AEN 1106 ENGINEERING MECHANICS 1

Lecturers   Mr. Allan Komakech   (B.Sc. Agric, MSc. Agric Eng)
                        Miss Fildah Ayaa (B.Sc. Agric Eng)

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

1. COURSE DESCRIPTION

Course Credits (CU):   **4 CU i.e. 60 Contact Hours per semester**

Course Duration: 15 weeks **(60 hours)** i.e. 48 LH, 24 PH

COURSE DESCRIPTION

2. COURSE OBJECTIVES

The main objective is to develop in a student the ability to analyze any static problem and to apply the solutions engineering applications

The **specific objectives** are to:

1. To equip students with the aptitude carry out force analysis on various engineering structures
2. To equip students with proficiency and knowledge for Engineering design

3. RECOMMENDED REFERENCES FOR READING

    i.   J. L Meriam and L. G Kraige. Engineering Mechanics (Statics) Fifth Edition.John Wiley&Sons,Inc.

    ii.   Carleton G. Fanger.1970 Engineering Mechanics. Statics And Dynamics.Charles E.Merrill Publishing Company,Columbus, Ohio.

    iii.   Timoshenko and Young. Engineering Mechanics Fourth Edition. Mcgraw-Hill Kogakusha,Ltd.

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

TOPIC	CONTENT	METHOD OF INSTRUCTION / Time allocated	TOOLS / EQUIPMENT NEEDED
Lecture 1. Statics of particles	• Introduction to statics • Scalars and vectors • Newton's laws • Problem solving in statics • Free body diagrams	Interactive lectures (4 hrs) Tutorial (2 hrs)	Chalk / BB or LC-projector and laptop for instructor
Lecture 2. Equivalent systems of forces	• Equilibrium of rigid bodies in two dimensions and three dimensions	Interactive lectures (6 hrs) Tutorial(2hrs)	Chalk / BB or LC-projector and laptop
Lecture 3.	• Plane trusses,	Interactive	Chalk / BB or

Analysis of Structures	• Analysis of trusses by method of joints and sections, • Frames and machines	lectures (8 hrs) Tutorial(2 hrs)	Markers / Flip charts
Lecture 4 Forces in Beams and Cables	• Internal forces in beams, • Types of loading and support, • Shear and bending moment diagrams, • Analysis of cables with concentrated and distributed loads • Parabolic cables and catenary cables	Interactive lectures (8 hrs) Tutorial(4 hrs)	Chalk / BB or Markers / Flip charts
Lecture 5 Moment of Inertia	• Moment of inertia of areas • Radius of gyration • Parallel axis theorem • moment of inertia of masses	Interactive lectures (6 hrs) tutorial (2 hrs)	Chalk / BB or Markers / Flip charts
Lecture 6 Friction	• Laws of dry friction, • Application of friction in machines(wedges, screws, disks ,wheels, axles and flexible belts)	Interactive lectures (8 hrs) Tutorial (4 hrs)	Chalk / BB or Markers / Flip charts. Projector and laptop
Lecture 7 Method of Virtual Work	• Work, equilibrium of particles and rigid bodies, potential energy and stability	Interactive lecture(8 hrs) Tutorial (2 hrs)	Chalk / BB or Markers / Flip charts. Projector and laptop
	• Evaluation	Tests(6 hrs)	

5. SUMMARY OF TIME NEEDED

Interactive lectures covering theory   48 hrs
Tutorials   18 hrs
Tests   06 hrs

6. OVERALL COURSE EVALUATION

Continuous Assessment Test and assignment   20%
Final examination   60%