EMSE 6760 - Discrete Event Simulation

Instructor Information:

Dr. J. René van Dorp
Professor
Office Address: 800 22nd Street, Office 2800, Washington DC 20052
Telephone Number: 202-994-6638
Fax Number: 202-994-0245
E-mail: dorpjr@gmail.com

Office Hours: Wednesday 2:00PM to 4:00PM

Class Meets as at: Tompkins Hall 4th floor, Room 406 (DSS LAB)

(22 Computers available)
Course Description:

An introduction will be provided to the application and theoretical background of systems simulation. Topics included modeling systems dynamics using discrete events, the modeling of manufacturing and materials handling systems and service systems through simulation. Theoretical topics include random variable generation, model verification and validation, statistical analysis of output. Simple simulation problems will be introduced using Microsoft Excel. A high-level simulation package SIMIO will be utilized for more complex simulation problems.

Prerequisite:

APSC 3115 Engineering Analysis III or
EMSE 6020 Elements of Problem Solving and Decision Making or
EMSE 6765 Data Analysis for Engineers and Scientists
Course Objectives:

Each student should: (1) Understand how computer simulation can be used to model complex systems and solve related decision problems (2), understand the assumptions made in building a discrete event simulation, (3) understand and apply statistical methods used in simulation analysis, (4) perform sensitivity analyses to test the effects of critical model parameters, (5) be able to run a simulation project from start to finish.

Method of Instruction:

One hour and 20 minutes lecture including homework discussion, followed by a 10 minute break. One hour lecture including breakout session to start with simulation exercises in class. **Homework will have to be completed and handed-in according to the outline schedule one class after it was assigned.**
Homework: For each homework problem a student may be called upon to discuss their solution, so you must be prepared! The rest of the class should be involved in the discussion. Your level of effort will be graded. Not handing in a homework problem will result in 0 points. Non-SIMIO Homework that is handed in and demonstrating an adequate level of effort will be awarded 1 point. SIMIO Homework with adequate level of effort will be awarded 2 points. You should each bring electronic files of your homework to class in case you are called upon to show your work to the rest of the class. Reading Assignments: Chapters for reading will be assigned prior to class and should be read prior to class.
Method of Evaluation:

Students will complete an in-class simulation Midterm Exam using Microsoft Excel + SIMIO (using a lab computer or the student’s laptop) and an in-class Final Exam using SIMIO. Students will submit with their Midterm Exam and Final Exam electronic files that will be graded.

FINAL GRADE CALCULATION:

10% Class Attendance

10% In-Class Quiz Simulation Stakeholder and Simulationist Bill of Rights

20% Homework

30% Midterm Exam

30% Final Exam
Text and Software:


Software: SIMIO. A student version of the software is available from:


Software: Microsoft Excel which standard available in our computer labs

Recommended Text:

“Discrete Event Simulation” by Banks, Carson and Nelson, Prentice Hall.
Academic Integrity:
THE ACADEMIC INTEGRITY CODE WAS DEVELOPED BY THE STUDENTS AND THE FACULTY OF GW WORKING TOGETHER IN 1995. BY ATTENDING GW EACH STUDENT IS PART OF THIS TRADITION.
"THE RIGHT ANSWER COMES FROM YOU"

Cheating will not be tolerated, i.e. copying or looking on another student's paper during the midterm exam or the final exam, will not be tolerated. Also, no material or electronic files from previous EMSE 3760, 6760 may be used. In the event of cheating action will be taken in accordance with the Academic Integrity Code. A copy of the Academic Integrity Code may be picked up at:
ACADEMIC INTEGRITY OFFICE
THE GEORGE WASHINGTON UNIVERSITY
609 22nd STREET, N.W. BLDG. AJ
WASHINGTON D.C. 20052

Lead Professor:
Dr. J. Rene van Dorp - Professor
Office Address: 800 22nd Street, Office 2800, Washington DC 20052
Telephone Number: 202-994-6638
Fax Number: 202-994-0245
E-mail: dorpjr@gmail.com

Office Hours: Wednesdays 2:00PM to 4:00PM
<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Class Topic</th>
<th>Reading Assignments</th>
<th>Homework Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/14/2016</td>
<td>Intro to Simulation, Basics of Queuing Theory</td>
<td>Chapter 1, Chapter 2</td>
<td>HW 1 in Lecture Notes Chapter 2</td>
</tr>
<tr>
<td>2</td>
<td>1/21/2016</td>
<td>IN-CLASS QUIZ Simulation Stake Holder and Simulationist Bill of Rights, Kinds of Simulation, Simple Queue Simulation in Excel</td>
<td>Chapter 3</td>
<td>HW 2 in Lecture Notes of CH. 2, Problem 2-3. Compare answer 2-3 to answers of 2-1 and 2-2</td>
</tr>
<tr>
<td>3</td>
<td>1/28/2016</td>
<td>Simulating a Simple Queue in MICROSOFT EXCEL and SIMIO</td>
<td>Chapter 3, Chapter 4</td>
<td>Homework Assignment 1, 2 in Lecture Notes of Chapter 3</td>
</tr>
<tr>
<td>4</td>
<td>2/4/2016</td>
<td>SIMIO - ATM Simulation</td>
<td>Chapter 4</td>
<td>HW 3 in Lecture Notes of Chapter 3, HW 4-14a, HW4-14b, HW4-14c</td>
</tr>
<tr>
<td>5</td>
<td>2/11/2016</td>
<td>SIMIO - Intermediate Modeling</td>
<td>Chapter 5</td>
<td>Problem 5-4, Problem 5-5</td>
</tr>
<tr>
<td>6</td>
<td>2/18/2016</td>
<td>SIMIO - Intermediate Modeling</td>
<td>Chapter 5</td>
<td>Problem 5-9</td>
</tr>
<tr>
<td>7</td>
<td>2/25/2016</td>
<td>MIDTERM REVIEW, Input Analysis</td>
<td>Chapter 6</td>
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<tr>
<td>8</td>
<td>3/3/2016</td>
<td>MIDTERM EXAM - in Class (Session 1 - 7 + Handouts and Spreadsheets)</td>
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<tr>
<td>9</td>
<td>3/10/2016</td>
<td>Discuss Midterm Solution, Input Analysis</td>
<td>Chapter 6</td>
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<tr>
<td>10</td>
<td>3/17/2016</td>
<td>SPRING BREAK</td>
<td></td>
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<tr>
<td>11</td>
<td>3/24/2016</td>
<td>Class Canceled</td>
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<tr>
<td>10</td>
<td>3/31/2016</td>
<td>Input Analysis, SIMIO - Modeling an EMERGENCY DEPARTMENT</td>
<td>Chapter 6, Extra Notes Random Number Generation</td>
<td>Problem in “HW_06_Template.xlsx”, Problem 7_1</td>
</tr>
<tr>
<td>11</td>
<td>4/7/2016</td>
<td>SIMIO - Modeling an EMERGENCY DEPARTMENT</td>
<td>Chapter 7</td>
<td>Problem 7-2, Problem 7_3</td>
</tr>
<tr>
<td>12</td>
<td>4/14/2016</td>
<td>SIMIO - Modeling an EMERGENCY DEPARTMENT</td>
<td>Chapter 7</td>
<td>Problem 7-4, Problem 7-6</td>
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<tr>
<td>13</td>
<td>4/21/2016</td>
<td>SIMIO - Animation and Entity Movement</td>
<td>Chapter 8</td>
<td></td>
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<tr>
<td>14</td>
<td>4/26/2016</td>
<td>MAKE UP CLASS - Pseudo Random Number Generation, FINAL REVIEW</td>
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<tr>
<td>15</td>
<td>5/5/2016</td>
<td>Final Exam - In Class (Sessions 9 - 14)</td>
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• Electronic copies of the lecture notes can be downloaded from my Faculty web-page at: http://www.seas.gwu.edu/~dorpjr/EMSE273/Intro.html

• I will provide regular feedback on home work and quiz grades via a graph and table with the grades. You will be assigned a random number to mask your identity. Don’t share this number with anyone to keep it that way.