TED UNIVERSITY

IE 341 Simulation - Section I

Fall 2017- 2018

Credit Hours: (3+0+0) 3 TEDU Credits, **7 ECTS Credits**

Course Instructor:
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Lectures: 10:00-12:00 Wednesday (A316)
Labs: 14:00-16:00 Friday (A316)
Office Hours: by appointment

Teaching Assistant:
Sırma Karakaya (instructor for lab sessions)
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Office Hours: by appointment

Course Description: Simulation methodology and model building. Modeling with a simulation language. Random number and random variate generation. Basic issues in the design, verification and validation of simulation models. Analysis of simulation output.
Pre-requisites: MATH 232

Learning Outcomes:
Upon succesful completion of this course, a student will be able to
1. Apply the basic concepts in discrete-event simulation modeling including model components, event list and flowchart. [e][B3]
2. Construct simulation models using a simulation package, and conduct simulation experiments on verified models. [b1, e] [B3]
3. Analyse the input and output data for simulation models. [b2][B4]
4. Identify engineering problems by using performance measures of simulation models. [e][B1]
5. Analyze solutions for industrial engineering problems and compare design alternatives by using simulation techniques. [e, b2][B4]

Grading:

Assignments (4)	13%
Midterm I	20%
Midterm II	20%
Final Exam	25%
Term Project	12%
Active Learning Exercises	10%

Required Textbook:

- Kelton, W. D., Sadowski, R. P., and Zupick, N.B. (2015), *Simulation with Arena (6th edition),* McGraw-Hill, New York

Recommended Textbooks:

- **Banks, J., Carson, J. S., Nelson, B. L., and Nicol, D. M. (2009), *Discrete Event System Simulation (5th edition),* Prentice Hall**
- Law, A. M. (2007), *Simulation Modeling and Analysis (4th edition)*, McGraw-Hill, New York
- Pegden, C.D., Shannon, R.E., and Sadowski, R.P., (1995), *Introduction to Simulation Using SIMAN (2nd edition),* McGraw-Hill, New York

Software: The simulation software package ARENA will be used.

Important Dates:

- Midterm I – November 3, 2017
- Midterm II – December 8, 2017
- Final Exam – Finals Week (To be dated)

Tentative Course Schedule

Week	Topic	Chapters
1	Introduction to Simulation	Kelton (Chapter 1)
2	Fundamental Simulation Concepts	Kelton (Chapter 2)
3	Hand Simulation	Kelton (Chapter 2)
4	Introduction to ARENA (Create-Process Modules)	Kelton (Chapter 3, Chapter 4)
5	Modeling Basic Operations (Model 4.1, Model 4.2)	Kelton (Chapter 4)
6	Modeling Basic Operations (Set Concept, Frequency Type Statistics, Utilizations)	Kelton (Chapter 4)
7	Modeling Basic Operations (Station, Route Modules)	Kelton (Chapter 4)
8	Intermediate Modeling (Sequence)	Kelton (Chapter 7)
9	Modeling Detailed Operations (Shared Queues; Batch-Match-Separate-Search-Remove Modules)	Kelton (Chapter 5, Chapter 9)
10	Input Modeling (Selecting Distribution, Parameter Estimation, Goodness of Fit Tests)	Banks (Chapter 9)
11	Random Number Generation, Random Variate Generation	Banks (Chapter 7, Chapter 8)

12	Input Modeling (Input Analyzer, Non-stationary Arrival Processes)	Kelton (Chapter 4)
13	Output Analysis for Terminating Simulation	Kelton (Chapter 6)
14	Output Analysis for Steady-State Simulation	Banks (Chapter 11)

General Policy

Syllabus Change: The course schedule announced is tentative. It will be adapted to the pace of class in agreement with the students.

Make up policy: Make up exams will be given only for medical excuses documented by medical reports that are approved by the Student Health Center or other documented excuses approved by the university's executive branches. There will only be one comprehensive make up exam.

Assignment submission policy:

- Assignment solutions must be handed in at the beginning of class on the day that it is due.
- Late submissions are not accepted.
- Your solutions must be written neatly and in an understandable fashion.
- Under no circumstances it is allowed to copy another student's work. Otherwise, the student(s) involved will receive 0 for that assignment.

Academic Integrity:

Please avoid all types of actions that can be considered as cheating or plagiarism. All of the following are considered plagiarism among others according to the web site www.plagiarism.org:

(i) turning in someone else's work as your own, (ii) copying words or ideas from someone else without giving credit, (iii) failing to put a quotation in quotation marks by referencing it, (iv) giving incorrect information about the source of a quotation, (v) changing words but copying the sentence structure of a source without giving credit, (vi) copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not.

Plagiarism is a very serious offense and will be penalized accordingly by the university disciplinary committee. The best way to avoid accidentally plagiarizing is to work on your own before you ask for the help of other resources.

Cheating has a very broad description which can be summarized as "acting dishonesty". Some of the things that can be considered as cheating are the following:

(i) copying answers on exams and all types of assignments, (ii) using prohibited material on exams, (iii) lying to gain any type of advantage in class, (iv) providing false, modified or forged data in a report, (v) modifying graded material to be re-graded, (vi) causing harm to colleagues by distributing false information about an exam or an assignment.

TED University takes academic integrity seriously. We, the students and faculty of the TED University, dedicate ourselves to upholding the highest standards of academic integrity. Academic integrity means that one's work is the product of one's own effort, and one neither receives nor gives unauthorized assistance in any assignment. Because advanced academic work depends on the sharing of information and ideas, academic integrity at the college level includes rigorous adherence to the conventions for acknowledging one's use of the words and ideas of other people, and instruction in this fundamental skill of college life is available to all TED University students (www.tedu.edu.tr).