SIE 458/558 Model-Based Systems Engineering

Syllabus Fall 2018

Class Location and Times:
>   TBD

Description of Course
>   An introduction to model-based systems engineering (MBSE), which is the formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases.   The course emphasizes practical use of the Systems Modeling Language (SysML) and MBSE methods.

Course Objectives and Expected Learning Outcomes:
>   During this course students will apply MBSE to model requirements and design of a range of systems expressing such models in SysML and related tools.
>
>   Upon completion of this course, students will be able to:
>   1. Identify the core tenets of MBSE,
>   2. Distinguish the differences between MBSE and traditional systems engineering,
>   3. Choose an appropriate scope, define the purpose, and define the approach for an MBSE project,
>   4. Describe the intent and basic structure of SysML, and
>   5. Construct and interpret SysML models.
>   Graduate students will additionally be able to:
>   6. Critique a project's implementation of MBSE

Course Prerequisites or Co-requisites
>   **Prerequisite:** Advanced Standing in the College of Engineering
>   **Co-Requisite:** SIE-454A/554A – The Systems Engineering Process

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
>   **Home Pag**e: http://www.sie.arizona.edu/david-gross.

Office Hours: TBD 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.

Course Text
>   **A Practical Guide to SysML**, Third Edition: The Systems Modeling Language (The MK/OMG Press) 3rd Edition by Sanford Friedenthal, Alan Moore, Rick Steiner

Course Software

Academic license for Cameo Systems Modeler (includes Cameo Requirements Modeler, MagicDraw, and Cameo Simulation ToolKit) will be provided at no cost to the student. This is a widely used engineering toolkit comparable to Enterprise Architect. The course is not a tutorial on this or any other software. Students will be expected to familiarize themselves with the toolset and resolve problems independently. Students are encouraged to collaborate on making best use of the tool set.

Course Format and Teaching Methods

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

The Desire2Learn course website organizes the course into modules. Each module contains archives of classroom lectures & discussions, presentations, notes and other instructional materials on each session's topic, and assignments. Each module includes one or two class meetings.

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.

Students should submit work for the assignments in the related D2L assignment drop folder named as: course-assignment-yourname.filetype
       Where:
              "course" is SIE-458-558-FA18
              "assignment" is the name of the assignment, e.g., HW-1, Midterm
              "yourname" is your name (for individual assignments) or your group's name (e.g., "group-1")
       And "filetype" is the usual extension for the file (e.g., "docx" for MS Word).
Work not using this naming convention will be penalized one letter grade.

Semester Project:
The semester project will require formation of small teams, which develop requirements, design, and predictive models of a significant system in its operational context.   The team will submit a final report documenting their work.

Course Schedule:
See separate SIE-458-558-Calendar-FA18.

Grading Scale and Policies:
University policy regarding grades and grading systems is available at:
       http://catalog.arizona.edu/policy/grades-and-grading-system

This course's grading scale is:

Grade:	Standard	Description
A	$90\% \leq x$	excellent
B	$80\% \leq x < 90\%$	good
C	$70\% \leq x < 80\%$	satisfactory
D	$60\% \leq x < 70\%$	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:

Assignment	Points Available
Homework (10)	100 points
Exam 1 (~1/3 thru semester)	100 Points
Exam 2 (~2/3 thru semester)	100 Points
Semester Project Proposal	10 Points
Semester Project Update	30 Points
Semester Project (final)	60 Points
Total	400 Points

Students in the graduate version (SIE-558) will additional complete a semester

paper worth 100 points and will be assigned readings beyond the text.

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete and http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal respectively.

Dispute of Grade Policy: Provide within the acceptable time period for disputing a grade on a paper, project, or exam.

Absence and Class Participation Policy

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop

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: https://deanofstudents.arizona.edu/absences

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

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 (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

Accessibility and Accommodations

At the University of Arizona we strive to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, you are welcome to let me know so that we can discuss options.   You are also encouraged to contact Disability Resources (520-621-3268) to explore reasonable accommodation.

If our class meets at a campus location: 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.

The University Libraries have some excellent tips for avoiding plagiarism, available at http://new.library.arizona.edu/research/citing/plagiarism.

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 e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail 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; see 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/policies

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/personal-information/family-educational-rights-and-

privacy-act-1974-ferpa?topic=ferpa

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.