

ECE 215/S – Principles of Electronic Cyber Warfare

Block 1: Resistive Circuits and Power Distribution

Lesson 14: Project 1 Workday 2

Department of Electrical and Computer Engineering
United States Air Force Academy

Fall 2026

Today's Plan

- **Submission 1 was due Mon 14 Sep, 2359.** If it is not in, it is late
- **Part 2 reached your team when you submitted Part 1** — you now become the government evaluator
- Rest of class: work Part 2 with your team
- **Submissions 2–3** are due **Wed 16 Sep, 2359**

You switch sides of the table today.

Part 2: You Are Now the Government

- You receive the **other teams' proposals** — the designs you were competing against
- Your job is to **objectively rate** them, including your own, against the stated criteria
- "Objectively" is the graded word. The matrix must be defensible by someone who does not know which design was yours

Evaluating a competitor's design fairly is harder than designing your own.

Applying the Decision Matrix

The criteria and weights were given in the solicitation:

Measure	Weight	Direction	Normalize with
Cost	$4/7 = 0.571$	smaller is better	$x_{\min}/x$
Efficiency	$2/7 = 0.286$	bigger is better	$x/x_{\max}$
Volume	$1/7 = 0.143$	smaller is better	$x_{\min}/x$

- **Two of the three are smaller-is-better.** Getting a direction backward is the fastest way to lose this point
- Submission 2 is **auto-graded** — trivial math errors will not earn credit. Rounding errors are fine
- Show the analysis behind the matrix: clearly labeled handwriting or an organized spreadsheet

Verifying Someone Else's Numbers

You are rating designs on *their* claimed cost, efficiency, and volume. Check them.

- **Efficiency** — does their generator real power actually produce their claimed η? Recompute $\eta = P_{\text{load}}/P_{\text{gen}}$
- **Compliance** — does every load get its specified voltage? Does every device have a breaker? Is the generator under 30 kW?
- **Cost and volume** — do their converter choices match Table 2?

A non-compliant design is not simply a low scorer — note it explicitly in your analysis.

Submission Checklist

Submission 2 — group, decision matrix

☐ Every option normalized in the correct direction

☐ Weights $0.571/0.286/0.143$ applied

☐ Scores computed and a winner identified

☐ Supporting analysis attached and legible

Submission 3 — individual, short answers

☐ **Concise** technical writing. Long answers earn no credit

☐ Your own words — this one is individual effort

☐ Documentation statement included

Submissions 2 and 3 are due **Wed 16 Sep, 2359**. Check Gradescope for the official deadline.

Wrap-Up

Block 1 is done:

- You can analyze a DC or AC circuit, protect it, move power through transformers and converters, and account for every watt lost on the way
- And you can defend a design choice with a decision matrix rather than an opinion

Coming due:

- **Wed 16 Sep, 2359** — **Project 1 Submissions 2–3**
- **Mon 21 Sep, 2359** — **Quiz 3** (Objectives 1.6–1.7)

Next lesson:

- **Lesson 15 — Block 2 begins: Objectives 2.1–2.2, the frequency domain and ideal filters**