

**New Jersey Institute of Technology
Department of Engineering Technology
MNET 303 Advanced Techniques in CAD/CAM**

COURSE NUMBER	MNET 303
COURSE NAME	Advanced Techniques in CAD/CAM
COURSE STRUCTURE	2-2-3 (lecture hr/wk - lab hr/wk – course credits)
COURSE COORDINATOR/ INSTRUCTOR	Dr. S Lieber /See Department
COURSE DESCRIPTION	Applications including hands-on experience with CAD/CAM systems. Emphasis is on understanding how displayed objects are represented and manipulated on the computer. Laboratory experiences contribute to an understanding of the advantages and limitations of CAD/CAM systems.
PREREQUISITE(S)	None
COREQUISITE(S)	None
REQUIRED, ELECTIVE OR SELECTED ELECTIVE	Elective
REQUIRED MATERIALS	See Instructor Syllabus
COMPUTER USAGE	Software: <i>Solidworks</i> .
COURSE LEARNING OUTCOMES(CLO)	By the end of the course students should be able to: <ol style="list-style-type: none">1. Develop CAD models with Parametric CAD software.2. Develop CAM models with CAM software.3. Apply knowledge of Manufacturing and Inspection processes to CAD/CAM.4. Conduct Engineering Analysis with CAD/CAM.5. Prepare Engineering documents/reports.
CLASS TOPICS	Castings and Forging process, CAD sketch and extrude, Cutting Operations (Mill, Wire EDM, Drill), CAD Mirror & Revolve, Helical Sweep, Pattern, CAM Milling/Drilling, CAM Turning, Inspection Methods, CAD Assembly, Geometric Dimensioning & Tolerancing, CAD 3D Annotation, Part and Assembly Drawing Formats/Templates, Working with STEP Files, Sheet Metal Modeling, Additive Manufacturing, CAD Blend and Shell: CAD/CAM Project: <u>Project 1:</u> Each student will describe the manufacturing processes needed to fabricate an existing modeled part. A Project Report will be submitted.

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Project 2: Each student will model the parts for an assembly. Students will prepare engineering drawings for parts and the assembly. Students will conduct engineering evaluation of fit and function. A Project Report will be submitted.

STUDENT OUTCOMES

The Course Learning Outcomes support the achievement of the following MET Student Outcomes and TAC of ABET Criterion 9 requirements:

Student Outcome a - an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities

Related CLO – 1-4

Student outcome b - an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

Related CLO –3-4

Student outcome c - an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

Related CLO – 3-4

Student Outcome d - an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives.

Related CLO – 1-4

Student outcome f - an ability to identify, analyze, and solve broadly-defined engineering technology problems

Related CLO – 3-4

Student Outcome g - an ability to communicate effectively regarding broadly-defined engineering technology activities

Related CLO – 5

Student Outcome m - technical expertise having added technical depth in mechanical design, solid mechanics, and electro-mechanical devices and controls.

Related CLO - 1-4

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GRADING POLICY	Homework	30 %
	Project 1 & 2	20 %
	Two Quizzes	30 %
	Final Exam	20 %

Note: Grading Policy may be modified by Instructor for each Section in the Course)

Note: There are two quizzes during the semester. There will be no makeup quizzes.

ACADEMIC INTEGRITY NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. In the cases the Honor Code violations are detected, the punishments range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT with notations on students' permanent record. Avoid situations where honorable behavior could be misinterpreted. For more information on the honor code, go to <http://www.njit.edu/academics/honorcode.php>

STUDENT BEHAVIOR See Individual Instructor Policies, which can include:

- No eating or drinking is allowed at the lectures, recitations, workshops, and laboratories.
- Cellular phones must be turned off during the class hours – if you are expecting an emergency call, leave it on vibrate.
- No headphones can be worn in class, unless allowed by the professor.
- Unless the professor allows the use during lecture, laptops should be closed during lecture.
- During laboratory, if you are finished earlier, you must show the professor your work before you leave class
- Class time should be participative. You should try to be part of a discussion

MODIFICATION TO COURSE The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course outline.

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PREPARED BY Et Department

COURSE COORDINATED BY S Lieber

MNET 303 - COURSE OUTLINE

Week	Topics
1	Description of Castings & Forgings Introduction to Solid Modeling (Solidworks) <ul style="list-style-type: none"> • Introduction (Chapter 1) • Parametric Modeling Fundamentals
2	Description of Cutting Operations (Mill, Wire EDM, Drill) Solid Modeling: <ul style="list-style-type: none"> • Constructive Solid Geometry Concepts • Idler Arm Part
3	CREO Manufacture <ul style="list-style-type: none"> • Plate Milling & Drilling
4	Description of Turning Operations (Screw Threads) Solid Modeling: <ul style="list-style-type: none"> • Revolve, Helical Sweep, Pattern • Thumb Screw
5	Symmetrical Features in Design
6	Quiz #1 Description of Inspection Methods Solid Modeling: <ul style="list-style-type: none"> • Assembly
7	Project 1 Submitted Dimensioning/Tolerancing & GD&T Part 1 Solid Modeling: <ul style="list-style-type: none"> • Part Drawings & Associative Functionality
8	Dimensioning/Tolerancing & GD&T Part 2 Solid Modeling: <ul style="list-style-type: none"> • Reference Geometry & Auxillary Views
9	Dimensioning/Tolerancing & GD&T Part 3 Solid Modeling: <ul style="list-style-type: none"> • Assembly Drawings
10	Solid Modeling: <ul style="list-style-type: none"> • Sheet Metal Part 1
11	Quiz #2 Solid Modeling: <ul style="list-style-type: none"> • Sheet Metal Part 2
12	Additive Manufacturing Solid Modeling: <ul style="list-style-type: none"> • Blend/Shell

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Week	Topics
	<ul style="list-style-type: none">• Dryer Housing
13	Solid Modeling: <ul style="list-style-type: none">• Family Table
14	Submit Project 2 CSWA Exam Preparation
15	Final Exam