



UNIVERSITI TEKNOLOGI MARA

AGR122: PLANT SCIENCE

Course Name (English)	PLANT SCIENCE APPROVED
Course Code	AGR122
MQF Credit	3
Course Description	An introduction to plant science, covering basic classification, anatomy, morphology, physiology, ecology and genetics. The emphasis will be given on understanding of underlying principles of plant growth, development and reproduction. Also the importance of plants in their natural environment, and human utilization of plants and plant products. The outcomes shall be assessed through a variety of tools which include final examination, tests, students project or assignments, laboratory practical and report
Transferable Skills	NONE
Teaching Methodologies	Lectures, Blended Learning, Lab Work, Presentation
CLO	CLO1 Describe the fundamentals, concepts and theories of plant science CLO2 Perform scientific investigation related to plant biology CLO3 Explain the biological processes in plant science
Pre-Requisite Courses	No course recommendations
Topics	
1. 1. Plant classification principles 1.1) Plant taxonomy and importance of taxonomy 1.2) Plant kingdom classification (Plantae); nomenclature and classification; Angiosperm, gymnosperm 1.3) Angiosperm classification and characteristics; dicotyledonous and Monocotyledonous, Growth types (Determinant, Indeterminant, Monocarpic, Polycarpic, Annual, Biennial, Herbaceous Perennial, Woody Perennial) 1.4) Classification hierarchy: kingdom, phylum/division, class, order, family, genus, species	
2. 2. Plant Cell 2.1) Cell and microscopy 2.2) The plant cell 2.3) Cell wall and plasma membrane 2.4) Cytoplasm (include organelles: mitochondria, chloroplast, golgi apparatus and endoplasmic reticulum) 2.5) Nucleus 2.6) Other cellular structures (vacuole, cytoskeleton) 2.7) Cell cycle & Cell division: mitosis and meiosis 2.8) Mitosis and meiosis stages in plant cell 2.9) Importance of mitosis and meiosis 2.10) Comparison between mitosis and meiosis	
3. 3. Plant Morphology & Anatomy 3.1) Identification of plants; morphological variations in leaves, flower, fruits, roots 3.2) Plant meristem and tissue: types, structure, distribution and function 3.3) Plant organs: leaf, root and stem (monocot and dicot plants)	
4. 4. Plant Physiology 4.1) Transportation 4.2) The vascular structures; anatomy and functions in plant transport (primary growth and secondary growth) 4.3) Transpiration and translocation: definition, importance and factors affecting the rate 4.4) Photosynthesis 4.5) Light reaction and dark reaction (Calvin cycle) 4.6) Factors affecting photosynthesis rate 4.7) Introduction to C3, C4 and CAM and examples 4.8) Respiration	

4.9) Aerobic respiration (glycolysis, Krebs cycle and electron transport chain 4.10) Anaerobic respiration
5. 5. Plant Reproduction 5.1) Asexual reproduction in plant: spore formation, vegetative reproduction 5.2) Sexual reproduction in plant 5.3) Advantages and disadvantages of asexual and sexual reproduction
6. 6. Seed and Fruits 6.1) Seed structure 6.2) Seed germination: types (epigeal and hypogeal) and factors affecting seed germination 6.3) Seed dormancy: definition, types and method to break dormancy 6.4) Fruit development
7. 7. Plant Growth and Development 7.1) 1. Plant hormone: auxin, gibberellin, cytokinin, abscisic acid and ethylene 7.2) 2. Plant response: Photoperiodism, tropism, taxis and nastic movements
8. 8. Plant Genetics 8.1) Introduction - the basic principle of heredity 8.2) Monohybrid heritability and dihybrid heritability

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Presentation	Video Presentation • students were asked to do the video and the contents are regarding to monocots and dicots plants. • students upload to youtube and give the link to lecturer for evaluations and the evaluations are based on rubric.	20%	CLO2
	Test	Online test	20%	CLO1
	Written Report	• students are given the respective video shared by lecturer through online apps and students are asked to make a report based on the video. The evaluation of the reports is based on the rubric.	20%	CLO3

Reading List	Reference Book Resources
	<ul style="list-style-type: none"> • Kingsley R. Stern, James E. Bidlack, Shelley 2006, <i>Introductory Plant Biology Laboratory Manual</i>, McGraw-Hill Higher Education. Bostan • Kingsley R. Stern, James E. Bidlack, Shelley 2008, <i>Introductory Plant Biology</i>, McGraw-Hill Higher Education. Boston • Thomas L. Rost, et al. 2006, <i>Plant Biology</i>, Thomson Brooks Cole USA • Murray W. Nabors. 2004, <i>Introduction to Botany</i>, Pearson Benjamin Cummings USA • Sylvia S. Mader 2007, <i>Biology Laboratory Manual</i>, McGraw-Hill Higher Education. Bostan • Choong Ngok Mang, Lee Soon Ching dan Liew Shee Leong 2000, <i>Kuasai Peperiksaan Biologi STPM</i>, Jilid 1 dan 2 Ed., Fajar Bakti. Shah Alam
Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources