UNIVERSITI TEKNOLOGI MARA
AGA705: CROP IMPROVEMENT AND CONSERVATION

Course Name (English)	CROP IMPROVEMENT AND CONSERVATION `APPROVED`
Course Code	AGA705

MQF Credit	3

Course Description	This course emphasizes the application and management of genetic crop improvement. Concepts of mendelian, inheritance of qualitative and quantitative traits and plant transformation as related to crop improvement will be designed to enhance management skills of the students at local, national and international level. Students are also required to discuss the role of environment, progeny selection, backcross method, and marker-assisted selection in crop improvement. This course will also discuss the need to conserve the plant genetic resources and the strategies employed to improve their long-term viability.

Transferable Skills	Communication skill

Teaching Methodologies	Lectures, Blended Learning, Discussion, Presentation

CLO		
	CLO1	Distinguish the role of environment, progeny selection, backcross method, and marker-assisted selection in crop improvement
	CLO2	Evaluate population genetics for the long-term viability of plant species
	CLO3	Propose the possible conservation strategies for rare and endangered species

Pre-Requisite Courses	No course recommendations

Topics
1. Introduction 1.1) 1.1 Threats to biodiversity - causes of biodiversity loss, species extinction, vulnerability of species to extinction 1.2) 1.2 Aims of crop improvement 1.3) 1.3 Recurrent selection methods and population improvement strategies
2. Conventional Breeding Plans 2.1) 2.1 Selection 2.2) 2.2 Hybridization
3. Modern Breeding Plans 3.1) 3.1 Molecular markers in plant breeding 3.2) 3.2 Roles of genetic engineering and biotechnology 3.3) 3.3 Plant transformation 3.4) 3.4 Mutation breeding 3.5) 3.5 Polyploidy breeding 3.6) 3.6 Clonal propagation by tissue culture
4. Plant Breeding Experiments 4.1) 4.1 Experimental design and statistical methods 4.2) 4.2 Greenhouse management 4.3) 4.3 Field plot techniques 4.4) 4.4 Case study of breeding techniques
5. Biodiversity Conservation 5.1) 5.1 Strategies and principles 5.2) 5.2 Conservation management plan - values of biodiversity 5.3) 5.3 In-situ and ex-situ conservation methods

Assessment Breakdown	%
Continuous Assessment	70.00%
Final Assessment	30.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Report assignment	25%	CLO3
	Presentation	Report Presentation	15%	CLO3
	Test	Online test	30%	CLO1

Reading List	Recommended Text	Narendra Tuteja Renu Tuteja Nishat Passricha Shabnam Saifi 2020, *Advancement in Crop Improvement Techniques*, Elsevier [ISBN: 9780128185810]
	Reference Book Resources	Rohitashw Kumar, Vijay P. Singh, Deepak Jhajharia, Rasoul Mirabbasi 2019, *Handbook of Conservation Agriculture*, 1 Ed., CRC Press [ISBN: 9780367340483]
		Brooker, R.J. 2015, *Genetics: Analysis and Principles. McGraw-Hills Higher Education*, McGraw-Hills Higher Education
Article/Paper List	Reference Article/Paper Resources	Mahmood, Tariq & Trethowan, Richard 2015, Crop Breeding for Conservation Agriculture, *Conservation Agriculture.*, 159 http://10.1007/978-3-319-11620-4_7.
		Zoë Migicovsky Emily Warschefsky Laura L. Klein Allison J. Miller 2019, Using Living Germplasm Collections to Characterize, Improve, and Conserve Woody Perennials, *Crop Science*, 59 (6), 2365
Other References	This Course does not have any other resources	