



UNIVERSITI TEKNOLOGI MARA

AGR422: PLANT PROPAGATION AND NURSERY MANAGEMENT

Course Name (English)	PLANT PROPAGATION AND NURSERY MANAGEMENT APPROVED
Course Code	AGR422
MQF Credit	3
Course Description	This course will cover important aspects of plant propagation and nursery management. Propagation of plants can be accomplished by sexual and asexual means. To fully understand plant propagation, topics on biology of plants, mode of reproduction, theories of propagation, various propagation techniques, tissue culture techniques and newer developments in propagation will be covered. Various topics covering the important elements of nursery will include site selection, different types of structures and equipment, plant propagation, nursery materials and operations (including growing media, potting and transplanting, irrigation, fertilisation, pest and disease management), managing nursery stock, management skills and marketing required in nurseries for plantation crops.
Transferable Skills	understand plant propagation, topics on biology of plants, mode of reproduction, theories of propagation, various propagation techniques, tissue culture techniques and newer developments in propagation
Teaching Methodologies	Lectures, Blended Learning, Field Trip
CLO	CLO1 Describe and explain the fundamental knowledge on plant propagation principles and theories CLO2 Apply techniques of plant propagation for plantation crops CLO3 Develop and manage a plant nursery for plantation industry
Pre-Requisite Courses	No course recommendations
Topics	
1. 1.0 INTRODUCTION TO PLANT PROPAGATION 1.1) 1.1 Biology of propagation in plants 1.2) 1.1.1 Cellular basis of propagation, Cell division, Inheritance of characters 1.3) 1.2 Morphology and anatomy of plants 1.4) 1.2.1 Roots, stems, buds, water sprouts, suckers, leaves, flowers, inflorescences, fruits, seeds 1.5) 1.2.2 Meristematic tissues, characteristics and classification of meristems, permanent tissues, simple tissues, complex tissues 1.6) 1.2.3 Process of healing of wounds	
2. 2.0 BIOLOGY OF PLANTS AND THEIR REPRODUCTION 2.1) 2.1 Principles of sexual reproduction 2.2) 2.1.1 Gametes, pollination, fertilization, embryogenesis 2.3) 2.1.2 Types of seeds 2.4) 2.2 Principles of asexual reproduction 2.5) 2.2.1 Vegetative propagation 2.6) 2.2.2 Polyembryony and apomixis	
3. 3.0 PRINCIPLES AND TECHNIQUES OF PROPAGATION FROM SEEDS, CUTTINGS AND 3.1) 3.1 Principles and techniques of propagation by seeds 3.2) 3.1 Seed dormancy 3.3) 3.2 Process of seed germination 3.4) 3.3 Seed viability and vigour 3.5) 3.4 Seed production 3.6) 3.4.1 Hybrid seed production 3.7) 3.4.2 Seed testing and certification 3.8) 3.2 The biology and techniques of propagation by cuttings 3.9) 3.3 Principles of propagation by cuttings 3.10) 3.3.1 Rooting of cuttings	

3.11) 3.3.2 Anatomical and physiological basis of rooting 3.12) 3.4 Types of cuttings 3.13) 3.4.1 Stem cuttings, root cuttings, leaf cuttings 3.14) 3.4.2 Other types of cuttings 3.15) 3.3 The biology and techniques of propagation by specialised vegetative structures
4. 4.0 PRINCIPLES AND TECHNIQUES OF BUDDING AND GRAFTING 4.1) 4.1 Principles of budding 4.2) 4.1.1 Bud union 4.3) 4.2 Methods of budding 4.4) 4.3 Roles and effects of rootstocks 4.5) 4.4 Principles of grafting 4.6) 4.4.1 Graft union 4.7) 4.4.2 Graft incompatibility 4.8) 4.5 Graft incompatibility 4.9) 4.6 Methods of grafting and special techniques
5. 5.0 PRINCIPLES AND TECHNIQUES OF TISSUE CULTURE MICROPROPAGATION 5.1) 5.1 Principles of tissue culture for micropropagation 5.2) 5.2 Basic requirements for in vitro micropropagation 5.3) 5.3 Establishment and operation of a tissue culture laboratory
6. 6.0 INTRODUCTION TO NURSERY INDUSTRY 6.1) 6.1 Importance of a nursery 6.2) 6.2 Factors affecting nursery establishment
7. 7.0 TYPE OF NURSERIES AND SITE SELECTION 7.1) 7.1 Classification of a nursery 7.2) 7.2 Pre-requisites for nursery establishment
8. 8.0 NURSERY STRUCTURES AND EQUIPMENT 8.1) 8.1 Parts of a nursery 8.2) 8.2 Structures used in plant propagation 8.3) 8.3 Tools, equipment, accessories
9. 9.0 NURSERY MATERIALS AND OPERATIONS 9.1) 9.1 Raising plants in the nursery 9.2) 9.1.1 Media and mixes for propagation 9.3) 9.1.2 Sowing, handling and transplanting 9.4) 9.1.3 Routine nursery practices 9.5) 9.2 Water management in nursery 9.6) 9.3 Nutritional management in nursery 9.7) 9.4 Pest management in nursery 9.8) 9.5 Hormones and chemicals in plant propagation
10. 10.0 MANAGEMENT SKILLS AND MARKETING 10.1) 10.1 Licensing requirements of nursery 10.2) 10.2 Inspection of nursery and nursery stock 10.3) 10.2 Marketing of nursery materials

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Written Assignment	20%	CLO1
	Group Project	SULAM	20%	CLO3
	Individual Project	Video Presentation	20%	CLO2

Reading List	Recommended Text
	<ul style="list-style-type: none"> • Sharma, R. R. and Srivastav, M. 2004, <i>Plant Propagation and Nursery Management</i>, International Book Distributing Co. • Corley, R. H. V. and Tinker, P. B. H. 2003, <i>The Oil Palm</i>, Wiley-Blackwell • Hartmann, H. T, Kester, D., Davies, F., and Geneve, R. 2010, <i>Plant Propagation: Principles and Practices</i>, 8th Ed., Prentice Hall • Mason, I. J 2004, <i>Nursery Management</i>, 2nd Ed., Landlinks Press • Priyadarshan, P. M. 2010, <i>Biology of Hevea Rubber</i>, CABI • Toogood, A. 1999, <i>Plant Propagation: The Fully Illustrated Plant-by-Plant Manual of Practical Techniques</i>, American Horticultural Society

Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources