Computer-Aided Drafting/Design (CAD)
Course Description

1. **Course Title**:   Computer-Aided Drafting/Design (CAD)

2. **CBEDs Title:**   Computer-Aided Drafting/Design

3. **Job Titles:**   Refer to Labor Market Survey

4. **Course Description:**   Computer-Aided Drafting/Design (CAD) is an overview of an interactive drawing system designed to permit a user to create or edit a drawing on a graphic display screen (computer). Drawings are stored on various formats. In this course, we will focus on 2D drawings but we do have 3D software for the system and it will be used, i.e. BIM, Autodesk, SolidWorks, Google Sketch Up, etc. CAD programs are widely used in the industry today.

   The basic course is developed for the student who is entering the following areas: Engineering, Architecture, Design, CAD Operation, and general construction. The student will have basic skills in the use of CAD. The students will have the skills to create and modify working drawings with the use of computers, from the information provided by engineers and architects.

   This basic introductory course provides the student with basic drafting practices conforming to current industry standards. Due to the nature of this course, an overview of the computer workstation, Operating System, and how to bring the CAD main menu to the screen must be discussed prior to any CAD commands. After the basic overview has been completed, students will proceed to the command structure and procedures. This course incorporates hands-on training as well as academic theory.

   CAD is a part of the Engineering and Design Career and Technical Education Industry Sector. The recommended sequence of courses is as follows: Technical Drawing, Architectural Design or Advanced Technical Drawing, then Construction Drawing or CAD.

5. **Course Prerequisites:**   None

6. **Course Hours:**   360

7. **Course Dates:**   Reviewed February 10, 2015
8. **Course Outline:**
   A. Career Preparation Standards/College and Career Ready:
      All work site learning methodologies including Community Classroom and Career Technical Education will be utilized when appropriate.
      - Students will understand how personal skill development affects their employability. They will exhibit positive attitudes, self-confidence, honesty, perseverance, self-discipline, and personal hygiene. They will manage time and balance priorities as well as demonstrate a capacity for lifelong learning.
      - Students will understand key concepts in group dynamics, conflict resolution, and negotiation. They will work cooperatively, share responsibilities, accept supervision, and assume leadership roles. They will demonstrate cooperative working relationships across gender and cultural groups.
      - Students will exhibit critical thinking skills, logical reasoning, and problem solving. They will apply numerical estimation, measurement, and calculation, as appropriate. They will recognize problem situations; identify, locate and organize needed information or data; and propose, evaluate, and select from alternative solutions.
      - Students will understand principles of effective communication. They will communicate both orally and in writing. They will listen attentively and follow instructions, requesting clarification or additional information as needed.
      - Students will understand occupational safety issues including the avoidance of physical hazards in the work environment. They will operate equipment safely so as not to endanger themselves or others.
      - Students will understand career paths and strategies for obtaining employment within their chosen fields. They will assume responsibility for professional growth. They will understand and promote the role of their field within a productive society, including the purposes of professional organizations.
      - Students will understand and adapt to changing technology by identifying, learning, and applying new skills to improve job performance. They will effectively employ technologies relevant to their fields.
      - Students will understand complex inter-relationships of systems.
        - ➢ Students will understand systems – know how social, organizational, and technological systems work and operate effectively with them.
        - ➢ Students will monitor and correct performance – distinguish trends, predict impacts on system operations, diagnose systems' performance and correct malfunctions.

> ➢ Students will improve or design systems – suggest modifications to existing systems and develop new or alternative systems to improve performance.
- Students will understand all aspects of the industry including: planning, management, and finance; technical and production skills; underlying principles of technology; labor, community, health, and environmental issues.

B. Content Area Skills:
- Safety
- Career Seeking Skills
- Introduction to CAD Features
- Overview of Basic Drafting Skills
- Starting and Settings on Drawings
- Introduction to Drawings and Saving Drawing
- Drawing Lines and Basic Geometric Shapes
- Layer Management
- Object Snap, Geometry, and Orthographic
- Placing Text on Drawings
- Drawing Display Options
- Layouts, Plotting, and Printing
- Editing Commands
- Automatic Editing
- Creating 2D and 3D views with multiple commands
- Basic Dimensioning Practices

C. Expected Student Proficiencies:
- The student will acquire the knowledge to approach problems analytically and demonstrate problem-solving techniques through meaningful activities.
- The student will function in a problem-solving environment.
- Drafting by nature deals with solving problems on a day-by-day situation.

D. Hours of Instruction: 360
See course outline for breakdown of instructional hours.

E. Industry/Licensing: Recommended Industry Validated Certification.

9. Additional Recommended/Optional Items:
A. Articulation: The prerequisites for the course are articulated with local community colleges as follows:
- *CAD Drafting & Design – Delta College*

- At the present time the CAD course is articulated with Delta College

B. Academic Credit: 20 credits

C. Instructional Strategies:
   - Lectures
   - Demonstrations
   - PowerPoint usage
   - Problem-solving
   - Questioning Techniques
   - Brain-storming
   - Evaluation
   - SkillsUSA Leadership and Skills Competition
   - State & County Fair Competitions
   - Technical Skills Association (TSA)
   - Project Based Learning

D. Evaluation: Completed drawings and tests.

E. Instructional Materials:
   - CAD and its Application (textbook)
   - CAD Online Documentation
   - Quick Reference Card
   - "What is CAD?" (video)
   - "How is a CAD Drawing Done?" (video)
   - "An Overview of CAM" (video)
   - CAD Drafting (video)
   - *Geometric Dimension and Tolerancing* by David Madsen

F. Certificates: Certificate of Completion, Recommended Industry Validated Certificate of Completion.