University of Toledo
Construction Engineering Technology
Master Syllabus

Course Title: Engineering Mechanics **Course Code & Number:** CET-1200

Credit Hour Total: 4 **Weekly Contact Hours Lecture:** 4 **Lab Hours:** 0

Prerequisite(s): MATH-1330, PHYS-2010

Text: Statics & Strength of Materials for Architecture & Building Construction, 4th Ed.
Onouye & Kane ISBN: 978-0135079256

Software: None

Course Coordinator: Beall

A. **Course Description** (Approved Catalog Description)

This course covers the basics of statics, load tracing and analysis of determinate structures. Special attention is paid to the application of the laws of statics and strength of materials as they relate to construction materials, techniques and methods. The course covers the analysis of direct and indirect stresses in structural members: stress, strain, bending moment, shear and deflection; and begins the structural design course progression with the design of beams, columns and structural connections.

B. **Related Program Outcomes:**

Upon successful completion of the Construction Engineering Technology program, graduates will have:

ABET/Student Outcomes

1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;

The course also supports coverage of the following curricular areas:

Program Criteria

d) the application of fundamental computational methods and elementary analytical techniques in sub-disciplines related to construction engineering;

g) the selection of appropriate construction materials and practices;

i) the performance of standard analysis and design in at least one sub-discipline related to construction engineering.

Discipline Specific Content

+ Industry standards & codes

+ Respect for diversity

+ Quality & continuous Improvement

Evidence of the success of these outcomes is provided by the collection and analysis of:

- Force Vector Mechanics Exam Problem
- Shear & Bending Moment Exam Problem

C. **Course Objectives:**

Upon the completion of the course the student will be able to:

1. Find resultants of any of two dimensional force system.
2. Determine resultant forces acting upon structural members using force and moment equilibrium.
3. Determine centroids and moments of inertia of composite areas.
4. Determine forces acting upon and within simple structural systems (trusses and frames).
5. Gain the ability to trace loading conditions and convert them to loads on a single component.
6. Develop shear, bending moment diagrams and maximum deflection for beams.
7. Analyze materials in tension, compression, shear, bending, buckling and torsion.

D. **Course Outline - Major Content Areas**

1. Basic Principles
2. Coplanar Force Systems
3. Trusses & Frames
4. Load Tracing
5. Cross-sectional properties of structural elements
6. Shear and bending stresses in beams
7. Column analysis

E. **Suggested Laboratory Tests**

1. None