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Spring 1-1-2020

Met 103-102: Engineering Graphics and Introduction to CAD

Mark Lanfrank

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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. A. Sengupta/ Mark Lanfrank, PE |
| COURSE DESCRIPTION | Basic principle of Engineering Graphics, blueprint reading and geometric constructions are reviewed. Multi-view projections and 3D visualization are introduced. CAD software named Inventor Professional is studied extensively. Using Inventor students learn dimensioning, creating Sectional, Auxiliary and Detail/Break views. |
| 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: <i>Autodesk Inventor 2020 and Engineering Graphics</i> by Randy H. Shih – SDC Publications |
| COMPUTER USAGE | Inventor Professional 2020 |
| COURSE LEARNING OUTCOMES (CLO) | By the end of the course students should be able to: <ol style="list-style-type: none">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 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 thru 5

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

Related CLO – 3 thru 5

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|-----------------------|--------------------------------|------|
| GRADING POLICY | Homework & class participation | 15 % |
| | Tests (2x25%) | 50 % |
| | Final Exam | 35 % |

Note: You may not pass the course if you are having failing grades (<60%) on the tests and final exam.

There are two tests and a final exam during the semester.

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**
- 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

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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 COURSE Mark Lanfrank, PE

COORDINATED BY Dr. A. Sengupta

CLASS HOURS

Monday 6:00 PM – 8:50 PM FENS 160

OFFICE HOURS (TBD)

Wednesday 02:30 PM – 04:00 PM (by appointment only)

Tuesday 02:30 AM – 05:00 PM (by appointment only)

Or by appointment: (973) 596-6072 or ml56@njit.edu

HOMEWORK - IMPORTANT

Homework is **due the week following the date they are assigned, and must be given to the instructor.**

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 |

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COURSE OUTLINE

| Week # | Date | Topic | Chapter (Assignments) |
|-------------------------------|-------------|---|----------------------------------|
| 1 | 1/27 | Introduction to Engineering graphics & CAD | 1 |
| | | Pictorials and Sketching (BY HAND) | |
| 2 | 2/3 | Geometric Construction (BY HAND) | |
| | | Orthographic Projection and Multiview Constructions (BY HAND) | |
| 3 | 2/10 | Parametric Modeling Fundamentals | 2 |
| | | Constructive Solid Geometry Concepts | 3 |
| 4 | 2/17 | Geometric Construction | 4 |
| 5 | 2/24 | Model History Tree, Test #1 | 5 |
| 6 | 3/2 | Geometric Construction Tools | 6 |
| 7 | 3/9 | Orthographic Projection and Multiview Constructions | 7 |
| SPRING BREAK 3/15-3/22 | | | |
| 8 | 3/23 | Dimensioning and Notes | 8 |
| 9 | 3/30 | Tolerancing and Fits | 9 |
| 10 | 4/6 | Pictorials and Sketching, Test #2 | 10 |
| 11 | 4/13 | Section Views & Symmetrical Features in Design | 12 |
| 12 | 4/20 | Auxiliary Views and Reference Geometry | 11 |
| | | Break view & Detail view | |
| 13 | 4/27 | Threads and Fasteners | 13 |
| 14 | 5/4 | Assembly Modeling and Working drawings | 14 |
| | | Review | |
| 15 | TBA | Final Examination (Cumulative) | |