

Western Michigan University
Department of Engineering Design, Manufacturing and Manufacturing Systems
EDMM 1420 (Engineering Graphics)

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Catalog Description: Essentials of engineering graphics including technical sketching, CAD applications, applied geometry, orthographic projection, section, dimensioning, tolerances, threads and fasteners, weldments, detail and assembly drawing, charting and basic elements of descriptive geometry. All work is according to current ANSI drafting standards. Previous technical drawing is recommended.

Lecture/Lab: (2-3), Credit: 3hrs.

Prerequisite: High school Math, Algebra, Geometry, Trigonometry and Calculus.

Prerequisite by Topic:

1. Ability to perform mathematical operations such as addition, subtraction, multiplication, division, etc.
2. Ability to measure and calculate length, angle, scale, area/volume, etc and their conversions.
3. Understanding of and ability to recognize and reason geometry; identify trigonometric characteristics of geometric shapes i.e., circle, triangle, square, rectangle, etc.
4. Ability to use basic tools to draw such as ruler, pencil, eraser, compass, divider, protractor, etc.
5. Successfully completed basic Algebra and Geometry courses.
6. Basic computer and internet literacy; ability to save, copy, rename, modify and submit electronic files; access e-mail accounts; ability to access internet sites and download files

Books and supplies (Required):

1. Textbook - ENGINEERING GRAPHICS, Giesecke, (8th edition)-Required
2. Workbook – ENGINEERING DRAWING, Problem Series 1, Giesecke F. E. - Required
3. Manual - LEARNING THE ESSENTIAL CONCEPTS OF ENGINEERING GRAPHICS AND AUTOCAD 2016, Slobodan Urdarevik (fifth edition) – Required
4. *Drafting Kit -Contents: Pencils (2 – 0.5 and 0.7 mm), eraser (1), flat scale Inch and Metric, 2 Triangles, Compass - Required
5. Grid papers (10) and Isometric grid papers (10)

* Available at WMU Bookstore (Bernhard Center) only.

Objectives:

In accordance with the stated course description, at the conclusion of the semester the student should be able to:

1. Understand characteristics of design process and role of Modeling CAD Graphics in Design.
2. Visualize and produce two-dimensional graphical representations of three-dimensional objects
3. Comprehend and visualize three-dimensional geometry from two-dimensional graphical representations.
4. Produce, graphically, size and shape descriptions of objects with multi-view orthographic projections, graphically display and manipulate numerical quantities, and demonstrate sufficient skill to make useful drawing, manually and with CAD.

Grading scale for this course is as follows:

<u>Evaluation</u>	<u>Percentile</u>
1. Weekly Lab and Home work	40%
2. Quizzes (unannounced)	20%
3. Midterm Exam	20%
4. Final Practical Exam	20%

<u>Overall Score</u>	<u>Grade</u>	<u>Significance</u>
94% - 100%	A	Outstanding
88-93 %	BA	
84-87 %	B	Very Good
78-83 %	CB	
74-77 %	C	Satisfactory
68-73 %	DC	
60-67 %	D	Poor
59 % or Below	E	Failing

Class schedule (projected):

Weeks	Topics
1	Lec: Introduction to the course, syllabus, overview of engineering design process and documentation, title block, lettering, line types, geometric construction (*Ch. 1, 2, 3, 4, and 5), Basics of the AutoCAD program (Δ Ch.1,2,4)
2	Lec: Orthographic sketching, orthographic projections (*Ch. 6); (Δ Ch.3) AutoCAD: Using Draw and Modify Toolbars, (Δ Ch.5,6) Lab: Instructions on computer accounts, e-mail, basics of AutoCAD Lettering, sketching, geometric constructions, title block, basics of AutoCAD
3	Lec: Multiview drawing, relationships between orthographic views, missing lines and views, isometric sketches (*Ch. 6); (Δ Ch.10). Object Snap Toolbar, 2D drawing in AutoCAD (Δ Ch.7). Lab: Orthographic and isometric sketches, missing lines and views, 2D drawing in AutoCAD
4	Lec: Layers, putting text on a drawing (Δ Ch.8,9). Properties, Zoom, Pan Realt. Lab: Orthographic and isometric drawings, multiview drawing in AutoCAD
5	Lec: Constructing objects, Overall dimensions, Editing of objects, Isometric drawings in AutoCAD (Δ Ch.11). <u>Review for midterm exam</u> Lab: AutoCAD 2D drawing, AutoCAD ISO drawing
6	Lec: Dimensioning (Δ Ch.12). Auxiliary views (Δ Ch.14), (*Ch. 8) Lab: MIDTERM EXAM DURING LAB PERIOD.
7	Lec: Blue print reading, Introduction to sections and conventions (*Ch.7), (Δ Ch.15) Lab: Auxiliary view, blue print reading, AutoCAD 2D drawing
8	Lec: Sections (hatching) in AutoCAD (Δ Ch.15), Viewports (Δ Ch.17) Lab: Sections, viewports
9	No class, Spring break
10	Lec: Dimensioning systems, Dimension styles and dimensioning variables in AutoCAD (Δ Ch.12,13) Lab: AutoCAD 2D drawing with dimensions
11	Lec: Symbols in engineering drawing, welding, hydraulic, civil and electrical drawings, AutoCAD Design Center, Blocks (Δ Ch.18). Machining and Surface Finish Symbols. Introduction to 3D Solid modeling (Δ Ch.19) Lab: Using design center and blocks, AutoCAD 3D drawing
12	Lec: 3D Solid modeling (Δ Ch.19). Threads and fasteners (Δ Ch.20). Lab: AutoCAD drawing using design center and blocks, AutoCAD 3D drawing
13	Lec: Basics of Inventor 2016 program (Δ Ch.21, Appendix 9). Working with Viewports in layouts (Δ Ch.17, Δ Ch.21 Appendix 5). Printing and plotting (Δ Ch.2), Tolerances, GD & T (*Ch.12), (Δ Ch.13) Lab: AutoCAD 3D drawing. Inventor 2016 drawing. Tolerance dimensioning.
14	Lec: 3D Solid modeling, concepts in creating drawings. <u>Review for final exam.</u> Lab: Tolerances
15	Lec: Regular class, preparation for finals Lab: FINAL EXAM DURING THE LAB HOUR

* ENGINEERING GRAPHICS, Giesecke (8th edition) - Textbook

Course Policies:

1. **Attendance in scheduled lecture and lab class is mandatory.** The student must notify the lecture/lab instructor prior to the scheduled meeting of unavoidable absences. Make-up for missed quizzes will not be allowed. Also, there will be no make-up opportunity for any missed activity due to an unexcused absence in lecture, lab or exams.

Academic Honesty: Experiments are best done with others as a group. Write-ups will be done as an individual. Failure to observe this directive will result in the penalties outlined in the University policy on academic honesty. You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate and Graduate Catalogs that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. [The policies can be found at <http://catalog.wmich.edu> under Academic Policies, Student Rights and Responsibilities.] If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.

2. **All scheduled assignments of the week will be due at the beginning of the lab,** unless approved otherwise by your lab instructor. In class assignments are due before the end of lab hour. No late assignments will be accepted for credit. There will be no extra credit work for making up of lost grade or poor performance.
3. Your instructor will require **access to your computer account** at any time for the purpose of evaluating your work. It is mandatory that you provide necessary account information as and when needed to your instructors. No credit will be given for those assignments/activities that cannot be evaluated on time due to unavailability of your account information from you.
4. Each lab and homework assignments will be graded according to the lab assignments paper. Zero credit shall be assigned to the missed assignments.
5. A minimum grade of **50 %** is expected **in most Evaluation Items** (on earlier page under “Grading”) in order to receive an overall **passing grade** in the course.
6. Office hours of lab instructors will be announced and posted on their office door (CEAS C-213). Any EDMM 1420 student can be assisted by ANY lab instructor during their scheduled office hours.
7. Students may evaluate their own performance based on the scale provided in the syllabus and their own record of individual grades received. Lab instructors do not have the authority to establish individual letter grades. No one can promise you a grade for the course prior to the official grade calculations by the instructor.