REGULAR COURSE SYLLABUS

School of: Professional Studies

Department: Engineering Technology

Prefix & Course Number: MET 4070  Crosslisted With*: 

Course Title: Computer Aided Design

Banner course title (21 characters): Computer Aided 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 (2+2)

Face-to-Face or Equivalent Hours per course:

Lecture 30  Lab 20  Internship  Practicum  Other (please specify type and hours): 

Additional Student Work Hours per course: 90

Schedule Type:  B  Grade Mode:  L  

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

Specified repeatable course:  No  X Yes  

APPROVED: 

Department Chair OR Program Director  

Dean OR Associate Dean  

Associate VP, Academic and Student Affairs  

*If crosslisted, attach completed Course Crosslisting Agreement Form
Prefix and Course Number: MET 4070

Prerequisite(s): MET 3070 with a grade of "C" or better

Corequisite(s): _____________

Prerequisite(s) or Corequisite(s): _____________

Banner Enforced:
Prerequisite(s): MET 3070 with a grade of "C" or better
Corequisite(s): _____________
Prerequisite(s) or Corequisite(s): _____________

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

Catalog Course Description:
The student studies combined stresses, gearing, brakes, curved beams, etc., and undertakes the design of a complete machine. This is the second in the two-course machine design series. The analysis includes computer solutions (e.g. Finite Element Analysis software solutions).

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. Analyze stress factors, combine and apply principles of statics, dynamics, and material strength factors to a machine design problem.
2. Apply lubrication techniques and lubricants to meet various design applications.
3. Design brakes, clutches, gears, etc., (mechanisms) applying fundamental knowledge concepts to a particular design.
4. Analyze design problems using computer software.
5. Design, draw, and establish specifications.

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision):
I. Design for Rigidity
   A. Machine Column Stability
   B. Cylindrical Piston Rods
   C. Friction and Resistance to Motion in Vehicles
   D. Wear and Design for Wear Resistance

II. Permanent Connections and Welding.
    A. Design of Welds
    B. Structural Welding Code
    C. Soldering, Brazing, Riveting
    D. Preload, Fatigue and Resiliency
    E. Stress Concentrations

III. Design and Function of Springs
     A. Load Deflection Relationship
     B. Energy Storage/Dissipation
     C. Allowable Stresses and Design Equations for
     D. Helical and Compressive
Prefix and Course Number: MET 4070

E. Extension and Torsional Spring Design

IV. Power Transmission, Principles and Control
   A. Screws for Power Transmission
   B. Transverse Force Considerations
   C. Centrifugal and Inertial Force Effects

V. Curved Beam Analysis
   A. Square and Round Cross Sections
   B. Impact/Impulse Loading
   C. Principal Stresses
   D. Shock Resistance

VI. Mechanical Clutches and Brakes

VII. Gaskets and Seals

VIII. Design Project
   A. Group Division
      1. Frame
      2. Power Transmissions
      3. Energy Source
      4. Notebook Keeping
   B. Mathematical Design
   C. Layout Design
   D. CAD/CAM Detail
   E. Cost Calculations-Economic
   F. Technical Presentation of Project

Evaluation of Student Performance:
1. Homework
2. Examinations
3. Design Project
REQUEST FOR REMOVAL OF SENIOR EXPERIENCE DESIGNATION

(To accompany old and new regular syllabus form and Curriculum Change Proposal forms)

Date: 10/4/2013
School: Professional Studies
Department: Engineering Technology

<table>
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<tr>
<th>Prefix</th>
<th>Course Number</th>
<th>Credit Hours</th>
<th>Contact Hours</th>
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<td>4070</td>
<td>3</td>
<td>(2+2)</td>
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Title: Computer Aided Design

Prerequisite(s): MET 3070 and MET 3210, all with a grade of "C" or better, satisfaction of all Level I and Level II

Corequisite(s): ___

Prerequisite(s) and/or corequisite(s): ___

Effective Term for Removal: 2014-50

Reason for Removal of Designation:
The Goal A of Strategic Theme 1 student and academic success of 2012-17 MSU Strategic Plan indicates: MSU Denver facilitates and enhances students success though the implementation of research-based, best-practices degree-completion strategies. In order to align MET curriculum with the University’s goal, a new set of capstone classes are to be proposed in the same packet. The new series of MET senior experience classes are also in agreement with CET and EET newly design senior experience classes so that cross disciplinary collaboration will be conducted more easily.

Approvals:

Department Curriculum Committee / Date

Department Chair OR Program Director / Date

School Curriculum Committee / Date

Dean or Associate Dean / Date

Chair, Faculty Senate Curriculum Committee / Date

Associate Vice President, Academic Affairs / Date