



## UNIVERSITI TEKNOLOGI MARA

### BIO103: BIOLOGY

<b>Course Name (English)</b>	BIOLOGY APPROVED
<b>Course Code</b>	BIO103
<b>MQF Credit</b>	3
<b>Course Description</b>	This course covers the concept and basic principles in botany. It emphasises on plants, and interactions between living things with the environment. It also covers studies on cytology, plant's physiology and anatomy, photosynthesis, diversity of ecosystem, ecology, kingdom classification and cell division.
<b>Transferable Skills</b>	On completion of the course the student will be able to:  1. Apply the basic principles of botany, plant processes, cell division, ecology and classification. 2. Apply the proper skill to handle basic biological experiments.
<b>Teaching Methodologies</b>	Lectures, Lab Work
<b>CLO</b>	CLO1 Describe the basic characteristics and processes in botany, cell division, photosynthesis, ecology and classification. CLO2 Identify the differences between plant processes and applications of fungi and plants. CLO3 Demonstrate the basic skills of handling laboratory apparatus and conducting experiments scientifically.
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Cytology</b> 1.1) General structure of plants & animals through compound microscope & electron microscope 1.2) Major parts of cells – plasma membrane, cell wall, cytoplasm, organelles, nucleus	
<b>2. Cell Division</b> 2.1) Haploid & diploid 2.2) Mitosis 2.3) Meiosis	
<b>3. Plant Anatomy</b> 3.1) Primary growth & secondary growth 3.2) Plant tissues – structure, function, distribution 3.3) Plant organs - roots, stems, leaves, flower, fruits	
<b>4. Plant Physiology</b> 4.1) Reproduction - male & female gamete development, double fertilization 4.2) Seed physiology – germination, fruit development 4.3) Photoperiodism, tropism, nastic 4.4) Plant hormones – auxin, gibberellins, cytokinins, abscisic acid, ethylene	
<b>5. Photosynthesis</b> 5.1) Chloroplast & photosynthetic pigments 5.2) Light-dependent & light-independent reactions 5.3) Factors affecting photosynthetic rate	
<b>6. Ecology</b> 6.1) Definition – ecology, populations, habitat & niche, community, ecosystem, biosphere 6.2) Community interactions – commensalism, mutualism, parasitism, competition, predation 6.3) Ecosystem – structure, trophic level, food chain & food web, energy flow, ecological pyramids 6.4) Water & nutrient cycle	

**7. Diversity of Ecosystems**

7.1) Major terrestrial and aquatic biomes of the world

7.2) Diversity in selected regions – tropical rainforest, savanna, swamp

**8. Introduction to Classification**

8.1) The Five-Kingdoms System, Three-Domain System, Six-Kingdom System - characteristics of the main groups

8.2) Linnean taxonomic hierarchy

**9. Kingdom Fungi**

9.1) General structure, nutrition, reproduction, significance

9.2) Divisions – Chytridiomycota, Zygomycota, Ascomycota, Basidiomycota, Deuteromycota

**10. Kingdom Plantae**

10.1) Bryophytes. Divisions – Bryophyta, Hepaticophyta, Anthoceroophyta

10.2) Pteridophytes. Divisions – Pterophyta, Sphenophyta, Psilophyta, Lycophyta

10.3) Gymnosperms. Divisions - Coniferophyta, Ginkgophyta, Cycadophyta & Gnetophyta

10.4) Angiosperms. Classes – Monocotyledonae & Dicotyledonae

10.5) Significance of plants

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Lab Exercise	Practical Assignment	15%	CLO3
	Quiz	n/a	15%	CLO1
	Test	n/a	30%	CLO2

Reading List	Reference Book Resources
	<ul style="list-style-type: none"> <li>• James D. Mauseth, <i>Botany</i>, Jones &amp; Bartlett Learning [ISBN: 9781449665807]</li> <li>• George Plopper, <i>Principals of Cell Biology</i>, Jones &amp; Bartlett Publishers [ISBN: 9780763757748]</li> <li>• [edited by] David Sadava.. [et al.], <i>Life</i>, Sinauer Associates ; c2011. Sunderland, Mass. [ISBN: 9781429219624]</li> <li>• Colleen Belk, Virginia Borden Maier, <i>Biology: Science for Life</i>, Benjamin Cummings [ISBN: 9780321767820]</li> <li>• Kevin Kavanagh (Editor), <i>Fungi: Biology and Applications</i>, Wiley [ISBN: 9780470977101]</li> <li>• Eric J. Simon, <i>Campbell Essential Biology</i>, Pearson Educacion [ISBN: 9780321807298]</li> <li>• Ray F. Evert, Susan E. Eichhorn, <i>Raven Biology of Plants</i>, W. H. Freeman [ISBN: 9781429219617]</li> </ul>
Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources