

16:765:528 Advanced Plant Breeding (3 credits)

Crosslisted As:

11:776:406 Advanced Plant Breeding (3 credits)

Normally Offered:

Spring every year

Instructor:

Dr. Stacy Bonos and Dr. Thomas Orton

Pre-requisites and other registration restrictions:

01:119:101-102 General Biology and 11:776:305 Plant Genetics

Format:

Two 80-minute lectures

Description:

This course is intended to introduce students to the fundamentals and applications of plant breeding. The first section of the course covers terminology, fundamentals and theory behind plant breeding. The second part of the course introduces methods used in plant breeding. The third part of the course introduces applications of breeding methods used in plant breeding programs. The plant breeding programs present at the New Jersey Agricultural Experiment Station are highlighted in this course.

Topics:

1. History, Important Plant Breeders
2. Modes of Reproduction
3. Qualitative vs. Quantitative Traits
4. Quantitative Genetics
5. Selection in self and cross-pollinated crops
6. Biotechnology and Genomics
7. Cytogenetics, Polyploidy
8. Mutation and Somaclonal Variation
9. Germplasm collection and preservation
10. Breeding methods – self pollinated crops
11. Breeding methods – cross-pollinated crops
12. Breeding for Pest Resistance
13. Variety Testing

Examinations:

Two midterm exams are given during the lecture periods. The final exam given during the final exam week is comprehensive, but emphasizes the last section of the course. Graduate and undergraduate student take separate exams.

Other requirements:

Students are required to complete a written research paper on a particular crop and trait of interest. There are also several homework assignments.