OM 452: Business Forecasting

Summer 2016, Session C
Section C01 (CRN 40835)

Dr. Harvey Singer

Course Syllabus

Office
Enterprise Hall (ENT), Room 143.

Office Hours
MWF from 5:30 to 6:15 PM in ENT 143 or by appointment.

Phone
(703) 993-1798

Fax
(703) 993-1809

E-mail
hsinger@gmu.edu

Website
at https://mymasonportal.gmu.edu/

Description
This course studies a variety of methods and models for producing predictions and projections of various aspects of future business, economic, and financial operations as aids for management in making planning decisions. Qualitative (subjective) techniques are presented but the emphasis is on quantitative (objective, analytical) methods, focusing on time series and associative (regression) models. Specific topics include judgmental forecasting; forecast accuracy; correlation (linear and auto); smoothing-based methods (naive, moving averages, exponential smoothing); simple, multiple, and curvilinear regression; time series decomposition; serial correlation; autoregressive modeling; and ARIMA methods. These techniques are demonstrated and used through computer software.

Class Sessions
MWF from 7:00 to 10:00 PM in the Enterprise Hall room 277 (ENT 277), from Monday, June 27, to Friday, July 29, 2015.

Prerequisites
1. OM 301 with a grade of C or higher.
2. Degree status.
3. Prerequisites are solely and strictly enforced by the OACS. Students not meeting the prerequisites will be dropped by OACS without input from me.
4. Additionally, proficiency in elementary algebra is essential and is expected. Deficiencies in elementary algebra should be self-remediated. Also, the student should be familiar with recent versions of MS Office products, especially MS Word, PowerPoint, and Excel.
Registration
1. The course instructor has 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
   ➢ The 9th 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.
   ➢ Available from the Mason bookstore bundled with a student version of Minitab.
2. The text is supplemental reading and is not a substitute or replacement for classroom instruction.

Required Computational Software
Excel.
Minitab.
➢ Availability:
   o Minitab 17 may be purchased by Mason students from the Mason Computer Store.
   o A 6-month rental of Minitab 17 may be obtained through www.mintab.com.
   o A 30-day free trial of Minitab 17 may be obtained through www.mintab.com.

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 Objectives
1. To thoroughly cover the concepts and methodologies of the full range of the major business forecasting methodologies covered in this course.
2. To provide a systematic working knowledge of the methodology through typical business problems and practical applications without bogging down in theoretical details.
3. To include a comprehensive set of forecasting horizons and provide systematic comparisons of the various methods so that the most appropriate method can be selected for each forecasting situation.
4. To be able to:
   - understand a business situation and formulate the technical problem quantitatively in terms of the available input data and the desired output results.
   - associate the appropriate forecasting methodology to best achieve the desired results.
   - understand and interpret the model results and deliver the required product.
4. To foster the communication and presentation of technical data and model results.
5. To provide a sound basis in business forecasting for the student’s future academic and professional careers.
6. To foster critical thinking and independent problem solving skills.

**Approach**
Geared for the business professional engaged in decision making or decision support. The emphasis is on business applications rather than rigorous mathematics. The format is lectures presenting methodology through numerous simple and fully explained examples. Discussions and questions are highly encouraged.

**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 adhere strictly to the University honor code as stated in the University Catalog and online at http://oai.gmu.edu/the-mason-honor-code-2/. Honor code expectations are stated explicitly in the School of Business Honor Code Pledge posted on the Blackboard OM 452 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, test, or quiz. Specifically:
   - All work submitted for a grade, including tests, quizzes, and homework assignments, is 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 is strictly and absolutely forbidden.
   - Communication and/or 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 connectivity is strictly and absolutely forbidden.
   - Any evidence or suspicion of collaboration on graded homework will be construed as an honor code violation and will be dealt with severely.
   - Any evidence or suspicion of collaboration on exams will be construed as an honor code violation and will be dealt with severely.
- For take-home exams, sharing information with other students is strictly and absolutely forbidden. Any evidence or suspicion of collaboration and/or communication on take-home exams will be construed as an honor code violation and will be dealt with severely.

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 and for which the maximum punishment will be sought.

4. Your 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/](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. **-mail from non-GMU accounts, i.e., yahoo, gmail, etc., 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-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 reply to an inquiry within 1 to 2 days after I read your 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 classes.

3. Class participation consists of active engagement in the presentation of material through note-taking, questions, and discussion.

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 [https://courses.gmu.edu](https://courses.gmu.edu) and click on the link for your OM 452 C01 section. (Note: This is a new website specific to this semester and section and is currently under construction.)

2. The Course Content page of the Blackboard course website for OM 452 comprises separate folders containing this syllabus, announcements and assignments, PowerPoint presentations,
supplemental notes, sample tests, and student grades. There is an intuitive architecture to the organization of the course website; the student should become familiar with navigating through it.

3. The website is continually being maintained. Course documents are continually created, edited, revised, and expanded; new versions are not re-posted.

4. Important course announcements will be posted in the “Announcements” folder on the Course Content page. **You should check the folder often, at least twice a week.**

5. As a convenience to alleviate the burden of taking notes in class and to give your full attention to the discussion, lecture presentations are posted in the “Topical Coverage” folder on the Course Content page. The folder is itself organized into separate pages in order of topic and chapter. **These pages contain condensed and abridged versions (with shortened coverage and content) of the PowerPoint presentations delivered in lecture.** You should be prepared to augment the downloaded versions with your own notes during lecture. These pages may also contain solutions to some of the problems worked in class.

6. Announcements of the coverage of the next class will be posted in the “Next Class” folder on the Course Content page.

7. The “Homework Assignments” folder on the Course Content page will contain the problem sets assigned from the textbook that are required to be submitted for a grade.

8. It is strongly recommended that students download the pertinent course documents before lecture and before assignment due dates and tests.

9. All course related documents posted to the OM 452 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 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 final course letter grade is assigned rationally and objectively on the sole basis of a student’s performance in the class, as measured solely by the total point score earned by the student on all grading metrics. (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.

2. The maximum possible score for the course is 1200 points. A numerical final course total score is calculated as the sum of scores earned on:
   - all three (3) tests (1000 points max),
   - all five (5) quizzes (100 points max),
   - all four (4) submitted and graded problem sets/case studies (100 points max).

3. Each of the aforementioned grading instruments is described in the paragraphs below.

**Homework/Cases**

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. Four (4) 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 twenty (25) points will be assigned to each homework assignment submitted on time. Altogether, the graded homework assignments count for up to 100 points of the final course score.

4. Documents containing the homework assignments will be posted on my OM 452 course website.
   a. These documents constitute permanent attachments to this syllabus once they are promulgated in this fashion.
   b. Follow the specific instructions given in each homework assignment to be submitted.
   c. Each homework assignment for a topic will consist of problems or cases selected from the corresponding chapter or chapters of the textbook.

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 452 course web site 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.
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 10 points) to the final course score. Altogether, the quizzes count for up to 50 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.)

Exam
1. Three (3) mandatory, non-cumulative exams will be given, as announced.
2. Specific topic coverage of all the exams will always be announced and posted in advance of test dates. Each individual exam contributes the points scored to the final course score. The tentative coverage and test valuation is as follows:
   • Exam 1: Basic forecasting concepts and methods.
     ➢ Exam 1 date is tentatively set for Friday, July 15.
     ▪ Date subject to change.
Maximum point value = 250 points.

- Exam 2: Regression methods and time-series decomposition.
  - Exam 2 date is tentatively set for Friday, July 22.
    - Date subject to change.
  - Maximum point value = 250 points.
- Final Exam: Regression with time series and ARIMA.
  - Final Exam date is set for Friday, July 29.
    - Date not subject to change.
  - Maximum point value = 500 points.

Altogether, the exams 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. The exams will be comprehensive of the material covered. Partial credit for problem solutions will be awarded. Exams are based upon the class presentation and discussion of the material covered as it was presented.

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 class.
   a. Exams 1 and 2 will be given in class on their announced dates. The Final Exam is scheduled to be given on Friday, July 29 (see item 5 of “Schedule”).
   b. A written document announcing each exam will always be posted on my OM 452 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.
   c. 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 test.

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

6. All exams given in class are closed book. Use of the textbook, class notes, etc. is prohibited unless otherwise explicitly stated by me.

7. The use of the textbook and any notes is permitted for take-home exams.

8. 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. One only one make-up exam 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 exams, quizzes, and graded homework assignments.
   - Outside influences and obligations will not be factored into the course grade.
2. Final course letter grade assignments on the 1200 point system are given in the table below.
3. The chart below will be adhered to strictly and without deviation or compromise.
4. 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.
5. Final course grades will be assigned as whole letters, WITH plus and minus.
6. Final total point scores are **NOT** “bumped” or rounded up to the next higher letter grade (e.g., a final total point score of 827 will be assigned a course grade of C- and not C).
7. There is no “extra credit” of any kind, for any reason.

<table>
<thead>
<tr>
<th>COURSE TOTAL SCORE *</th>
<th>COURSE GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM</td>
<td>UP TO</td>
</tr>
<tr>
<td>1127</td>
<td>1150</td>
</tr>
<tr>
<td>1070</td>
<td>1126</td>
</tr>
<tr>
<td>1035</td>
<td>1069</td>
</tr>
<tr>
<td>1012</td>
<td>1034</td>
</tr>
<tr>
<td>955</td>
<td>1011</td>
</tr>
<tr>
<td>920</td>
<td>954</td>
</tr>
<tr>
<td>897</td>
<td>919</td>
</tr>
<tr>
<td>828</td>
<td>896</td>
</tr>
<tr>
<td>805</td>
<td>827</td>
</tr>
<tr>
<td>690</td>
<td>804</td>
</tr>
<tr>
<td>0</td>
<td>689</td>
</tr>
</tbody>
</table>

*Point ranges are inclusive.

**Schedule**
1. The Summer 2016 semester calendar is at [http://registrar.gmu.edu/calendars/summer/](http://registrar.gmu.edu/calendars/summer/).
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 452 Blackboard course website.
3. There is no class on Monday, July 4, and Tuesday, July 5, because of the Independence Day holiday.
4. The exam/quiz make-up period is Friday, July 22. Time and location are TBA.
5. The last regular class is on Wednesday, July 27, from 7:00 to 10:00 PM.
7. Scheduling conflicts with the Final Exam schedule can only be resolved through OACS (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**
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>1. Introduction to Business Forecasting</td>
<td>1</td>
</tr>
<tr>
<td>• Qualitative and quantitative forecasting</td>
<td></td>
</tr>
<tr>
<td>2. Basic Forecasting Concepts and Tools</td>
<td>2, 3</td>
</tr>
<tr>
<td>• Trend components and time series plotting</td>
<td></td>
</tr>
<tr>
<td>• Linear correlation</td>
<td></td>
</tr>
<tr>
<td>• Autocorrelation and correlograms</td>
<td></td>
</tr>
<tr>
<td>• Forecast accuracy</td>
<td></td>
</tr>
<tr>
<td>3. Forecasting from Time Series Models (Smoothing Methods)</td>
<td>4</td>
</tr>
<tr>
<td>• Naïve models.</td>
<td></td>
</tr>
<tr>
<td>• Moving averages methods.</td>
<td></td>
</tr>
<tr>
<td>• Exponential smoothing methods.</td>
<td></td>
</tr>
<tr>
<td>4. Forecasting with Regression Methods (Causal Methods)</td>
<td>6</td>
</tr>
<tr>
<td>• Simple linear regression.</td>
<td></td>
</tr>
<tr>
<td>• Multiple linear regression.</td>
<td>7</td>
</tr>
<tr>
<td>• Non-linear regression.</td>
<td>*</td>
</tr>
<tr>
<td>5. Time Series Decomposition and Analysis</td>
<td>5</td>
</tr>
<tr>
<td>• Decomposition models.</td>
<td></td>
</tr>
<tr>
<td>• Component isolation.</td>
<td></td>
</tr>
<tr>
<td>6. Time Series Regression</td>
<td>8</td>
</tr>
<tr>
<td>• Special issues in modeling time series data.</td>
<td></td>
</tr>
<tr>
<td>• Serial correlation.</td>
<td></td>
</tr>
<tr>
<td>• Forecasting differences.</td>
<td></td>
</tr>
<tr>
<td>• Autoregressive modeling and forecasting.</td>
<td></td>
</tr>
<tr>
<td>7. ARIMA: The Box-Jenkins Method</td>
<td>9</td>
</tr>
<tr>
<td>8. Forecast Practice and Implementation</td>
<td>*, 10</td>
</tr>
<tr>
<td>• Control, validation, and combining models.</td>
<td></td>
</tr>
<tr>
<td>• Evaluating forecasts and forecast methodologies.</td>
<td></td>
</tr>
<tr>
<td>9. Advanced Forecasting Models</td>
<td>*, 10</td>
</tr>
</tbody>
</table>

* Text Supplements.