ENGR 11: Learn MATLAB
Meeting 1: Thursday 2/18/2021 from 8:45AM – 9:50AM

BEFORE CLASS:

☐ Get Zoom Set Up

☐ Get YouTube Live Stream Set Up (Unlisted Video)

DURING TEAM MEETING:

☐ Deep learning versus system navigation:

Deep learning

Let's define *deep learning* to be learning that involves an intense, distraction-free focus on growing your abilities by pushing beyond the limits of your current capacity. When you engage in deep learning, you actively reach for and repeat skills that you want to build by paying extra special attention to your performance during each repetition. (adapted from *The Talent Code: Greatness isn't Born, it's Grown* and *The Little Book of Talent: 52 Tips for Improving Skills*, both by author Daniel Coyle).

For more about deep learning, please read my blog posts on this subject:

- What is deep learning?
- Why is deep learning so hard?

System navigation

- the process of navigating the college education system. This process involves passing your required list of classes and successfully completing all your degree requirements to earn your diploma.

- For many learners, mathematics classes make the difference between continuing on in college and dropping out.

- To pass math classes, many teachers require you to perform on timed, in-class exams. Such exams proport to test your "learning." In reality, high performance on in-class timed exams test four or five different features of your life as a student:

    A. Your level of understanding of course material
    B. Your ability to remember course material under pressure
    C. Your ability to solve problems under time pressure
    D. Your ability to perform (the strength of your test-taking skills)
    E. The level of privilege you have in your personal life.

☐ In our problem solving team, we will target items C, item D, and item E from the list above.

Item C: Your ability to solve problems under time pressure

We will be studying the problem-solving philosophy and techniques of George Pulya. We will do so be studying the book *How to Solve It*. This book is one part of a five volume bible of problem solving written by George Pulya.

I'm going to make the following claim: if we can empower you to read this book slowly and deeply, to study the techniques presented by Pulya, and to reflect on how to use those techniques in your math classes, you will grow your ability to solve any math problem you see in your undergraduate math classes.

I hope this helps you build skills that you can leverage to get good grades on your math tests and also to navigate our system. In other words, this book is designed as one part of your ability to do well on math tests.

Item D: Your ability to perform (the strength of your test-taking skills)

Strong performance on in-class math exams is a learned skill. In our team, we will be exploring useful test-taking techniques. I provide lots of support for learning how to take tests on my Conquering College support website.

These include the following resources:

- How to use suggested problems
- How to prepare for a math exam
- How to manage yourself before a math exam
- How to thrive on in-class math exams

We will work through these together over the coming months as part of our problem solving team. The more comfortable you get with these practices, the more able you will become to get any grade you want on in-class timed exams. Remember that the timed exam process is about domination and control. It's really designed to weed out students. These test-taking skills are protection against the harmful practice of timed in-class exams.

Item E: The level of privilege you have in your personal life.

One of the most important privileges we can build in your career as a student is the privilege of a strong community. There are lots of ways we will build community in this group, including:

- Having fun working together to learn how to solve problems
- Signing up for Pass the Torch for the next quarter
- Visiting the STEM Center to get tutoring at least once a week

AFTER THIS MEETING:

- ☐ Get your own copy of the book *How to Solve It* by George Pulya
- ☐ Please read the New York Times article titled: Surviving Weed-Out Classes in Science May Be a State of Mind by Dalmeet Singh Chawla on 11/16/2020
- ☐ Read the four stages of problem solving from the How to Solve It method (see p. xvi)
- ☐ Read pages 1 – 10 of How to Solve It including the following sections:

  PURPOSE
  1. Helping the student (page 1)
  2. Questions, recommendations, mental operations (pages 1 – 2)
  3. Generality (pages 2 – 3)
  4. Common sense (page 3)
  5. Teacher and student. Imitation and practice (page 3 – 5)

  MAIN DIVISIONS
  6. Four phases (pages 5 – 6)
  7. Understanding the problem (pages 7 – 8)
  8. Example (pages 7 – 8)
  9. Devising a plan (pages 9 – 10)

DISCUSSION POINT:

- ☐ How to run this problem solving team?
- ☐ Self-advocacy or self-help habits: “To pass a math class, I make sure that the teacher knows that I actually care.”- Andres (seek help early and often)
- ☐ For my stats class, we formed strong bonds with a small group. “Utilizing the tool of using your peers whenever you can really helps me. Math classes are hard. Having the idea of community, having the experience of going through a tough time together is a great experience.” -Sonali
- ☐ “Every other math class I ever had was very individual. The schools I went to always tried to tell us how to solve problems on my own.” -Jordenne
- ☐ “My high school math classes always made me feel super alone. I felt like I was alone and I often felt dumb.” -Sebastian