Subject Description Form

Subject Code	ME23001
Subject Title	Engineering Mechanics
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: AP10005 Physics I
Objectives	To provide students the fundamental mechanics concepts of equilibrium and motion for rigid structural systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Apply the fundamental knowledge of mechanics to solve for forces and moments in simple systems. b. Distinguish the basic differences between diverse engineering systems and select the suitable design in achieving the engineering purposes. c. Employ engineering mechanics to solve the problems encountered in assignments and projects. d. Collaborate with peers in experiments and projects and present effectively the results of experiment or project.
Subject Synopsis/ Indicative Syllabus	***Fundamentals of Mechanics*** **-** Basic concepts of mechanics; Scalar and vectors: Vector algebra and vector components; Position, unit of force vectors; Two and three-dimensional force systems; Moment of a force about a point; Moment of a force about a line. ***Statics*** **-** Equilibrium of a particle and the associated free-body diagrams; Equilibrium of a rigid body and the associated free-body diagram; Two and three force members equilibrium in three dimensions; Simple trusses: the method of joints; the method of sections; zero-force members; Internal forces developed in structural members; Shear and moment equations and diagrams in structural members; Relations between distributed load, shear and moment; Theory of dry friction; Systems with friction; Wedges; Belt friction; Rolling resistance. ***Equivalent Systems*** **-** Determination of the resultant concurrent forces; Equivalent force/couple systems; Centre of gravity and centroid: by composite parts, by integration; Resultant of a general distributed force system; Moment of inertia of areas; Parallel-axis theorem for an area; Radius of gyration of an area; Calculation of moments of areas: by composite areas, by integration; Product of inertia for an area; Principles of virtual work. ***Dynamics*** **-** Kinematics and kinetics of particles; rectilinear motion; plane curvilinear motion; relative motion; equation of motion.

Teaching/Learning Methodology

Lectures are used to deliver the fundamental knowledge in relation to the topics as described in the section subject synopsis (Outcomes a, b and c).

Tutorials are used to illustrate the application of fundamental knowledge to practical situations (Outcomes a, b and c).

Experiments are used to relate the concepts to practical applications and students are exposed to hand-on experience, proper use of equipment and application of analytical skills on interpreting experimental results (Outcomes c and d).

Teaching/Learning Methodology	Outcomes			
	a	b	c	d
Lecture	√	√	√	
Tutorial	√	√	√	
Experiment/Projects			√	√

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		a	b	c	d
1. Assignment	20%	√	√	√	√
2. Test	20%	√	√	√	
3. Examination	60%	√	√	√	
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

$0.60 \times$ End of Subject Examination + $0.40 \times$ Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by the tests, assignments and laboratory/project reports which provide timely feedbacks to both lecturers and students on various topics of the syllabus.

Student Study Effort Expected

Class contact:	
▪ Lecture	33 Hrs.
▪ Tutorial/Laboratory/Projects	6 Hrs.
Other student study effort:	
▪ Course work	23 Hrs.
▪ Self-study	43 Hrs.
Total student study effort	105 Hrs.

Reading List and References	1. R.C. Hibbeler, Engineering Mechanics – Statics, Prentice Hall, latest edition. 2. A. Pytel, J. Kiusalaas, Engineering Mechanics – Statics, Stamford, CT: Cengage Learning, latest edition.

Revised June 2020