Course resumes showcase the technical skills students obtain in each PLTW course. Each resume outlines the computational skills, analytical skills, and knowledge acquired in the course. Course resumes also detail student experience with tools, software, lab work, and engineering design. The detailed skills listed within course resumes illustrate the immediate, applicable contributions that students can make within a workplace.

Computational and Analytical Skills

- Calculate the weight and balance of an aircraft
- Apply lift and drag equations
- Calculate pressure, density, and altitude interrelationship
- Collect data related to mechanical properties of materials
- Calculate mechanical properties of materials based on test data
- Analyze an issue in which Space Law applies
- Calculate energy needed for an orbital change
- Model and analyze air- and space-based systems
- Calculate rocket engine impulse
- Plan a route from latitude and longitude waypoints
- Simulate air traffic control scenarios
- Calculate alternative vectors for safe operation of aircraft
- Calculate orbital periods
- Calculate gravitational potential, kinetic, and total energy

Aerospace Engineering and Design Experience

- Collaborate effectively with peers to solve problems using a design process
- Apply an engineering design process to solve a problem
- Design, build, and test an autonomous system
- Create and test a software program to control a system
- Design an airfoil
- Design and simulate loading on an aircraft structure
- Design a simulated turbine engine
- Design and build a mockup of a system to mitigate space junk
- Design, build and test a parachute
- Design a satellite orbit
- Design, build, test, and optimize a glider
- Choose aircraft material
- Simulate satellite data acquisition using a physical model
- Create a terrain map using model satellite data
- Create a program to control a physical model of an automatic pilot controlled aircraft
- Investigate aerospace engineering careers

Tools and Software

- Aircraft flight simulator software
- Data collection and analysis software
- Air- and space-based modeling
- CAD modeling software
- Manufacturing and robot design kit
- Robot programming language

- Robot programming language
- Glider design
- GPS

Professional Skills

- Team collaboration
- Project management
- Problem-solving
- Communication skills
- Presentation skills
- Technical writing

Course Knowledge

- Aerospace Engineering
  - Evolution of aerospace engineering
  - Alternative applications for aerospace engineering
  - Aerospace careers
- Physics of Flight
  - Aircraft components and control surfaces
  - Four forces of flight
  - Weight and balance in an aircraft
  - Lift and drag
  - Airfoil design
  - Interrelationship of atmospheric pressure, temperature, and density
- Propulsion Systems
  - Atmospheric propulsion systems
  - Model rocket design and testing
  - Space propulsion systems
- Navigation
  - Historical perspective related to current navigation systems
  - Aircraft radio navigation
  - Global Positioning System
  - Air traffic control system
- Aerospace Materials
  - Common aerospace materials
  - Composite materials
  - Mechanical properties of material testing
- Flight Physiology
  - Human physiology related to flight
  - Ergonomic design
  - Accident analysis

- Space
  - Celestial composition
  - Space law
  - Space junk
  - Commercialization of space-related activities
  - Keplerian elements
  - Orbital patterns and application
  - Energy of an orbiting body
- Remote Systems
  - Application of aerospace engineering concepts beyond aircraft and spacecraft
  - Software programming design
  - Autonomous vehicles
  - Satellite simulation