New Jersey Institute of Technology
Department of Engineering Technology
MET 103 Engineering Graphics & Introduction To CAD

COURSE NUMBER MET 103

COURSE NAME Engineering Graphics and Introduction to CAD

COURSE STRUCTURE (1-2-2) (lecture hr/wk - lab hr/wk – course credits)

COURSE COORDINATOR/ INSTRUCTOR Dr. J. Sodhi/ Mark Lanfrank

COURSE DESCRIPTION A first course in Computer Aided Design (CAD), includes lab work using AutoCAD software. Topics include fundamentals of engineering graphics, AutoCAD command structure, setting units and limits, drafting primitives, layering, use of editing tools; grid, snap, and axis commands. Upon successful completion of this course, students should be able to effectively produce two-dimensional drawings using the AutoCAD software program.

PREREQUISITE(S) None.

COREQUISITE(S) None.

REQUIRED, ELECTIVE OR SELECTED ELECTIVE Required.

REQUIRED MATERIALS Instruments: Pencil, Eraser, Scales (Eng. & Arch.), Triangles (30-60 and 45-45), Compass, Protractor.
Text: ***Autodesk Inventor 2025 and Engineering Graphics*** by Randy H. Shih – *SDC* Publications ISBN: 978-1-63057-664-6

COMPUTER USAGE Inventor Professional 2025

COURSE OUTCOMES (CO) By the end of the course students should be able to:

1. Read a blue print.
2. Create standard orthographic views of a three dimensional object by using geometric tools (without CAD software).
3. Create a three dimensional object and standard orthographic views by using Inventor.
4. Show dimensions and tolerances of an object by following the rules.
5. Use Inventor to create Sectional, Auxiliary and Detail/Break views of a three dimensional object.

CLASS TOPICS Introduction to Engineering graphics & CAD, Line types/Geometric constructions, Introduction to Inventor, Scales in Engineering Graphics/Inventor, Shape Description, Orthographic Projections, 3D Visualization, Dimensioning, Sectional Views, Auxiliary Views, Detail/Break views, Axonometric Drawings, Assembly/Working Drawings, Discipline-specific projects.

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STUDENT OUTCOMES

The Course Outcomes support the achievement of the following MET Student Outcomes:

Student Outcome (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
Related CO – 1 thru 5

Student Outcome (2) - an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;.
Related CO – 3 thru 5

GRADING POLICY

Homework	10 %
Project	20 %
Tests (2x20%)	40 %
Final Exam	30 %

Note: There are two tests and a final exam during the semester. There will be no makeup quizzes.

ACADEMIC INTEGRITY

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: NJIT Academic Integrity Code.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

GENERATIVE AI

Student use of artificial intelligence (AI) is permitted in this course for certain assignments and activities. It is not permitted to be used in the assignments noted by the instructor, as doing so would undermine student learning and achievement of course learning outcomes. Additionally, if and when students use AI in this course, the AI must be cited as is shown within the NJIT Library AI citation page for AI. If you have any questions or concerns about AI technology use in this class, please reach out to your instructor prior to submitting any assignments.

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STUDENT BEHAVIOR

- 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 cell phone during exams
- No headphones can be worn in class. No video or audio recording.
- 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.

PREPARED BY Mark Lanfrank / Dr. J. Sodhi

COURSE COORDINATED BY Dr. J. Sodhi

CLASS HOURS

Tuesday 6 – 8:50 PM PC MALL 39

OFFICE HOURS (TBD)

By appointment: mark.lanfrank@njit.edu

HOMEWORK & PROJECT – IMPORTANT ANNOUCEMENTS

Homework

- Homework sets are due one week after they are assigned.
  - Late penalty is minus 25% each week.
  - Assignments more than one week late will not be accepted.
- Homework must be submitted in the format provided by the professor.

Project:

The semester project requires <u>all</u> students to have completed the following Makerspace Training courses:

- Make 101 Introduction to the Makerspace
- Make 102 Introduction to Laser Engraving and Cutting
- Make 103 Introduction to 3D Printing

Your instructor will provide the deadline for completion of training.

- Students who are registered for ET-101 during the same semester as this course will receive these trainings.

- All students can sign up for training through the following link:
    - Training Courses for the NJIT Community | NJIT Makerspace

The project will be conducted in teams.

- Projects are due on the dates indicated.
    - No late projects will be accepted.
- Projects should be submitted in the format provided by the professor.

GRADING LEGEND

GRADE	NUMERIC RANGE
A	90 to 100
B+	85 to 89
B	80 to 84
C+	75 to 79
C	70 to 74
D	60 to 69
F	0 to 59

NJIT ONLINE INFORMATION

The instructor will discuss these requirements on the first day of the course and/or post on their Learning Management System (LMS). Please become familiar

- Canvas: https://canvas.njit.edu/
- Zoom: https://njit-edu.zoom.us/
- Online Proctoring: https://ist.njit.edu/online-course-exam-proctoring

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COURSE OUTLINE

Wk	Date	Topic	Assignments
1	Jan 21	Introduction to Engineering graphics & CAD (Chapter 1) Pictorials and Sketching-By Hand (Ch. 10) Introduction of Semester Project	Ch. 10-Exercise 1, 4, 5
2	Jan 28	Parametric Modeling Fundamentals (Ch. 2) Constructive Solid Geometry Concepts (Ch. 3)	Ch. 2-Exercise 1,3,4 Ch. 3-Exercise 1,3,5
3	Feb 4	Geometric Construction-By Hand & CAD (Ch. 4)	Ch. 4-Exercise 2,4,6
4	Feb 11	Orthographic Projection and Multiview Constructions-By Hand (Ch. 7: 7-1 thru 7-45) Part 1	Study For Exam
5	Feb 18	Orthographic Projection and Multiview Constructions-By Hand (Ch. 7: 7-1 thru 7-45) Part 2 **Test #1**	Proposed Project
6	Feb 25	Model History Tree (Ch. 5) Geometric Construction Tools (Ch. 6) **Proposed Project Due**.	Ch. 5-Review Question 7 Ch. 5-Exercise 2,4 Ch. 6-Exercise 2,4,6
7	Mar 4	Orthographic Projection and Multiview Constructions (Ch. 7: 7-46 thru 7-84)	Ch. 7-Exercise 1,3,6
8	Mar 11	Dimensioning and Notes (Ch. 8) Tolerancing and Fits (Ch. 9) Part 1	Ch. 8-Exercise 1,2,4 Ch. 9-Review Qu. 1-6
9	Mar 25	Tolerancing and Fits (Ch. 9) Part 2 **Test #2**	Ch. 9-Exercise 1-3
10	Apr 1	Auxiliary Views and Reference Geometry (Ch. 11)	Ch. 11-Exercise 1, 3
11	Apr 8	Section Views & Symmetrical Features in Design (Ch.12)	Ch. 12-Exercise 6, 7
12	Apr 15	Assembly Modeling and Working Drawings (Ch.14)	Ch. 12-Exercise 1
13	Apr 22	Threads and Fasteners (Ch. 13)	Project Report & Presentation
14	Apr 29	**Project Report Due & Team Presentations**	
15	TBD	**Final Examination (Cumulative)**	