AEN 3205 FARM MACHINERY

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

Course Type: CORE (B.Sc. Agric. Engineering)

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

Hitching systems. Pre-harvest mechanized operations and equipment. Harvesting methods and equipment. Analysis of field machinery operations for optimum performance. Environmental aspects of machinery operations

2. COURSE OBJECTIVES

The overall objective of this course is to introduce students to utilisation of farm machinery for crop operation and harvest. From this course, students will acquire:

· Fundamental understanding of the principles of farm machinery and their mode of operation.
· Knowledge and skills for proper management of farm machinery.

The specific objectives:

i) To provide students with an understanding of the design and mode of operation of various farm machinery.
ii) To equip students with competences of determining power requirements of various farm implements.
iii) To provide students with knowledge and skills for optimum performance of farm machinery
iv) To equip students with competences of operating and maintaining various implements and equipment.

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

TOPIC	CONTENT	METHOD OF INSTRUCTION / Time allocated	TOOLS / EQUIPMENT NEEDED
1.Hitching systems	• Introduction: o Hitching of animal drawn implements o Dependence of drawbar pull, rolling resistance and tractive efficiency on the weight carried by the driving wheels of a tractor • Hitching of tractor drawn implements	Interactive lectures (3 hrs) Practical (6 hrs)	Chalk / BB or LCD projector & laptop/draft animals & ergonomics equipment
2.Primary tillage	• Definition	Interactive	Chalk / BB or

	• Design and mode of operation of the various primary tillage implements • Forces acting on the various primary tillage implements • Determining of power requirements of the various primary tillage implements	lectures (6 hrs) Practical (6 hrs)	LCD projector & laptop/IC engine model
3. Secondary tillage	• Definition • Design and mode of operation of the various secondary tillage implements • Forces acting on the various secondary tillage implements • Determining of power requirements 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/ IC engine model & farm tractor
4. Planters	• Types of planters • Design and mode of operation of the various types of planters • Calibration of the various planters • Determining of power requirements of planters	Interactive lectures (3 hrs) Practical (6 hrs)	Chalk / BB or LCD projector & laptop/ transmission model/tractor
5. Equipment for application of agricultural chemicals	• Types ofagricultural chemicals and their proper mixing with water • Types ofagricultural chemical applicators • Design and 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
6. Hay and Forage harvesting	• Methods and equipment • Functional processes	Interactive lectures (2 hrs)	Chalk / BB or LCD projector & laptop
7. Grain harvesting	• Methods and equipment • Directing harvesting using a combine • Functional processes	Interactive lectures (3 hr) Practical (3 hrs)	Chalk / BB or LCD projector & laptop
8. Farm machinery management	• Selection criteria • Determining optimum machine size • Calculation of ownership and operating costs • Understanding the concept of break-even-use • Appreciating the need for proper maintenance of farm machinery	Interactive lectures (4 hrs)	Chalk / BB or LCD projector & laptop

5. OVERALL COURSE EVALUATION

Continuous Assessment Test	20%
Practical and assignments	20%
Final examination	60%