



Advanced Production/Operations Management Lab

OSCM 3322A Spring 2019

Instructor: Dr. José Humberto Ablanedo-Rosas

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Class Hours: R 3:00-4:20 pm BUSN 328

Office Hours: T 9:00-10:30 am & 12:00-1:00 pm

R 9:00-10:30 am

Reference books:

Simulation Using ProModel, by Dr. Charles Harrell, Dr. Biman Ghosh, and Dr. Royce Bowden, Jr. McGraw Hill, Third Edition (ISBN-13 9780073401300).

Reference books:

Business Process Modeling, Simulation and Design, by Manuel Laguna and Johan Marklund, Pearson Prentice Hall, (ISBN 0-13-091519-X).

Simulation with Arena, by W. David Kelton, Randall P. Sadowski, and David T. Sturrock, McGraw Hill, Fourth Edition (ISBN: 13: 978-0-07-110685-6).

Business Dynamics: Systems thinking and modeling for a complex world, by John D. Sterman, McGraw Hill (ISBN: 13: 978-0-07-231135-8).

Course description:

This course introduces the concepts and tools to design and build computer simulation models of real-world business systems in both the service and manufacturing sector. The simulation models emphasize the analysis of the system's processes and operations over time. The purpose of the simulation models is to conduct numerical experiments and understand the behavior of the system under a given set of conditions.

Objectives:

At the completion of this course students will be able to:

1. Define the components of a simulation model
2. Design a simulation model of a real-world business system
3. Build a simulation model of a real-world business system
4. Define strategies for data collection and analysis
5. Explain the statistical analysis of the simulation output
6. Evaluate different scenarios using a simulation model
7. Define the time frame for a simulation
8. Model discrete and continuous business environments
9. Conduct an experimental design
10. Explain the role of simulation in continuous improvement

Prerequisite:

OSCM 3321 and concurrent registration OSCM 3322

STUDENT ACCOMODATIONS: If you have or suspect a disability and need accommodations you should contact Disabled Student Services Office (DSSO) at 747-5148 or at dss@utep.edu or go to Room 106 Union East Building.

GRADE POLICY: Course grade to be determined by the student's weighted performance in the following categories, with the final course grade based on the 100 point scale, i.e. 90 percent is an A, 80 percent is a B, etc.

ACTIVITY	WEIGHT
Mid-term Exam	30 percent
Final Exam (Comprehensive)	30 percent
Laboratory reports (15 reports)	30 percent
Attendance	10 percent

ACADEMIC HONESTY: Academic honesty is paramount to the existence of academic integrity in a course. During the taking of exams, no student in this course is to receive or give assistance to any other student in this course, nor should assistance through the use of unauthorized materials be used by anyone. In fulfilling other course requirements, work submitted by any student, or any assigned group of students in the case of group projects, must be the original work of that student or group, with appropriate credit given when other sources are used.

Section 1.3.1 of UTEPs Handbook of Operating Procedures provides the basis for the academic administration of charges of scholastic dishonesty. The Handbook states: “Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Disciplinary proceedings may be initiated against any student for any of the following acts or omissions:

1.3.1.1 "Cheating" includes:

- a. copying from the test paper of another student, engaging in written, oral, or any other means of communication with another student during a test, or giving aid to or seeking aid from another student during a test;
- b. possession and/or use during a test of materials which are not authorized by the person giving the test, such as class notes, books, or specifically designed "crib notes";
- c. using, obtaining, or attempting to obtain by any means the whole or any part of non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters, but which will be used again either in whole or in part without permission of the instructor; or accessing a test bank without instructor permission;
- d. substituting for another person, or permitting another person to substitute for one's self, to take a test; and
- e. falsifying research data, laboratory reports, and/or other records or academic work offered for credit;

1.3.1.2 "Plagiarism" means the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the unacknowledged submission or incorporation of it in one's own academic work offered for credit, or using work in a paper or assignment for which the student had received credit in another course without direct permission of all involved instructors.

1.3.1.3 "Collusion" means the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on scholastic dishonesty.”

Course Outline (15 session/15 weeks)

Attendance is assumed and expected and absences are penalized

Session	Lab Practice
1	1. Introduction to Simulation 1.1 Average waiting time 1.2 Queue length 1.3 Average time in the system 1.4 Customers served 1.5 Utilization
2	2. Building the first simulation model 2.1 Locations 2.2 Entity 2.3 Processing and routing 2.4 Arrival 2.5 Run time 2.6 Analysis of results
3	3. Expanding the simulation model 3.1 Multiple locations 3.2 Multiple entities 3.3 Changing data parameters
4	4. Dynamic plots and charts embedded in the simulation model
5	5. Modeling concepts 5.1 Multiple parallel identical locations 5.2 Resources 5.3 Routing rules
6	5.4 Variables 5.5 Uncertainty in routing 5.6 Batching multiple entities of similar type
7	5.7 Attaching entities 5.8 Accumulation of entities 5.9 Splitting of One Entity into Multiple Entities
8	5.10 Decision statements 5.11 While-Do loop 5.12 Do-until statement
9	5.13 Go to statement 5.14 Wait until statement 5.15 Periodic system shut down
10	6. Fitting Statistical Distributions to Input Data
11	7. Advanced modeling concepts 7.1 Attributes 7.2 Cycle time 7.3 Sorting, Inspecting a Sample, and Rework
12	7.4 Preventive Maintenance and Machine Breakdowns 7.5 Shift working schedule 7.6 Job Shop
13	7.7 Modeling priorities 7.8 Modelling a pull system 7.9 Tracking cost Modeling service systems
14	8. Modeling service systems
15	9. Modeling manufacturing systems