

# The University Of Toledo

## Existing Graduate Course Modification Form

\* denotes required fields

Contact Person\*: P. S. Sundararaghavan Phone: 530-2456 (xxx - xxxx) Email:  
p.sundararaghavan@utoledo.

### Present

Supply all information asked for in this column.  
(Supply core, research intensive and transfer module info if applicable)

College\*: College Business and Innovation ▼

Dept/Academic Unit\*:

Info Operations and Tech Management ▼

Course Alpha/Numeric\*: OPMT  
6270

Course Title:

Simulation

Credit hours: Fixed: 03 or Variable: to

**CrossListings:**

Insert

To add a course, type in course ID and click the Insert button.

To remove a course, select the course on left and click the Remove button.

Remove

**Prerequisite(s)**(if longer than 50 characters, please place it in Catalog Description):

**Corequisite(s)**(if longer than 50 characters, please place it in Catalog Description):

### Proposed

Fill in appropriate blanks only where entry differs from first column.

College: College Business and Innovation ▼

Dept/Academic Unit:

Info Operations and Tech Management ▼

Course Alpha/Numeric: OSCM  
6270

**Course Title:**

Simulation and Waiting Lines

**Credit Hours:** Fixed: 03 or Variable: to

**CrossListings:**

Insert

To add a course, type in course ID and click the Insert button.

To remove a course, select the course on left and click the Remove button.

Remove

**Prerequisite(s)**(if longer than 50 characters, please place it in Catalog Description):

OPMT 5520 or OSCM 5520 with C or better

**Corequisite(s)**(if longer than 50 characters, please place it in Catalog Description):

**Catalog Description (only if changed) 75 words max:** **Catalog Description (only if changed) 75 words max:**

Students are introduced to modeling uncertainty in supply chain systems using simulation. Simulation will be introduced through appropriate software (e.g. , @Risk, Simul8, ARENA). Topics such as fitting distributions, validation, verification, confidence intervals, experimental design, comparison with analytic models will be covered.  
Prerequisites: OPMT 5520 FOR LEVEL GR WITH MIN. GRADE OF C OR BUAD 3020 FOR LEVEL UG WITH MIN. GRADE OF C

Students are introduced to modeling uncertainty in supply chain systems using simulation. Simulation will be introduced through spread sheet as well as simulation software (e.g. , @Risk, Simul8, ARENA). Topics such as fitting distributions, validation, verification, confidence intervals, experimental design as well as an introduction to waiting line models and comparison of simulation with analytical models will be covered.  
Prerequisites: OSCM 5520 or OPMT 5520 FOR LEVEL GR WITH MIN. GRADE OF C OR BUAD 3020 FOR LEVEL UG WITH MIN. GRADE OF C

Has course content changed?

Yes

No

If course content is changed, give a brief topical outline of the revised course below( less than 200 words)

Waiting line analysis has been formally added to the course to make it appealing as an analytical course also.

Proposed effective term\*:  ( e.g. 201140 for 2011 Fall)

File Type	View File
Syllabus	<a href="#">View</a>

List any course or courses to be deleted.

Effective Date:  








Effective Date:  

Comments/Notes:

**Rationale:**

In general, Operations and Supply Chain Management is a better description of the program we are doing and the name for the undergraduate major was changed in 2015 along with all courses renamed and modified as needed to OSCM from OPMT. We are carrying out a similar process for the graduate courses. That is OPMT will be phased out and OSCM will be used for courses in the area offered by the department.

**Approval:**

Department Curriculum Authority:	<input type="text" value="Bassam Hasan"/>	 Date	<input type="text" value="2017/04/10"/>
Department Chairperson:	<input type="text" value="P. S. Sundararaghavan"/>	 Date	<input type="text" value="2017/04/11"/>
College Curriculum Authority or Chair:	<input type="text" value="Michael Mallin"/>	 Date	<input type="text" value="2017/04/11"/>
College Dean:	<input type="text" value="Anand S. Kunnathur"/>	 Date	<input type="text" value="2017/04/11"/>
Graduate Council:	<input type="text" value="Constance Schall, GC mtg 5/2/17"/>	 Date	<input type="text" value="2017/05/03"/>
Dean of Graduate Studies:	<input type="text" value="Amanda C. Bryant-Friedrich"/>	 Date	<input type="text" value="2017/05/04"/>
Office of the Provost :	<input type="text" value="marcia king-blandford"/>	 Date	<input type="text" value="2017/05/10"/>

**Administrative Use Only**

**Effective Date:**   (YYYY/MM/DD)

**CIP Code:**

**Subsidy Taxonomy:**

**Program Code:**

**Instructional Level:**

**Registrar's Office Use Only**

**Processed in Banner on:**

**Processed in Banner by:**

**Banner Subject Code:**

**Banner Course Number:**

**Banner Term Code:**

**Banner Course Title:**

## OSCM 6270: Simulation and Waiting Lines

### Catalog Description:

Students are introduced to modeling uncertainty in supply chain systems using simulation. Simulation will be introduced through spread sheet as well as simulation software (e.g. , @Risk, Simul8, ARENA). Topics such as fitting distributions, validation, verification, confidence intervals, experimental design as well an introduction to waiting line models and comparison of simulation with analytical models will be covered.

### Course Prerequisites

BUAD 3020/OSCM 5520 or equivalent courses. Please check with the instructor about the equivalence of other courses for meeting prerequisite requirements.

### Course Objectives

This course provides an introduction to modeling stochasticity in manufacturing and service systems using various techniques such as simulation, queuing networks, and other techniques. We will learn these concepts using industrial grade simulation software such as Simul8 or Arena, spreadsheets, and business cases. Analytical waiting line models will also be discussed in service and manufacturing contexts.

### Learning Objectives

The objectives of this course are to

- i) provide the students with the basic concepts of manual and computer simulation,
  - ii) develop skills in model building, and use those skills in developing simulation models for practical situations in manufacturing and service industries, and
  - iii) gain analysis skills through business cases and simulation software
- IV) Gain an understanding of analytical waiting line models and their applications in service and manufacturing systems.

Our focus will be on the development of skills in formulating practical situations as simulation models, verifying and testing these models and analyzing the simulation output so that managers can make appropriate decisions in their jobs. We will use industrial grade software (Simul8). We will also use spreadsheet based software, @RISK. We will also use

widely used spreadsheets such as Excel in our analysis. Simul8 is available on the machines in the computer laboratories in the College of Business. You will also be able to download a copy of Simul8 for course use to be installed on your personal computers (Simul8 is a Windows based software). I will distribute additional details for each week based on the pace of the class.

Analytical waiting line models and their application in manufacturing and service operations will be discussed.

### Text and Course Materials

1) Banks, J., J. S. Carson, B.L. Nelson , and D.M. Nichol (2010), "Discrete Event System Simulation," (Fifth edition), Prentice-Hall, New Jersey (not geared to any particular software (ISBN 978-0-13-606212-7)

2) Handouts to be distributed by the instructor.

#### Additional useful books

i) Kelton, W.D., Sandowski, R. P., and N.B. Swets, "Simulation with Arena," (fifth edition), McGraw-Hill Inc., New York , 2010.

ii) Simul8 software , published by Visual Thinking International. (Note: This is same as the full version of the software package installed in the computer laboratories. It includes an introductory manual). You are allowed to use it for at most 3 months for academic use.

iii) Profozich, D. (1998), Managing Change with Business Process Simulation, Prentice-Hall PTR, Upper Saddle River, New Jersey.

#### Grading

Your course grade will depend on the five components listed below:

Project 25% Midterm Examination 25% Final Examination 25% Assignments 25%

A [93,100], A- [90,93), B+ [87,90), B [83, 87), B- [80,83), C+ [77,80), C [73, 77), C- [70, 73), D+ [67, 70), D [63, 67), D- [60, 63)

#### Class Schedule

Note: There will be no makeup exams. You cannot miss the scheduled examinations unless there are unforeseen emergencies such as medical needs. Homework assignments are due on the date on which they are specified to be turned in. Late submissions will be heavily penalized or not accepted at all, subject to instructor's discretion.

#### Academic Dishonesty

As a student taking coursework in the COBI of UT, you have an obligation to maintain the highest standards of ethical conduct. All homework assignments must be done and submitted independently. Any violation of academic honesty will result in an F grade, plus additional disciplinary actions. For further clarification refer to:

[http://www.utoledo.edu/catalog/2000catalog/admissions/academic\\_dishonesty.html](http://www.utoledo.edu/catalog/2000catalog/admissions/academic_dishonesty.html)