



UNIVERSITI TEKNOLOGI MARA

AGR232: PLANT PROPAGATION

Course Name (English)	PLANT PROPAGATION <b>APPROVED</b>
Course Code	AGR232

MQF Credit	2
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Course Description	This course will cover the important aspect of the propagation of plants, by both sexual and asexual methods. Theories of propagation, practical techniques and propagation equipment and facilities used to increase plant numbers will be discussed. These will include common techniques used for plantation crops such as propagation by seeds, propagation by cuttings, grafting, layering, buddings, modified stems, roots and leaves. Tissue culture techniques will also be explored. The outcomes shall be assessed through a variety of tools which include final examination, test, assignment and project.
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Transferable Skills	Problem solving Practical skills Personal skills
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Teaching Methodologies	Lectures, Demonstrations, Presentation, Project-based Learning
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CLO	CLO1 Explain the fundamental knowledge on plant propagation principles and theories CLO2 Demonstrate techniques relating to plant propagation CLO3 State and explain the techniques of plant propagation used in plantation industry in written form
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Pre-Requisite Courses	No course recommendations
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<b>Topics</b>
<b>1. INTRODUCTION TO PLANT PROPAGATION</b> 1.1) 1.1 Biology of propagation in plants 1.2) 1.1.1 Cellular basis of propagation 1.3) 1.1.2 Cell division 1.4) 1.1.3 Inheritance of characters 1.5) 1.2 Morphology and anatomy of plants 1.6) 1.2.1 Roots, stems,buds, water sprouts, suckers, leaves, flowers, inflorescenes, fruits, seeds 1.7) 1.2.2 Meristematic tissues, permanent tissues, simple tissues, complex tissues. 1.8) 1.2.3 Process of healing of wounds 1.9) 1.3 Environmental factors affecting propagation
<b>2. SEXUAL REPRODUCTION</b> 2.1) 2.1 Principles of sexual propagation 2.2) 2.1.1 Gametes, pollination,fertilization,embryogenesis 2.3) 2.2 Types of seeds
<b>3. ASEXUAL REPRODUCTION</b> 3.1) 3.1 Vegetative propagation
<b>4. PRINCIPLES AND TECHNIQUES OF PROPAGATION BY SEEDS</b> 4.1) 4.1 Seed dormancy 4.2) 4.2 Process of seed germination 4.3) 4.3 Seed production 4.4) 4.3.1 Hybrid seed production 4.5) 4.4 Seed testing and certification

**5. PRINCIPLES AND TECHNIQUES OF PROPAGATION BY CUTTINGS AND LAYERING**

- 5.1) 5.1 Principles of propagation by cuttings
- 5.2) 5.1.1 Rotting of cuttings
- 5.3) 5.1.2 Anatomical and physiological basis of rotting
- 5.4) 5.2 Types of cuttings
- 5.5) 5.2.1 Stem cuttings, root cuttings, leaf cuttings
- 5.6) 5.2.2 Other types of cuttings

**6. PRINCIPLES AND TECHNIQUES OF BUDDING**

- 6.1) 6.1 Principles of budding
- 6.2) 6.1.1 Bud union
- 6.3) 6.2 Methods of budding
- 6.4) 6.3 Roles and effects of rootstocks

**7. PRINCIPLES AND TECHNIQUES OF GRAFTING**

- 7.1) 7.1 Principles of grafting
- 7.2) 7.1.1 Graft union
- 7.3) 7.1.2 Graft incompatibility
- 7.4) 7.2 Graft incompatibility
- 7.5) 7.3 Methods of grafting

**8. PRINCIPLES AND TECHNIQUES OF TISSUE CULTURE**

- 8.1) 8.1 Principles of tissue culture for micropropagation
- 8.2) 8.2 Techniques of in vitro micropropagation

**9. PROPAGATION OF PLANTATION CROPS (OIL PALM, RUBBER, COCOA AND COCONUT)**

- 9.1) 9.1 Oil palm
- 9.2) 9.2 Rubber
- 9.3) 9.3 Cocoa
- 9.4) 9.4 Coconut

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Student need to write case study related with the techniques of plant propagation used in plantation industry.	20%	CLO3
	Discussion	Problem based discussion	20%	CLO2
	Test	Online Test	20%	CLO1

Reading List	Recommended Text	<ul style="list-style-type: none"> <li>• Odilo Duarte, Robert Paull 2015, <i>Exotic Fruits and Nuts of the New World</i>, CABI [ISBN: 9781780645056]</li> <li>• Robert E. Paull, Odilo Duarte 2012, <i>Tropical Fruits</i>, 2 Ed., CABI [ISBN: 9781845937898]</li> <li>• Raymond A. T. George 2011, <i>Agricultural Seed Production</i>, CABI [ISBN: 9781845938192]</li> <li>• Hartmann, H.T, Kester, D., Davies, F., and Geneve, R. 2010, <i>Plant Propagation: Principles and ractices</i>, 8th Ed., Prentice Hall</li> <li>• James L. Brewster 2008, <i>Onions and Other Vegetable Alliums</i>, CABI [ISBN: 9781845933999]</li> </ul>
	Reference Book Resources	<ul style="list-style-type: none"> <li>• Bryant, G. 2006, <i>Plant Propagation A to Z: Growing Plants for Free</i>, Firefly Books</li> <li>• Toogood, A. 1999, <i>Plant Propagation: The Fully Illustrated Plant by Plant Manual of Practical Techniques</i>, American Horticultural Society</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	