Department of Engineering Technology ET-328

Course Number and Name: ET 328, Kinematics of Machines
Credits & Contact Hours

Credits	Lectures	Lab	Contact Hours
3.0	(2) 50 min lectures/ week	(1) 2.5 hour /week	50

Instructor Name: Manuel Gomez

Textbook title, *Design of Machinery (4th Ed*)
author and year: Norton, Robert L., 2008

Specific Course Description:

a. **Course Catalog Description** – Kinematic analysis of machine elements with topics of linkages, cams, and gears. Graphical and analytical solutions using computer techniques.
b. **Prerequisites:** ET 241 (Dynamics)
c. This course is required for MET degrees.

Course Goals & Objectives: To familiarize students with the kinematic synthesis and analysis techniques for linkages, cams and gears.

Related ABET Objectives & Course Outcomes: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline, to include the following:

Student Outcomes of Instruction from MET (x.)	Student Outcomes /Criteria 3
(1.) **Algebra, trigonometry**, Boolean mathematics**, calculus**, statistics and probability, **fundamental principles and concepts of science and engineering technology, good practice in problem solving,** and **methods of standard practice in the analysis and applied design** of **mechanical systems** as applied to analysis and design of machine elements.	3.a, 3.b, 3.d, 3.f
(3.) **Basic knowledge of manufacturing processes, engineering materials and their selection, measuring tools, machine tools, quality systems and processes,** process improvement methods, **economic principles, cost analysis techniques, and project management relevant to mechanical technology areas**	3.a, 3.b, 3.c, 3.d, 3.e, 3.f, 3.g
(4**.) Current software corresponding to good practice in the application of mechanical engineering technologies**. Software application functions to include: **word processing**, spreadsheet calculations, graphing**, presentation media**, **computer assisted drafting and manufacturing, manufacturing processes**, statistics, **data acquisition, project management**, and the **analysis and applied design of systems involving mechanisms, machines**, or fluid thermal processes. (Mathcad, Working Model, Dynacam, Solidworks)	3.a, 3.b, 3.c, 3.d, 3.f, 3.k

Course Topics	Class Hours
Course Introduction & overview	1
Design, Kinematic Fundamentals	3
Lab: Mechanical Mechanism Analysis, DOF, Classification, Grashof	
Graphical Linkage Synthesis	3
Lab: Linkage Synthesis – Working Model	
Position Analysis	3
Analytical Linkage Synthesis	3
Review, [Exam I]	2
Linkage Position Analysis	3
Linkage Velocity Analysis	6
Lab: Velocity Analysis – Motor/Piston Linkage	
Linkage Acceleration Analysis	6
Lab: Acceleration Analysis – Motor/Piston Linkage	
Review, [Exam II]	2
Cam Design/Analysis	5
Lab: Cam Design -	
Intro to Gears & Gear Trains	5
Lab: Gear Train Design – Amatrol Mechanical Bench	
Review, [Exam III]	
Final Exam	2
	2

Prepared by Manuel Gomez, 01/11/2011