

An essential component to any occupied residential or commercial structure is a fully functional HVAC system in order to ensure that the space is comfortable to live or work in. Designing a system that will keep a space warm in the winter and cool in the summer comes with many hidden challenges and is certainly no small task. Factors that must be considered are, the local climate of the area and the time at which it reaches its highest or lowest temperature, the solar heat addition as it fluctuates year-round, the number of people or machines working in the space and producing heat, the structure's material and insulation, and the energy efficiency of the system. Taking all of these factors into account while also keeping the price point as low as possible is the aim of HVAC engineers all around the world. The intent of this project is to design a cost-effective HVAC system for Glitch Works LLC. The structure of interest for this study is a machine shop located in Buena Vista, VA. The objective is to design an HVAC system suitable for the 1800 ft² area to maintain the comfort of the employees working inside and to provide