**AEN 2212 FARM ENGINEERING I**

Lecturer: Dr. Levi L. Kasisira (BSc, MSc, PhD (Agric.Eng))

Fulltime Senior Lecturer

**Course Type**: **CORE (BARI)**

**1. COURSE DESCRIPTION**

**Course Credits (CU)**: **3 CU i.e. 45 Contact Hours per semester**

**Course Duration**: **15 weeks (45 hours) i.e. 30 LH, 30 PH**

**COURSE DESCRIPTION**

This course is intended to impart theoretical and practical knowledge to students for operation, selection and maintenance of farm machinery.

**2. COURSE OBJECTIVES**

From this course, students will acquire skills:

* To plan for agricultural mechanization
* For operating and maintaining farm machinery
* For on-farm post-harvest handling of agricultural produce

The specific objectives:

1. To provide students with an understanding of the importance of mechanization in agricultural production
2. To equip students with an understanding of the mode of operation of various farm machinery and implements.
3. To equip students with competences of operating and maintaining various implements and equipment.
4. To equip students with skills for on-farm post-harvest handling of agricultural prodce

**3. RECOMMENDED REFERENCES FOR READING**

1. Claude Culpin. 1992. Farm machinery. 12th Edition. OxfordUniversity Press.
2. Kaul, R.N. and C.O.Egbo. Introduction to Agricultural Mechanization. McMillan Publishers Ltd. London, UK.
3. Donnell Hunt. 2001. Farm power and machinery management. IowaState Press.

**4. COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS AND EQUIPMENT REQUIRED**

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| **TOPIC** | **CONTENT** | **METHOD OF INSTRUCTION / Time allocated** | **TOOLS / EQUIPMENT NEEDED** |
| 1. Mechanization | * Definition * Its importance in agricultural production * Power units for mechanised agriculture * Factors for sustainable agricultural mechanization | Interactive lectures (2 hrs)  Practical (3 hrs) | Chalk / BB or LCD projector & laptop/draft animals & engine |
| Farm Tractor | * Power generation in an internal combustion engine * Power transmission system * Tapping power from a farm tractor | Interactive lectures (2 hrs)  Practical (3 hrs) | Chalk / BB or LCD projector & tractor |
| 2.Primary tillage | * Definition * Mode of operation of the various primary tillage | Interactive lectures (6 hrs)  Practical (6 hrs) | Chalk / BB or LCD projector & laptop/ farm tractor & implements |
| 3. Secondary tillage | * Definition * Mode of operation of the various secondary tillage implements * Environmental concerns when working with tillage implements * Evaluation of tillage operations | Interactive lectures (6 hrs)  Practical ( 6 hrs) | Chalk / BB or LCD projector & laptop/ farm tractor & implements |
| 4. Planters | * Types of planters * Mode of operation of the various types of planters * Calibration of the various planters | Interactive lectures (3 hrs)  Practical ( 6 hrs) | Chalk / BB or LCD projector & laptop/ grain planters |
| 5. Equipment for application of agricultural chemicals | * Types ofagricultural chemicals and their proper mixing with water * Types ofagricultural chemical applicators * Mode of operation of the various agricultural chemical applicators * Calibration of the agricultural chemical applicators * Environmental concerns during agricultural chemical application | Interactive lectures (3 hrs)  Practical ( 3 hrs) | Chalk / BB or LCD projector & laptop /hydraulic model /tractor & hydraulic sorayers |
| 7. Grain harvesting | * Methods and equipment | Interactive lectures (3 hr)  Practical ( 3 hrs) | Chalk / BB or LCD projector & laptop, harvesting machinery |
| 8 On-farm post-harvest handling | * Grain drying, storage and processing | Interactive lectures (3 hrs) | Chalk / BB or LCD projector & laptop |
| Integrated biosystems | * Definition * Examples | Interactive lectures (2 hrs) | Chalk / BB or LCD projector & laptop |

**5. OVERALL COURSE EVALUATION**

Continuous Assessment Test 20%

Practical and assignments 20%

Final examination 60%