



Jordan University of Science and Technology
Faculty of Agriculture
Plant Production Department

PP715 Advanced Plant Breeding

First Semester 2023-2024

Course Catalog

3 Credit Hours. Course Description: The course Description include: Principles of plant breeding, applications of genetic principles by means of plant breeding procedures, Methods of selection for self and cross-pollinated and asexually propagated crops, Field techniques for breeding crops and source of germplasm and Problems facing plant breeders and ways to overcome them.

Teaching Method: On Campus

Text Book

Title	Principles of Cultivar Development Vol. 1
Author(s)	Walter R. Fehr
Edition	1st Edition
Short Name	Ref. 1.
Other Information	Iowa State University

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref. 2	Principles of Cultivar Development Vol. 2	Walter R. Fehr	1st Edition	Iowa State University

Instructor

Name	Prof. Mohammed Alajlouni
Office Location	M1L2
Office Hours	Sun : 10:00 - 12:00 Mon : 12:00 - 13:00 Tue : 10:00 - 12:00 Wed : 12:00 - 13:00
Email	majl@just.edu.jo

Class Schedule & Room
Section 2: Lecture Time: Mon, Wed : 10:00 - 11:30 Room: LAB

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	PART 1: ONE. Role of plant breeding in agriculture TWO. Modes of reproduction THREE. Genetic principles Discussion Topic	
Weeks 3, 4	PART 2: FOUR. Polyploidy FIVE. Variation in chromosome number and structure SIXTEEN. Genetic male sterility for population improvement TWENTY. Mutation breeding Discussion Topic	
Weeks 5, 6	PART 3: SIX. Quantitative inheritance SEVEN. Heritability EIGHT. Inbreeding NINE. Heterosis Discussion Topic	
Weeks 7, 8	PART 4: TEN. Parent selection ELEVEN. Plant introduction and genetic diversity TWELVE. Population formation by hybridization THIRTEEN. Techniques for artificial hybridization FOURTEEN. Interspecific hybridization Discussion Topic	
Weeks 9, 10, 11, 12, 13	PART 5: FIFTEEN. Recurrent selection SEVENTEEN. Maximizing genetic improvement TWENTY-ONE. Breeding for pest resistance TWENTY-TWO. Bulk method TWENTY-THREE. Single-seed descent method TWENTY-FOUR. Mass selection in self-pollinated populations TWENTY-FIVE. Pedigree method TWENTY-SIX. Early-generation testing TWENTY-SEVEN. Homozygous lines from doubled haploids TWENTY-EAGHT. Backcross method	
Weeks 14, 15, 16	PART 6: TWENTY-NINE. Types of cultivars THIRTY. Development of asexually propagated cultivars THIRTY-ONE. Development of self-pollinated cultivars THIRTY-TWO. Multilines THIRTY-THREE. Development of synthetic cultivars THIRTY-FOUR. Development of hybrid cultivars THIRTY-FIVE. Hybrid seed production THIRTY-SIX. Release and distribution of cultivars Discussion Topic	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
The genetic principles and their relation with plant breeding understood.	10%	
Plant improvement methods including self, cross-pollinated and sexually propagated methods understood.	30%	
Critical thinking in relation to improvement strategies and methods promoted.	20%	
Methods for genetic variation in crop improvement and the important stages for establishing a breeding program known.	20%	
The main obstacles hindering plant breeding business identified.	10%	
Examples of problems facing plant breeders and approaches to overcome them discussed.	10%	

Relationship to Program Student Outcomes (Out of 100%)

PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7

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