THE UNIVERSITY
OF ARIZONA

SIE 377 Fall 2022 Software for Engineers

Description of Course

Rapid prototyping of decision support systems using VBA and Python with Excel and external packages to solve for optimization, build models and simulations, and create scheduling and forecasting tools. Decision support system types include financial, supply chain, product portfolio and facility location and operations.

Course Prerequisites or Co-requisites

ECE 175 or CSC 127A or CSC 110

Instructor Contact Information

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Course Objectives and Expected Learning Outcomes

By the end of this course, students should be able to do the following:

- Determine, design, and implement the appropriate modeling approach for a problem solution.
- Construct and use spreadsheets, tools, object models and programs to help solve engineering problems.
- Apply the techniques and skills learned to develop customized solution software for decision support.

Course Assessments and Weighted Distribution

Assessment	Weight	Learning Outcome	Description
Class Participation Homework	20 %	All	• Each of these categories, Class Participation and Homework, are designed to provide practice, evoke, questions, and help self-assess progress and understanding. • Class Participation measures in-class engagement including participating by asking and answering questions, helping others, and submitting low-stake, ungraded in-class activities which are based on real-world problems as practice. • Homework consists of more detailed practice that is similar to in-class activities, but usually much longer. Conventionally graded (e.g., A is 90 to 100%).

Midterm Exam 1	20%	All	• Comprehensive. • Delivered online and will include instructions and requirements for the problem(s) to the solved.
Midterm Exam 2	20%	All	• Comprehensive. • Delivered online and will include instructions and requirements for the problem(s) to the solved.
Final Exam	20%	All	• Comprehensive. • Delivered online and will include instructions and requirements for the problem(s) to the solved.
Semester Project	20%	All	• Each individual student will create a solution based on the requirements and characteristics described in the case study.

Grading Scale and Distribution

Semester grades use Regular Grades:

A	90% - 100%
B	80% - 89%
C	70% - 79%
D	60% - 69%
E	0% - 59%

Course Format and Teaching Methods

The course will include lectures, in-class activities and discussion, projects, web-delivered content, and intermittent assessment.

Please make sure you visit the D2L site frequently to stay up-to-date. Any notices, changes, or corrections will be posted in the Announcements section of the course (Course Home) on D2L. All course information and materials will be posted on the site.

A quick overview of a typical class meeting is illustrated below:

Before Class	During Class	After Class
• Reading Assignment • Video Lesson	• Questions / Discussion • Lesson Activity	• Homework • Project • Reflection

There are very few lectures given during class. Most are pre-recorded, last 5 to 10 minutes, and are viewed prior to class. Class begins with questions and discussions based on what you want to discuss, have questions, or are curious about. If I have an agenda item to discuss, then I will cover that first so that we can move on to your interests. We will typically delve into a relevant learning activity, so please remember to bring your laptops to class. After class you will work on any assigned homework or project.

Active learning, partially represented by in-class activities mentioned in the last paragraph, reinforces important material, concepts, and skills. The activities I have designed for this course are experiential; based on real-world work that I have performed as an engineer and also assigned to engineering teams not as a learning experience, but as part of our work. This representative work allows you to apply what you have learned, and what you are actively learning, to promote a personal bond between you and that work. I've also found that I don't know what questions I have until I try something firsthand.

Equipment, Operating System, and Software Requirements

For this course you will need daily access to a laptop or web-enabled device with webcam and microphone; regular access to a reliable internet signal; and the ability to download and run the following software: web browser, Adobe Acrobat, Microsoft Excel, Microsoft Access, Python and Pandas etc.

This course uses the Microsoft Windows 10 Operating System (OS) for programming languages and environments. If you are using an Apple Mac OS or any OS other than Windows 10, you will need to be able to access and use a cloud version of Microsoft Excel that will be provided by the University or use a University-supplied virtual machine and load the (also University-supplied) Windows 10 OS, along with the Windows versions of Excel and MS Access. No exceptions. The software we will be writing in this course does not work on the Excel version that runs on Apple products.

Reference Material (Optional, but very helpful)

- McGuire, Saundra Yancy, and McGuire, Stephanie, <u>Teach Yourself How to Learn : Strategies You Can Use to Ace Any Course at Any Level</u>, First Edition, Stylus Publishing, LLC., 2018.
  - From our Library: https://bit.ly/3g1xcoI

Project Due Date and Final Examination Date and Time

Project Deadline:	Wednesday	12/7	11:59 pm
Final Examination: *	Thursday	12/15	10:30 am - 12:30 pm

* This date and time is set by the Office of the Registrar and states that the policy "As Confirmed by the Faculty Senate: No deviation from the exam schedule, once it is published, is authorized."

https://registrar.arizona.edu/faculty-staff-resources/room-course-scheduling/schedule-classes/final-exams/final-exams-fall-2022

Absence and Class Participation Policy

Participating in the course and attending class meetings are vital to the learning process. As such, attendance is required at all class meetings. Absences may affect a student's final course grade. If you anticipate being absent, are unexpectedly absent, or are unable to participate in class online activities, please contact me as soon as possible.

When you miss a class meeting you are responsible for any in-class assignments missed. If the assignment was to be handed in, then you are responsible for handing in the work as soon as possible. It is best if you hand in the work before the start of the next class meeting time.

Unless it is an emergency, you are required to send a request via email well in advance of any class or deadline that you might miss. If possible, I will work with you to help you complete missed work.

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

Class Meeting Recordings

For class meeting recordings, which are used at the discretion of the instructor, students must access the content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with University of Arizona values and educational policies are subject to suspension or civil action.

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.

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

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 the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center 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.

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.

Re-distributing class notes and / or other course materials in any way is not permitted without the instructor's express written consent. This includes student notes or summaries that substantially reflect lectures or other materials. These resources are made available only for personal use by students. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. 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.