

CRITICAL THINKING SKILLS AND LIFE-LESSONS FOR ENGINEERS -or-HOW TO TAKE YOUR BRAIN OUT OF AUTOPILOT AND SURVIVE TRIAL BY FIRE IN THE REAL WORLD!!!

Why THIS course?

As engineers, it is frequently necessary for us to be able to step back from computations and calculations and assess whether a solution even makes basic sense, considering the parameters framing the problem. Critical thinking includes the ability to look at the solution to a problem, and immediately recognize that it is incorrect by one or more orders of magnitude. Another aspect – If you work with automated equipment– or if you design such equipment – how do you adequately test it for functionality?

This kind of thinking goes beyond equations and numerical answers and moves into the real of what we frequently call "sanity checks" or "reality checks". This is at the heart of what we will be asked to do as engineers – over and over... for the rest of our careers. As engineers – people place their trust in us to design functional and safe solutions to problems... one way we make sure that we provide this is by training ourselves to think critically.

If your journey takes you into leadership roles, this type of thinking skillset is equally important. Critical thinking frequently challenges the status quo, and so we also need to consider how to engage others when we see something that needs change. (Yes... communicating the answer is easily as important as actually knowing the answer!)

Course Objectives:

- Discuss and develop a working definition of critical thinking
- Explore the interrelation of failure and critical thinking
 - o Understand what happens after failure
 - o Explore the concept of "preventable" failure
- IS "common" sense a valid expectation? Is it even a valid expression?
- Develop a "Sanity Check" playbook and use it to...
 - o Understand how to apply sanity checks when problem solving
 - o Know your limits CAN you apply a sanity check?
 - o What you do when you don't have a base reference for a sanity check
- Prioritize using critical thinking and sanity checks as the first "tools" out of the box
- Explore real-world problems and understand how critical thinking and sanity checks have helped us and failed us in the past
- Utilize working-group discussions to probe philosophy as well as real-world applications of problem solving including concepts like "good enough" vs. "root cause" and containment vs. corrective actions.