

# **Engineering 180**

# **Systems Engineering**

## **Course Introduction**

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**Zoom Meeting ID 5623873493**

# *Engineering 180 – Systems Engineering*

## ➤ **Course Objective:**

- Provide students a broad background of Systems Engineering principles, methodologies, processes, and available tools
- Use examples to help students to enhance their learning

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Theory

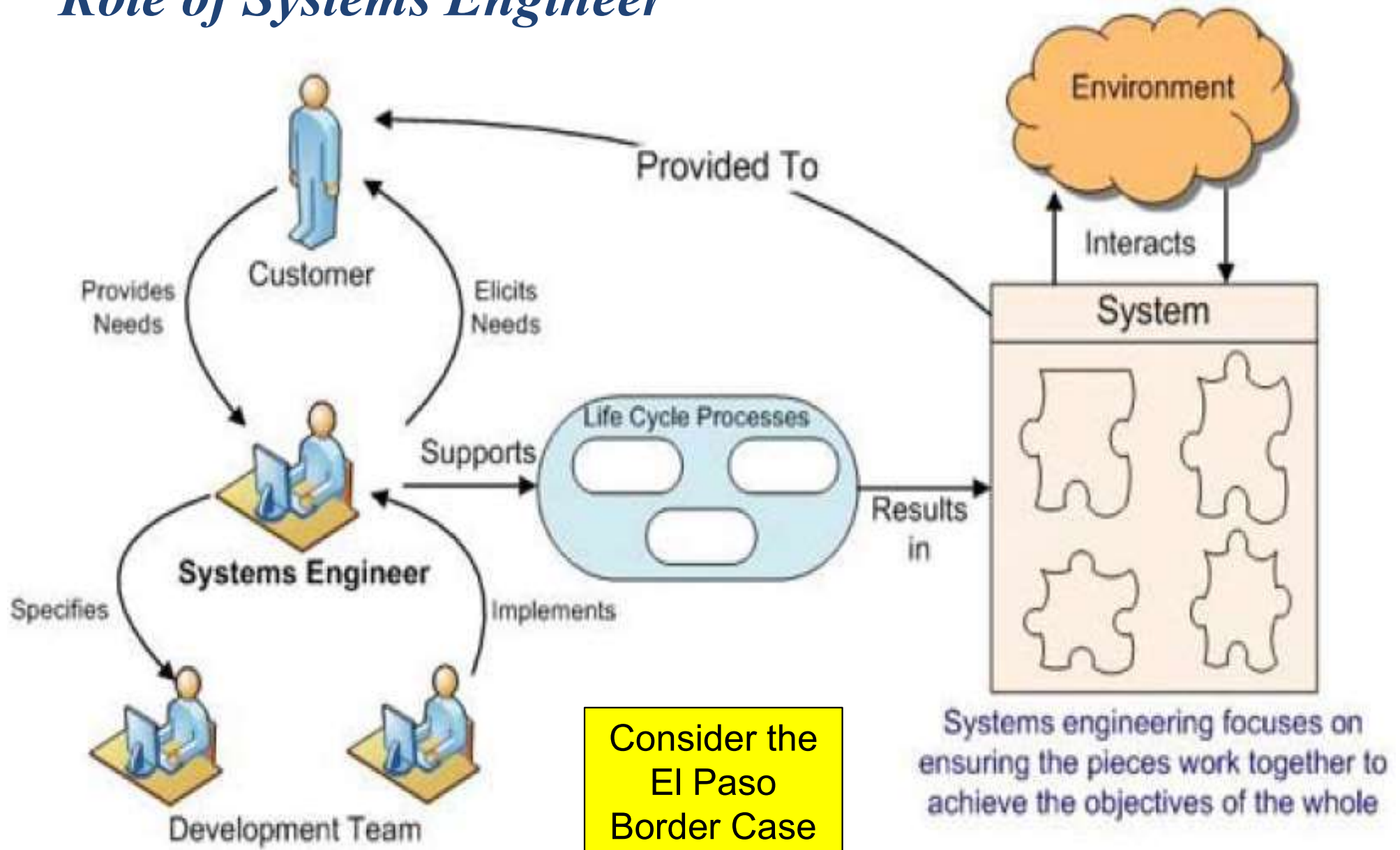
## ➤ **Major Topics:**

- Introduction to systems engineering
- Conceptual Design
- Preliminary Design
- Detailed Design
- Systems Engineering Management and Tools
- Case Study

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Practice

## *Role of Systems Engineer*



## ➤ Managing Complex Technical Risks – A Systems Engineering Approach

- Author: R. Ian Faulconbridge and Michael J. Ryan
- Publisher: Artech House, 2003
- Available via UCLA Engineering Digital Library
  - See Bruinlearn for the link

## ➤ Systems Engineering Body of Knowledge (SEBoK)

- See Bruinlearn for a copy

## ➤ Recommended Book:

- Systems Engineering and Analysis, Fifth Edition
  - Author: Benjamin S Blanchard and Wolter J Fabrycky
  - Publisher: Prentice Hall, 2011



## *Teaching Assistant*

- Sarah Enayati
  - sarahena@g.ucla.edu
- More information during TA Discussion Session

## *How Will This Course Be Taught?*

- For each week
  - One hour of recorded lecture
  - Three hours of lecture and application to case studies



## *One-Hour Recorded Lecture*

- You must listen to the recorded lecture before the Friday lecture
- Do the homework assigned in the recorded lecture
  - Submit before 8 AM on Fridays

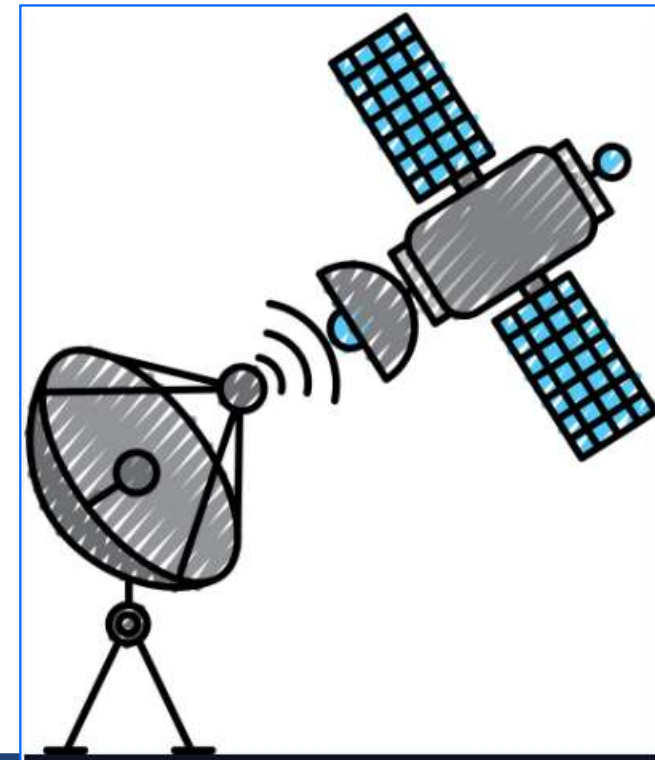
## *Three-Hour Lectures*

- Summarize the recorded lecture
  - Answer any questions
- Continue the lecture
  - Elaborate the material
- Case study to practice the material covered
  - Enhance the learning by case studies
- Divide the class into small groups for in class discussions
  - Appoint one or two students to outbrief the results
- Participate in the discussions
- Note for those not feeling well – see my announcement on March 31



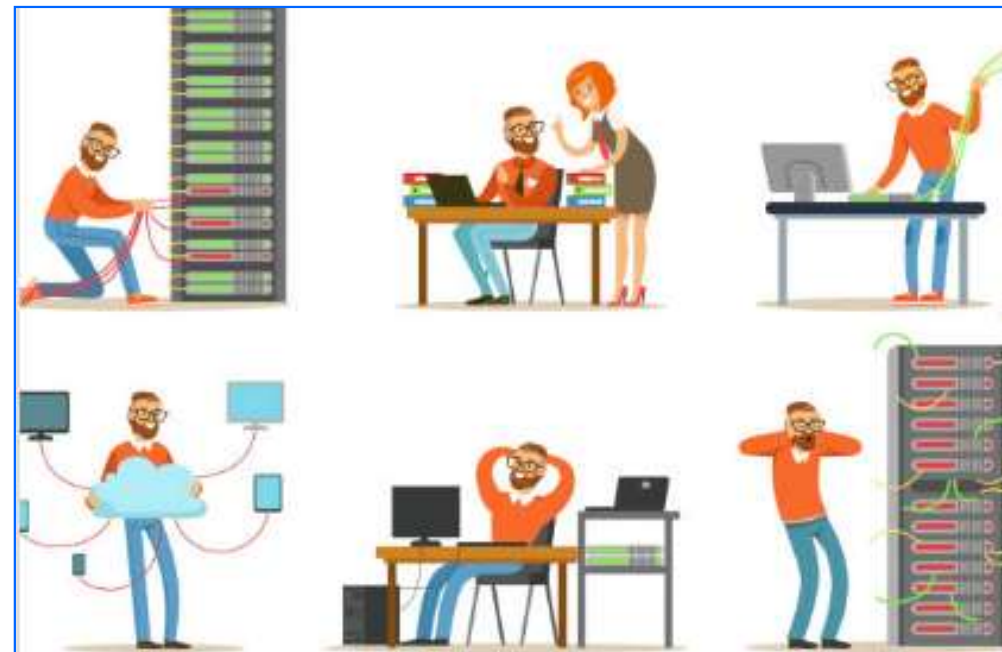
## *Communication Systems Case Study*

- Guest Lecturer – Dr. John Olsen
- Learn the application of systems engineering in the domain of communication systems
  - Design considerations
  - Demonstrate how systems engineering is performed
  - Show the benefits of applying systems engineering methodology



## *Trusted Systems Engineering Case Study*

- Learn the application of systems engineering to protect the cyberspace of a system
  - Combine the technology, process, and management for total trust



- Reading assignments
  - There will be reading assignments prior to lectures
- Weekly homework – usually 2 each week
- TA will discuss the grading of homework



# *Office Hour and Discussion Session*

## ➤ Office Hours

- Monday 8 – 9 AM via Zoom
  - Meeting ID: 940 3419 2679
  - Passcode: 3493180
- During the week, please contact me by e-mail for any specific questions
  - Email questions to both TA and me

## ➤ Discussion Session

- Wednesday 12 – 1:50 PM



## *Group Project*

- A group project is to
  - Reinforce the knowledge gained in lectures
  - Motivate students to continue their learning and reinforce lifelong learning habits
- Each team has students from various engineering majors
- Will discuss the group project assignment during Week 2 Recorded Lecture
- Week 1 Lecture Homework input used for team formation



# Grading Criteria

- Mid-term (30%)
  - May 5 (more details later)
  - Test will be on the knowledge and comprehension of the first 4 weeks of course material
- Final Examination (30%)
  - June 12, 3 to 6 PM
  - Test will be on the knowledge and comprehension of the entire class
- Homework and Class Participations (20%)
  - Homework assignments are given for students to show understanding of the lecture material
  - One to two homework per week
- Group Project (20%)

## *Lecture Schedule*

- Week 1 – Course Introduction and Overview
- Week 2 – Introduction to Systems Engineering
- Week 3 – Introduction to Systems Engineering and Conceptual Design
- Week 4 – Conceptual Design
- Week 5 – Mid Term Exam (Two Hours). Use the third hour for group project team get together
- Week 6-8 – Preliminary Design and Detailed Design, and Communication Systems Case Study
- Week 9 – Systems Engineering Management and Trusted Systems Engineering Case Study
- Week 10 – Group Project Presentations & Wrap Up

## *Week 1 Lecture*

- Will go over Introduction
- See you in class
- Week 1 Lecture Homework – see Bruinlearn  
Assignment Week 1 Homework 1
  - Due April 7 before 8 AM