

# Exploration into Computer Aided Design

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## Introduction

Computer Aided Design, more commonly known as “CAD”, combines the art of design along with the power of technology. As an aspiring architect, getting familiar with the computer program “AutoCAD” has been a great jumpstart into my future studies at Iowa State University. After approval, I began my research and practice in the independent study “Introduction to AutoCAD”.



## Research Methods

The research methods that I went about consisted of three level training periods that contained four components each. The components included daily lessons, daily quizzes, final level quizzes, and a level project.

- Level 1 - The Basics
- Level 2 - Intermediate
- Level 3 - 3D Drafting

## Discussion

This independent study introduced me to the many possibilities of Computer Aided Design. The importance of CAD can shape the lives of others through the built environment. AutoCAD is a very powerful tool that industries across the world take advantage of. The many tools and features allowed me to practice a wide variety of skills. Attempting to learn an advanced computer program like AutoCAD is not an easy task. Through searching the internet, trial and error, and perseverance, I was able to overcome the challenges that this program presented. This research and practice has been a significant help to my future endeavors.

## References

Autodesk. (n.d.). Autodesk AutoCAD 2023. Autodesk. Retrieved January 9 2023, from <https://www.autodesk.com/>

Iowa State University. (n.d.). Iowa State University Logo. Retrieved from <https://www.iastate.edu/>.

MyCADsite. (2012). My CAD Site. Learn AutoCAD Free Tutorial. Retrieved January 9 , 2023, from <https://www.mycadsite.com/tutorials.html>

## Results

### Level 1 - The Basics

#### Key Concepts

- Basic Terminology
- Introduction to Commands
- 2D Drafting
- Layers
- Dimensions
- Orthographic Projection



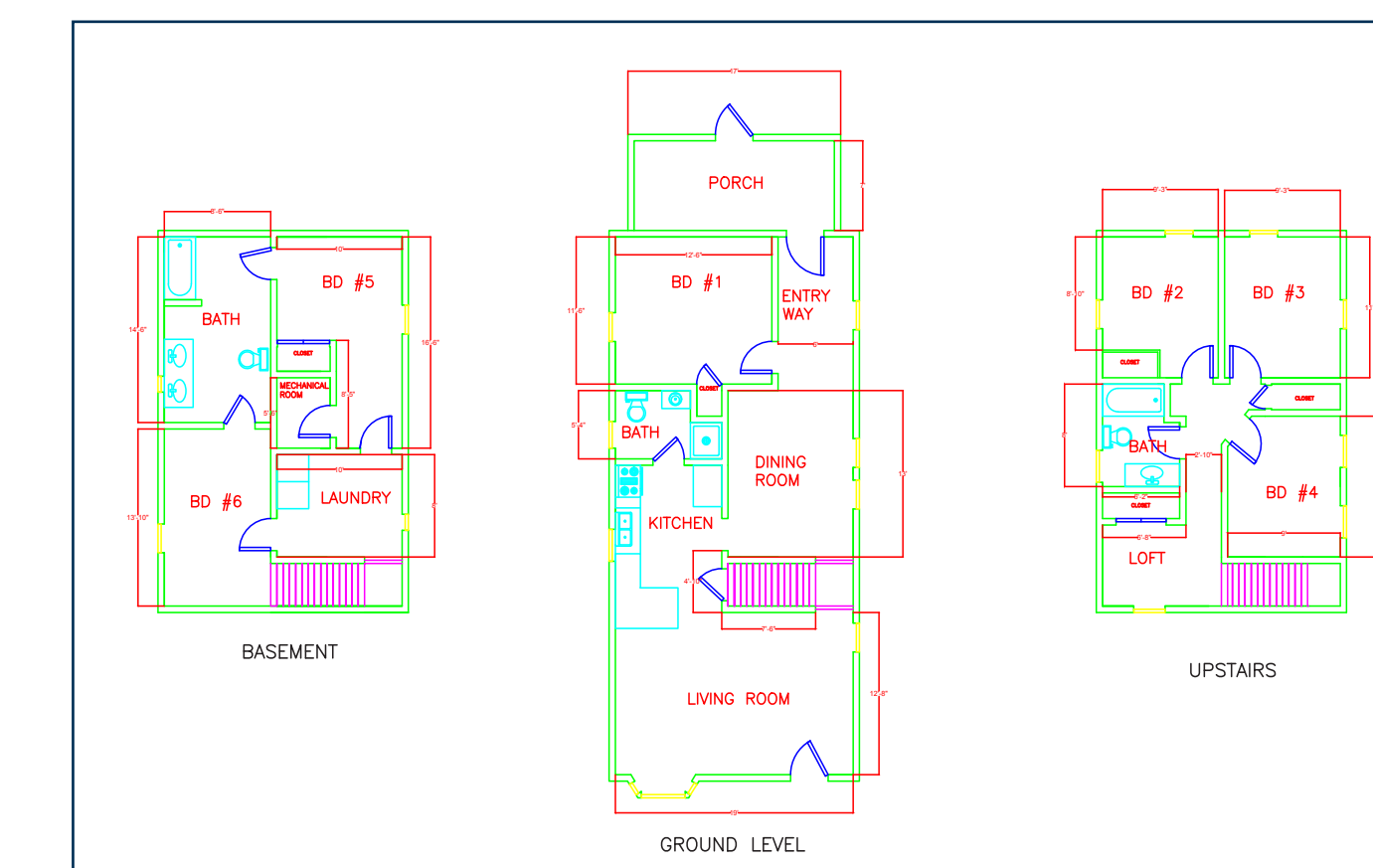
Level 1 Project - CSP Football Field

For my level 1 project, I decided to recreate CSP's football field. The major tools used in this project included array, hatching, and the line command. Creating a separate AutoCAD file was necessary for the recreation of the CSP logo. In addition, properly scaling the field using the array command was a challenge. Using my knowledge of two dimensional drafting, I was able to successfully create the field to scale.

### Level 2 - Intermediate

#### Key Concepts

- Introduction to Blocks
- Working with Text
- Polylines
- Floor Plans
- Elevation Drawings



Level 2 Project - House Floor Plan

My level 2 project is a floor plan of my current college house. Creating a professional looking floor plan was the end goal. As shown above, the house layout contains the ground level, basement, and upstairs. After measuring all important dimensions, I was able to recreate my house in AutoCAD. Proper scaling and inefficient measuring methods created challenges when working with something of this scale. After multiple revisions, I was able to successfully create my house floor plan.

### Level 3 - 3D Drafting

#### Key Concepts

- Working in 3 Dimensions
- Regions, Extruding, & Lofting
- Creating Solids
- Revolving Objects
- Mapping Materials
- Rendering and Lighting



Level 3 Project - Bedroom Project

My level 3 project consisted of the recreation of my bedroom. All the walls, windows, and furniture are to scale. This project focused on the practice of working in three dimensions and mapping materials. Working in three dimensions created many problems due to the unavailability of certain features on AutoCAD for Mac. While not all tools and features were readily available, I was still able to create an accurate representation.

## 3D Printing

### A-Puzzle-A-Day Project

This project consisted of the design and recreation of A-Puzzle-A-Day by *DragonFjord Puzzles*. The inconvenience of AutoCAD for Mac created many challenges for this project. To combat this, I used another computer program Tinker CAD to revise and adjust my original design. By putting my skills to the test, I was able to successfully design and create this puzzle from scratch using AutoCAD and the Math Department's 3D printer.

