

Introduction to the Engineering Design Process

Justin Gong

About Me

- Originally from Long Island, New York
- 4th Year student at MIT graduating in June 2018
- Major in Aerospace Engineering
- Minor in Political Science
- Interested in all things space!
- Other interests; music, travel



Massachusetts Institute of Technology®



Overview and Goals

- By the end of this workshop, you will have an understanding of the engineering design process
- How to approach problems with an engineering mindset
- Different way of thinking- you don't have to want to be an engineer for this course to be relevant!
- Project based workshop- you will design and present your own projects by the end

The Class

- ASK QUESTIONS!
- You can raise your hand or just ask them directly, just be respectful
- You don't need to ask me to go to the bathroom
- Write these down:

Justin Gong, jlwgong@mit.edu

<https://github.com/jlwgong/hangman>

Syllabus

Week 1

- Introduction
- Programming in Python
- Coding like an engineer

Week 2

- Engineering design process
- Conceive and design team projects

Week 3

- Design and implement team projects
- Giving Technical Presentations

What is engineering?

- How can we solve hard technical problems in a rigorous way
- Taking a problem statement:
 - “How do we get a human on the moon?”
 - “How do we get across this river?”
- Designing a solution that solves the problem
- Implementing that solution in the real world



The CDIO Approach

- **Conceive**
 - What is the problem, how could we begin to solve it?
- **Design**
 - Figuring out the best approach to the problem
- **Implement**
 - Creating a solution that best meets all of your objectives
- **Operate**
 - How does the system work in the real world and how can it be better?

Designing systems

- Engineering design is very different from solving homework problems
- Not about right and wrong answers- always trying to improve solutions!
- For the next couple lessons, we'll focus on designing software systems
- But these skills can be applied beyond software into many different kinds of projects