairly by anyone that is a part of this class, please contact the instructor.

**References**

**Introductory Tropical Horticulture themes**

Levetin, E., & McMahon, K. (2011). *Plants and Society* (6<sup>th</sup> ed.). New York, NY: McGraw-Hill. Chapters 10-14 & 19

Bautista, O. (1994). *Introduction to Tropical Horticulture*. SEAMEO, Regional Centre for Graduate Study and Research in Agriculture.

Midmore, D.J. (2015). *Principles of Tropical Horticulture*. Oxfordshire, UK: CABI. 19-20, 113-116, 406

### **Production systems**

Connor, D.J. (2008). *Organic agriculture cannot feed the world*. Field Crops Research. 106:187-190

Badgley et al. (2006). *Organic agriculture and the global food supply*. Renewable Agriculture and Food Systems 22(2): 86-108

Goldin, L. (2011). *Global Maya: work and ideology in rural Guatemala*. University of Arizona Press.

Tilman et al. (2011). *Global food demand and sustainable intensification of agriculture*. PNAS. 108 (50): 20260-20264

### **Plant breeding, food security and nutrition**

Altieri, M., et. al. (2015). Agroecology and the design of climate change-resilient farming systems. *Agron Sustain. Dev.* 35:869-890.

Altieri, M.A. (2004). *Linking ecologists and traditional farmers in the search for sustainable agriculture*. *Front Ecol Environ* 2(1):35-42

Merchant, C. (2005). *Radical Ecology: The Search for a Livable World*. Taylor & Francis Group. 226-234.

Naylor et al. (2007). *The ripple effect: biofuels, food security, and the environment*. *Environment*. Agronomy and Horticulture. Faculty Publications. Paper 386

### **Sustainability**

Galey, M., & Endres, A. B. (2012). *Locating the Boundaries of Sustainable Agriculture*. NEXUS Journal of Law and Public Policy. 17:3-34.

### **GMO and conventional crops**

Baram, M., & Bourrier, M. (2011). *Governing risk in GM agriculture*. Cambridge University Press. 2

### **Traditional knowledge, intellectual property rights and open source biology**

David Grignon –Pharmacopea of the Menominee tribe  
<http://video.wpt.org/video/2365306294/>

Kloppenborg, J. (2010). Seed Sovereignty: The Promise of Open Source Biology. In H. Wittman, A.A. Desmarais & N. Wiebe (Eds), *Food Sovereignty: Reconnecting Food, Nature and Community*. Winnipeg: Fernwood Publishing. 152-165

Kloppenborg, J., (2010). *Impeding Dispossession, Enabling Repossession: Biological Open Source and the Recovery of Seed Sovereignty*. *Journal of Agrarian Change* 10 (3):367-388

### **Biodiversity and sustainability**

Thormann, I., Fiorino, E., Halewood & M, Engels, J. (2015). Plant genetic resources collections and associated information as a baseline resource for genetic diversity studies: an assessment of the BPGR-supported collections. *Genetic Resources and Crop Evolution*. 62 (2), 1279-1293

Altieri, M. (2010). Scaling Up Agroecological Approaches for Food Sovereignty in Latin America. In H. Wittman, A.A. Desmarais & N. Wiebe (Eds), *Food Sovereignty: Reconnecting Food, Nature and Community*. Winnipeg: Fernwood Publishing. 120-133

### **Guides for research paper assignments**

Knisely, Karin., (2005). *A Student Handbook for Writing in Biology* (2<sup>nd</sup> ed.). Sunderland, Mass.: Sinauer Associates.