

Mercer County Community College

Arts, Communication and Engineering Technology Division

DRA 248

Modeling with AUTOCAD Mechanical Desktop

COURSE DESCRIPTION:

Exploratory course using AUTOCAD Mechanical Desktop™ software. Students build intelligent 3-D models of their designs using this parametric, feature based modeling software. After refinement, 2-D dimensioned drawings are created automatically from the 3-D model.

Text (s): **Reference Division Booklist**

Prerequisites: **DRA190**

Corequisites: **None**

Credits: **3** Lecture Hours: **2** Studio/Lab Hours: **2**

Course Coordinator: **W. D. Crawford**

Latest Review: **2004**

GENERAL COURSE OBJECTIVES:

1. The student will learn to use the AUTOCAD Mechanical Desktop™ parametric design software as a sketch pad in the design process.
2. The student will learn to develop preliminary dimensioned working drawings from conceptual designs.
3. The student will learn how to change a conceptual designs features as the design process evolves through refinement.
4. The student will gain an understanding of the inherent strengths, weaknesses, and capabilities of a computer aided design system.
5. Students will gain an insight into the evolving world of computer aided design and how this evolution will affect them.

Unit I: THE DESIGN PROCESS AND SKETCHING

- A. Unit Length:** 3 Weeks
- B. Text Reference:** Chapters 1, 2, & 3
- C. Unit Description:** Getting started by using the design process to create a base feature of your design. Sketches are refined and constraints added in preparation for adding features.
- D. Specific Objectives:**
1. The students will learn how to use the sketching commands within AUTOCAD Mechanical Desktop™.
 2. The student will learn how to use sketch planes and work planes.
 3. The student will learn how to apply constraints to their sketched models.
 4. The student will learn how to dimension a sketch.
 5. The student will learn how to use the built-in parametric dimensioning.
- E. Method of Instruction:**
- This unit will be taught with illustrated lectures and demonstrations using the video net. Lab exercises will reinforce and allow students to practice the principles being taught.
- F. Evaluation:**
- This unit can best be evaluated by several short quizzes using the computer to solve appropriate problems relevant to the concepts being studied.

Unit II: DEVELOPING PART FEATURES

- A. Unit Length:** 8 Weeks
- B. Text Reference:** Chapters 4, 5, 6, 7, 8, 9, & 10
- C. Unit Description:** Geometric solid and work features are added to the constrained sketches developed in the previous unit. After any needed modification, parametric feature dependencies and relationships are defined.
- D. Specific Objectives:**
1. The student will learn how to apply geometric features to their constrained sketches.
 2. The student will learn how to apply work features to their constrained sketches.
 3. The students will learn how to modify or edit applied features.
 4. The student will learn to manipulate feature dependencies and relationships.
 5. The student will learn to create a sweep using sketches and develop it into a feature.
- E. Method of Instruction:**
- Real-time demonstrations on the Video Net System and illustrated lectures will be used to provide instruction for this unit.
- F. Evaluation:**
- Either written or computer based tests or quizzes will be used to evaluate the attainment of the unit objectives.

Unit III: CREATING DRAWINGS

- A. Unit Length:** 4 Weeks
- B. Text Reference:** Chapters 11, 12, 13, & 14
- C. Unit Description:** Using AUTOCAD Mechanical Desktop™ in drawing mode. Creating 2-D drawings with many different views in paper space. Editing and dimensioning views is also covered.
- D. Specific Objectives:**
1. The student will learn to create base and parent views of a part.
 2. The student will learn to create auxiliary and sectional views of a part.
 3. The student will learn to create isometric views of a part.
 4. The student will edit (modify) various views of a part.
 5. The student will learn to dimension and annotate drawings of various parts.
- E. Method of Instruction:**
- Illustrated lectures and video net demonstrations will be used to provide instruction for this unit. Additional video tapes of dimensioning techniques, sectioning methods, etc. will also be used if necessary.
- F. Evaluation:**
- Short "to the point" computer based quizzes will be used to evaluate the attainment of the unit objectives.

COURSE GRADING:

While the exact procedures for course grading will be left up to the individual instructor, the following guidelines will apply:

1. Assignments: All assignments will be graded on an A+ to F basis. Late assignments will be subject to grade reductions of one letter grade per day. After five days, assignments will not be accepted. Assignments not turned in will be recorded as a zero grade. (40% of final grade)
2. Quizzes: Quizzes may be given at any time during the class. They may be written or performance based, and students may or may not be given prior notice. Quizzes missed because of student absence may not be made up and will be recorded as a zero. (20% of final grade)
3. MidTerm Exam: A midterm exam will be given during the eighth week of the semester. (15% of final grade)
4. Final Exam: A comprehensive final examination will be administered during the regular college final examination period. (25% of final grade)
5. Final Grade Calculation: Your final grade will be calculated by averaging all of your grades and weighing them as indicated above.