Lake Highlands High School
Richardson Independent School District
Career and Technology Education

COURSE SYLLABUS – 2014 - 2015
CT7124 / DFTG-1309-83930 Basic CAD

OurMissionStatement:
Inspire Individual Greatness and Meaningful Careers for All!

CATALOG DESCRIPTION
Introduction to computer aided drafting. Emphasis placed on setup; creating and modifying geometry; storing and retrieving predefined shapes; placing, rotating, and scaling objects, adding text and dimensions, using layers, coordinate systems, and plot/print to scale.

COURSE LEARNING OUTCOMES
Demonstrate the use of CAD hardware and software to create, display, and plot/print working drawings.
In addition: This is the first course in computer-aided design which can be used by electronics and mechanical technicians, architects and landscape architects or anyone who finds it necessary to learn to use a CAD system to produce graphics or interface with design software. Two dimensional multiview drawings and three dimensional models will be produced.
COURSE DESCRIPTION:

Course Number: CT 7124

Course Title: BASIC COMPUTER AIDED DRAFTING

Credit Hours: 3      Lecture Hours: 2      Lab Hours: 4

Suggested Prerequisites: None

Introduction to computer-aided drafting. Emphasis placed on setup; creating and modifying geometry; storing and retrieving predefined shapes; placing, rotating, and scaling objects, adding text and dimensions, using layers, coordinate systems, and plot/print to scale.

TEXTBOOK:


Supplies & Learning Tools:
Calculator
Computer
Internet Access

COURSE REQUIREMENTS:

Students are encouraged to participate in on-line chat sessions, complete and submit assigned material in for grading. To receive full credit for your work, assignments must be turned in on or before the due date of assignment, unless otherwise specified by the instructor. Late work will be accepted but only partial credit will be given. Students must participate and complete lab assignments during the scheduled lab time, unless alternative arrangements are made.

METHOD OF PRESENTATION:

The class will be presented using formats that will include on-line video lectures, Video demonstrations, discussion board posting and/or group on-line activities. Student participation and interaction is expected during scheduled on-line chat sessions.
METHOD OF EVALUATION:

Evaluation will be based upon completion of all assigned work. The course average will be computed as follows:

- Research Project: 10%
- Laboratory Grade: 65%
- Mid-Term Final Exam: 10%
- Final Exam: 15%

Unless otherwise specified by the instructor, the grading system will be:

- 90 - 100 .....A
- 80 - 89.......B
- 70 - 79.......C
- 60 & below..F

CLASSROOM POLICIES:

Determined by Instructor

CLASSROOM FOOD AND DRINK POLICY:

Food and drink are not allowed in the classroom.

ACADEMIC PROGRESS:

Students are encouraged to discuss academic goals and graduation goals with their instructors.

SYLLABUS CHANGE DISCLAIMER:

The instructor reserves the right to amend syllabus and/or course outline as necessary.

COURSE OBJECTIVES

1.00 Demonstrate 2-D geometry construction
   - 1.01 Utilize geometry creation commands
   - 1.02 Employ drawing layout procedures
   - 1.03 Demonstrate CAD drawing setup process
   - 1.04 Control (types and colors) line characteristics
   - 1.05 Demonstrate multiple object creation techniques
1.06 Determine most efficient process for drawing creation
1.07 Control drawing viewing area
1.08 Demonstrate text creation

2.00 Demonstrate 2-D geometry editing

2.01 Apply object selection editing techniques
2.02 Apply drawing editing procedures
2.03 Revise existing dimensioned objects
2.04 Scale, move, and rotate entities
2.05 Represent fillets, rounds, holes, chamfers, and runouts
2.06 Demonstrate text editing

3.00 Create production drawing-details

3.01 Create necessary views using orthographic projection
3.02 Explain orthographic view design representation
3.03 Produce orthographic view detail drawings
3.04 Use metric, engineer's, and architect's units
3.05 Establish standard conforming dimensioning parameters
3.06 Use baseline and datum dimensioning process
3.07 Produce unilateral and bilateral tolerance dimensions
3.08 Layout a sectioned view
3.09 Demonstrate choosing and positioning hatch patterns, mixed hatch patterns

4.00 Demonstrate geometric constructions

4.01 Construct polygons
4.02 Bisect a circular arc
4.03 Bisect an angle
4.04 Divide a line into equal parts
4.05 Set off a distance along a line
4.06 Draw a line through a point and perpendicular to a line
4.07 Draw a triangle with side given
4.08 Draw a right triangle with one side and hypotenuse given
4.09 Draw a circle through three points
4.10 Draw a circle tangent to a line at a given point
4.11 Construct line tangent to two arcs or circles
4.12 Construct arc tangent to two lines
4.13 Construct arc tangent to two arcs
4.14 Set off a given length along a given arc

5.0 Customize a CAD environment

5.01 Set preferences
5.02 Set CAD environment variables
5.03 Change Program properties
5.04 Display and hide toolbars

6.0 Demonstrate specific CAD/Computer Skills

6.01 Demonstrate file(deleting, copying and renaming) manipulation
6.02 Identify system requirements to run CAD software
6.03 Demonstrate software menu manipulation
6.04 Describe drawing file naming guidelines
6.05 Adjust plotting parameters
6.06 Produce a drawing plot and position correctly on page

7.00 Math Course Goals

7.01 Demonstrate math operations involving angles
7.02 Addition of whole numbers and decimal fractions
7.03 Subtraction of whole numbers and decimal fractions
7.04 Multiplication of whole numbers and decimal fractions
7.05 Division of whole numbers and decimal fractions
7.06 Express common fractions as decimal fractions
7.07 Convert millimeter-inch equivalents
7.08 Identify common polygons
7.09 Define properties of circles
7.10 Find areas of shapes

8.00 Cost Analysis

8.01 Construct a 2D Multi-View drawing
8.02 Calculate the volume of the part from your detailed drawing
8.03 Manually calculate the volume of part
8.04 Employ technology (AUTOCAD) and confirm manual volume calculations
8.05 Explore the functionality of part and define the physical and mechanical requirement and select material
8.06 Calculate the material cost per part
8.07 Estimate production cost per manufacturing process chosen to produce part.
Compose a cost analysis report, identifying manufacturing processes used in industry to manufacture part/s. Document all resources during your investigation. Be prepared to defend your choice of material and manufacturing process.

**Guidelines for Research**

Investigate manufacturing processes available to engineers in today’s rapidly changing, but advanced technological world and predict which manufacturing process would be appropriate and cost effective to produce designed part.

Compose a short presentation on the manufacturing process that you have chosen to produce part and reasons for choosing process and material. Feel free to include videos (YouTube), Power Points and any other creative tools that demonstrate and help translate the manufacturing process identified.

**MAXIMIZE RESOURCE ALLOCATIONS**

Allocate time by organizing class time to accomplish class activities and assignments. Feedback on observed effective use of available time will be provided.

Estimate the materials and manufacturing cost for one part per a cost analysis. (Project Proposal 8.00)

**USE INFORMATION SKILLS**

Acquire, Evaluate, Organize, Maintain, Interpret, Communicate, and Process Computer information through means such as lectures, literature, computer resources, lab reports, portfolios, and group discussions to accomplish class requirements and successfully achieve the learning outcomes.

Acquire information by contacting material resellers and determine raw material cost to manufacturing part. (Project Proposal 8.00)

Evaluate Information by collecting and evaluating system data and comparing it to calculated results.

Evaluate information by reviewing the information acquired during proposal and determining the manufacturing process and part price to produce. (Project Proposal 8.00)

Interpret information gathered from the manufacturing industry and calculate the part weight/volume, cost of raw material and manufacturing cost. (Project proposal 8.00)
Communicate information by giving an oral report and submitting cost analysis for evaluation.

EMPLOY INTERPERSONAL SKILLS
Participate as a team member by interacting within groups during lab or group projects. Feedback on observed team participation will be provided.

USE TECHNOLOGY
Select Technology by identifying electronic, electromechanical, and/or computer resources to accomplish a defined task.

Apply Technology by utilizing electronic test equipment and computer applications to analyze electronic circuits.

Maintain Technology by monitoring, evaluating, adjusting, and repairing electronic equipment.

Troubleshoot technology by applying troubleshooting techniques as needed to interact, assess, and correct system malfunctions.

ENHANCE BASIC SKILLS
Demonstrate (technical) writing skills through written lab reports, technical presentations, etc.

Demonstrate listening skills by acquiring, interpreting, and evaluating data from lectures and group discussions required for class assignments.

Demonstrate reading competence through the understanding and interpretation of written materials, including texts, manuals, graphs, tables, schedules, and charts to explain or solve engineering technology problems.

Demonstrate arithmetic skills utilizing numerical values, such as percentages and dimensions, acquiring data from tables, charts, and graphs to convey or solve engineering technology related problems.

Demonstrate mathematical skills by selecting and applying appropriate mathematical formulas to explain and solve engineering technology related problems.

APPLY CRITICAL THINKING SKILLS
Exhibit decision-making skill when selecting tools, mathematical formulas, data records, and project selections.
Use problem-solving skills in the application of scientific and engineering principles to solve real world problems.

Visualize mind’s eye concept by organizing and processing symbols, graphs, objects, and other information, such as determining a circuit operation from a schematic, seeing a finished product from a blueprint, and seeing a product from a CAD line drawing and schematic.

Exhibit reasoning skills by using logic to draw conclusions from available data and applying scientific standards and principles to solve technical problems.

DISPLAY APPROPRIATE PERSONAL QUALITIES

Exhibit responsibility by demonstrating task completion to required standards, paying attention to detail, attendance, punctuality, and enthusiasm. Feedback on observed responsibility exhibited will be provided.

Exhibit self-esteem by showing confidence in one’s own skills and abilities and an awareness of one’s capabilities. Feedback on observed self-esteem exhibited will be provided.

Demonstrate appropriate social skills by the interaction in-group or team setting, which includes self-assertion, listening, and participation. Feedback on observed social skills exhibited will be provided.

Display self-management skills by demonstrating task completion to required standards, paying attention to detail, attendance, punctuality, and enthusiasm. Feedback on observed self-management skills exhibited will be provided.

Display integrity/honesty by demonstrating behavior consistent with professional and ethical standards commonly held in industry and society. Feedback on observed integrity/honesty exhibited will be provided.