

SIE 654 Advanced Systems Engineering Concepts Syllabus Spring 2019

Class Hours and Location

Monday & Wednesday; 4:30 pm to 5:45 pm; ENG 301

Description of Course

This course surveys the state of systems engineering as a coherent field of study, discusses the state of active research initiatives in the field, and presents research methods most appropriate for use in this field. Class discussions will focus on evaluating the potential merit of current systems engineering research and formulating new research initiatives. The course serves as a capstone for systems engineering students and an enabler for those pursuing Masters' Reports, Projects, Theses, or Dissertations in the field.

Course Prerequisites or Co-requisites

Prerequisites: SIE 554A: Systems Engineering Process

Co-requisite: none

Instructor and Contact Information

Instructor: Dr. David Gross

Office: ENG 129

Phone: 404-775-7522 (personal cell, text encouraged)

Email Address: davidcgross@email.arizona.edu

Office Hours: 1 to 3 M & W and by arrangement. Also, I maintain an open door policy, such that if my office door is open you are welcome to come in and talk about anything you need.

All course information is located on the course homepage which is in Desire2Learn at <https://d2l.arizona.edu/>.

Detailed information on using the Desire2Learn course website is available at <https://d2l.arizona.edu/>.

The instructor's home page is <http://www.sie.arizona.edu/david-gross>.

Course Format and Teaching Methods

The course will utilize lecture, in-class discussion, individual homework assignments, a midterm, and a semester project with presentation and paper.

This course is organized around weekly modules linked into the Desire2Learn course website. Each module contains archives of classroom lectures & discussions, presentations, notes and other instructional materials on each session's topic, and assignments. Each module included one or two class meetings are dictated by the university calendar.

Module 1 includes a course calendar showing topics by session along with other dates of interest.

During the scheduled class meetings, the instructor will deliver lectures via live video-audio connection in a "Live Classroom" environment. The lectures will emphasize the important concepts and selected techniques from the textbooks and the instructor's point of view. Students will have an opportunity to ask questions during these class meetings.

These class meetings will be recorded and archived on the Desire2Learn course website.

Online & Distance Learning students are encouraged to attend the scheduled class meetings and use the archives to review lectures.

Between class meetings, students study the appropriate textbook chapters, references, and complete assignments.

The instructor may record and post additional lectures beyond the scheduled class meetings as needed to assist the class in understand the material.

Students should visit the course's D2L website often (not just during scheduled class meetings) for announcements, other important instructions, and to participate in online discussions.

Course Objectives and Expected Learning Outcomes

Upon successful completion, the student should be able to:

1. Demonstrate knowledge of the essentials in each subfield of systems engineering.
2. Demonstrate a knowledge of the state of research in systems engineering.
3. Formulate a systems engineering research project by
 - a. identifying specific shortcomings/gaps in systems engineering knowledge by reference to both the methodological and case study literature,
 - b. developing one or more research questions with accompanying hypotheses, and
 - c. developing a project plan to test said hypotheses using appropriate research methods.
4. Develop a proposal for a dissertation topic in partial completion of a PhD in Systems and Industrial Engineering at the University of Arizona.

Absence and Class Participation Policy

Participating in course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all scheduled class meetings. In addition, attendance may be required at online discussion meetings. Students who miss class due to illness or emergency are required to bring documentation from their healthcare provider or other relevant, professional third parties. Failure to submit third-party documentation will result in unexcused absences.

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/2015-16/policies/classatten.htm>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <http://uhap.web.arizona.edu/policy/appointed-personnel/7.04.02>

Makeup Policy for Students Who Register Late – after the first class meeting

Students registering late but in accord with University policy will be allowed to make up missed assignments provided they coordinate with the instructor.

Make-Up Assignments

The instructor has the sole discretion of whether to permit make-up of missed assignments. Students are required to notify the instructor as soon as possible via in-course e-mail of situations requiring missed work. Ideally, such notification will be in advance. Any make-up work approved may receive a reduced grade.

Course Communications

The instructor will communicate via the course D2L web site. Students are encouraged to do likewise but may also use the instructor's email address and phone number above.

Required Texts or Readings

INCOSE Systems Engineering Handbook

<https://www.incose.org/products-and-publications/se-handbook>

The instructor will provide additional reading material.

Required or Special Materials

None.

Required Extracurricular Activities (if any)

None.

Assignments and Examinations: Schedule/Due Dates

See the separately provided SIE-654-Calendar-SP19 in Module 1 on the course D2L web site.

Final Examination or Project

The semester project presentation is due as scheduled in class. The semester project paper will be due the final day of class. There is no final exam in this course.

Grading Scale and Policies

University policy regarding grades and grading systems is available at <http://catalog.arizona.edu/2015-16/policies/grade.htm>

This course's grading scale is:

<u>Grade: Standard</u>	<u>Description</u>
A	90%<x excellent
B	80%<x<90% good
C	70%<x<80% satisfactory
D	60%<x<70% poor
E	x<60% failure

Where "x" = (points earned divided by points available X 100%) in the course.

The instructor reserves the right to award a higher grade than earned at his sole discretion.

This course's graded work includes:

<u>Assignment</u>	<u>Points Available</u>
Homework	100 points (maybe scaled)
Midterm	100 Points
Semester Project Paper	100 Points
<u>Semester Project Presentation</u>	<u>100 Points</u>
Total	400 Points

The midterm is the INCOSE systems engineering certification exam.

Specific grading criteria will be provided with each assignment; however, the following general criteria always apply:

- 1) Primary: Technical correctness
- 2) Secondary: Coherence/understandability
- 3) Tertiary: Evidence of professional practice (complete & consistent)

Each assignment will be made via folders on the course's D2L web site with a downloadable instruction file to be completed and returned at the specified due date as noted on each assignment.

Students are encouraged to share ideas, discuss approaches, or offer suggestions on the assignments via the D2L discussion board. Any other type of collaboration (such as sharing written work, data or computer files) is not permitted. Collaboration on exams (such as the midterm) is not permitted.

Extra credit work may be offered during the semester. Only students participating in class will be offered the opportunity for the extra points.

All work submitted should be submitted to the related D2L drop folder named as: course-assignment-yourname.filetype

Where:

“course” is SIE-654-SP19

“assignment” is the name of the assignment, e.g., HW-1, Midterm

“yourname” is your name

And “filetype” is the usual extension for the file (e.g., “doc” for MS Word).

Work not using this naming convention will be penalized one letter grade.

All assignments submitted by the student for grading will be returned to the student with a grade and with comments within one week after the student submits the assignment, not counting weekends, holidays, or scheduled breaks.

Requests for incompletes (I) and withdrawal (W) must be made in accordance with University policies which are available at <http://catalog.arizona.edu/2015-16/policies/grade.htm#I> and <http://catalog.arizona.edu/2015-16/policies/grade.htm#W> respectively.

Dispute of Grade Policy:

Students disputing a grade on any assignment must do so within two days (48 hours) of the graded work being returned. Note: unexcused absences will not extend this deadline.

Scheduled Topics/Activities

See the separately provided SIE-654-Calendar-SP19 on the course D2L web site.

Bibliography

See Course Modules on the course D2L web site.

Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (i.e. texting, chatting, reading a newspaper, making phone calls, web surfing, etc).

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to one’s self. See:

<http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

Accessibility and Accommodations

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact Disability

Resources (520-621-3268) to establish reasonable accommodations. For additional information on Disability Resources and reasonable accommodations, please visit <http://drc.arizona.edu/>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See:

<http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

University Libraries have some excellent tips for avoiding plagiarism available at:

<http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student email addresses. This conduct may also constitute copyright infringement.

UA Nondiscrimination and Anti-harassment Policy

The University is committed to creating and maintaining an environment free of discrimination, <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

Additional Resources for Students

UA Academic policies and procedures are available at:

<http://catalog.arizona.edu/2015-16/policies/aaindex.html>

Student Assistance and Advocacy information is available at:

<http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Confidentiality of Student Records

<http://www.registrar.arizona.edu/ferpa/default.htm>

Inclusive Excellence:

Inclusive Excellence is a fundamental part of the University of Arizona's strategic plan and culture. As part of this initiative, the institution embraces and practices diversity and inclusiveness. These values are expected, respected and welcomed in this course.

This course supports elective gender pronoun use and self-identification; rosters indicating such choices will be updated throughout the semester, upon student request. As the course includes group work and in-class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect.

Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.