OM 435-001

Business Process Analysis & Simulation
Spring 2016

Syllabus

Instructor: Hossein Fateh, PhD
Office: Enterprise Hall 277
Phone: 703.993.1880
Office Hours: by appointment.
Email: hfateh@gmu.edu

Course Meeting Times: Tuesday, 07:20-10:00 pm
January 20th – May 12th
Enterprise Hall – Room 277


Software: ExtendSim Demo
Free download from http://www.extendsim.com/prods_demo.html
Students are responsible for testing the software on their machine. Any compatibility issues should be addressed early in the semester.

Course Web Page: On Blackboard

Course Description:
Introduces concepts and tools used in designing, modeling, analyzing, and improving business processes. Various business process analysis and simulation methods, such as process mapping/flowcharting, process flow and capacity analysis, service process design, theory of constraints, process modeling and simulation, and business process reengineering are discussed. Introduces methods and analytical tools such as queue theory and computer simulation used to design, model, analyze, and improve business processes. Discusses methods such as process mapping/diagramming, service process design, process modeling, and business process reengineering.

This course is intended to be a survey of business process analysis practices and modeling in both manufacturing- and service-oriented firms. It is intended to provide managers in all functional areas with sufficient knowledge to make informed “total business decisions” and to introduce standard terms and concepts for communications with stakeholders. In such a course, it should be recognized that breadth of subject matter, not depth of topic, is the goal.

Prerequisites:
A student must have received a C or higher in OM 301, degree status. Prerequisite enforced by registration system. It is assumed that each student is proficient in elementary algebra, calculus, probability, and

Last Updated: 03 January 2015
Geometry. Familiarity with MS Word, Excel, and PowerPoint is also expected. Deficiencies should be self-remediated early in the semester.

**Undergraduate Program Learning Goals** (goals addressed in this course are in **bold**):

- **Our students will be competent in their discipline.**
- **Our students will be aware of the uses of technology in business.**
- Our students will be effective communicators.
- **Our students will have an interdisciplinary perspective.**
- Our students will be knowledgeable about global business and trade.
- Our students will recognize the importance of ethical decisions.
- Our students will be knowledgeable about the legal environment of business.
- **Our students will be knowledgeable about team dynamics and the characteristics of effective teams.**
- Our students will understand the value of diversity and the importance of managing diversity in the context of business.
- **Our students will be critical thinkers.**

**Course Objectives:**

- Build an understanding of how business process analysis fits into the organization
- Provide a knowledge base for conversing with stakeholders of BPR efforts
- Build both quantitative and qualitative analysis skills, especially those needed for managing analysis of core business processes
- Provide common sense modeling concepts, which can be used to help managers evaluate various problems that arise in practice
- Introduce real-world applications and their connection with business process analysis
- Understand and appreciate the role of variability in an organization

**Slides, Additional Handouts & Readings:**

I will be posting the slides and spreadsheets that we will discuss in class on Blackboard. However, they will not be complete and will require your attention during lectures to complete them and add explanatory notes. You will find it useful to print them out prior to class and take notes on them during class. In addition to your text, I will be posting additional readings, cases, and news articles on Blackboard. We will use these to help motivate the concepts discussed in class and how they can be used to address real business issues effectively. We will also go through several in-class exercises. I will regularly send out emails through Blackboard. Please make sure you are checking all messages and taking the appropriate action. If you are not receiving my emails, please let me know as soon as possible.

**Grading Policy:**

Grading for the course will be based on **2 exams, a group project, homework, and class participation**. **Participation** can make a difference if you are borderline between two grades to boost your grade. Final course grades will be assigned according to the following weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Group Project</td>
<td>20%</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10%</td>
</tr>
</tbody>
</table>

**GRADING SCALE:**

A = 90-100; B = 80-89.99; C = 70-79.99; D = 60-69.99; F = below 59.99. Final cumulated scores of the class will be analyzed to determine if an adjustment or curve is necessary. However, a curve will only help you. Therefore, if you have a 90% or more you will get an A in the class – I won’t curve to raise the

Last Updated: 03 January 2015
minimum requirements for grades, only lower them if necessary. Depending on the distribution of the
grades I may or may not assign +/- (i.e., A+, A-, B+, B-, C+, C-).

**Exam Policies:**

There are two in-class exams: one midterm and one final. The final exam is non-cumulative (i.e., only new
materials haven’t been tested in midterm exam are covered). The scheduled exam date and covered
materials for each exam can be found on the last page of this course syllabus. Exam questions test both
qualitative concepts and quantitative methods. To well prepare these exams, students should work on
homework assignments on a regular basis.

All exams are closed book, closed notes, individual efforts. You may also bring one two-sided (8.5x11)
original hand-written or typed note and formula sheet to each exam. To help students understand the
material and prepare the exams, practice problems will be assigned.

Makeup exams will not be given. IF YOU CANNOT TAKE THE FINAL AT THE TIME SHOWN, DO
NOT REGISTER FOR THIS CLASS. NO MAKEUPS WILL BE GIVEN without a valid, per university
policy, documented excuse. Students missing a scheduled exam due to an official GMU event must
prearrange an alternate time to take the exam. Other excused absences (for health reasons, etc.) must be
documented, and the grade missed will be the average of the other exam scores. All other cases will
receive a grade of zero for the missed exam. Cell phones, smartphones, lap-tops, pagers, and other
transmitting devices are not permitted during the exam at any time. These devices may not be used as a
calculator and must be powered o_ during the exam. Violation of these rules constitutes an Honor Code
violation. If there is an emergency situation that requires a transmitting device to be active, please contact
the proctor prior to the exam. Students must have desks clear of all items during the test.

**Group Project:**

**Overview** – The purpose of this group project is for students to analyze and improve real-world business
operations by applying business process analysis and simulation techniques learned in this course. This
project exposes students to important business process modeling and design steps. Students will need to
1) investigate a real-world business operations, 2) identify the corresponding business processes in use, 3)
measure the performance of existing business processes, 4) suggest an alternative business process
design, and 5) evaluate the improvement of the newly suggested business process design. Each team is
responsible for a project proposal, a final report, and a presentation. You are encouraged to discuss your
project with the instructors at any stage to assure your team is making expected progresses.

**Team** – To promote teamwork experience, this project requires every student to work in a team. Students
with similar interests should group themselves. There could be 5-6 students in a team. Each team needs to
turn in a list of your team-members’ names and contacts on 1/27. When planning your group meetings and
activities, DON´T forget to account for your other commitments particularly near the end of semester.
Successful teamwork requires effective communication and efficient coordination among team members.

**Project Topic** – Each team needs to select and analyze a real-world business operation and to propose
and evaluate an improving solution. For example, while a group project team may work on reducing
customer waiting times at a retailer store, another team may deal with increasing throughput rates at a
manufacturing plant. Looking up magazines/newspapers, interviewing managers, or even observing
business operations would help you find interesting real-world subjects for your business process
improvement project. While selecting your topic, make sure you can collect necessary data/information
for identifying and measuring the inefficiency ineffectiveness in the business processes of interest. Feel
free to discuss your tentative topics with the instructor before preparing your proposal.

**Proposal** – Each team needs to submit a project proposal on 2/22. Your proposal should consist of the
following components: 1) Problem Statement – clearly states the potential inefficiency/ineffectiveness in

Last Updated: 03 January 2015
the selected business operations, 2) Data Collection – specifies the data/information you need and your collection plan, 3) Performance Measures – specifically indicates how you plan to measure the process efficiency/effectiveness, 4) New Process Design – proposes some alternative designs for improving the selected business processes, 5) Questions – raises any relevant questions or concerns about your project. The length of this outline-style proposal should be within 2 pages. The instructor will then provide critical comments to help your team’s project get on the right track quickly.

**Final Report** – For each team, a final project report is due on 4/25. Your report should include the following sections: 1) Introduction – briefly introduces the business operations your team attempts to improve, 2) Problem Statement – clearly states potential inefficiency/ineffectiveness of the selected business processes and defines specific quantifiable performance measures, 3) Business Process Modeling – identifies and models specific business processes embedded in the selected business operations currently in use, 4) Performance Analysis – analyzes and quantifies the performance of existing business processes in use, 5) New Process Design – develops and designs alternative business processes to improve the business operation, 6) Improvement Analysis – analyzes and quantifies the improvement of your new process design over the existing one in use, 7) Conclusions and Recommendations. Make sure your final report is no longer than 15 double-space pages in 12-point font – excluding tables and figures.

**Presentation** – Each team is required to give a presentation to share your business improvement efforts with the rest of the class on 4/25. Every team has 12 minutes for presentation and another 3 minutes for questions. Presentation media, such as Power Point, should be used to help your classmates understand your project. Be prepared with a backup plan to survive possible computer system failures.

**Grading** – Your overall project grade is based on your final report (60%) and presentation (40%). When preparing your presentation and report, please assume general audiences and readers like your classmates who have some business process analysis and simulation background but have no idea about your project. Make sure you show the business process improvement with sufficient supporting quantitative evidences in your project. Be also sensitive to any tradeoffs resulted from your new process design. There will be a peer evaluation mechanism for differentiating grades among members in a team. Those team members who contribute significantly less would receive a lower grade than their other teammates.

**Homework Assignments:**
Homework problems will be assigned in class. Late homework is subject to a 10-point penalty per day for the following two days of the due date. No further extension is acceptable except for legitimate reasons with official documents. You are strongly encouraged to form a small study group to discuss course materials and homework assignments with a few other classmates on a regular basis and to stop by office hours to clarify any questions. However, each student is responsible for preparing his/her individual answers neatly on letter-size papers. Copying answers from your classmates or any other sources is considered a violation of the Honor Codes. Please note that exam questions are very similar to homework problems assigned. In order to do well on exams, you want to work on each homework problem carefully to make sure you fully understand course materials.

**Class Participation:**
Every student is expected to prepare for and attend each class and to constructively participate in class discussions. Let the instructor know in advance, should you have to plan on missing a class. Students are particularly encouraged to share their views and work experiences on various topics. In-class exercises/quizzes may be collected from time to time to detect student learning. Constructive actions and superior in-class exercises/quizzes will be recorded and rewarded with a higher class participation grade. Merely attending all lectures is not sufficient to obtain a high class participation grade. On the other hand, any destructive actions or failure to attend classes can adversely affect your class participation grade. Note that playing with cell-phone/iPod, checking e-mail, browsing the Internet, doing irrelevant work, and frequently leaving your seat are considered destructive actions.

Last Updated: 03 January 2015
**Classroom Etiquette:**
It is expected that you are courteous and professional to both your instructor and classmates. This includes, but is not limited to, **turning off your cell phone** during class. I reserve the right to ask you to leave the classroom if I consider your behavior disruptive to the delivery of the lecture or exam.

During class you are allowed to use a laptop or a tablet **only for note-taking purposes.** If during the class you are seen using your laptop or tablet for other than note-taking purposes you will be asked to turn off your device. If you want to use a voice/video recording device as a substitute of note taking, please discuss it with me before the class.

**E-mail Contact:**
- I communicate remotely with students **only** by GMU e-mail. I will not reply to voice mail messages left on a GMU office telephone.
- For security and confidentiality, I will only reply to GMU e-mail addresses. E-mail from Yahoo, Gmail, Hotmail, or other free email providers will be deleted without reply.
- I will only reply to student e-mail that is signed with your full name and that states your course and section. E-mail without this information will be deleted without reply.

**Disability:**
Any student with special needs should bring them to the instructor’s attention no later than the second week of class. For students with any disabilities, please also contact the Office of Disability Services (ODS) at 703-993-2474. All academic accommodations must be arranged through the ODS. For more information, please visit ODS’s home page: [http://ods.gmu.edu/](http://ods.gmu.edu/)

**Inclement Weather & Campus Emergencies:**
Information regarding weather-related changes in the University's schedule (e.g., closing or late opening) will be provided on the GMU website and via Mason Alert. Students sign up for the Mason Alert system to provide emergency information of various sorts at [https://alert.gmu.edu](https://alert.gmu.edu). If campus is closed, please check Blackboard for announcements from the professor.

**Honor Code:**
Students are obligated to strict adherence to the University honor system and code as stated in the University Catalog. You are bound by the code to neither receive nor furnish any assistance of any kind by any means on any graded assignment, test, or quiz. Specifically:

- All work submitted for a grade, including tests, quizzes, and homework, are to be completed individually, on your own, and alone. Copying quiz or test answers from another student and/or allowing your answers to be copied by another student are strictly and absolutely forbidden.

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Last Updated: 03 January 2015
• Communication and collaboration, or suspicion thereof, of any kind between students during tests and quizzes is strictly and absolutely forbidden.

• Using an impermissible aid on any quiz or test such as unauthorized notes or electronic devices with Internet or peer-to-peer connectivity is strictly and absolutely forbidden.

• Any evidence or suspicion of collaboration on graded material will be construed as an honor code violation.

• Removing an exam from the classroom and sharing information about exams with other students is strictly and absolutely forbidden.

• Unless the instructor has authorized use of such material, using quiz/test material from classes that were offered by the same instructor in previous semesters is also considered a violation.

• Any violations of the honor code will result in an immediate filing of formal charges with the University Honor Committee which will be aggressively pursued with great vigor. For more information on the University's Honor Code, please visit oai.gmu.edu/honor-code/

<table>
<thead>
<tr>
<th>School of Business Recommendations for Honor Code Violations</th>
<th>Adopted by the faculty May 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UG-Non Freshman Students (including transfer students)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type of Violation</strong></td>
<td><strong>First Offense</strong></td>
</tr>
<tr>
<td>Plagiarism—failure to cite/attribute sources</td>
<td>An F in the class; multiple visits to the Writing Center required; and Academic Integrity Seminar Attendance</td>
</tr>
<tr>
<td>Plagiarism—representing someone else’s work as the student’s own</td>
<td>An F in the class; multiple visits to the Writing Center required; and Academic Integrity Seminar Attendance</td>
</tr>
<tr>
<td>Cheating on an assignment, homework, class participation, or minor project</td>
<td>An F in the class; and Academic Integrity Seminar Attendance</td>
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<tr>
<td>Cheating on a major project, test, or exam</td>
<td>An F in the class; Academic Integrity Seminar Attendance; and at least one semester suspension</td>
</tr>
<tr>
<td>Egregious Violation [e.g., stealing an exam; submitting coursework from another class as original work; lying to an employer about academic performance]</td>
<td>Dismissal from the program; at least one year suspension; and attendance at Academic Integrity Seminar at the time of hearing and just prior to reenrollment</td>
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**Tentative Schedule:**
The following schedule is tentative. In general, even if the specific date of coverage may change slightly, the order of coverage should remain as presented below. Modifications may be made as the semester progresses.

Last Updated: 03 January 2015
progresses and the appropriate changes will be announced in class.

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Topic (Tentative)</th>
<th>Chapter</th>
<th>Chapter Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tue</td>
<td>19-Jan</td>
<td>Introduction to Business Process Design</td>
<td>Lecture notes</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Tue</td>
<td>19-Jan</td>
<td>More on Business Process Design</td>
<td>Lecture notes</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Tue</td>
<td>26-Jan</td>
<td>Introduction to Simulation</td>
<td>Lecture notes</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>3</td>
<td>Tue</td>
<td>2-Feb</td>
<td>Simulation Examples</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tue</td>
<td>9-Feb</td>
<td>More on Simulation Examples</td>
<td>3</td>
<td></td>
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<tr>
<td>5</td>
<td>Tue</td>
<td>16-Feb</td>
<td>Statistical Models in Simulation</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tue</td>
<td>23-Feb</td>
<td>More on Statistical Models in Simulation</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Tue</td>
<td>1-Mar</td>
<td>Midterm (from weeks 1 to 6)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tue</td>
<td>8-Mar</td>
<td>Spring Recess</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Tue</td>
<td>15-Mar</td>
<td>Queuing Models</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Tue</td>
<td>22-Mar</td>
<td>More on Queuing Models, Project Proposal discussion</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Tue</td>
<td>29-Mar</td>
<td>Random Variable Generation</td>
<td>8</td>
<td></td>
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<tr>
<td>12</td>
<td>Tue</td>
<td>5-Apr</td>
<td>Input Modeling</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Tue</td>
<td>12-Apr</td>
<td>Optimizing Business Process Performance</td>
<td>11</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Business Process Analytics</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Tue</td>
<td>19-Apr</td>
<td>Final Exam Review</td>
<td>N/A</td>
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</tr>
<tr>
<td>15</td>
<td>Tue</td>
<td>26-Apr</td>
<td>Student Group-Project Presentation</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Tue</td>
<td>2-May</td>
<td>Final Exam (from weeks 9 to 15) 7:20-10:00pm</td>
<td>N/A</td>
<td></td>
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</tbody>
</table>

Last Updated: 03 January 2015