



PLTW Engineering

Civil Engineering and Architecture | Course Resume

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

- Analyze and/or design a simply supported beam
- Select a floor system to support applied loads
- Perform a closed loop (control) survey
- Perform sieve analysis and classify a soil sample
- Calculate heat loss/gain
- Calculate head loss and pressure in a pipe
- Estimate the simple cost of a small building system or project
- Calculate storm water runoff from a site
- Size a spread footing
- Create a project schedule for a small design project

Design Experience

- Design a small single family residential structure that reflects a set of basic building guidelines
- Create a site opportunities map and site plan for a small residential structure
- Create a simple residential electrical plan
- Document a residential design with construction drawings and a 3D computer model using 3D architectural software
- Collaborate effectively with peers to design a renovation to an existing commercial facility according to applicable building codes and regulations
- Collaborate effectively with peers to design a viable small commercial building that meets identified code and ordinance requirements
- Use Low Impact Development principals to design a site that support a commercial facility
- Document the design or renovation of a commercial facility with construction drawings and a 3D computer model, using 3D architectural software
- Design a sewer lateral
- Analyze a given building/site design and make recommendations to identify errors and/or omissions improve energy efficiency reduce the quantity and/or improve the quality of storm water runoff

Tools and Software

- Building Design Software
- Structural Analysis Tool
- Survey equipment - Autolevel
- Budgeting and Project Management

Professional Skills

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



Course Knowledge

- History
 - Historical development of civil engineering and architecture
 - Elements and principles of design
- Careers
 - Educational and professional requirements related to civil engineering
 - Educational and professional requirements related to architecture
 - Primary responsibilities of civil engineers and architects
 - Specialty disciplines related to civil engineering
 - Design Teams and Charrettes
- Residential Design
 - Residential framing methods and roof styles
 - Cost of construction
 - Heat loss/gain and energy efficiency
 - Residential building code requirements
 - Universal Design principles
 - Green building and sustainable design
 - Site design and orientation
 - Residential building systems (plumbing, electrical, wastewater, and water supply)
- Commercial Design
 - Commercial building code requirements
 - Building loads
 - Zoning Ordinance
 - Land development regulations
 - Energy code requirements
 - Commercial wall, roof, and floor framing systems
 - Commercial foundation systems
 - Utilities and Services
 - Land surveying
 - Low Impact Development (LID)
 - Parking lot and site design
 - Project viability
 - Project management
 - Project report and presentation