**ABM 1103 PRINCIPLES OF AGRICULTURE**

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Course Type: CORE (B.Sc. Agric. 1, B.Sc. Hort. 1 & B.Sc. Land use 1)

1. COURSE STRUCTURE

Course Credits (CU): 3 CU, i.e., 45 Contact Hours per Semester

Course Duration: 15 weeks (45 hours)

Course Duration: 14 weeks (45 hours)

2. COURSE DESCRIPTION:

Concepts in agronomy: definitions, key elements of the definition of agronomy; different types of yield including biological and economic yields, crop growth and development stages and parameters for measuring growth and development: Concept of source and sink: Factors that determine yield potential, yield loss and challenges of controlling them, fluctuations in yield: Yield and interception of solar radiation: Utilization of growth resources to enhance yield; plant traits and attributes related to efficient use of light, water and nutrients: Constraints in crop cultivation: Strategies for increasing crop yield: expansion of crop land and intensification of crop cultivation, limitations of intensification; irrigation and water harvesting: Concept of agroecosystem, components of ecosystem, interactions in ecosystems, comparison with natural forest ecosystems: Soil-related limitations in crop cultivation, problem soils, soil degradation, soil erosion, soil and water conservation methods, methods of soil fertility replenishment: Role of agroforestry, role of trees in enhancing crop yield and sustainable farming, integration of trees in crop-livestock production: Concerns in agronomy (chemicals in agroecosystems, global warming, climate change, women’s issues in farming, biodiversity, etc,).

3. COURSE OBJECTIVES

Crop production constitutes the larger fraction of agriculture in the tropics. The **overall objective** of this course is to introduce students to the principles of agronomy that are generally applicable in crop cultivation paying attention to both theoretical and practical foundations of agronomy. The course introduces students to basic principles involved in crop production including introduction to concepts needed to improve crop yields and, hence, food security. Major concerns in crop cultivation are presented including environmental and socio-economic issues that arise from crop cultivation.

The **specific objectives** are to:

1. provide students with the broad scope of agronomy and crop husbandry,
2. enable students describe elements of crop growth and development that are related to crop cultivation and yield,
3. introduce the concept of yield, its determination and factors that influence it, including yield loss,
4. introduce students to strategies of increasing crop cultivation and yield ,and efficient use of resources in crop cultivation,
5. enable the students to grasp the major concerns in agronomy including effects of crop cultivation on the environment, gender issues and other pertinent socio-economic limitations.

4. RECOMMENDED REFERENCES FOR READING

1. Ssekabembe, C.K. 2010. INTRODUCTION TO AGRONOMY: PRINCIPLES AND PRACTICES. Fountain Publishers.ISBN 978-9970-02-740-8.

2. Ssekabembe, C.K. 2003. COLLEGE AGROFORESTRY.MakerereUniversity Press.ISBN 9970-418-13-4.

 5. COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS AND EQUIPMENT REQUIRED

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| TOPIC | CONTENT | METHOD OF INSTRUCTION/Time allocated | Tools/EQUIPMENT NEEDED |
| Week 1.Introduction and concepts in Agronomy | * Definition of agronomy
* Keywords in the definition of agronomy
* Definition of yield and yield components
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 2.Crop growth and development | * Definition of growth and development
* Important growth and development stages
* Parameters for measuring growth and development
* Concept of source and sink
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 3.Crop Yield | * General aspects
* Different types of yield
* Factors that determine yield potential
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 4.Yield loss | * Elements of yield loss
* Fluctuations in crop yield and pertinent factors
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 5.Constraints in crop cultivation | * Challenges in controlling weeds
* Challenges in controlling insect pests
* Challenges of controlling diseases of crops
* Important vertebrate pests
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 6.Other constraints | * Women’s issues and constraints in crop cultivation
* Other socio-economic constraints
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 7.Utilization of growth resources to enhance yield | * General aspects
* Plant traits, attributes and factors involved in efficient use of resources in crop cultivation
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 8.Different growth resources | * Efficient use of light
* Efficient use of water
* Nutrient use efficiency and integrated nutrient use management
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 9.Strategies for increasing crop cultivation and yield | * Expansion of cropland
* Intensification of crop productivity
* Limitations to intensification of crop cultivation
* Irrigation
* Water harvesting
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 10.Agroecosystem | * Definition
* Components of agroecosystems
* Interactions in agroecosystems
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 11.Undisturbed ecosystems | * Definitions
* Comparison of forest ecosystem with agroecosystems
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 12.Soil-related limitations in crop cultivation  | * Major limitations of tropical soils
* Problem soils
* Soil degradation
* Soil erosion and soil and water conservation
* Salinity and soil mining
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 13.Replenishment of soil fertility | * General aspects
* Methods of soil fertility replenishment
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 14.Agroforestry | * General aspects
* Role of trees and shrubs in crop cultivation and sustainable farming
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 15.Concerns in agronomy  | * Chemicals in agroecosystems
* Global warming
* Climate change
* Heavy metals in the soil
* Fire in crop cultivation
* Erosion of biodiversity
* Concept of agrodiversity
* Soil compaction
 | Interactive lectures (3 hrs) | Chalk/BB/Lab Reference books |
| Week 18-17 | * Revision and evaluation
 | Student groups and close book examination  |  |

5. SUMMARY OF TIME NEEDED

Interactive lectures 45 hours

Revision 1 week

Evaluation/examinations 4 hours

6. OVERALL COURSE EVALUATION

Continuous assessment 40%

Final examination 60%