

Caleb Christianson

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Education

Bachelor of Science in Mechanical Engineering Expected Completion: May 2022

Bachelor of Arts in Physics

Bethel University, St. Paul, MN

GPA: 3.56

Classes: Electronics, Computer Methods, Mechanics, Engineering Thermal Science, Statics and Mechanics of Materials, Mathematical Methods in Physics and Engineering, Control Systems, Lasers, Computer Aided Design, Heat Transfer, Fundamentals of Design and Manufacturing, Engineering Materials, Mechanical Measurements and Systems, Fluid Mechanics, Design of Mechanical Components and Systems

Skills

- Computer Aided Design: AutoDesk Fusion 360, Inventor and Onshape
- Skilled in design and implementation of design through machining with a CNC mill
- Experienced with Matlab, Mathematica, C, C++, Arduino, and LabVIEW
- Communication with my peers

Work Experience

Research Assistant

June 2020-Present

Bethel University, St. Paul, MN

- Working with Dr. Lemke, I designed a laser system that rapidly switches between three wavelengths covering the visible spectrum, with switching times below 1 microsecond
- The laser system will be used to initiate Raman scattering, and after which take high-speed movies of single molecules interacting with nanoparticles
- Laser system was designed with Fusion 360 my first summer then implemented, constructed and tested to completion the following school year and summer
- Within the construction process, several instances of adaptability and redesign were needed and applied without any detriment to the functionality of the laser system
- Time was also spent constructing a diode laser with a wavelength range of 20nm

Tech Services Student Manager

August 2021-Present

Bethel University, St. Paul, MN

- Management of the entire filter system in academic buildings and dorms
 - Monitoring, changing, purchasing, and maintaining inventory of filters
 - Making the proper accommodations and plans for shipping delays

- Management of student team and coordination of tasks with the full-time technicians

Facilities Maintenance HVAC

May 2020-July 2021

Bethel University, St. Paul, MN

- Replaced air filters throughout campus and other buildings owned by Bethel with a team
- Cleaned the rooftop units, mini-splits, individual motors, and condensers
- Helped the full-time technicians with jobs involving electrical and mechanical systems
- Updating the HVAC system to accommodate the COVID related changes

Volunteer Experience

- The Veterans Hospital: Wheeled veterans around the VA and to religious services
- Feed My Starving Children: From the food preparation line to Warehouse crew, I have volunteered there many times over the last few years

Projects

Fundamentals of Design and Manufacturing, Fall 2021: Designed an Archimedes screw system under specific constraints with a team of likeminded engineers

Fluid Mechanics, Fall 2021: Designed and built a flow bench model for testing of fluid properties such as digital vs analog readings, velocity, pressure, and flow rate

Heat Transfer, Spring 2021: Calculating and analyzing the temperature dependence of thermal conductivity as well as the impact of radiation and forced convection on a cooling cup of coffee

Lasers, Spring 2021: Optimizing the Raman scattering optical setup and assisting in implementation of a system that takes a sub-microsecond time array of photons

Computer Methods, Spring 2020: Running a continuous loop on LabVIEW where one can add a new soundbite each loop and combine them to make a song or rhythm

Computer Methods, Spring 2020: Making a simulation of a bouncing ball with varying material characteristics of the ball and of the surface on Matlab