MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 228 Engineering Design Communication (2 Units) Required for Transfer Students

Course Descriptions: (2019-20 Catalog)	Use of engineering communication principles to communicate details of project designs including: sketching, orthographic projection, section and auxiliary views, dimensioning, and tolerances. Hand and computer based methods explored. Introduction to design for manufacturability. 2 laboratories.
Prerequisite Courses:	None
Prerequisites by Topic:	None
Textbook: (and/or other required material)	Technical Graphics Communication, 4th Edition, Bertoline ME 129/228 - Engineering Design Communication Workbook Engineering Drafting Toolkit
References:	Any specified by Instructor
Course Coordinator:	Ashley Leitzell, ME Lecturer

Course Learning Outcomes:

1. Understand the fundamentals of the graphical methods used to convey engineering concepts.
2. Ability to create, read, and interpret engineering drawings.
3. Identify and analyze the relationships of geometrically defined entities.
4. Demonstrate the use of terminology and symbols used in engineering communications.
5. Ability to relate design concepts to fabricators using standard graphic communication conventions.
6. Fundamental use of the engineering design process to make decisions related to design and fabrication.
7. Ability to construct engineering communication documents describing mechanical devices and systems by using points, vectors, and surfaces.
8. Selection of appropriate orthographic, sectional, auxiliary, and pictorial vies, to convey engineering design concepts to fabricators.
9. Construct appropriate dimensions and geometric tolerances to convey a part's functional design requirements to fabricators.
10. Calculate size tolerances necessary to ensure the functional relationship to multi-part assemblies.
11. Ability to create and define a conceptual solution to an engineering problem.
12. Ability to use a common industrial cad package to create engineering documentation.

Relationship of Course to Mechanical Engineering Student Outcomes:

SO 1: Introduce (I)
SO 2:
SO 3: Introduce (I)
SO 4:
SO 5:
SO 6:
SO 7:

Topics Covered:

1. Lettering, Scales, Orthographic Sketching
2. Orthographic Projection, Line Conventions
3. Fillets & Rounds; Hole, Counter bore & Countersink Conventions
4. Pictorial, Sectional, and Auxiliary Views
5. Descriptive Geometry: True size and shape- auxiliary view and rotation
6. Descriptive Geometry: Intersections & Dihedral Angle
7. Detail Drawings, Size Tolerances, Notes
8. Clearance, Interference, & Transition Fit Calculations.
9. Fundamental Geometric Dimensioning & Tolerancing (ASME-Y14.5M)
10. Design of Functional Layouts.
11. Assembly Drawings & Bill of Materials
11. Threads and Fasteners
13. Cad Skills: Parametric Modeling, Dimensioning, Tolerance Specification, Assembly Mates, Functional Assemblies.

Laboratory Activities:

Assignments and projects that require students to directly apply the laboratory topics. Industrial CAD software requires the students to:

Create Part Models encompassing:
Extrusions, revolves, and lofts
Patterns, holes, and common features
Construct multi-view detail drawings including:
Dimensions, size tolerances, and notes
Datums, basic dimensions, and geometric tolerances
Produce functional multi-part assemblies
Prepare assembly drawings including bill of materials
Instructor gives group and individual assistance as needed.

Class/Lab Schedule: Two 170 minute lab per week

Contribution of Course to Meeting the Professional Component:

(a) College-level math & basic sciences:	0 credits
(b) Engineering Topics:	2 credits
Design - Yes	
(c) General Education:	0 credits
(d) Other	0 credits

Prepared by: Ashley Leitzell **Date:** 3/12/20