STATE UNIVERSITY OF NEW YORK !
COLLEGE OF TECHNOLOGY !
CANTON, NEW YORK !

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MECH 112 – 3D MODELING

Created by: Cullen Haskins

Updated by:

Canino School of Engineering Technology !

Department: MECHANICAL ENGINEERING TECHNOLOGY !

Semester/Year: FALL 2018 !

A. **TITLE**: 3D MODELING

B. **COURSE NUMBER:** MECH 112

C. **CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)**

 # Credit Hours: 3
 # Lecture Hours: 1 **per week**
 # Lab Hours: 4 **per week**
Other: **per week**

Course Length: 15 **Weeks**

D. **WRITING INTENSIVE COURSE**: Yes ☐ No ☒

E. **GER CATEGORY: None:** ☒ **Yes:** GER !
***If course satisfies more than one*:** GER !

F. **SEMESTER(S) OFFERED: Fall** ☐ **Spring** ☒ **Fall & Spring** ☐

G. **COURSE DESCRIPTION:**

A 3D CAD Modeling course that introduces the student to topics of dimensioning, tolerances, keys and key seats, assembly drawings and detail drawings, gears, and cams. 3D rapid prototyping systems, 3D modeling concepts and ASME standards will be emphasized. All CAD drawings will be created using solid modeling software.

H. **PRE-REQUISITES: None** ☒ **Yes** ☐ **If yes, list below:**

CO-REQUISITES: None ☒ **Yes** ☐ **If yes, list below:**

I. STUDENT LEARNING OUTCOMES: (*see key below*)

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
A. Interpret geometric dimensions and tolerances from engineering drawings and apply to engineering drawings	PENDING ABET OUTCOME UPDATE		1-Comm Skills 5-Ind, Prof, Disc, Know Skills ISLO	W Subsets Subsets Subsets
B. Examine assembly drawings to develop knowledge of the assembled parts function and interaction			1-Comm Skills ISLO ISLO	W Subsets Subsets Subsets
C. Differentiate the terminology of gears, cams, and threads			2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
D. Produce gears, cams, and threads for use in engineering applications			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
E. Illustrate welding drawings and symbols			5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
F. Compile assembly drawing packages that meet industry standards			1-Comm Skills 5-Ind, Prof, Disc, Know Skills ISLO	W Subsets Subsets Subsets

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KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit,/Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

*Include program objectives if applicable. Please consult with Program Coordinator !

J. APPLIED LEARNING COMPONENT: Yes ☒ No ☐

If YES, select one or more of the following categories:

- ☒ Classroom/Lab
- ☐ Internship
- ☐ Clinical Placement
- ☐ Practicum
- ☐ Service Learning
- ☐ Community Service
- ☐ Civic Engagement
- ☐ Creative Works/Senior Project
- ☐ Research
- ☐ Entrepreneurship (program, class, project)

K. TEXTS:

SolidProfessor Subscription: http://app.solidprofessor.com/iframes/studentstore.asp

L. REFERENCES:

American National Standards Institute Drafting Manual Modern Drafting Practices and Standards Manual, by: General Electric and Genium Publishing Corporation
Shih, Randy H. Parametric Modeling with Autodesk Inventor 2014. Mission, Kan.: SDC Publications, 2013. Print. ISBN: 1585037990

M. EQUIPMENT: None ☐ **Needed:** Computer Lab with AUTODesk Inventor

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Exams, Quizzes, Homework & Projects

P. DETAILED COURSE OUTLINE:

I. Threaded, non-threaded fasteners and springs
A. Nomenclature B. Symbolically drawn
C. Use of fasteners
D. Use of Springs
II. Geometric Dimensioning and Tolerancing
A. Datums
B. Material condition symbols
C. Tolerance of form
D. Tolerance of profile
E. Tolerance of orientation
F. Tolerance of runout
G. Locational tolerance
H. Virtual condition
III. Gears
A. Identify the various types

B. Draw and label the nomenclature of a gear
IV. Cams
A. Identify the various types of cams and followers
B. Draw displacement diagrams and cams
V. Weldment Drawing
A. Identify the symbols of welding
B. Correctly place the symbols on a welding drawing
VI. Advanced Assembly Drawing
A. Detail drawing of mating parts
B. Compile an assembly drawing
C. Develop a materials list
D. Purchased parts vs. locally produced

Q. <u>LABORATORY OUTLINE</u>: None ☐ Yes ☒

I. Parametric Modeling Fundamentals
II. Constructive Solid Geometry Concepts
III. Model History Tree
IV. Parametric Constraints Fundamentals
V. Geometric Construction Tools
VI. Parent/Child Relationships and the BORN Technique
VII. Part Drawings and Associative Functionality
VIII. Incorporation of GD&T into Drawings
IX. Datum Features and Auxiliary Views
X. Symmetrical Features in Designs
XI. Advanced 3D Construction Tools
XII. Sheet Metal Designs
XIII. Welding Designs
XIV. Assembly Modeling – Putting It All Together
XV. Content Center and Basic Motion Analysis
XVI. 2D Design Reuse, Collision and Contact
XVII. Introduction to Stress Analysis