

Illinois College

Saturday, February 7, 2026

Engineering Merit Badge Activities

Merit badge counselor – Meredith Kunz & Josiah Kunz, Ph.D,

Agenda

Approximate Total Time = 4 hours

Welcome + Intro to Engineering (20 minutes)

- Quick overview of engineering fields.
- Tour of Crispin 3rd floor.
- Introduction to the engineering design process.
- Explain challenge + constraints.

CAD Tutorial & Warm-Up (1 hour)

- Tutorial on CAD.
- Guided mini-build: precision sketching, extrusions, holes, rounds, revolves

Main Design Challenge (1 - 1.5 hours)

- Scouts can work in pairs.
- Merit badge counselor and volunteers will circulate for support.
- Students must sketch ideas on whiteboards, build in CAD, apply constraints, and export file.

Engineering Guest Speaker (30 minutes)

- Presentation
- Q&A

Presentations (30 - 45 minutes)

- Each scout and/or team presents their design, how it meets constraints, and why they chose their approach.
- Scouts will receive feedback from the engineering guest speaker

*Depending on time and number of scouts, we may be able to have them 3D print one scaled down component of their model.

Pre-camp Prerequisite per merit badge counselor:

- Pick a product at home (toy, tool, appliance, gadget), sketch or describe the main parts, and explain how it works.
- Research the main engineering disciplines (mechanical, electrical, civil, and chemical).
- Pick one engineer type, explain the required education and training, and why it appeals to you.
- Read about the Engineer's Code of Ethics. Pick one rule or principle from the code that you think is important. Why? How is that rule similar to something in the Scout Oath or Scout Law?
- Research an engineering project (bridge, building, power plant, etc.), name the engineer(s) involved, describe the challenges they faced, and explain the impact on society.

Prerequisites are a combination of requirements 1,3, 8 and 9

Scouts must bring with them all pre work to show and discuss with their merit badge counselor. If a scout is unable to complete all above prerequisites it will not stop them from attending the camp, they will have to work on completing it with another council approved engineering counselor. If you have any questions or concerns, please contact camp director Renna Brock – rennabrock@gmail.com