PATHWAY TO LEARNING ENGINEERING

Siemens Engineering Design

Course Overview

In this project-based course students work in teams to solve complex design problems.

Students will:

- Learn the engineering design process, including how to research, design, develop, and communicate design solutions
- Work to solve real-world problems
- Use engineering software to prepare and evaluate designs and make extensive use of 3D printing to prepare models for presentation to authentic audiences

Goals

The goal of this course is to teach the engineering design process and allow students to rapidly create and analyze proposed solutions using industry tools to address unique problems:

- Apply mathematics and analysis to their solutions, simulating methods used by engineers
- Leverage Excel to organize data, create graphs, and perform statistical analysis
- Maintain an Engineering Notebook to track progress, document an explanation of their solution, and record reflections on their work
- Present solutions at the end of each project
- Communicate and document design processes professionally, using Engineering Notebooks, technical reports, and data visualization to present solutions effectively

Major units

- Engineering design process
- Sketching
- 3D solid modeling/fabrication and 3D printing
- Renderings/working drawings/design presentations
- Assembly modeling/documentation/exploded assemblies/bill of materials
- Reverse engineering/engineering features
- Simple machines
- Mechanical systems
- Structures and forces
- Engineering systems

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