

**EST 519-T01 – Systems Engineering Management**  
**FALL 2019**

**Room:** SCI 1310

**Wednesdays:** 9:00 – 11:50AM

**Instructor:** Ed Palacio Email: [Eduardo.Palacio@Stonybrook.edu](mailto:Eduardo.Palacio@Stonybrook.edu)

**Office Hours:** I have an office in the East Campus, inside the LIHTI building; individual meetings can be arranged upon request.

**Prerequisites:** none

**Credits:** 3

**Course Description:**

Systems engineering (SE) establishes the technical framework for delivering material capabilities to the customer. SE provides the foundation upon which everything else is built and supports program success. SE ensures the effective development and delivery of capability through the implementation of a balanced approach with respect to cost, schedule, performance and risk, using integrated, disciplined and consistent SE activities and processes regardless of when a program enters the developmental life cycle. SE also enables the development of resilient systems that are trusted, assured and easily modified. The value of systems engineering is supported by the GAO Report 17-77, which indicates that, "Systems engineering is the primary means for determining whether and how the challenge posed by a program's requirements can be met with available resources. It is a disciplined learning process that translates capability requirements into specific design features and thus identifies key risks to be resolved. Prior best practices work has indicated that if detailed systems engineering is done before the start of product development, the program can resolve these risks through trade-offs and additional investments, ensuring that risks have been sufficiently retired or that they are clearly understood and adequately resourced if they are being carried forward."

**Course Learning Objectives:**

1. Illustrate the current concepts and methodologies in the System Engineering processes.
2. Deconstruct and assess two highly diverse system design processes – 1) a classical top-down flow down traditionally used in complex, large system, product development, and 2) the Agile system development process preferred by modern day SW design endeavors ( SCRUM)

**Texts:**

**Systems Engineering and Analysis:** 5th Edition

Benjamin S Blanchard and Wolter J Fabrycky

ISBN-10: 1292025972, ISBN-13: 978-1292025971 (Paperback on Amazon \$69)

**Essential Scrum A Practical Guide to the Most Popular Agile Process:** 1st Edition,  
Kenneth S. Rubin. Addison-Wesley (\$40 on Amazon)

ISBN-10: 0-13-704329-5, ISBN-13: 978-0-13-704329-3

**Defense Acquisition Guide – Chapter 3 -Systems Engineering-** I will provide

**Other sources quoted/used**

C. Merle Crawford and C. Anthony Di Benedetto, **New Products Management, (Latest Edition)**, McGraw-Hill (\$6 used on line Thrift books)

**The Innovator’s Dilemma**, Clayton Christensen, Harper Business 2011

(\$5 used on line Thrift books)

**Project Management: Achieving Competitive Advantage**, 4th Edition by **J. Pinto** - Prentice-Hall.

**A guide to the Project Management Body of Knowledge (PMBOK Guide)** – Project Management Institute (PMI) - fifth edition

**General Notes:**

The course will be conducted using lecture and open discussions during scheduled classes. Blackboard will be used for announcements and for distribution of course-lecture notes. HW will be assigned, graded, and due on the assigned date.

A group project will also be assigned where teams will have the opportunity to work together on a specific problem assigned to each team. Whereas the team project is meant to be collaborative, the homework assignments are meant to be completed individually. It is also expected that students will maintain standards of personal integrity that are in concert with the educational goals of the Institution.

**Course Grading**

**Exams:** 40 % (20% each) **Team Project:** 60% - (Presentations -30% HW/ Paper - 30%)

***Basis of Grade Determination***

*A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82),*

*C+ (77-79), C (73-76), C- (70-72), F (69 and below)*

## Class Syllabus:

<u>Week</u>	<u>Date</u>	<u>Chapters</u>	<u>Topic</u>
1	Aug 31	SE&A 1, 2	Course Introduction, Expectations, Class Project, Introduction to Systems Engineering/ Class Team Selections
2	Sept 7	SE&A 3, 4	<b>Classical Model-</b> Bringing Systems into Being/Conceptual Design <b>Class Project-</b> Defining the Problem
3	Sept 14	SE&A 5, 6	<b>Classical Model</b> –Preliminary and Detail Design / Test and Eval/ Systems Engineering Management <b>Class Project-</b> Validating the Problem
4	Sept 21	SE&A 18	<b>Classical Model-</b> Program Management and Control. <b>Class Project-</b> Defining the Key System Performance Requirements
5	Sept 28	SE&A 19	<b>Classical Model</b> – Program Management and Control <b>Class Project-</b> Analysis of Alternatives
6	Oct 5	ES 1, 2	<b>Scrum Model-</b> Introduction to Scrum/ Scrum Framework <b>Class Project-</b> Selecting an Approach
7	Oct 12	ES 3, 4	<b>Scrum Model-</b> Agile Principles/ Sprint <b>Class Project-</b> Identifying Key Performance Parameters
8	Oct 19	ES 5, 6	<b>Scrum Model-</b> Requirements & User Stories <b>Class Project-</b> Functional decomposition
9	Oct 26	ES 7, 8	<b>Scrum Model-</b> Estimation & Velocity/ Technical Debt <b>Class Project-</b> Functional Design
10	Nov 2	SE&A 7, 8	<b>Analysis</b> – Decision Making and Economic Evaluation <b>Class Project-</b> Functional Partitioning
11	Nov 9		<b>Classical Model</b> – Design for Usability and Producibility <b>Class Project-</b> Sub-Functional Partitioning
12	Nov 16		<b>Class Project Presentations</b> – Design Solutions - Full presentation 45 mins each
13	Nov 23 Nov 30		<b>Class Project</b> – Team Presentation clean-ups and Updates <b>Thanksgiving Holiday</b>
14	Dec 7		<b>Individual Papers Due</b>

## **"Stony Brook University Syllabus Statements**

**If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, 128 ECC Building (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.**

**Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.ehs.sunysb.edu> and search Fire Safety and Evacuation and Disabilities." Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at [http://www.stonybrook.edu/commcms/academic\\_integrity/index.html](http://www.stonybrook.edu/commcms/academic_integrity/index.html)**

**Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.**