MET 150 Statics and Strength of Materials for MET

Course Description: A course on analyzing forces that occur within machine and structural elements subjected to various types of loads. Topics include: vector panalysis, free body diagrams, individual stresses, and combined stresses.

Prerequisites(s): MAT 121 or MAT 125 **Corequisite(s):** No corequisite

Lecture Hours: 2	Lab Hours: 3	Credit Hours: 3
Lab Fee: 105	Supplemental Fee: 0	Purpose:
☐ Transfer Assurance Guide Course (TAG)	☐ Transfer Module Course (TM)	
Course Format: Lec/Lab	Grading: A/B/C/D/F/I	
Delivery Method: □ Web	□ Hybrid	☒ Classroom
Semesters Offered: ☒ Fall	☒ Spring	☒ Summer

Course Primary Text:

Title: Applied Statics & Strength of Materials	Edition: 6th
Author(s): George Limbrunner	
Publisher: Prentice Hall	

Supplemental Materials:

None

Course Outcomes:

1	The student will be able to apply knowledge, techniques, skills and modern tools of the discipline to narrowly defined engineering technology problems.
2	The student will have the ability to identify, analyze, and solve narrowly defined engineering technology problems.
3	The student will demonstrate a commitment to quality, timeliness, and continuous improvement.

Course Topics:

Week 1	The Mathematics of Statics, Calculations and Numerical Accuracy, Calculations and Dimensional Analysis, SI Units for Statics and Strength of Materials, Forces and the Effects of Forces, Characteristics of a Force, Units of a Force, Types and Occurrence of Forces, Scalar and Vector Quantities, The Principle of Transmissibility Types of Force Systems, Orthogonal Concurrent Forces: Resultants and Components.
Week 2	Resultant of Two Concurrent Forces, Resultant of Three or More Concurrent Forces, Moment of a Force, The Principle of Moments: Varignon's Theorem, Resultants of Parallel Force Systems, Couples, Resultants of Non-concurrent Force Systems
Week 3	Conditions of Equilibrium, The Free-Body Diagram, Equilibrium of Concurrent Force Systems, Equilibrium of Parallel Force Systems, Equilibrium of Non-concurrent Force Systems
Week 4	Trusses, Forces in Members of Trusses, The Method of Joints, The Method of Sections
Week 5	Friction Theory, Angle of Friction, Friction Applications
Week 6	Center of Gravity, Centroids and Centroidal Axes, Centroids and Centroidal Axes of Composite Areas
Week 7	Moment of Inertia, The Transfer Formula, Moment of Inertia of Composite Area, Radius of Gyration, Polar Moment of Inertia
Week 8	Tensile and Compressive Stresses, Shear Stresses, Tensile and Compressive Strain and Deformation, Shear Strain, The Relation between Stress and Strain (Hooke's Law
Week 9	Poisson's Ratio, Thermal Effects, Members Composed of Two or More Components, Stress Concentration, Stresses on Inclined Planes, Shear Stresses on Mutually Perpendicular Planes, Tension and Compression Caused by Shear
Week 10	Members in Torsion, Torsional Shear Stress, Angle of Twist, Transmission of Power by a Shaft
Week 11	Types of Beams and Supports. Types of Loads on Beams, Beam Reactions, Shear Force and Bending Moment
Week 12	Shear Diagrams, Moment Diagrams, Sections of Maximum Moment

Week 13	Tensile and Compressive Stresses Due to Bending, The Flexure Formula, Computation of Bending Stresses, Shear Stresses, The General Shear Formula, Shear Stresses in Structural Members, Beam Analysis
Week 14	Combined Stresses
Week 15	Review and Final Exam

Methods of Evaluation/Assessment

□ Formative: □ Summative

List assessment activities (e.g. quizzes, discussions, essays, research papers, debates, oral presentations, exams):

Weekly Quizzes
Online Quizzes
Exams
Homework Assignments

Course Keeper: Abbey Yee Date Completed: 8/11/18