18F-PLSC302-010/020L: VEGETABLE SCIENCE

PLSC 302 Syllabus 2018

PLSC 302 – Vegetable Science

Course Information

In this course we will cover the production of major vegetable crops and the science involved with vegetables from plant breeding to crop physiology. We will discuss how vegetables are produced commercially on a major scale as well as smaller scale and alternative production systems. We will also feature research being done at UD on vegetable crops. A large portion of the course will focus on individual vegetables, their botanical characteristics and growth requirements, and how these plant characteristics and requirements impact vegetable production systems.

Much of the course will be taught on the University farm and greenhouse with hands-on laboratories and on-site/in-garden lectures. Students will get a chance to have hands-on experiences with vegetables and will be required to maintain a small vegetable plot on the UD farm through the course (we will all share a final meal together from these plots at the end of the course). Another requirement will be to interview a vegetable farmer in the region and to write a report on that interview.

Text:

Commercial Vegetable Production Recommendations for Delaware (provided cost $20.00).

Handouts will be available on-line for all other course readings. No other textbook is recommended.

Requirements:

1) Attendance at lectures and laboratories. Many laboratories will be held out of doors or in the greenhouse or high tunnel and will involve working with plants and soils so appropriate clothing and footwear should be worn.

2) There will be 2 mid-term exams and one final exam. The final exam will not be comprehensive but will cover the last third of the class work. All exams will be in short and long answer format and will be open book due at the end of the exam day or take home due at final exam period.

3) Establishment and maintenance of a garden plot. Each student will be given a small garden plot to grow vegetables in. Students will be required to grow a minimum of
5 different vegetables from 4 different botanical families. Students will be graded on their effort and results. Students will be expected to maintain plots outside of class time.

4) Laboratory notebook and reports. Each student will be required to keep a laboratory notebook and produce a laboratory report for each weekly laboratory in the following format:

1. Objective
2. Background and references or literature cited
3. Materials and methods
4. Results and discussion

5) Interview with a commercial vegetable grower. Each student will be expected to interview a commercial vegetable grower in the region and write a report on that interview (suggested list will be provided). The report should contain information on the farm (location, soils, growing areas), details on vegetable grown, production practices and growing systems, harvest and handling, marketing, costs, and returns. Reports should be a minimum of 1000 words.

6) Short demonstration. Each student will be expected to give a 10 minute demonstration on a selected vegetable crop showing the botany of the crop and demonstrating the utilization of the vegetable.

7) Class participation. All students are expected to participate in class discussions.

8) Attendance at two Saturday tours of commercial vegetable farms.

Grading (points):

50 Class, laboratory, and tour attendance and participation

100 Midterm 1
100 Midterm 2
100 Final Exam
150 Laboratory reports
100 Grower interview and report
50 Class demonstration
100 Garden plot

______________________

750 Total
Class Format

Vegetable science or production lecture topic – 30 minutes
Student demonstrations and discussion – 10 minutes
Specific vegetable lecture topic – 40 minutes

Laboratory Format

Will vary with each laboratory but commonly will include the following:

Lecture or walking lecture
Instructions and demonstrations
Student laboratory exercise or hands-on activity

Syllabus

August 28 Lecture 1 – General vegetable science, what is a vegetable, botanical families, plant usage. Crucifers – Cole crops (cabbage, broccoli, cauliflower, Brussel’s sprouts, kohl rabi, Kale, Collards)

August 30 Laboratory – Developing your garden plot, crop selection, soil management, seeds, transplants and direct seeding


September 6 Lecture – Plant development, vegetative growth, flowering. Lettuce and related crops.

September 6 Laboratory – work on garden plot

September 11 Lecture online – Pollination, fruit development, seed development. Spinach and chard.

September 13 Lecture outside and laboratory – Vegetable botany fruiting vegetables, Garden plots

September 18 Lecture – Ripening, flavor components, phytochemicals. Amaranth, other leafy vegetables and potherbs.

September 20 Lecture outside and laboratories – Cover crops, Leafy Vegetables and plants where above vegetative plant parts are eaten, Visit to UD vegetable production area (organic production)

September 25 Lecture – Vegetable disorders. Alliums I scallions, leeks, chives, other leafy Alliums.
September 27 Lecture - Development of below ground vegetable plant parts, bulbing responses. Alliums II bulb onions, garlic, shallots.

September 27 Laboratories – Vegetable botany root, tuber, corm, bulb, and rhizome vegetables; Growing systems plasticulture, irrigation.

October 2 Lecture – Exam 1 take home released and due at the end of the day

October 4 Lecture – Mineral nutrition of vegetable crops, deficiencies. Potatoes.

October 4 Laboratory – Nutrient management, fertilizers, soil amendments; Soil testing

October 9 Lecture – Growing systems conventional production systems, tillage and cultivation; rotations, cover crops. Solanaceous fruits I Tomatoes

October 11 Laboratory – Growing systems tillage, cover crops, conventional, organic.

October 11 Lecture – Growing systems organic production systems. Solanaceous fruits II peppers.


October 18 Laboratory – Field season extension techniques

October 23 Lecture – Growing systems greenhouse production, vertical farming. Legumes II peas.

October 25 Lecture – Irrigation and water management. Legumes III cowpeas, tropical legumes.

October 25 Laboratory – Growing systems, protected culture, high tunnels and greenhouse production


November 1 Exam 2 – open book exam released during class period. It will be due by the end of the day.

November 1 Laboratory – Produce Food Safety

November 8 Lecture – IPM/Pest management diseases. Cucurbits II Cantaloupes and mixed melons.

November 8 Laboratory – Integrated pest management for insects and diseases

November 13 Lecture – IPM/Pest management insects and mites. Cucurbits III Watermelons and citrons.
November 15 Lecture – Mechanization and labor efficiency, harvest management. Root crops 1 Carrots and Parsnips

November 15 Laboratory – Weed management

November 27 Lecture – Vegetable processing industries. Root crops II Radishes, turnips, rutabagas; beetroot.

November 29 Lecture – Vegetable post-harvest handling, packing, cooling, and storage
Root crops III Sweet potatoes; other root, tuber, and rhizome vegetables.

December 29 Laboratory – Vegetable breeding, improvement, evaluation, sensory evaluations.

December 4 Lecture – Asparagus, Rhubarb, artichoke, other perennial vegetables; Parsley, basil, other field grown culinary herbs; specialty vegetables.

December 6 Lecture and Laboratory – Preparing and eating what you grew

December 10 Final exam released as a take home exam. Final exam due the date of listed final exam.