

The University of Texas at El Paso



**Industrial Systems Simulation**

Course Number: IE 4353

Fall 2020

**Class Details:**

**Instructor** : Sreenath Chalil Madathil, Ph.D.  
**Schedule** : New modules released every Monday at 12:00 AM  
**Location** : Online in Blackboard  
**Office Hours** : TR 8:00 AM – 9:00 AM at Blackboard Collaborate  
: By Appointment in Microsoft Teams  
**Email** : [schalil@utep.edu](mailto:schalil@utep.edu)

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**TA Office Hours**

From	To	Mon	Tue	Wed	Thu	Fri
8:00 AM	9:00 AM	Joshua				
9:00 AM	10:00 AM	Joshua			Joshua	
10:00 AM	11:00 AM	Prajina	Prajina	Prajina	Prajina	Prajina
12:00 PM	1:00 PM					Aimee
2:00 PM	3:00 PM				Joshua	
3:00 PM	4:00PM				Joshua	
4:00 PM	5:00 PM		Aimee			
5:00 PM	6:00 PM		Aimee	Aimee		
6:00 PM	7:00 PM			Aimee		

**Course Objectives:**

Discrete event simulation (DES) is a method of simulating the behavior and performance of a real-life process, facility or system. DES models help to depict the behavior of a complex system as a series of well-defined and ordered events and works well in virtually any process where there is variability, constrained or limited resources or complex system interactions. Students will investigate the use of discrete-event simulation to solve mathematically intractable problems in stochastic modeling. The course emphasizes the fundamental concepts of, and proper interpretation of results from discrete-event simulation models.

The primary program objectives pursued in this course are as follows:

- be familiar with commonly used techniques in simulation, such as random number and variate generation, input modeling, events and event types, run-length issues, auto-correlated output, and presentation of simulation results.
- be able to identify problems from their specific domains suitable for simulation, and correctly approach the modeling of those problems, including identification of simulation goals and necessary real-world data.
- be able to implement and execute discrete-event simulation models and correctly interpret and present the results.

**Required Reference Book:**

- Simulation Modeling with SIMIO: A Workbook - Fourth Edition by Jeffrey A. Joines and Stephen Roberts. E-book can be purchased at <https://simio.contentshelf.com/product?product=I151119000004A16>

**Preferred Reference Book:**

- SIMIO and Simulation: Modeling, Analysis, Applications - Fifth Edition by Jeffrey S. Smith, David T. Sturrock and W. David Kelton

**Other Reference Books:**

- Simulation Modeling and Analysis, Fifth Edition, Averill M. Law, Ph.D. McGraw-Hill, 2015

**Prerequisites:**

Knowledge of probability and statistics at the level of IE 3373. Many topics such as generation of realizations from probability distributions and analysis of simulation input/output require a variety of statistical tools.

**Technology Requirements:**

Course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop, scanner, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about [Microsoft Office 365](#) and follow the instructions. **SIMIO works only on a Windows Operating System.**

**IMPORTANT:** If you encounter technical difficulties beyond your scope of troubleshooting, please contact the [UTEP Help Desk](#) as they are trained specifically in assisting with technological needs of students. Please

do not contact me for this type of assistance. The Help Desk is much better equipped than I am to assist you!

### **Course Materials and Office Hours:**

I will post lectures, links to other relevant reading materials, homework questions, and project details on blackboard. All submissions **MUST** be submitted through blackboard. Paper submissions will not be accepted. The office hours are on Tuesday and Thursday between 8:00 AM and 9:00 AM in Blackboard Collaborate. However, I can also meet with you using video conferencing services such as Microsoft Teams based on a pre-determined meeting time.

**Email:** UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 24-48 hours of receipt. When e-mailing me, be sure to email from your UTEP student account and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name, and your university identification number.

### **Course Projects:**

All students are required to do a course project in this class. The project will be based on the SIMIO Student Simulation Competition and follows all the requirements for the competition. Students are strongly encouraged to form teams (maximum 4 members per team) to work on the project.

### **Assignments and In-class Activities**

Students are strongly encouraged to form teams (maximum 4 members per team) to work on all course homework assignments. Early in the course, one person on a team (you will self-select the teams) should submit team roster in blackboard link. You can use course's discussion boards to find your team members if you don't know anyone else. I will define those teams in Blackboard for convenience of submitting assignments and activities. I will grade only the last submitted submission for each assignments and activities by the team. Two complaints of non-performance/non-participation about a student from at least 2 other teammates will result in reduction of grade by one grade. Four cumulative complaints will result in an F-grade.

Activities, Quizzes, and Exams are individual submissions.

### **Exam Make-up Policy:**

There will be **NO** make-up policy for exams, homework, and quizzes in this class.

### **Late-Submission Policy:**

All late submissions for homework, poster presentation, and exams are automatically awarded zero points.

### **Evaluation:**

Students will be evaluated according to their performance on two examinations, class projects, homework, and quizzes. Class members are expected to be prepared for each class by reading the assigned material before each session, and by attending each class session.

**Grades:**

A	90 and above
B	$\geq 80$ and $< 90$
C	$\geq 70$ and $< 80$
D	$\geq 60$ and $< 70$
F	$< 60$

*The course grade will be aggregated as follows:*

	<b>Item</b>	<b>Weight</b>
1	Mid-term Examination	10%
2	Final Examination	10%
3	Project	40%
4	Assignment	30%
5	In-class Activities	10%
	Total	100%

**Blackboard Submission**

I strongly suggest that you submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. It is your responsibility to submit the assignments in Blackboard before the due date.

**Excused Absences and/or Course Drop Policy**

I will not drop you from the course. However, if you feel that you are unable to complete the course successfully, please let me know and then contact the [Registrar's Office](#) to initiate the drop process. If you do not, you are at risk of receiving an "F" for the course.

**Netiquette**

As we know, sometimes communication online can be challenging. It's possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider audience. This is a college-level course; therefore, all communication should reflect polite consideration of other's ideas.
- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

## **Test Proctoring Software**

Two Exams (the midterm and final exams) will make use of Respondus Lock Down Browser and Respondus Monitor inside of Blackboard to promote academic integrity. You are encouraged to learn more about how to use these programs prior to the first test.

Please review the following guidelines:

- The assessments will only be available at the times identified on the course calendar.
- You may take the test at any time during the 24-hour window.
- A reliable Internet connection is essential to completing the exam. If you must go to a location to take the exam (such as the library), be sure to follow their health and safety requirements.
- You have only 1 attempt to take the test. Once the window closes, your answers will be saved, and no changes can be made.
- Respondus Lockdown Browser will require that all internet tabs are closed prior to the start of the test.
- Respondus Monitor requires a webcam and microphone.
- You will be required to show the webcam your student ID prior to the start of the test.
- Your face should be completely visible during the test. Blocking the camera will disable the test.
- Respondus Monitor requires you to take a video of your surrounding area (desk, chair, walls, etc.)
- You should not have conversations with other people and/or leave and return to the area during the test.

## **Center for Accommodations and Support Services:**

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass). Schedule an appointment with the professor(s) during the first week of classes to clarify any accommodation needs and resolve all questions pertaining to course assignments and the classroom environment. Students should present a Faculty Accommodation Letter for Student Disability Services when they meet with instructors. Accommodations are not retroactive and new Faculty Accommodation Letters must be presented each semester.

## **Academic Integrity:**

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more, please visit [HOOP: Student Conduct and Discipline](#).

### **Plagiarism Detecting Software**

Some of your course work and assessments may be submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used to review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase.

### **Copyright Statement for Course Materials**

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

### **COVID-19 Precautions**

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at [screening.utep.edu](https://screening.utep.edu). If you know of anyone who should report any of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to [COVIDaction@utep.edu](mailto:COVIDaction@utep.edu).

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website ([screening.utep.edu](https://screening.utep.edu)) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are present. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

### **Civility Statement:**

Please be respectful of all students' right to learn without disruptions. In line with this statement please make an active effort to keep the talking to a minimum during lectures and presentations. Also make an active effort to either turn cell phones off or turn them to vibrate mode prior to the start of class. Appointments with instructor should be made in advance.

**Course Outline (Tentative)**

<b>Week</b>	<b>From</b>	<b>Title</b>	<b>Comments</b>
1	08/24/20	Course overview	Fall classes begin on August 24 <sup>th</sup>
		Introduction to Simulation	
2	08/31/20	Basic queuing theory	
3	09/07/20	Introduction to Discrete event simulation	Labor Day Holiday
4	09/14/20	Getting Started with SIMIO®	
5	09/21/20	Random number generation and Monte Carlo	
6	09/28/20	Process modeling	
7	10/05/20	Advanced Modeling	
8	10/12/20	<b>Mid-term Examination</b>	
9	10/19/20	Data driven models	
10	10/26/20	Task Sequence	
11	11/02/20	Working with Model Data	IISE Annual Conference
12	11/09/20	Optimizing with OptQuest	INFORMS Conference
13	11/16/20	Debugging Tools and Techniques	
14	11/23/20	<b>Final Project Presentation</b>	Thanksgiving Holiday
15	11/30/20	<b>Final Project Presentation</b>	Dec 3 - Last day of Fall 2020 classes
16	TBD	<b>Final Examination</b>	Fall 2020 Final Exams

PS: I reserve the right to change the course outline based on the course progress.