OM 352: Operations Management

Spring 2011 Course Syllabus

Section 001 (CRN 11856)

Dr. Harvey Singer

Office
Enterprise Hall (ENT), Room 144.

Office Hours
Monday from 2:00 to 3:30 PM, Tuesday from 12:00 Noon to 2:00 PM,
Thursday from 12:00 Noon to 2:00 PM, Friday from 11:00 AM to 12:30 PM,
or by appointment. (Schedule subject to change.)

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Class Session
Thursday from 7:20 to 10:00 PM in Enterprise Hall room 277 (ENT 277).

Description
This is a course in applied operations research for business management. Business situations are
represented by analytical mathematical models solved by the effective application of the methods
mathematical programming and probabilistic process analysis. Emphasis is placed on the proper
association of a specific methodology with a particular type of business problem. Specific topics
include linear programming, integer programming, transportation problems, goal programming,
network flow models, decision analysis, waiting line models, and Monte Carlo simulation.
Emphasis is also placed on the effective written communication of technical data and results.
Extensive use is made of computer software in problem solving.

Prerequisites
1. OM 210 (Statistical Analysis for Management) and OM 301 (Operations Management).
   Note that prerequisites are strictly enforced by the Office of Academic and Career Advising.
2. Proficiency in elementary algebra is essential and is expected. Deficiencies in elementary
   algebra should be self-remediated.

Required Text
   ▶ The 10th Edition supersedes and replaces all previous editions. I will not support any
   edition of the textbook other than that stated above.
2. The text is supplemental reading and is not a substitute or replacement for classroom instruction.

**Undergraduate Program Learning Goals** (Goals addressed in this course are in **bold**)
1. Our students will be competent in their discipline.
2. **Our students will be aware of the uses of technology in business.**
3. Our students will be effective communicators.
4. **Our students will have an interdisciplinary perspective.**
5. **Our students will be knowledgeable about global business and trade.**
6. Our students will recognize the importance of ethical decisions.
7. Our students will be knowledgeable about the legal environment of business.
8. **Our students will be knowledgeable about team dynamics and the characteristics of effective teams.**
9. Our students will understand the value of diversity and the importance of managing diversity in the context of business.
10. **Our students will be critical thinkers.**

**ISOM Major Learning Goals** (Goals addressed in this course are in **bold**)
1. **Apply knowledge of information technology and business functions to understand its application in assessing, designing and improving business processes.**
2. Develop data organization, storage and processing solutions to support organizational needs for information management. They will also have the option of developing skills in the area of supporting decision making through business intelligence solutions.
3. Use knowledge of computer networks as part of the IT solutions for improving business processes. They will also have option of developing more advanced skills in the areas of network and security.
4. **Effectively manage information technology projects.**
5. Understand the overall systems development life cycle and be able to recommend IT system solutions accordingly. They will also have option of learning appropriate development tools to develop prototype of IT solutions for business management.

**Specific Course Objectives**
1. To master the essentials of the concepts and methodologies of the tools of management science and to apply those methodologies to solve practical technical business problems.
2. To provide a sound basis in management science for the student’s future academic and professional careers.
3. To foster critical thinking and independent problem solving skills. Specifically, to gain the ability to independently analyze business data and to model business situations, and to understand and learn from the data.
4. To foster the clear communication and presentation of technical model results.
5. To raise awareness of ethics in the practice of management science.

**Approach**
1. Geared for the future business professional engaged in decision support and/or decision making. The emphasis is on practical business applications rather than on technical rigor. The format will be lectures, but discussions and questions are highly encouraged.
2. As the instructor, I am responsible for teaching the best course possible, including providing the best possible resources which promote learning. Students are individually and solely responsible for their own learning, including the application of the information presented, as demonstrated by performance on the graded homework, quizzes, and exams. I will use my office hours to meet with students individually to work with them on a one-to-one basis to help their understanding and mastery of the material.

Disability
All academic accommodations due to disability must be arranged by the student with the Office of Disability Services (ODS); contact ODS at 703-993-2474. I will cooperate with ODS to the greatest extent possible to accommodate a student’s special needs.

Honor Code
1. Students are obligated to strict adherence to the University honor system and code as stated in the 2010-11 University Catalog. You are bound by the code to neither receive nor furnish any assistance of any kind on any graded assignment, test, or quiz.
2. Specifically:
   - All work submitted for a grade, including tests, quizzes, and homeworks, are to be completed individually, on your own, and alone.
   - Communication and collaboration, or suspicion thereof, of any kind between students during tests and quizzes is strictly and absolutely forbidden.
   - Any evidence or suspicion of collaboration on graded homework will be construed as an honor code violation.
3. Any violations of the honor code will result in an immediate, automatic, and severe devaluation of the score on that test, quiz, or homework and the filing of formal charges to the university Honor Committee.

Connectivity
1. It is the student’s responsibility to have reliable and adequate Internet connectivity and access (including GMU computers available on campus).
2. For technical assistance, visit the ITU Support Center at http://itusupport.gmu.edu/ or call 703-993-8870 or send e-mail to support@gmu.edu. However, it is solely the student’s responsibility to determine and resolve connectivity and other problems.

E-mail Contact
1. I communicate remotely with students only by GMU e-mail. I will not reply to voice mail messages left on my GMU office telephone.
2. For security and confidentiality, I will only reply to GMU e-mail addresses.
3. I will only reply to student e-mail that is signed with your full name and that states your course and section. E-mails without this information will not receive a reply.
4. I check and respond to e-mail during my posted office hours. I do not check or respond to e-mail at night after business hours or on the weekends.
5. Expect a response to an inquiry within 1 to 2 days after I read the e-mail.
Class Etiquette
Be courteous to and respectful of others in class. Please refer to the document “Lecture Etiquette” posted under the link “Getting Started.”

Class Participation
1. Performance is highly associated with class attendance and participation.
2. Students are expected to attend all scheduled classes.
3. Class participation consists of active engagement in the presentation of material and through questions and discussions.
4. The student is solely responsible for all assignments and material presented in class even if missed due to absence.

Course Website on Blackboard
1. Login to at https://courses.gmu.edu and click on the link for OM 352. (Note: This is a new website specific to this semester and section and is currently under construction.)
2. My OM 352 course website consists of separate pages and links containing this syllabus; announcements and assignments, PowerPoint presentations, supplemental notes; solutions to some textbook and homework problems; and student grades. There is an intuitive architecture to the organization of course website; the student should become familiar with navigating the website. Note that the on-line presentations are condensed and abridged versions (with shortened coverage and content) of the corresponding presentations delivered in class.
3. The website is continually being maintained. During the semester, new documents may be created and existing documents may be modified as appropriate. Important course announcements will be posted under the link “Announcements” and/or on the course calendar. You should check the website often, at least twice a week.
4. Students will be informed beforehand of the pertinent documents for the next class. It is recommended that students download the pertinent course documents before class and well before exams and assignment due dates. To alleviate the burden of taking notes in class and to give your full attention to the discussion, I recommend that you annotate my documents with your own notes as appropriate during class.
5. The student should be familiar with recent versions of MS Office products, especially MS Word, PowerPoint, and Excel.
6. The course website is an electronic medium to facilitate the transfer and dissemination of the course content. It is provided solely to augment classroom presentation and discussion of the material. The website is not a substitute or replacement for attending class. On-line is not on vacation!

Grading Metrics
1. The course is scored and graded on a point system; the value of the course is 1200 points.
2. The metrics used for determining the final course grade are the scores earned on:
   ➢ all three (3) tests (1000 points max),
   ➢ all five (5) quizzes (100 points max),
   ➢ all ten (10) submitted and graded problem sets/case studies (100 points max).
3. Each of the aforementioned grading instruments is described in the paragraphs below.
4. A numerical final course total score is calculated as the sum of scores earned on all tests, quizzes, homeworks, and project (out of a maximum possible score of 1200 points).

5. The final course letter grade is assigned objectively and strictly according to the numerical final course total score. (See “Course Grade” below.)
   • There is no “extra credit” of any kind, for any reason.
   • Final total point scores are NOT “bumped” or rounded up to the next higher letter grade.

Homework
1. Mastery of the subject matter is measured by skill and proficiency in problem solving. Proficiency is gained by practice. The assigned homework should be considered the minimum amount of practice. (It is also a diagnostic tool by which the student may assess his or her understanding and performance.)
2. Ten (10) problem sets or case studies from the textbook chapters will be assigned as homework and will be collected and graded, as announced. Any homework problems/case studies to be submitted should be regarded as required deliverables of the course. The problems/case studies to be submitted will be announced before the assignment is due.
3. Up to ten (10) points will be assigned to each homework assignment submitted on time. Altogether, the graded homeworks count for up to 100 points of the final course score.
4. Homework assignments will be posted on my OM 352 course website. Follow the instructions given for each homework assignment to be submitted.
5. Homework assignments, including their solution and submission, are the sole responsibility of the student.
6. The submitted homework is an individual effort. Absolutely NO collaboration of any kind is permitted. Any collaboration will be treated as an Honor Code violation.
7. Solutions to some of the homework problems may be posted on my OM 352 course website after the assignment is due for submission.
8. Late homework will not be accepted under any circumstances.
9. Missing homework will be assigned a score of zero; zero homework scores will be counted in the total final course score. (No exceptions, regardless of reason, including [but not limited to] medical, family, work, and transportation emergencies.)

Quizzes
1. Five mandatory in-class quizzes will be given in class (at anytime during the class).
2. Some of the in-class quizzes will be unannounced, unscheduled, “pop” quizzes.
3. Each individual in-class quiz contributes the points scored (out of 20 points) to the final course score. Altogether, the quizzes count for up to 100 points of the final course score.
4. A quiz may consist of a single word problem that may be based on the coverage in the previous lecture.
5. All quizzes are individual efforts. Absolutely NO collaboration of any kind is permitted. Any collaboration will be treated as an Honor Code violation.
6. A missed quiz will be assigned a score of zero. A missed quiz CANNOT BE MADE UP UNDER ANY CIRCUMSTANCES. (No exceptions, regardless of the reason, including [but not limited to] medical, family, work, and transportation emergencies.)
Tests
1. Three mandatory, non-cumulative, tests will be given, as announced. The tests will be comprehensive of the topics they cover.

2. Specific topic coverage of all the exams will always be announced and posted in advance of test dates. Each individual test contributes the points scored to the final course score. The tentative coverage and test valuation is as follows:
   - Test 1: Linear programming: graphical solution and graphical sensitivity analysis and multidimensional computer solution and sensitivity analysis (worth up to 250 points).
   - Test 2: Special linear programs, network flow models, and queuing analysis (worth up to 250 points).
   - Test 3: Multicriteria (goal) programming, decision analysis, queuing analysis, and simulation (worth up to 500 points).

Altogether, the tests count for up to 1000 points of the final course score.

3. Exams will test concepts, technical skill, and critical thinking through word problems; each problem may itself contain several parts. Partial credit for word problem solutions may be awarded, as appropriate.

4. Tests are based upon the class presentation and discussion of the material as presented in class. Moreover, the tests will be comprehensive of the material as covered in class.

5. The schedule of tests is to be announced. Advance notice of the date and specific coverage of each test will be given in class and posted on my OM 352 course website. Test 3, the final, will be given as stated in the published Final Exam Schedule (see “Schedule” below).

6. All tests are an individual effort. Absolutely NO collaboration of any kind is permitted. Any collaboration will be treated as an Honor Code violation.

7. All exams given in class are closed book. Use of the textbook, class notes, etc., is prohibited unless otherwise stated by me. No study guides are allowed.

8. MISSED TESTS.
   - A missed test will be assigned a score of zero.
   - A missed test may be made up only under extreme circumstances, WITH supporting documentation, AND at the sole discretion of the lecture instructor. One only one make-up test is allowed. (See the “Make-ups” paragraph below).

Course Grade
1. Final course grades are assigned rationally, objectively, and strictly on the sole basis of a student’s performance in the class as measured by the numerical total point score which is the sum of the scores earned by the student on all tests, quizzes, and graded homework assignments.
   - Outside influences and obligations will not be factored into the course grade.

2. Students must be officially registered in this section to receive a grade. It is the sole responsibility of the student to verify their own registration status.

3. Final course grades will be assigned as whole letters, WITH plus and minus.

4. Final total point scores are NOT “bumped” or rounded up to the next higher letter grade (e.g., a final total point score of 959 will be assigned a course grade of C+ and not B-).

5. There is no “extra credit” of any kind, for any reason.
6. Final course letter grade assignments on the 1200 point system are given in the table below.

<table>
<thead>
<tr>
<th>COURSE TOTAL SCORE *</th>
<th>COURSE GRADE</th>
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</thead>
<tbody>
<tr>
<td>FROM</td>
<td>UP TO</td>
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<tr>
<td>1176</td>
<td>1200</td>
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<tr>
<td>1116</td>
<td>1175</td>
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<td>839</td>
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<td>0</td>
<td>719</td>
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*Point ranges are inclusive.

7. The above chart will be adhered to strictly and without deviation or compromise.

Schedule
2. The schedules for all “deliverables” will be announced during the semester. Advance notice of the dates and specific coverage will be announced in class and posted on my OM 301 course website.
3. The test make-up day is Friday, April 29, 2011. Time and location are TBA.
4. The last class is on Thursday, May 5, 2011.
5. In conformity with the official Spring 2011 Final Exam Schedule promulgated by the Registrar’s Office (at registrar.gmu.edu/calendars/2011SpringExam.html), Test 3, the Final Exam, is scheduled to be given on Thursday, May 12, from 7:30 to 10:15 PM.
6. Conflicts in the final (Test 3) schedule can only be resolved through the Office of Academic and Career Services (and not me) at least one week prior to the date of the final, with the appropriate paperwork. Requests not meeting any part of this condition will be automatically denied.

Topics The tentative list of topics is given below. The list follows the basic order and coverage of topics in the required text. The list is subject to change during the semester.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Introduction and Course Overview</td>
<td>1</td>
</tr>
<tr>
<td>2  Linear Programming: Model Formulation and Graphical Solution</td>
<td>2</td>
</tr>
<tr>
<td>3  Linear Programming: Sensitivity Analysis (Graphical)</td>
<td>2</td>
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<tr>
<td>4  Linear Programming: Computer Solution and Sensitivity Analysis</td>
<td>3</td>
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<tr>
<td>5  Linear Programming: Modeling Examples</td>
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<tr>
<td>5  Integer Programming</td>
<td>5</td>
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<td>6  LP for Logistics</td>
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<tr>
<td>7  Network Flow Models</td>
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<tr>
<td>8  Multicriteria Decision Making</td>
<td>9</td>
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<tr>
<td>9  Decision Analysis</td>
<td>12</td>
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<tr>
<td>10 Queuing Analysis</td>
<td>13</td>
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<tr>
<td>11 Simulation</td>
<td>14</td>
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</table>