

Course Title: **MECHANICAL DRAFTING 2**

8/07

Credit: ½ Unit – 1 Semester

Instructor: L. Westphal

Prerequisite: Successful completion of Exploratory Mechanical Drafting

Text: BASIC TECHNICAL DRAWING, SPENCER/DYGDON

Course Purpose:

The purpose of this course is to develop knowledge, understanding, and application of the mechanical drawing conventions that are related to the fields of engineering, design, and manufacturing. The students should develop the skills and abilities required to make such drawings with instruments and primarily the computer. Students will use both 2-D (AutoCAD-LT) and 3-D (Solidworks) drafting programs. Students considering careers in Mechanical Drafting and Design, Engineering, Tool & Die, CNC Machining, Cabinetmaking, etc. will benefit from this course.

Course Outcomes:

The student will:

1. Determine if he/she has the skills and interests to pursue a career related to the drafting field.
2. Develop the ability to competently make various types of drawings required by industry using instruments and the computer.
3. Recognize that accuracy, technique, speed and neatness are important to being successful in a drafting environment.
4. Develop his/her ability to work cooperatively with others.
5. Learn to analyze and think critically by moving from the abstract to the concrete in the drawing process.

Course Goals:

The student will:

1. Learn to recognize that God's gifts of time and talent are to be appreciated and utilized.
2. Learn more about himself/herself as to his/her ability to think and see abstractly and problem solve.
3. Value his/her math classes as they relate to the field of drafting.

COURSE OUTLINE:

Unit 1: Introduction to the Graphic Language

- * Learn the steps of the manufacturing process and the role that drafting plays in it.
- * Learn and use proper lettering techniques.
- * Learn the purpose of sketching in the manufacturing process
- * Review the 3 basic views of a working drawing
- * Review the different kinds of lines used in drafting and their purpose
- * Apply proper sketching techniques to create pictorial and working drawings

TEXT: Pg. 7-14, 19-26, 50-57, 83-100

Number of days: 12-15

S.O. - 2, 3, 4, 5, 6

D.O. – 2.1, 2.4, 3.1, 3.2, 3.3, 3.4, 5.1, 5.2, 5.4, 6.1, 6.2, 6.3

W.S.S. - B1, B2, B8

Unit 2: Mechanical Drafting and Geometric Construction

- * Learn to identify basic geometric shapes
- * Learn the value of proper construction of basic geometric figures
- * Review the proper use of mechanical drafting tools
- * Apply proper construction techniques in making several one-view working drawings

TEXT: Pg. 27-47, 69-82

Number of days: 13-15

S.O. - 2, 4, 6

D.O. – 1, 2.1, 2.4, 3.1, 3.2, 3.3, 3.4, 5.1, 5.4, 6.1, 6.2, 6.3

W.S.S. - B8

Unit 3: Computer-Aided-Drafting (CAD)

- * Learn the importance of modern technology in the manufacturing process by describing the advantages of using a CAD software program for drafting
- * Learn and apply the basic commands of a CAD program by creating multi-view working drawings with dimensions.
- * Learn to differentiate the various applications of dimensioning rules.
- * Apply the rules of dimensioning by drawing several plates.

TEXT: Pg. 123-130 & 141-147

Number of days: 32-37

S.O. - 2, 4, 6

D.O. – 1.1, 3.1, 3.2, 3.3, 3.4, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.3

W.S.S. - B1, B2, B8

Unit 4: Architectural Computer-Aided-Drafting

- * Define architectural drafting
- * Learn the basic architectural CAD commands
- * Learn proper architectural drafting rules and conventions
- * Demonstrate knowledge of conventions and commands by drawing a detail section and floor plan

TEXT: None CAD software: AutoCAD LT

Number of days: 5-7

S.O. - 2, 4, 6

D.O. – 3.1, 3.2, 3.3, 3.4, 5.1, 5.3, 5.4, 6.1, 6.2, 6.3

W.S.S. - A2,A7, B1, B2, B3, B5,B6,B7, B8, D4

Unit 5: 3-D Drafting

- * Learn the importance of using a 3-D drafting program in designing solid objects
- * Learn the basic commands of a 3-D drafting program

TEXT: None CAD software: Solidworks

Number of days: 5-7

S.O. - 2, 4, 6

D.O. – 3.1, 3.2, 3.3, 3.4, 5.1, 5.3, 5.4, 6.1, 6.2, 6.3

W.S.S. - A2,A7, B1, B2, B3, B5,B6,B7, B8, D4

Unit 6: Career Exploration

*Learn about the opportunities for careers in mechanical and architectural drafting.

*Evaluate God-given talents related to career opportunities.

TEXT: None

Number of days: 1

S.O. - 5

D.O. – 3.3

W.S.S. - None

INSTRUCTIONAL STRATEGIES:

Lecture and demonstration: 10%

Class discussion: 5%

Individual classroom lab work: 85%

GRADING:

Quizzes + Drawings: 100% Each Quarter

Quarter 1 = 40%

Quarter 2 = 40%

Final Exam: 20%

APPENDIX:

COURSE: MECHANICAL DRAFTING 2
INSTRUCTOR: LEE WESTPHAL

Unit One: Introduction to the Graphic Language

- 2.1 Assist others in a common goal
- 2.4 Encourage others
- 3.1 Recognize the need to be a life-longer learner
- 3.2 Identify and evaluate trends in the work place
- 3.3 Identify their own personal abilities and interests
- 3.4 Develop their gifts
- 5.1 Apply mathematical and scientific principles to industrial applications
- 5.2 Explore technologies
- 5.4 Produce products with high quality standards
- 6.1 Follow verbal and written direction
- 6.2 Communicate clearly and precisely
- 6.3 Read technical literature and/or drawings effectively

Unit Two: Mechanical Drafting and Geometric Construction

- 1.1 Apply the problem-solving process to challenging situations
- 2.1 Assist others in a common goal
- 2.4 Encourages others
- 3.1 Recognize the need to be a life-longer learner
- 3.2 Identify and evaluate trends in the work place
- 3.3 Identify their own personal abilities and interests
- 3.4 Develop their gifts
- 5.1 Apply mathematical and scientific principles to industrial applications
- 5.4 Produce products with high quality standards
- 6.1 Follow verbal and written direction
- 6.2 Communicate clearly and precisely
- 6.3 Read technical literature and/or drawings effectively

Unit Three: Computer-Aided-Drafting

- 1.1 Apply the problem-solving process to challenging situations
- 3.1 Recognize the need to be a life-longer learner
- 3.2 Identify and evaluate trends in the work place
- 3.3 Identify their own personal abilities and interests
- 3.4 Develop their gifts
- 5.1 Apply mathematical and scientific principles to industrial applications
- 5.2 Explore technologies
- 5.3 Produce products by using current technology
- 5.4 Produce products with high quality standards
- 6.1 Follow verbal and written direction
- 6.2 Communicate clearly and precisely
- 6.3 Read technical literature and/or drawings effectively

Unit Four: Architectural Computer-Aided-Drafting

- 3.1 Recognize the need to be a life-longer learner
- 3.2 Identify and evaluate trends in the work place
- 3.3 Identify their own personal abilities and interests
- 3.4 Develop their gifts
- 5.1 Apply mathematical and scientific principles to industrial applications
- 5.3 Produce products by using current technology
- 5.4 Produce products with high quality standards
- 6.1 Follow verbal and written direction
- 6.2 Communicate clearly and precisely
- 6.3 Read technical literature and/or drawings effectively

Unit Five: 3-D Drafting

- 3.1 Recognize the need to be a life-longer learner
- 3.2 Identify and evaluate trends in the work place
- 3.3 Identify their own personal abilities and interests
- 3.4 Develop their gifts
- 5.1 Apply mathematical and scientific principles to industrial applications
- 5.3 Produce products by using current technology
- 5.4 Produce products with high quality standards
- 6.1 Follow verbal and written direction
- 6.2 Communicate clearly and precisely
- 6.3 Read technical literature and/or drawings effectively

Unit Six: Career Exploration

- 3.3 Identify their own personal abilities and interests

WISCONSIN STATE STANDARDS

Unit 1: Introduction to the Graphic Language

- B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
- B2 Demonstrate how systems are planned, organized, designed, built, and controlled
- B8 Select and apply appropriate processes to transform information into its most useful format

Unit 2: Mechanical Drafting and Geometric Construction

- B8 Select and apply appropriate processes to transform information into its most useful format

Unit 3: Computer-Aided-Drafting (CAD)

- A2 Understand that humans are faced with moral and ethical issues because technology is enabling very significant modifications to the natural world
- A7 Explain how scientific and technological research can contribute to improved quality of life and a better standard of living
- B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
- B2 Demonstrate how systems are planned, organized, designed, built, and controlled
- B5 Asses the impact new and improved products and services have had on the quality of life; explain how the development of new tools, materials and processes is

- necessary to maintain and improve high productivity and quality
- B6 Show how new knowledge is usually, by design or otherwise, an outcome of technological activity that contributes to the exponential growth of technological knowledge
- B7 Explain how new and higher quality products require new and higher quality materials and processing techniques
- B8 Select and apply appropriate processes to transform information into its most useful format
- D4 Evaluate the relative appropriateness of a given technology by comparing the risks with the benefits or the advantages with the disadvantages

Unit 4: Architectural Computer-Aided-Drafting

- A2 Understand that humans are faced with moral and ethical issues because technology is enabling very significant modifications to the natural world
- A7 Explain how scientific and technological research can contribute to improved quality of life and a better standard of living
- B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
- B2 Demonstrate how systems are planned, organized, designed, built, and controlled
- B5 Asses the impact new and improved products and services have had on the quality of life; explain how the development of new tools, materials and processes is necessary to maintain and improve high productivity and quality
- B6 Show how new knowledge is usually, by design or otherwise, an outcome of technological activity that contributes to the exponential growth of technological knowledge
- B7 Explain how new and higher quality products require new and higher quality materials and processing techniques
- B8 Select and apply appropriate processes to transform information into its most useful format
- D4 Evaluate the relative appropriateness of a given technology by comparing the risks with the benefits or the advantages with the disadvantages

Unit 5: 3-D Drafting

- A2 Understand that humans are faced with moral and ethical issues because technology is enabling very significant modifications to the natural world
- A7 Explain how scientific and technological research can contribute to improved quality of life and a better standard of living
- B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
- B2 Demonstrate how systems are planned, organized, designed, built, and controlled
- B5 Asses the impact new and improved products and services have had on the quality of life; explain how the development of new tools, materials and processes is necessary to maintain and improve high productivity and quality
- B6 Show how new knowledge is usually, by design or otherwise, an outcome of technological activity that contributes to the exponential growth of technological knowledge
- B7 Explain how new and higher quality products require new and higher quality materials and processing techniques
- B8 Select and apply appropriate processes to transform information into its most useful format
- D4 Evaluate the relative appropriateness of a given technology by comparing the risks with the benefits or the advantages with the disadvantages

Unit 6: Career Exploration

W.S.S. - None

