OM 210: Statistical Analysis for Management

Fall 2014 Course Syllabus

Lecture Section 002
(Monday, CRN 73277)

Dr. Harvey Singer

Office Enterprise Hall (ENT), Room 144.
Office Hours Monday, Tuesday, and Wednesday from 1:00 to 3:00 PM; or by appointment.
(Schedule subject to change)
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Description
Introduces the application of statistical methods to support quantitative decision analysis for resolving business problems. Topics include descriptive statistics, probability and probability distributions, sampling and sampling distributions, estimation, hypothesis testing, and linear regression (both simple and multiple). Lecture, recitation format with weekly lecture and weekly recitation; attendance in both lecture and recitation is mandatory and obligatory. See the “Topics” section for the list of subjects.

Lecture Session: Monday from 9:30 to 11:40 AM in the Harris Theater Auditorium (HT AUD).

Recitations: Students MUST also register for a recitation (any one of OM 210 301 to 310).

Prerequisites
1. MATH 108 or MATH 113 with a minimum grade of C, or MATH U108 or MATH U113 with a minimum grade of T, or HNRS 125 or HNRT 125 or HNRT 225 with a minimum grade of C.
2. Prerequisites are solely and strictly enforced by the OACS. Students not meeting the MATH 108 prerequisite will be dropped by OACS without input from me.
3. Essential and expected knowledge: Proficiency in elementary algebra and geometry. Familiarity with recent versions of MS Word, PowerPoint, and Excel. Deficiencies in any of these areas should be self-remediated.
Registration
1. The course instructor or graduate teaching assistants (GTAs) have no authority to resolve any issues concerning student registration. All matters relating to course registration are the exclusive domain of the Office of Academic and Career Services (OACS), and are handled solely by them. OACS is located on the lower level of Enterprise Hall in room 008. OACS can be reached by phone at 703-993-1880 or send e-mail to somserv@gmu.edu.
2. There are no force-adds or schedule adjustments in the School of Business.
3. Students must be officially registered for the course to receive a grade. Students are solely responsible to verify their own registration status.

Required Textbook
   - It is not necessary to purchase the access code. Any data files required for textbook problems and case studies will be posted on the Blackboard course website.
   - The 7th Edition supersedes and replaces all other editions. Specifically, all previous editions and the international edition are unacceptable, as they are different. Any edition of the textbook other than that listed above will not be supported; students using other editions do so solely at their own risk.
2. The text is supplemental reading and is not a substitute or replacement for classroom instruction.

iclicker remote
1. Class participation is encouraged and will be assessed in part by student use of an iclicker remote, which is a response system that allows students to answer questions posed during lecture. iclicker remotes can be purchased at the GMU Bookstore.
2. Students should bring their iclicker remote to all lectures, as it will greatly enhance the value of those classes by enabling more active participation and learning. Also, grades will be influenced by whether or not students answer questions.
3. Students must register their iclicker remotes at http://www.iclicker.com/registration with their Mason ID (not the G number).
4. Using an iclicker remote on behalf of someone or having someone use an iclicker remote on your behalf is an Honor Code violation (see below).

Calculator
You should have a “scientific” or “graphical” type calculator which can calculate square roots (√), powers (xʸ), and exponentials (eˣ). (The factorial function is optional).

Laptop Use
1. The use of laptops during lecture and recitation for activities directly related to the ongoing class is allowed and encouraged.
2. Laptops can be distracting to your neighbors, especially for unrelated activities which include, but are not limited to, surfing the Internet, checking email, playing games, and doing
homework for this or another class. Such use will result in the loss of the privilege to use a laptop in class.

**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.**

**Specific Course Objectives**

1. To master the essential concepts and tools of statistics and probability, and to apply these methodologies to solve practical, real-world, problems emphasizing business applications.
2. To provide a sound basis in statistics and probability for the student’s future academic and professional careers.
3. To demonstrate the use of statistics, probability, and statistical models to support decision making in business.
4. To develop the critical thinking and independent problem solving skills necessary to independently analyze business data and model business situations.

**Approach**

1. Geared for the future business professional engaged in decision making or decision support. The emphasis is on business applications, and not mathematics. Lectures are the formal presentation and teaching of the material and basic problem solving skills; discussions and questions are highly encouraged. Recitations are the practical side of the course, stressing learning by doing through solution of practical problems.
2. The lecture and recitation instructors are 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 evidenced by their participation and as demonstrated by their performance on the graded homework, quizzes, and exams. The instructor and GTAs both have office hours scheduled 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**

1. The lecture faculty instructor and the recitation GTA will cooperate with ODS to the greatest extent possible to accommodate a student’s special needs. 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 or send e-mail to ods@gmu.edu.
2. Prior approval for any and all arrangements must be obtained from the lecture faculty instructor (and not the recitation GTA).

Honor Code
1. Students are obligated to strict adherence to the University honor system and code as stated in the 2014-2015 University Catalog (online at http://catalog.gmu.edu). Honor code expectations are stated explicitly in the School of Management Honor Code Pledge posted on the Blackboard OM 210 course website. Your enrollment in this course is taken to be your implied affirmation of this pledge.

2. You are bound by the Honor Code to neither receive nor furnish any assistance of any kind on any graded assignment, exam, or quiz. Specifically:
   - All work submitted for a grade, including exams, quizzes, and homework assignments, is to be completed individually, on your own, and alone.
   - Copying quiz or exam answers from another student and/or allowing your answers to be copied by another student are strictly and absolutely forbidden.
   - Communication and/or collaboration, or suspicion thereof, of any kind between students during exams and quizzes is strictly and absolutely forbidden.
   - Using an impermissible aid on any quiz or exam such as unauthorized notes or electronic devices with communication and Internet connectivity is strictly and absolutely forbidden.
   - Any evidence or suspicion of collaboration on graded homework will be construed as an honor code violation.
   - Using an iclicker remote on behalf of someone or having someone use an iclicker remote on your behalf is strictly and absolutely forbidden.
   - Removing an exam from the classroom and sharing information about exams with other students is strictly and absolutely forbidden.

3. Honor code violations will not be tolerated. 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.

4. Registration in this course is taken as your implied compliance with the honor code policy in general and the specific terms cited in item 2 above.

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 any 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. E-mail from yahoo, gmail, or any other account will be deleted without reply.

3. 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.
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. You should expect a reply to an inquiry within 1 to 2 days after I read your e-mail.

Class Etiquette
Be courteous to and respectfull of others in lecture and recitation. Please refer to the document “Classroom Etiquette” posted under the link “Getting Started.”

Class Participation
1. Performance is highly associated with attendance and participation in all classes (both lecture and recitation).
2. Students are expected to attend all classes. The student is solely responsible for all assignments and for all material presented in class (even if missed due to absence).
3. Class participation consists of active engagement in the presentation of material through note-taking, questions, and discussion. Class participation, which requires attendance, contributes materially and measurably to a student’s final course grade.
4. For lecture, participation is quantitatively assessed by a student’s earned score on “lecture quizzes” which are described in the section below.

Course Website on Blackboard
1. Login to https://mymasonportal.gmu.edu and click on the link for OM 210 002. (Note: This is a new website specific to this semester and section and is currently under construction.)
2. My Blackboard OM 210 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, sample exams, and student grades. There is an intuitive architecture to the organization of the course website; the student should become familiar with navigating through it. Course documents are continually created, edited, revised, expanded, and posted.
3. You should navigate the folders on the “Course Content” page often. It is recommended to check the Bb course website several times a week. The website is continually being maintained. The student is solely responsible for staying current with the course.
4. As a convenience to the student to alleviate the burden of taking notes in class and to give their full attention to the discussion, downloadable versions of the lecture presentations are posted on my Blackboard OM 210 course website. These slide sets are located on the “Course Content” page in the “Topical Course Coverage” folder, which is itself organized by topic (and corresponding textbook chapter). These are condensed and abridged versions (with shortened coverage and content) of the corresponding presentations delivered in lecture.
   - It is strongly recommended that before class students download the pertinent slide sets to be presented. Also, students should have pen in hand to augment the downloaded versions with their own notes during class.
   - These pages may also contain solutions to some of the problems worked in class.
5. The coverage planned for the next lecture and recitation will be announced in class and posted in the “Next Class” folder on the Course Content page. Students will be informed beforehand of the pertinent documents to be presented in the next class.
6. Important course announcements, including dates and descriptions of exams and quizzes, will be posted in the “Announcements” folder on the Course Content page. The student is solely responsible for the information contained these announcements.

7. Homework assignments and their due dates are specified in documents located in the “Homework Assignments” folder on the Course Content page. The student is solely responsible for submitting all course deliverables on their due date.

8. It is strongly recommended that students download the pertinent course documents well before assignment due dates and exams (e.g., sample problems and sample exams).

9. All course related documents posted to the OM 210 course website constitute permanent attachments to this syllabus once they are promulgated in this fashion.

10. The course website is an electronic medium to facilitate the transfer and dissemination of the course content. Specifically, it is provided as a repository of course content and information so as to augment classroom presentations. 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 1255 points.
2. A numerical final course total score is calculated as the sum of scores earned on all exams, quizzes, homework assignments (out of a maximum possible score of 1255 points).
3. The metrics used for determining the final course grade are the scores earned on:
   - all three (3) exams (850 points max),
   - all six (6) recitation quizzes (240 points max),
   - all nine (9) lecture quizzes (55 points max),
   - all eleven (11) submitted and graded problem sets/case studies (110 points max).
4. Each of the aforementioned grading instruments is described in the paragraphs below.
5. The final course letter grade is assigned objectively, strictly, and solely 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. Grades are not raised because a total score is close to the cutoff between two grades.
6. Students are solely responsible for tracking their grades on Blackboard to ensure that the information entered is accurate.

Homework
1. Mastery of the subject matter is measured by skill and proficiency in problem solving, which is gained by practice. The assigned homework should be regarded as the minimum amount of practice. (Homework is for the student’s benefit; it keeps the student current and it is a diagnostic tool by which the student may assess understanding and performance.)
2. Documents containing the homework assignments will be posted in the folder “Homework Assignments” on the Course Content page of the Blackboard OM 210 course website. These documents constitute permanent attachments to this syllabus once they are promulgated in this fashion.
3. Each homework assignment for a topic will consist of problems selected from the corresponding chapter or chapters of the textbook.
4. Eleven (11) sets of problems selected from the textbook will be assigned as homework and will be collected and graded, as stated in the homework assignment document.
5. Up to ten (10) points will be assigned to each collected homework assignment submitted on time. The graded homeworks contribute up to 110 points of the final course score.

6. Submissions of the assigned homework must be handwritten with the students name and section. Printed copies, photocopies, or electronic submissions will not be accepted.

7. Late homework will not be accepted under any circumstances. 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.)

8. 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.

9. Homework assignments, including their solution and submission, are the sole responsibility of the student.

10. Solutions to some of the problems to some of the homework assignments may be posted under the link “Homework Assignments” after the assignment is due to be submitted.

**Exams**

1. Three (3) mandatory, **non-cumulative**, exams will be given, as announced. The exams will be comprehensive of the topics they cover.

2. Specific topic coverage, tentative dates, and valuation of the exams are as follows:
   - **Exam 1**: Descriptive Statistics and Exploratory Data Analysis.
     - In recitation on Thursday, October 2, or Friday, October 3, 2014.
     - Dates subject to change.
     - Maximum point value = 200 points.
   - **Exam 2**: Probability, Random Variables, and Probability Distributions.
     - In recitation on Thursday, November 6, or Friday, November 7, 2014.
     - Dates subject to change.
     - Maximum point value = 200 points.
   - **Final Exam**: Inferential Statistics (sampling distributions, estimation, and hypothesis testing) and Regression and Correlation (both simple and multiple).
     - Saturday, December 13 from 9:30 AM to 12:15 PM in Innovation Hall room 103 (IN 103).
     - Date NOT subject to change except by the University Registrar.
     - Maximum point value = 450 points.

3. Altogether, the exams count for up to 850 points of the final course score. Each individual exam contributes the points scored to the final total course score.

4. Exams will always be announced well in advance of their dates. Advance notice of the date and specific coverage of each exam will be announced in both lecture and recitation.
   - A written document announcing each exam will always be posted on my OM 210 course website well in advance of the exam. This document will describe the exam by specifying its coverage, format, honor code, conditions, and other pertinent information. Once promulgated in this fashion, each and every document becomes a permanent attachment to this syllabus.
   - The student is solely responsible for reading and understanding the exam announcement document. This document should be used as a guide in studying and preparing for each exam.
5. Each exam will consist of multiple word problems; each problem may itself contain several or many parts.
6. Exams are based upon the class presentation and discussion of the material covered in lecture. Moreover, the exams will be comprehensive of the material as covered in lecture and recitation.
7. All exams are strictly an individual effort. Absolutely NO collaboration or communication between students of any kind is permitted. (See the “Honor Code” paragraph above.)
8. All exams are “closed book.” Use of the textbook, study notes, etc., is strictly prohibited.
9. Exams 1 and 2 must be taken in the recitation in which the student is officially registered. Exams taken in any recitation other than the one in which the student is officially registered will not be graded.
10. Any scheduling issues with test dates other than that of the Final Exam should be directed to the course instructor and not your recitation teaching assistant.
11. MISSED EXAMS.
   - A missed exam will be assigned a score of zero.
   - A missed exam may be made up only under extreme circumstances, WITH supporting documentation, AND at the sole discretion of the lecture instructor. Note that one only one (1) make-up (either exam or recitation quiz) is allowed. (See the “Make-ups” paragraph below).

Recitation Quizzes
1. Six (6) mandatory, non-cumulative, quizzes will be given in the recitation, as announced.
2. Quizzes will always be announced well in advance of their dates. Advance notice of the date and specific coverage of each quiz will be announced in both lecture and recitation.
   a. A written document announcing each quiz will always be posted on my OM 210 course website well in advance of the exam. This document will describe the quiz by specifying its coverage, format, honor code, conditions, and other pertinent information. Once promulgated in this fashion, each and every document becomes a permanent attachment to this syllabus.
   b. The student is solely responsible for reading and understanding the quiz announcement document. This document should be used as a guide in studying and preparing for each quiz.
   c. As a general guidance, quizzes will alternate with exams and homework.
3. Each quiz will be comprehensive of the topic it covers. Specific topic coverage of each quiz will always be announced well in advance as stated in item 2a above.
4. Each individual recitation quiz contributes the points scored (out of 40 points) to the final course score. Altogether, the quizzes count for up to 240 points of the final course score.
5. Each quiz will consist of a single word problem; which may contain several or many parts.
6. Items 6 through 11 inclusive for “Exams” apply to all recitation quizzes.

Lecture Quizzes
1. Nine (9) mandatory quizzes will be given in the lecture (at any time during the lecture). Altogether, the lecture quizzes count for up to 55 points of the final course score.
2. All lecture quizzes are individual efforts. Under the Honor Code, absolutely NO collaboration or communication between students of any kind is permitted.
3. The first and the last lecture quizzes are by Scantron form (form 882-E). These two quizzes are for self-evaluation purposes only to assess your state of knowledge of statistics and probability prior to and then after formal instruction in this course. Incomplete Scantron forms will not be scored. Each Scantron quiz is worth up to 10 points for a total of 20 points for both.

4. The other seven lecture quizzes will all use the iclicker remote. These lecture quizzes will consist of several short problems or questions that are based on the coverage in the previous or current lecture.
   a. Each iclicker quiz is worth up to 5 points for a total of 35 points for all seven.
   b. Students who answer all iclicker questions that are asked during a lecture will receive 10 points for that lecture. Students who answer no questions that are asked on a day will receive 0 points for that day. Students who answer one or more, but not all, of the questions asked on a day receive credit equal to 5 points minus 1.5 points for each unanswered question for that day, with a minimum score of 0.
   c. Students will receive full credit for their good-faith attempt at answering questions, regardless of whether their answer is correct or not. However, if students do not appear to be putting adequate effort into correctly answering questions or if an insufficient number of students are getting correct answers, then the scoring these lecture quizzes may be modified to give more credit for correct answers.
   d. Students will not receive credit for participation until their iclicker is correctly registered. Once scores are downloaded for a given class, the instructor will not go back and give credit for students who voted, but who had not registered their remotes by the time scores were downloaded.
   e. One or more questions may be asked at the start of class, so being on time and ready at the start of class is important. One or more questions may be asked towards the end of class, so stay until lecture is dismissed.
   f. Using an iclicker remote on behalf of someone or having someone use an iclicker remote on your behalf is an Honor Code violation. Students may be asked to present ID.

5. MISSED LECTURE QUIZZES:
   a. A missed Scantron quiz cannot be made up under any circumstances; it will be will be assigned a score of zero. (No exceptions, regardless of the reason, including [but not limited to] medical, family, work, and transportation emergencies.)
   b. One and only one iclicker quiz will be excused with the full credit of 5 points; all other missed iclicker quizzes will be assigned a score of zero.

Make-ups
1. One and only one (1) make-up is allowed (either an exam or a recitation quiz). Note that lecture quizzes and the Final Exam cannot be made-up.
2. Taking a make-up is not automatic. You must qualify and register for any make-up with the lecture instructor (ONLY) prior to registration deadline. (You must provide a valid and bona fide reason for missing the exam or recitation quiz when it was originally scheduled, supported and verified by documentation. All decisions are final; there is no appeal.)
3. Re-testing to replace scores already earned on recitation quizzes and/or exams is strictly prohibited and will not be allowed under any circumstances.
4. A document stating the make-up policies and procedures will be posted on the OM 210 course website under “Announcements.”
5. Make-ups will be of a different format and level of difficulty than the original exam or recitation quiz which it is meant to replace.
6. A missed exam or recitation quiz will be assigned a score of zero until it is made-up. After the make-up, the grade on the make-up will replace the zero and will be added into the final total course score.
7. The exam/quiz make-up day is tentatively set for Wednesday, December 3, 2014 (date subject to change); test room and time is TBA.

Course Grade
1. The final course letter grade is assigned rationally and objectively on the sole basis of a student’s performance in the course as measured by the total point score earned by the student on all grading metrics in strict accordance with the table listed in item 7 below.
   ➢ Outside influences and obligations will not be factored into the course grade.
2. Midterm course grades will be assigned as whole letters, WITHOUT plus and minus, based on the total of all scores received up to the time of their assignment.
3. Final course grades will be assigned as whole letters, WITH plus and minus.
4. Final course letter grades are assigned on a point system with a maximum of 1255 points for the course; see the table below. The final total point score for the course is the sum of the scores earned on all exams, recitation quizzes, lecture quizzes, and graded homework assignments.
5. Final total point scores are NOT “bumped” or rounded up to the next higher letter grade. Specifically, a final total point score of 903 will be assigned a course grade of C- and not C. (Note that a grade of C- is unsatisfactory in the School of Business; a grade of C or better is required in OM 210 for acceptance into the Business School.)
6. There is no “extra credit” of any kind, for any reason.
7. Final course letter grade assignments on the 1255 point system are given in the table below.
8. The chart below will be adhered to strictly and without deviation or compromise.

<table>
<thead>
<tr>
<th>COURSE TOTAL SCORE * FROM</th>
<th>COURSE TOTAL SCORE * UP TO</th>
<th>COURSE GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1230</td>
<td>1255</td>
<td>A+</td>
</tr>
<tr>
<td>1167</td>
<td>1229</td>
<td>A</td>
</tr>
<tr>
<td>1130</td>
<td>1166</td>
<td>A-</td>
</tr>
<tr>
<td>1104</td>
<td>1129</td>
<td>B+</td>
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<tr>
<td>1042</td>
<td>1103</td>
<td>B</td>
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<td>1004</td>
<td>1041</td>
<td>B-</td>
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<td>979</td>
<td>1003</td>
<td>C+</td>
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<td>904</td>
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<td>C</td>
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<td>879</td>
<td>903</td>
<td>C-</td>
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<td>753</td>
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<td>D</td>
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<td>0</td>
<td>752</td>
<td>F</td>
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</tbody>
</table>

* Point ranges are inclusive.
**Incompletes**
An incomplete will only be given to a student who has completed a majority of the work for the semester, has a course grade of C or better in the work completed at the time of the request, and has a documented excusable reason such as a serious illness or unanticipated family emergency for being unable to complete the remainder of the work as scheduled. Poor time management or failure to deal with a situation earlier in the semester will not be accepted as reasons for an incomplete.

**Schedule**
2. The schedules for all “deliverables” will be announced well in advance of their due dates during the semester and posted on my Blackboard OM 210 course website.
3. Because of the Columbus Day recess, “Monday” lecture will be held on Tuesday, October 14. Recitations will be held that week as scheduled on Thursday, October 16, and Friday, October 17.
4. There is lecture on Monday, November 24 - absences from lecture will not be excused for any reason. There are no recitations on Thursday, November 27, and Friday, November 28, because of the Thanksgiving recess.
5. Tentative dates for Exams 1 and 2 are October 2-3 and November 6-7, 2014, respectively; these tentative dates are subject to change.
6. The last lecture is Monday December 1, 2014. The last recitations will be held that week on Thursday, December 4, and Friday, December 5.
7. The exam/recitation quiz make-up day is tentatively set for Wednesday, December 3, 2014. Time and location are TBA.
8. In conformity with the official Fall 2014 Final Exam Schedule promulgated by the Office of the University Registrar (at [http://registrar.gmu.edu/calendars/fall-2014/exams/](http://registrar.gmu.edu/calendars/fall-2014/exams/)) for “non-standard” courses, the Final Exam, is scheduled to be given on Tuesday, December 16, 2014 from 7:30 to 10:15 PM, in Innovation Hall room 103 (IN 103).
9. Conflicts in the Final Exam schedule can only be resolved through the Office of Academic and Career Services (not the course professor [me] or the GTAs) 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**
1. The tentative list of topics is given below, which follows the basic order of topics in the required text.
2. The list of topics is subject to change during the semester. Some sections in the text will be skipped and some material not contained in the text may be presented, as announced.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part I. Describing Technical Data and its Variability (Descriptive Statistics)</strong></td>
<td></td>
</tr>
<tr>
<td>1. Data types and sources</td>
<td>1</td>
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<tr>
<td>2. Data presentation: Tabular and graphical methods</td>
<td>2</td>
</tr>
<tr>
<td>3. Data summarization: Numerical summary statistics</td>
<td>3</td>
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<tr>
<td><strong>Part II. Dealing With Uncertainty (Probability)</strong></td>
<td></td>
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<tr>
<td>4. Basic probability</td>
<td>4</td>
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<tr>
<td>5. Random variables and discrete probability distributions</td>
<td>5</td>
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<tr>
<td>General random variable and probability distribution concepts</td>
<td></td>
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<tr>
<td>Uniform, binomial, and Poisson probability distributions</td>
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<tr>
<td>6. Normal probability distribution</td>
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<tr>
<td><strong>Part III. Inferring from Data with its Variability (Inferential Statistics)</strong></td>
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<tr>
<td>7. Sampling and sampling distributions</td>
<td>7</td>
</tr>
<tr>
<td>Sampling distribution of sample means</td>
<td></td>
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<tr>
<td>8. Estimation theory</td>
<td>8</td>
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<tr>
<td>Point estimation</td>
<td></td>
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<tr>
<td>Confidence interval estimation for means: $\sigma$ known and $\sigma$ unknown</td>
<td></td>
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<tr>
<td>Sample size estimation</td>
<td></td>
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<tr>
<td>9. Basic hypothesis testing: One Sample</td>
<td>9</td>
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<tr>
<td>Error types</td>
<td></td>
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<tr>
<td>Significance tests for means: $\sigma$ known and $\sigma$ unknown</td>
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<tr>
<td>Testing with p-values</td>
<td></td>
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<tr>
<td>10. More hypothesis tests: Two Samples</td>
<td>10</td>
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<tr>
<td>Comparison of two population means: $\sigma$ known and $\sigma$ unknown</td>
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