HRT 2104PLANT PROPAGATION AND NURSERY MANAGEMENT

**2. INSTRUCTOR(S): Mr**. Wanyama David (BSc. Hort., SUA, Morogoro, Tanzania; MSc. Hort., JKUAT, Nairobi, Kenya; PhD (on-going), JKUAT, Nairobi, Kenya)

**3. COURSE TYPE:** Core BSc. Horticulture II

**4. COURSE STRUCTURE:** Three (3) credit units: 30 lecture hours (2 contact hours per week for 15 study weeks) and 30 practical hours (1 contact hour per week for 15 study weeks).

**5. COURSE DESCRIPTION**

The course covers all aspects of plant propagation using both sexual and asexual means. General management and production practices related to plant propagation are also discussed with emphasis on nursery management and culture.

**6. THE COURSE OBJECTIVES**

**Major objective/aim**

To make students be able to appreciate the principles and practices of plant propagation and nursery management with the aim of multiplying high quality horticultural planting materials to growers

**Specific objectives**

To provide the student with:

* Basic principles in plant propagation of horticultural plants.
* Practical, hands-on experience in plant propagation methods.
* Principles, practices and skills required in the culture and management of nursery plants.

**7. READING LIST** (not limited to the following)

* Acquaah, G. 2005. Horticulture- Principles and Practices. 3rd Edition. Pearson, Prentice Hall, Upper Saddle River, New Jersey.
* Godfrey, W.; Aggrey, S. and Norman, J.C. 1996. Handbook of Common Vegetative Propagation Methods for Fruits and Ornamental Plants. 1st Edition.Vantage Press, New York.
* Hartmann, H.T.; Kester, F.T. and Geneve R.L. Jr. 1997. Plant Propagation- Principles and Practices. 6th Edition. Prentice-Hall of India, Private Limited, New Delhi.
* Hartmann, H.T.; Kofranek, A.M.; Rubatzky, V. E.; and Flocker, W.J. 1988. Plant Science. Growth, Development, and Utilization of Cultivated Plants. 2nd Edition.regents/Pretince Hall, Englewood Cliffs, New Jersey.

**8. COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS EQUIPMENT REQUIRED**

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| **TOPIC** | **CONTENT** | **METHOD OF INSTRUCTION / Time allocated** | **TOOLS / EQUIPMENT NEEDED** |
| 1. General introduction to plant propagation | * Definition of plant propagation
* Why plants are produced in a nursery
* Ways of propagating horticultural plants
 | Interactive Lecture (1hr) | Black board and Chalk |
| 2. Sexual/seed propagation (Seedage) | * Overview of seedage
* Advantages and disadvantages
* Polyembryony versus apomixis
* Seed description, collection, processing, testing and storage
* Seed dormancies, sowing and seedling transplating
 | Lecture ( 3 hrs) | Black board and Chalk |
| 3. Cutting propagation (Cuttage) | * Overview of cuttage
* Advantages and disadvantage
* Factors affecting rooting of cuttings
* Types of cuttings
 | Lecture (2 hrs) | Black board and Chalk |
| 4.Grafting and budding (Graftage) | * Terminology in grafting
* Importance of grafting
* Principles of grafting
* Polarity in grafting and limits of grafting
* Scion and rootstock selection
* Techniques of grafting
 | Lecture (2hrs) | Black board and Chalk |
| 5.Layering/layerage | * Overview of layering
* Factors which enhance layering
* Types of layering
 | Lecture (2hrs) | Black board and Chalk |
| 6.Micropropagation**Quiz 1** | * Overview of micropropagation
* Characteristics/advantages and disadvantages of micropropagation
 | Lecture (2hrs) | Black board and Chalk |
| 7. General Introduction to the nursery industr**y** | * History of plant nurseries
* Importance of plant nurseries
* Why plants are produced in nurseries
 | Lecture (2hrs) | Black board and Chalk |
| 8.Nursery Classification | * Classification by Ownership, Function, Production system, and Type of plant material produced
 | Lecture (2hrs) | Black board and Chalk |
| 9.Establishment of nursery**/** nursery site and location | * Nursery site characteristics
* Factors affecting nursery location
 | Lecture (2hrs) | Black board and Chalk |
| 10.Organization and development of the nursery site | * Nursery design
* Designing for effective environmental management
 | Lecture (2hrs) | Black board and Chalk |
| 11. The Nursery Growing Media | * Soil and nutrient management for field-grown nursery plants
* Media and Nutrient Management for Container-Grown Nursery Plants
 | Interactive Lecture (2hrs) | Black board and Chalk |
| 12. Irrigation (Water management) of Nursery Crops | * Water supply and its sources
* Water treatment
* Water recycling
* Irrigation systems
 | Interactive Lecture (2hrs) | Black board and Chalk |
| 13. Modifying Plant Growth and Development in the Nursery | * Developing a thicker stem or trunk
* Making a plant taller
* Developing a compact root system
* Developing compact, bushy growth
* Improving foliage color and vigor
* Encouraging flower development
* Using chemical growth regulators to modify plant growth
* Using light to modify plant growth Making flower out of season (Effects of Environmental factors)
 | Lecture (2hrs) | Black board and Chalk |
| 14. Pest and Disease Management in the Nursery | * Integrated Pest Management
* Identifying the problem
* Identifying pests
* Identifying diseases
* **Quiz 2**
 | Interactive Lecture (2hrs) | Black board and Chalk |
| 15. Practical sessions | Field-based practical on propagation techniques (grafting, layering, cutting, tissue culture) |  | All materials provided by research institutesTransport for 25 students |
| 16-17:  | Preparation for University Examinations |  |  |

**9. SUMMARY OF THE REQUIRED TIME**

Lectures 28 hrs

Quizzes 2 hours

Practical 30 hrs

**10. COURSE ASSESSMENT**

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| Continuous assessment (quizzes) | 2 quizzes will be done during 6th and 14th weeks of the semester | **20%** |
| Continuous assessment (Practical report) | A practical report will be prepared on the various propagation techniques covered during practical sessions in the 15th week of the semester. | **20%** |
| University Examination | This will be done between the 16th and the 17th weeks of the semester | **60%** |