REGULAR COURSE SYLLABUS

School of: Professional Studies

Department: Engineering Technology

Prefix & Course Number: MET 3070

Course Title: Machine Design

Banner course title (30 characters): Machine Design

Check All That Apply: Required for Major: _____ Required for Minor: _____ Specified Elective: _____

Required for Concentration: X Elective: X Service Course: ____

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition.

**Federal Credit Hour Definition:** A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:

1. one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or
2. at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward the award of credit hours. 34CFR 600.2 (11/1/2010)

Credit Hours: 3 (3+0)

**Face-to-Face or Equivalent Hours per course:**

Lecture 45 Lab ___ Internship ____ Practicum ____ Other (please specify type and hours): ____

**Additional Student Work Hours per course:** 90

Schedule Type: L Grade Mode: L

Variable topics umbrella course: No X Yes ____ If Yes, number of credit hours allowed ____

Specified repeatable course: No X Yes ____

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APPROVED:

[Signature] 01/29/14
Department Chair OR Program Director

[Signature] 01/30/14
Dean OR Associate Dean

[Signature] 03/13/14
Associate VP, Academic and Student Affairs

*If crosslisted, attach completed Course Crosslisting Agreement Form*
Prefix and Course Number: MET 3070

Prerequisite(s):  MET 2200, CET3135, MET3160, with grades of "C" or better

Corequisite(s): 

Prerequisite(s) or Corequisite(s): 

Banner Enforced:
Prerequisite(s):  MET 2200, CET3135, MET3160, with grades of "C" or better
Corequisite(s): 
Prerequisite(s) or Corequisite(s): 

Registration restrictions: Level _____ Class _____ Program/Major _____ Student attribute _____

Catalog Course Description:
The art of designing machines to accomplish specific purposes is studied. The students will be introduced to the fundamental principles required to design the separate machine elements. The economics of design is stressed along with strength and safety considerations. The lab work uses selected software, e.g. ALGOR and AutoCAD, to produce preferred designs.

Specific Variable Topics Course Description (if applicable, umbrella course description included above):

Required Reading and Other Materials will be equivalent to:

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:
1. Demonstrate the application of methods learned to sol representative mechanical design problems.
2. Apply the fundamental principles of solid mechanics as associated with design.
3. Relate mechanism and design to material properties.
4. Practice recommended design procedures.
5. Analyze a design problem establishing basic criteria and assumptions, material specifications, manufacturing processes, and estimate production costs.
6. Analyze and solve 3D static and dynamic designs using selected software, e.g. AucoCAD, Pro/E, and Solid Works.

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision):

This course identifies the principles of machine design theory and practice with examples of application of fundamentals to design problems. To accomplish this, the course covers the below listed content:

I. Fundamental principles
   A. Statics
   B. Force/Mass
   C. Moment of Inertia
   D. Shear and Bending

II. Shafting Design
   A. Torsion
   B. Critical Speed
   C. Bending

III. Working Stresses
   A. Normal
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B. Bi-Directional
C. Endurance

IV. Bearing
   A. Design
   B. Selection

V. Spur gears
   A. Pitch
   B. Forces
   C. Ratios

VI. Machine Drives
   A. Belts
   B. Chains
   C. Brakes
   D. Clutches

Evaluation of Student Performance:
1. Homework
2. Examinations
3. Design Project