

Huron Area Technical Center

1160 South Van Dyke

Bad Axe, MI. 48413

Phone: (989) 269-9284

Course Name: CAD Mechanical – CAD Architectural

School Year: 2021-2022

Instructor: Mr. Ruth

TEACHING EXPERIENCE

- **Teacher (Mechanical/Architectural Engineering and Design)**
Huron Area Technical Center, Bad Axe, MI.
- **Teacher (CAD 2012, Board Drafting, Computer Applications, Home Repair)**
Lamphere High School, Madison Heights, MI
- **Lamphere Robotics Coach**
- **Teacher (Youth Build, NCCER)**
Beaver Island Lighthouse School, Beaver Island, MI

RELEVANT WORK EXPERIENCE:

- Braun Builders Incorporated, Caseville MI
- Wolfe Construction, Elkton MI

EDUCATION:

Teacher Certification in Secondary Education

Saginaw Valley State University, University Center, MI
Endorsements: IX- Industrial Technology

Bachelor of Applied Science

Saginaw Valley State University, University Center, MI
Minor: **Physical Education**

Associate in Applied Science in Industrial Technology Education

Delta College, University Center, MI

Career Technical Education

Wayne State University, Detroit, MI
Endorsement: OC, Drafting & Design Technology/Architectural (15.1301, 15.1306)

Course Description:

In this course you will learn to use multiple programs that have been created by Autodesk and Solidworks. The programs that we will be using are AutoCAD, Autodesk 360 Fusion and Inventor/Solidworks. With these programs you will learn to create 2Dimensional drawings, 3Dimensional models, assembly's and program code for HAAS CNC mill and lathe. Once you learn to use the software programs you will be designing a VEX Robot and working on the Mini Innovative Vehicle Design Project. Students interested in learning to program a FANUC robotic arm can also take a 32 hour course that teaches tool handling and operation. If you are interested in Architectural Design you will learn to design a house using Chief Architect, AutoCAD, and Autodesk Revit.

Classroom Fees

SkillsUSA Competition and Membership (\$15.00)

Content Delivery

Semester One

- Students will cover Autodesk Inventor/Solidworks (Mechanical Drafting CIP 15.1306)
 - o Segments 1,2,3,6,7 & 10
- Students will cover Chief Architect and AutoCAD (Drafting and Design Technology CIP 15.1301)
 - o Segments 1,2,3,5,7 & 8

Semester Two

- Students will cover AutoCAD (Mechanical Drafting CIP 15.1306)
 - o Segments 4,5,8,9,11 & 12
- Students will cover Autodesk Revit (Drafting and Design Technology CIP 15.1301)
 - o Segments 4,6,9,10,11 & 12

Lecture/Lab

Lab – 80%

Lecture – 20%

Course Objectives:

- Learn to use Autodesk Inventor/Solidworks
- Learn the Basics of AutoCAD
- Autodesk Fusion 360 Mill Design Toolpaths and CAD IMPORT
- VEX Robotics Design
- Mini Innovative Vehicle Design
- Autonomous Innovative Vehicle Design
- Architectural Design using Chief Architect
- Architectural Design using AutoCAD
- Architectural Design using Autodesk Revit
- Mathematical concepts used in Mechanical/Architectural Design
- Use and Handling of Drone
- FANUC Robotic Arm – Tool Handling and Operation

Student Competencies:

- Use and understanding of Autodesk Inventor/Solidworks
- Use and understanding of Autodesk Mechanical
- Use and understanding of Autodesk 360 Fusion
- Understanding technical terms used in Mechanical Engineering
- Use and understanding of Chief Architect
- Use and understanding of AutoCAD
- Understanding technical terms used in Architectural Engineering

- Ability to use mathematical concepts used in Engineering
- Use and Handling of Drone
- Ability to program FANUC Robotic Arm

FANUC: Tool Handling and Operation (32 hr. course)

- Safety:
- Robot System
- Teach Pendant
- Power Up, Jogging and Initial Setup
- Error Fault Recovery
- Frames
- Motion Programs
- Motion Instruction
- Copying and Editing Programs
- Branching
- Instructions – Position Register and Miscellaneous
- Input and Output
- Macros
- Program Adjust
- Program and File Manipulation
- TEST

Required Text:

Autodesk Education Community. 2021. 3 September 2021.

Group, Cheif Architect. *Chief Architect X12*. Coeur d'Alene, 31 August 2020.

Hansen, Scott. *Autodesk Inventor 2020 A Turtorial Introdcution*. Mission: Stephen Schroff, 2019.

Larkin, Dr. John C. *Practical Problems in Mathematics for DRAFTING AND CAD*. Clifton Park : DELMAR CENGAGE Learning, 2005.

Moss, Elise. *Autodesk AutoCAD 2020 Fundamentals*. Mission: Stephen Schroff, 2019.

Reyes, Alejandro. *Begginer's Guide to SOLIDWORKS 2019*. Mission: Stephen Schroff, 2019.

Shih, Randy H. *AutoCAD 2020 Tutorial - First Level: 2D Fundamentals*. Mission: Stephen Schroff, 2018.

—. *AutoCAD 2019 Turtorial First Level 2D Fundamental* . Mission: Stephen Schroff, 2018.

—. *Learning Autodesk Inventor 2013*. Mission: Stephen Schroff, 2012.

—. *Learning Autodesk Iventor 2017*. Mission: Stephen Schoff, 2016.

—. *Parametric Modeling with Autodesk Fusion 360*. Mission: Stephen Schroff, 2020.

—. *Parametric Moeling with Autodesk Inventor 2020*. Mission: Stephen Schroff, 2019.

Stine, Daniel J. *Residential Design Using Autodesk Revit 2019*. Mission: Stephen Schroff, 2018.

Stine, Daniel John. *Residential Design Using AutoCAD 2013*. Mission: Stephen Schroff, 2012.

—. *Residential Design Using Autodesk Revit Architecture 2013*. Mission: Stephen Schroff, 2012.

Stine, Daniel. *Residential Design Using Autodesk Revit 2019*. Mission: Stephen Schroff, 2018.

Required Software

Autodesk Design Academy 2020

Solidworks 2019

References & Other Resources:

students.autodesk.com

<http://www.vexrobotics.com>

www.solidworks.com/SDK

Course Advisory Committee:

Andrew Batzer

Scott Jump

Jeff Skinner

Dan Sweeney

Dave Jimpkoski

Sandi Smith

Tyler Geiger

Rob Stiverson

Nathan Cobb

Scott Ranquist

John Kennedy

Terry Stafford

Jason Jurgess

Shaun LeJeune

Michaela Glass

Final Exam:

The FINAL EXAM will only be application utilizing Autodesk Inventor or Solidworks or AutoCAD.

Class Policies:

- **Missed Classes:** You are responsible for obtaining any material that you missed during your absence whether it is from another student or the instructor.
- **Assignments:** All assignments are due at the beginning of the class on the due date. Late submission of assignments will be assessed a penalty of 10% per day. NO EXCEPTIONS.
- **Academic Dishonesty:** There is to be no cheating on any assignment for this is a serious offense and will be dealt with by receiving a zero for that assignment. The assignment will still be completed in order to receive participation for the class period.
- **Need for Assistance:** If you have any condition, such as a physical learning disability, which will make it difficult for you to carry out the work as I have outlined it, or which will require academic accommodations, please notify me as soon as possible.
- **All school rules and policies will be followed as well as the ones covered in the syllabus.**

Evaluation & Grading:

- 40% - Career Skills
- 60% - Academic Skills

Career Clusters:

- Science, Technology, Engineering & Mathematics

Planning, managing, and providing scientific research and professional and technical services (e.g., physical science, social science, engineering) including laboratory and testing services, and research and development services.

- Architecture & Construction

Careers in designing, planning, managing, building and maintaining the built environment.