COMPUTER AIDED DRAFTING/ DESIGN I (CADD)

Grade Level:	10-11-12
Length:	1 Semester
Period(s) Per Day:	1
Credit:	2
Credit Requirement Fulfilled:	Vocational/Elective
Career Tracking:	Aerospace, architectural, civil, electrical, and mechanical engineering; designers, drafting technicians, computer graphics.

Course Description

Content: The course begins with the emphasis on lettering and mechanical drafting detail. Using the hands-on approach, students gain knowledge and develop basic skills and the understanding of line types and weights. The course introduces orthographic and isometric views. Students will investigate the history of CADD, along with different types of software used in industry today. Once they have mastered the basic commands, 3D and solid model editing, rendering and 3D Printing will be explored.

Course Objectives and Expectations

1. To explore basic and advanced skills associated with the Drafting and Design Industry.
2. To create a greater awareness to safety in our everyday routines.
3. To become aware of when to apply academic appropriate and technical skills in Drafting and Design Industry.
4. To work productively in teams, and to use technology to enhance productivity.
5. To utilize critical thinking to make sense of problems and persevere in solving them.

Student Objectives

After completing this course the student will be able

1. Complete exercises that will reflect the importance of drafting in relation to technology in our society today.
2. Develop and refine graphics skills in:
    A. Lettering,
    B. Freehand sketching,
    C. Drafting layout,
    D. Graphic skills and techniques.
3. Conduct classroom activities and graphics exercises in a manner that emphasizes an appreciation on the relationship of time and its effect on costs.
4. Introduce the student to graphics symbols, standards, metrification, and codes.
5. Perform exercises in multi-view drawings and geometric construction.
6. Complete exercises that emphasize terminology, operational configurations, and standards.
7. Develop an understanding and appreciation of dimensioning.
8. Develop an understanding for tolerances of the contents of the working drafting.

Quarter I/First 9 Weeks

Career and Education Exploration 1 Week

MTCIS-Career and Learning Exploration

Personal Portfolio/Interest Surveys

Multiple Intelligences/Holland Personality Comparison

Technology **1 Week**

What is Technology?

How is Technology used in Computer Aided Drafting and Design (CADD) Industry?

Section I

Mechanical Drafting **4-6 Weeks**

What is Mechanical Drafting?

Types of Mechanical Drafting/Basics

Lettering/Alphabet of Lines/Scales/Dimensioning

Fundamentals of Drafting

The Drafts person

Layout/Tools/Pencils/Paper

Orthographic/Plan/Isometric

Section II

Computer Aided Drafting/ Design- CADD **Week 4, 5, 6, 7, 8, 9**

Introduction to Computer Aided Drafting/Design

OBJECTIVES:

After completing this course the student will be able to:

1. Understand and appreciate various computer technology systems.
2. Discuss the history of computer graphics and possible future directions.
3. Define terminology associated with computers and CADD.
4. Identify common design functions available with many CADD systems.
5. Identify the various types of plotters, print devices, and graphic output devices available.
6. Identify application programs using CADD.
7. Create mechanical, Isometric, or orthographic drafting's utilizing CADD software.
8. Draft and plot many styles of views prepared with different CADD software.
9. Understand the steps needed to build an object utilizing 3d solid applications.
10. Animate objects 3d objects and print 3d objects.
11. Understand the necessity for the use of a profession portfolio by preparing one with the projects prepared in class.

Quarter II/ Second 9 Weeks

Section II

Computer Aided Drafting/ Design- CADD **Weeks 9-18**

Introduction to Computer Aided Drafting/Design

Define what safety and CADD Technology have in common. **Week 9**

Brainstorming/Concept Ideas/Designing/Prototyping/Manufacturing
Explore Different Engineering design methods **Weeks 10-11**
Sketching/Computer Simulation/Modeling **Weeks 12-18**
Explore Different Engineering ways to better Society.
Introduction to 3 Dimensional Drawing **Weeks 15-18**
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Montana Content Standards/RST

MONTANA STANDARDS FOR CAREER AND VOCATIONAL TECHNICAL EDUCATION

Content Standards indicate what all students should know, understand and be able to do in a specific content area. Benchmarks define our expectations for students' knowledge, skills and abilities along a developmental continuum in each content area. That continuum is focused at three points—at the end of grade 8, the end of one high school course, and the completion of six units of vocational coursework.

CS1 BM 1 2 3
CS2 BM 2 34
CS3 BM 1 2 3
CS4 BM 1 2 345
CS5 BM 1 2 34

MONTANA STANDARDS FOR WORKPLACE COMPETENCIES

Content Standards indicate what all students should know, understand and be able to do in a specific content area. Benchmarks define our expectations for students' knowledge, skills and abilities along a developmental continuum in each content area. That continuum is focused at three points—at the end of grade 4, the end of grade 8, and grade 12.

CS1 BM 2 3
CS2 BM 12 345
CS3 BM 1 2 34
CS4 BM
CS5 BM 1 2 345
CS6 BM 1 2 346

Evaluation

Career and Vocational/Technical Education Performance Standards: A Profile of Four Levels

The Career and Vocational/Technical Education Performance Standards describe students' knowledge, skills, and abilities in the Career and Vocational/Technical content areas on a continuum from kindergarten through grade 12. These descriptions provide a picture or profile of student achievement at the four performance levels: advanced, proficient, nearing proficiency, and novice.

Advanced This level denotes superior performance.

Proficient This level denotes solid academic performance for each benchmark. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.

Nearing This level denotes that the student has partial mastery or prerequisite knowledge and **Proficiency** skills fundamental for proficient work at each benchmark.

Novice This level denotes that the student is beginning to attain the prerequisite knowledge and skills that are fundamental for work at each benchmark.

Upon Graduation Workplace Competencies

Advanced A graduating student at the advanced level in Workplace Competencies demonstrates superior performance. He/she:(a) independently identifies, organizes, plans and allocates workplace resources of time, money, human resources, material and facilities; (b) consistently practices workplace skills to identify, analyze, and evaluate procedures, policies, and individual team members' strengths;
(c) competently communicates, interprets, and evaluates information; **10/00** -10- (d) independently evaluates and redesigns a variety of complex systems to improve system performance; (e) consistently selects, uses, and evaluates appropriate technologies and troubleshooting protocol in all learning situations; and (f) purposefully develops, evaluates and adjusts life and career plans and effectively demonstrates workplace readiness skills.

Proficient A graduating student at the proficient level in Workplace Competencies demonstrates solid academic performance. He/she: (a) identifies, organizes, plans and allocates workplace resources of time, money, human resources, material and facilities; (b) practices workplace skills to identify, analyze, and evaluate procedures, policies, and individual team members' strengths; (c) competently communicates, interprets, and evaluates information;(d) evaluates and redesigns a variety of complex systems to improve system performance; (e) selects, uses, and evaluates appropriate technologies and troubleshooting protocol in all learning situations; and(f) develops, evaluates and adjusts life and career plans and demonstrates workplace readiness skills.

Nearing Proficiency A graduating student at the nearing proficiency level in Workplace Competencies demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Workplace Competencies. He/she: (a) sometimes identifies, organizes and plans workplace resources of time, money, human resources, material and facilities, but has difficulty allocating these resources effectively;
(b) sometimes practices workplace skills to identify and analyze procedures, policies, and individual team members' strengths; and, with assistance, evaluates the results;(c) communicates basic workplace information and, with assistance, interprets and evaluates basic workplace information; (d) sometimes evaluates and with assistance redesigns a system to improve system performance;(e) sometimes selects and uses appropriate technologies in learning situations and, with assistance, uses troubleshooting protocol; and (f) develops life and career plans and, with assistance, evaluates and makes adjustments; demonstrates workplace readiness skills.

Novice A graduating student at the proficient level in Workplace Competencies is beginning to attain the prerequisite knowledge and skills that are fundamental in Workplace Competencies. He/she: (a) identifies, but has difficulty organizing, planning, or allocating workplace resources of time, money, human resources,

material and facilities; (b) seldom practices workplace skills; (c) seldom communicates, interprets, or evaluates information; (d) seldom evaluates and has difficulty redesigning a basic system to improve system performance; (e) seldom selects or uses technologies or troubleshooting protocol in learning situations; and (f) rarely develops, evaluates, or adjusts life and career plans; but, with assistance, demonstrates workplace readiness skills.

Resources

Montana Content Standards/RST

English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects Grade-Level November 2011
Grades 11-12
Reading Standards for Literacy in Science and Technical Subjects

MONTANA STANDARDS FOR CAREER AND VOCATIONAL TECHNICAL EDUCATION
Career and Technical Education (CTE)
http://opi.mt.gov/Programs/CTAE/CTE.html#gpm1_13

MONTANA STANDARDS FOR WORKPLACE COMPETENCIES
Career and Technical Education (CTE)
http://opi.mt.gov/pdf/Standards/ContStds-Workplace.pdf