AEN 4106 MOBILE AND STATIONARY POWER EQUIPMENT

Instructor: Dr. Levi L. Kasisira
Emial: levikas@agric.mak.ac.ug
Mob.No: +256-752-960-146

Course Type: ELECTIVE (BSc. Agricultural 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
The course covers factors that affect the performance of mobile and stationary power units and their determination.

2. COURSE OBJECTIVES
To equip students with the knowledge of determining the performance of performance of mobile and stationary power units.

The specific objectives:

3. RECOMMENDED REFERENCES FOR READING

1. Carroll E. Goering. 1992. Engine and tractor power. 3rd Edition. ASAE. St. Joseph, Michigan,USA.
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. Internet

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

TOPIC	CONTENT	METHOD OF INSTRUCTION / Time allocated	TOOLS / EQUIPMENT NEEDED
1.Introduction	• Sources of farm power and their characteristics • Definition of agricultural mechanization and its importance in agricultural production	Interactive lectures (3 hrs) Practical (6 hrs)	Chalk / BB or LCD projector & laptop/draft animals & ergonomics equipment
2. Internal combustion (IC) engine	• Thermodynamics of IC engines • Practical engine cycle and timing • Power efficiencies • Engine balancing	Interactive lectures (6 hrs) Practical (6 hrs)	Chalk / BB or LCD projector & laptop/IC engine model
3. IC engine accessorysystems	• Fuel systems including turbochargers, governor and performance of governed engines • Ignition system • Engine cooling systems • Engine lubrication system	Interactive lectures (6 hrs) Practical (6 hrs)	Chalk / BB or LCD projector & laptop/ IC engine model & farm tractor

4. Power transmission systems	• Power train • Power shift transmissions • Hydrostatic transmissions	Interactive lectures (6 hrs) Practical (6 hrs)	Chalk / BB or LCD projector & laptop/ transmission model/tractor
5. Farm tractor hydraulic system	• JIC symbols • Open-centre hydraulic system • Pressure-compensatedhydraulic system • Pressure-flow-compensatedhydraulic system	Interactive lectures (4 hrs) Practical (6 hrs)	Chalk / BB or LCD projector & laptop /hydraulic model /tractor
6. Mechanics of tractor chassis and weight transfer	• Definition of mechanics of tractor chassis • Centre of gravity; its longitudinal and vertical location • Weight transfer and instability	Interactive lectures (3 hrs)	Chalk / BB or LCD projector & laptop
7. Environmental issues when using farm power units	• Disposal of used lubricants • Noise pollution • Effect of engine exhaust gases to the atmosphere • Soil compaction	Interactive lectures (2 hr)	Chalk / BB or LCD projector & laptop

5. OVERALL COURSE EVALUATION

Continuous Assessment Test	25%
Practical and assignments	15%
Final examination	60%