

University of Wisconsin-Madison
Horticulture 370: World Vegetable Crops
3 credits

Canvas Course URL: [<https://canvas.wisc.edu/courses/217629>]

Course Designations: Level: Intermediate, Advanced; Breadth: Biological Science; Counts as LAS Credit (L&S)

Meeting Time and Location: 11-11:50 am MW and 11-1 F, class meets in person

Instructional Mode: Face to face, with a small amount of online content

How Credit Hours are met by the Course

This course uses the traditional Carnegie Definition for how credit hours are met by the course. This definition means that one class period is associated with a minimum of two hours of out of class student work each week over the semester.

Instructors

Professor Irwin Goldman, 262-7781, 486 Moore Hall, ilgoldman@wisc.edu and
Professor Yi Wang, 265-4781, 492 Moore Hall, wang52@wisc.edu

Both instructors are available by appointment. Please email with preferred meeting times.

Course Description

This course provides an overview of the importance of fresh and processed vegetables worldwide, focusing on some of the major vegetable families including Solanaceae, Brassicaceae, Fabaceae, Cucurbitaceae, Amaryllidaceae, Apiaceae, Asteraceae, Amaranthaceae, Poaceae, and Convulvulaceae. Vegetable origin, history, classification, culture, marketing, physiology, genetics, handling, quality, and significance in world cultures and diets are discussed.

Requisites

A course in horticulture and a course in biology are recommended but not considered formal prerequisites for the course. Specific terminology on plant anatomy and physiology are used in the course, which is why these courses are recommended. Horticulture 370 is open to freshmen. The course is one of the choices in the major for students studying Horticulture.

Learning outcomes:

Learning Outcome 1: Acquire, integrate and apply knowledge of vegetable plants to worldwide consumption and production of vegetable crops

Learning Outcome 2: Appreciate and communicate the diversity of vegetable plants consumed around the world with particular attention to how vegetable plant families are used in different world regions

Learning Outcome 3: Understand how the biological aspects of vegetable plants, including their physiology and genetics, dictate how these crops will be produced in different world regions

Learning Outcome 4: Understand the nutritional profile, culinary characteristics, and important metabolites that are found in vegetable plants for defensive and attractant purposes

Grading

The total number of points for the course is 1000. Eight hundred points (80%) of your letter grade will be based on the mean of four exams. Each exam is worth 200 points (20%) toward your final grade. You may substitute a paper for one of the exams if you wish, and the paper is worth 200 points (20%). The paper should be on a vegetable topic, but it should not be a summary paper on a vegetable topic. Instead, the paper should explore an innovative question related to vegetable crops and include your own analysis and your own assessment of this question. If you wish to submit a paper, it is due on December 3rd at 11 am. The paper should be on a vegetable topic of interest to you and we encourage you to discuss your topic with the instructors. If papers are not turned in during class time on December 4th, they will be assessed a late penalty that will increase with the amount of time the paper is late.

The paper should be a maximum of seven double spaced pages using a 12-point font, excluding references. The references in the bibliography or literature cited section should be from a variety of sources including scientific journal articles, books, and other peer-reviewed sources. Using references only from websites that may not be peer reviewed will generally result in lower scores on the paper. The paper should include diagrams, figures, and tables to support your points. The paper must be your own work. If you wish to cite the work of others it must be done appropriately through a citation or through the use of quotation marks if it is used verbatim.

The remaining 200 points (20%) come from regular assignments throughout the semester. Ten assignments of 20 points each are required, each of which is due at class time (11 am) on a particular day through a file upload to CANVAS. These assignments cannot be turned in late- CANVAS will only accept them until 11 am on the day they are due.

There is no final exam.

There are no makeup exams given in the course. If you need to miss an exam, you may choose to submit a paper as described above.

We strongly recommend keeping up with the regular material of the class. We also require that

any work submitted for this course, including exams and papers, be solely your own work.

Course Materials

There is no required text; however, the book *World Vegetables* provides an excellent overview of vegetables. Rubatzky, V.E. and Mas Yamaguchi. 1997. *World Vegetables – Principles, Production and Nutritive Value* (2nd edition). Chapman and Hall (publishers). Other course materials including videos, reading materials, websites, powerpoints and related articles will be posted on the Canvas site.

STUDENT RIGHTS AND RESPONSIBILITIES

Every member of the University of Wisconsin–Madison community has the right to expect to conduct his or her academic and social life in an environment free from threats, danger, or harassment. Students also have the responsibility to conduct themselves in a manner compatible with membership in the university and local communities. UWS Chapters 17 and 18 of the Wisconsin Administrative Code list the university policies students are expected to uphold and describes the procedures used when students are accused of misconduct. Chapter 17 also lists the possible responses the university may apply when a student is found to violate policy. The process used to determine any violations and disciplinary actions is an important part of UWS 17. For the complete text of UWS Chapter 17, see [this link](#), or contact the on-call dean in the Dean of Students Office, 608-263-5700, Room 70 Bascom Hall.

No student may be denied admission to, participation in or the benefits of, or discriminated against in any service, program, course or facility of the [UW] system or its institutions or centers because of the student's race, color, creed, religion, sex, national origin, disability, ancestry, age, sexual orientation, pregnancy, marital status or parental status.

SEEKING ASSISTANCE

A student can seek help at many places on campus, for both personal and academic problems. For answers to general questions on many topics, a good place to start is [Ask Bucky](#), which is an excellent general referral service.

For personal problems, Counseling Services, a unit of [University Health Services](#), offers a variety of individual, group and couple counseling services. Experienced counselors, psychologists, and psychiatrists are available to assist students in overcoming depression and managing anxiety, and in developing self-awareness and understanding, independence, and self-direction. The counseling staff is experienced and sensitive to students of diverse cultural and ethnic backgrounds. Counseling Services is located at 333 East Campus Mall; 608-265-5600. In addition, an on-call dean in Student Assistance and Judicial Affairs is usually available by telephone (608-263-5700) or on a walk-in basis (75 Bascom Hall) Monday–Friday, 8:30 a.m.–4:30 p.m.

For academic problems, many places can offer help. The student should first discuss the problem with the professor or TA. If the problem is not resolved at that time, the student can speak with an academic advisor or the chair of the department. If further assistance is needed, the student should contact one of the academic deans in the school or college.

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." <http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

DIVERSITY & INCLUSION

Institutional statement on diversity: Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world. <https://diversity.wisc.edu/>

Course Calendar

Wed	Sept 8	Module: <i>Amaryllidaceae</i> medicines and health functional vegetables
Fri	Sept 10	Laboratory: understanding sulfur chemistry, flavor and the Maillard reaction, and bulbing in <i>Allium</i> vegetables (Meet in Babcock Food Applications Lab)

Mon	Sept 13	Module <i>Amaryllidaceae</i> , onion, garlic, leek, chive, and their relatives
Wed	Sep 15	Module <i>Amaryllidaceae</i> , onion, garlic, leek, chive, and their relatives
Fri	Sept 17	Assignment 1 due (at 11 am): drawing of the exteriors and interiors of onion, garlic, and leek annotated with detail on how these crops grow and form bulbs and/or pseudostems. Laboratory: Eagle Heights Garden, Allen Centennial Garden field trip (Meet at Eagle Heights Community Garden)

Mon	Sept 20	Module: <i>Apiaceae</i> , carrot, parsnip, celery, and their relatives
Wed	Sept 22	Module: <i>Apiaceae</i> , carrot, parsnip, celery, and their relatives
Fri	Sept 24	Assignment 2 due (at 11 am): Reflection writing assignment of no more than 300 words on the spice trade along the Silk Road, with an emphasis on <i>Apiaceae</i> crops Laboratory: <i>Apiaceae</i> volatiles and carotenoid chemistry (Meet in Babcock Food Applications Lab)

Mon	Sept 27	Module: <i>Asteraceae</i> , lettuce, artichoke, sunflower, and their relatives
Wed	Sep 29	Module: <i>Asteraceae</i> , lettuce, artichoke, sunflower, and their relatives
Fri	Oct 1	Exam # 1

Mon	Oct 4	Module: <i>Brassicaceae</i> , cabbage, cauliflower, broccoli, collards, kale, and their relatives
Wed	Oct 6	Module: <i>Brassicaceae</i> , cabbage, cauliflower, broccoli, collards, kale, and their relatives
Fri	Oct 8	Assignment 3 due (at 11 am): Choose a plant part (stem, root / hypocotyl, leaf, etc.) and describe a Brassica vegetable domesticated

from that organ. Describe its origin and explain where it is primarily consumed today. Six different vegetables are required for this assignment, and the total should be no more than 500 words.

Module: Discussion on the Columbian Exchange: How did the Columbian exchange impact vegetable crops?

Mon	Oct 11	Module: <i>Amaranthaceae</i> , beet, chard, amaranth, and their relatives
Wed	Oct 13	Module: <i>Amaranthaceae</i> , beet, chard, amaranth, and their relatives
Fri	Oct 15	Assignment 4 due (at 11 am): Written reflection on how the Columbian exchange impacted vegetable production and consumption in Europe, Africa, and other parts of the Old World. 300 words maximum.

Vegetables and Art: Field Trip to the Chazen Museum (Meet in the foyer of the Chazen Museum)

Mon	Oct 18	Module: <i>Poaceae</i> , sweet corn and bamboo
Wed	Oct 20	Module: <i>Poaceae</i> , sweet corn and bamboo
Fri	Oct 22	Assignment 5 due (at 11 am): Written reflection on the nature of vegetable crops. Based on your knowledge gained from the first half of this course, what are the primary characteristics of a vegetable crop, and how does it differ from other types of crops? If you were going to set out to domesticate a vegetable crop today, what would be your primary approach? No more than 300 words.

Vegetables in human cultural celebrations and events: global awareness

Mon	Oct 25	Module: <i>Cucurbitaceae</i> , cucumber, gourd, zucchini, squash, pumpkin
Wed	Oct 27	Module: <i>Cucurbitaceae</i> , cucumber, gourd, zucchini, squash, pumpkin
Fri	Oct 29	Exam #2 & Laboratory: Pumpkin carving

Mon	Nov 1	Module: <i>Convolvulaceae</i> , sweet potato, water spinach, morning glory
Wed	Nov 3	Module: <i>Convolvulaceae</i> , sweet potato, water spinach, morning glory

Fri	Nov 5	Assignment 6 due (at 11 am): drawing of a sweet potato plant with details about aboveground parts and underground parts; written reflection on major difference between spinach and water spinach (with a table) Laboratory: Making roasted sweet potato slices with varieties purchased from American, Chinese, and Korean grocery stores
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Mon	Nov 8	Module: <i>Araceae</i> (taro), <i>Dioscoreaceae</i> (yam), <i>Euphorbiaceae</i> (Cassava)
Wed	Nov 10	Module: <i>Araceae</i> (taro), <i>Dioscoreaceae</i> (yam), <i>Euphorbiaceae</i> (Cassava)
Fri	Nov 12	Assignment 7 due (at 11 am): written reflection on how starchy vegetables play a role in feeding the world. No more than 300 words. Laboratory: Making chips of sweet potato, yam, taro and cassava
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Mon	Nov 15	Module: <i>Solanaceae</i>, potato
Wed	Nov 17	Module: <i>Solanaceae</i>, potato
Fri	Nov 19	Assignment 8 due (at 11 am): drawing of a potato plant with details on aboveground parts and underground parts & explain why potatoes are the most consumed vegetable in the world. No more than 300 words. Laboratory: Making potato chips and French Fries
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Mon	Nov 22	Module: <i>Piperaceae</i>, black pepper and white pepper
Wed	Nov 24	Exam #3
Fri	Nov 26	Thanksgiving Holiday
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Mon	Nov 29	Module: <i>Solanaceae</i>, tomato
Wed	Dec 1	Module: <i>Solanaceae</i>, tomatillo, eggplant, chili
Fri	Dec 3	Assignment 9 due (at 11 am): Written reflectance of the economic importance of the <i>Solanaceae</i> family. No more than 300 words. Laboratory: Making tomato sauce and having pasta for lunch
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Mon	Dec 6	Module: <i>Fabaceae</i>, snap beans, lima beans, black beans, kidney beans

Vegetables - Works of art that you can eat

Wed Dec 8 **Module: *Fabaceae*, snap beans, lima beans, black beans, kidney beans**

Fri Dec 10 **Assignment 10 due (at 11 am): Written reflection on the biggest difference of *Fabaceae* and other families that have been covered this semester. Focus on their environmental benefits. No more than 300 words.**

Laboratory: Making bean chilies

Mon Dec 13 **Module: multiple families, post-harvest storage of vegetables**

Wed Dec 15 **Exam #4**
