

Spring 2024

Instructor: Sergio Luna, Ph.D.

Course Web Address: [SE Practicum - Blackboard shell](#)

Course Schedule: Tuesday to Monday, assignments due on Monday at 11:59 pm MST.

Contact Information: salunafong@utep.edu

Virtual Office Hours: Thursday, from 3:00 p.m. - 4:30 p.m. MST or by appointment.

Virtual session: **Tuesday at 6:00 pm MST**

Virtual session URL: [Join live session](#)

The virtual live session serves as a review and clarification session. Students are expected to come prepared by reading the material and weekly assignments in advance.

This course is online; thus, participation is not mandatory nor penalized.

COURSE DESCRIPTION

The Systems Engineering Project Practicum course provides students the opportunity to apply Systems Engineering principles, methodologies, and processes in customer projects. The class is project-based, where students are members of self-directed teams. In this course, students practice soft skills to manage system development and customer participation. In addition, participants play the role of systems engineering consulting experts who oversee the implementation of engineering principles to understand multiple phases of the system development lifecycle, such as customer needs, system requirements, proposed system solutions, implementation, and maintenance, among others. To manage the evolution of the course project, teams generate systems engineering documents, including problem definition, stakeholder requirements, system requirements, system engineering project management plan, design, and test plans. To contribute to the body of knowledge while developing technical SE competencies, teams develop a systems engineering management plan (SEMP) to present the proposed approach to their respective customer.

STUDENT LEARNING OUTCOMES

After successful completion of this course, students will be able to:

- Understand, critically derive, and apply systems engineering principles to approach stakeholders' needs while developing a systems approach that addresses the need.
 - The students will be able to use systems thinking to derive and develop a system that addresses a real-life need.
- Develop public speaking and project management experience by creating a systems engineering management plan (SEMP), and a team presentation to disseminate key insights to technical and non-technical audiences.
 - Students will develop 3 significant project reviews that will need to be managed in collaboration with team members. Text artifacts and oral presentation skills are being practiced and evaluated.

COURSE FORMAT AND STRUCTURE

- Our weeks will run from Tuesday to Monday. I will post information (online activities, discussion starters, etc.) in Blackboard for the upcoming week by Monday evening so that when you log in on Tuesday, you can begin the new week.
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 - Virtual session URL: [Join live session](#)

- Virtual office hours will be held on Thursday from 3:00 p.m. - 4:30 p.m. MST or by appointment. Please email me at salunafong@utep.edu or reach out via MS TEAMS to schedule a meeting.
- Assignments are due by 11:59 p.m. MST on the due date listed in the course schedule. Late submissions will be accepted up to 24 hours after the due date. However, 50% of the maximum will be deducted from the assignment score. **No assignments will be accepted after 24 hours from the due date.**

TENTATIVE COURSE SCHEDULE

The schedule below is subject to change. If, for any reason, I am required to make any amendments, I will inform you via Blackboard, email, or MS Teams.

Tentative Schedule

Week	Date	Topic(s)	Readings	Assignment
Week 1	Jan 16 th – 22 nd , 2024	Introductions and Course Dynamics	<ul style="list-style-type: none"> • Syllabus 	Quiz #1 deadline: 1/22nd, Syllabus, dynamics, and Post Class Introduction
Week 2	Jan 23 rd – 29 th	Systems Engineering Principles – A Review	INCOSE Handbook 5th Ed. Chapter 1: Section 1.1 to Section 1.5 Articles: <ul style="list-style-type: none"> • System of Systems Engineering Basic Concepts • INCOSE Vision 2035 	Activity #1 deadline 1/29th: Article critical review
Week 3	Jan 30 th – Feb 5 th	Life Cycle Concept, Models, and Processes	Chapter 2: Section 2.1 to Section 2.3.4	Quiz #2: Week 2 and 3 – deadline: 2/5th
Week 4	Feb 6 th – 12 th	Understanding Stakeholders	Chapter 2: Section 2.3.5.1 to Section 2.3.5.2 SEBoK - Mission and Business Analysis	Activity #2 deadline 2/12th: Project presentation – introductions
Week 5	Feb 13 th – 19 th	Review Requirements	Chapter 2: Section 2.3.5.3 SEBoK - Requirements	Quiz #3: Week 4 and 5, deadline: 2/19th
Week 6	Feb 20 th – 26 th	Allocating Functions to Components	Chapter 2: Section 2.3.5.4 SEBoK - Architecture Definition SEBoK - Logical Architecture SEBoK - Physical Architecture	Quiz#4: Week 6 – deadline: 2/26th

Week 7	Feb 27 th – March 4 th	System Design	Chapter 2: Section 2.3.5.5 to Section 2.3.5.6 SEBoK - Design Definition	Activity #3 deadline 3/4th: Project presentation – progress I INCOSE Handbook: Ch 4.5, 9.3
Week 8	March 5 th – 11 th	SYSML 1	Chapter 4: Section 4.2.1 to Section 4.2.4	Quiz#6: Week 7 and 8 – deadline: 3/11th Release midterm project
Week 9	March 12th – 18th	SYSML 2		Quiz #7: Week 9, deadline: 3/18th
Week 10	March 19 th – 25 th	Review: Project Update		Midterm SEMP UPDATE, deadline: 3/25th Progress II
Week 11	March 26 th – April 1 st	Implementation, Integration, & Transition, Interface Analysis	Chapter 2: Section 2.3.5.7, Section 2.3.5.8, and Section 2.3.5.10 SEBoK - Implementation SEBoK - Integration SEBoK - Transition	Quiz #8: Week 11, deadline: 4/1st
Week 12	April 2 nd – 8 th	Verification, Validation, Quality, Test	Chapter 2: Section 2.3.5.9 to Section 2.3.5.11 SEBoK - Verification SEBoK - Validation Final Project Instructions	Quiz #9: Week 12, deadline: 4/8th
Week 13	April 9 th – 15 th	Specialty Engineering Decision Analysis and Value Functions	Chapter 3: Section 3.1 to Section 3.2.8 SEBoK - SE and Quality Attributes Final Project Instructions	Activity #5 deadline: 4/15th - Project presentation – progress III
Week 14	April 16 th – 22 nd	Operation, Maintenance, Disposal	Chapter 2: Section 2.3.5.12 to Section 2.3.5.14 SEBoK - Operation SEBoK - Maintenance SEBoK - Disposal and Retirement Final Project Instructions	Quiz #10: Week 13 and 14, deadline: 4/22nd
Week 15	April 28th	Project review	Final Project Instructions	SEMP Final Manuscript and Presentation – deadline 4/28th

COURSE MATERIALS

You may need the following reading materials throughout this course:

- International Council on Systems Engineering. (2023). *INCOSE systems engineering handbook: A guide for system life cycle processes and activities*. Fifth edition. Eds. Forsberg, K. Roedler, G., Walden, D. et. al. Hoboken, NJ: Wiley.
 - (please see the [UTEP Library Guide for MSSE 5345](#) for instructions on creating an INCOSE account to download the handbook)
- BKCase. (2015). *Guide to the systems engineering body of knowledge (SEBoK)*. SEBoK Wiki. SeBokWiki.org. Version 1.4 (available from the [SEBoK website](#))

Recommended Books

- Friedenthal, S., A. Moore, R. Steiner, and M. Kaufman. 2012. *A Practical Guide to SysML: The Systems Modeling Language, Second Edition*. Needham, MA, USA: OMG Press.

COURSE REQUIREMENTS

- **Attendance:** Attendance is not mandatory but recommended.
- **Assignments:**
 - A biweekly quiz based on the INCOSE Handbook v. 5. Please see the calendar to discuss the relevant chapter.
 - SEMP updates. Complete the respective section.
- **Project(s):** 1 Final Project will be assigned.
 - Conference-level manuscript indicating contribution and implementation of systems engineering perspective to support the described need.

GRADING PROCEDURES

Grades will be based on the following weights:

Quizzes	15%
Activities	30%
Midterm Report	25%
Final Report	25%
Final Presentation	5%

The final grading rubric will be as follows:

A	90 - 100
B	80-89
C	70 - 79
D	60 – 69
F	< 60

TECHNOLOGY REQUIREMENTS

Required Software:

- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint

Optional

- Cameo Systems Modeler
- MS Visio
- IBM Rational Rhapsody

LEARNING ACCOMMODATIONS

The Center for Accommodations and Support Services (CASS) aspires to provide students with disabilities, accommodations and support services to help them pursue their academic, graduation, and career goals. For more information concerning services for students with disabilities, please contact the Center for Accommodations and Support Services at <https://www.utep.edu/student-affairs/cass/>

INCLUSIVITY

Name and Pronoun Usage

As this course includes group work and class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions