



An-Najah National University
Faculty of Agriculture and Vet. Med.
Department of Plant Production and Protection

Course title and number	Principles of Plant Breeding (10911403)	
Instructor(s) name(s)	Dr. Munqez Shtaya	
Contact information	mshtaya@najah.edu	
Semester/ academic year	1 st Semester 2023-2024	
Compulsory / Elective	Compulsory	
Prerequisites	Genetics 10911206 or 94240	
Lectures	Sunday and Tuesday (11:00 – 12:00)	
Discussion		
Course Contents (description)	This course deals with basic principles and concepts of genetic improvement of crop plants through application of basic qualitative and quantitative genetic principles. Different plant breeding methodologies relative to the mode of reproduction of crop plants will be presented and discussed. Application of modern tools in the breeding of crop plants will also be	
Course Objectives	<ol style="list-style-type: none"> 1. Fostering student understanding of genetic principles underlining plant improvement. 2. Understanding plant improvement methods. 3. Promote critical thinking in relation to improvement strategies and methods. 	
Intended learning Outcomes and Competences	<p>After successful completion of this course students are expected to be able to:</p> <ol style="list-style-type: none"> 1. Understand the importance of genetic principles in plant breeding and realize the close linkage between genetics and plant breeding. 2. Consider the importance of plant genetic resources as a source of variability in plant breeding programmes. 3. Compare the major methods used for the improvement of the major crops. 4. Recognize the main applications of MAS in breeding programmes. 5. Develop a breeding program for a certain crop. 	
Textbook and References (Online Resources)	<p>Title: Principles of plant genetics and breeding. Author: George Acquaah Publisher: John Wiley & Sons, Ltd Year: 2012</p>	
Assignment Criteria	Activity	Percent (%)
	<i>First exam (22/10/2023)</i>	20
	<i>Second exam (5/12/2023)</i>	20
	<i>Project</i>	20
	<i>Final Exam</i>	40

Week	Subject
1 + 2	Introduction <ol style="list-style-type: none"> 1. History and role of plant breeding in society 2. Plant genetic resources for plant breeding
3 - 5	Quantitative genetics <ol style="list-style-type: none"> 1. Polygenes and polygenic inheritance 2. Variance components of a quantitative trait 3. Heritability and heritability applications
6 - 9	Breeding self-pollinated Species <ol style="list-style-type: none"> 1. Mass selection. 2. Pure-line selection. 3. Pedigree selection. 4. Bulk population. 5. Single-seed descent 6. Backcross technique
10 - 12	Breeding cross-pollinated Species <ol style="list-style-type: none"> 1. Mass selection in cross-pollinated species. 2. The concept of recurrent selection. 3. Methods of half- and full-sib selection. 4. The development of synthetic cultivars.
13	Breeding hybrid cultivars <ol style="list-style-type: none"> 1. The concept of hybrid vigour. 2. The genetic basis of hybrid seed development. 3. The steps in the procedure of hybrid breeding.
14 - 16	Biotechnology in plant Breeding <ol style="list-style-type: none"> 1. The basic steps in genetic engineering. 2. The enabling technologies of genetic engineering. 3. The concept of molecular breeding.

Important Regulations

1. Attendance and departure of students on time to have full lecture.
2. Close your mobile before entering the class room.
3. The instructor is ready to answer any question out of office hours if presented in the office.
4. Makeup examinations will only be given for excused absences when the student has contacted the instructor prior to the examination. Written verification for the reason the exam is missed may be required.
5. Class attendance and participation is of a great value as it brings different viewpoints that enhance everyone's knowledge in the class. Students are highly encouraged to attend all class sessions in order to get the most benefit from their time spent in traveling to the university, the expenses of tuition fees and many other activities given up to obtain their degree. Please keep in mind that Zajel allows you only to miss six class sessions without valid excuses and six sessions with valid excuses!! Having more than 12 sessions missed is fair enough to fail you in this course.