OM 452: Business Forecasting

Summer 2019, Session C
Section C01 (CRN 40083)

Professor Harvey Singer

Course Syllabus

Office: Enterprise Hall (ENT) Room 137.
Office Hours: MWF from 5:15 to 6:15 PM in ENT 137 or by appointment. (Schedule subject to change without prior notice.)
Phone: (703) 993-1798
Fax: (703) 993-1809
E-mail: hsinger@gmu.edu
Website: at https://mymasonportal.gmu.edu/
Schedule: The official Summer 2019 Semester calendar from the University Registrar can be downloaded from https://registrar.gmu.edu/calendars/summer-2019-calendar/.

Class Sessions
MWF from 7:00 to 10:00 PM in Art and Design Building room 2026 (AB 2026), from Monday, June 24, to Friday, July 26, 2019 (no class on Friday, July 5).

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 (naïve, 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.

Prerequisites
1. OM 301 or 303 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. Proficiency in elementary algebra is essential and is expected. Deficiencies in elementary algebra should be self-remediated. Additionally, 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.
3. Note that OM 452 REQUIRES both the textbook and Minitab 19.

Required and Mandatory Computational Software
➢ Excel.
➢ Minitab 18.
   o A 6-month rental of Minitab 19 costs $29.99 and may be purchased starting at http://www.minitab.com/en-us/academic/pricing/ and click the button “OnTheHub.com.” You will be redirected to the OnTheHub website. On that page click the button “Rent Now.” Scroll down the page that appears and select the 6-month rental; when you click “Add to Cart” you will prompted to Register which requires you to enter your Mason e-mail address to verify that you are a bona fide student. Then complete the form.
   o A 30-day free trial of Minitab 19 may be obtained online at http://www.minitab.com/en-us/products/minitab/free-trial/. Scroll down the page to which you are directed and fill in and submit the form.
   ➢ If you select this option bear in mind that you have 30 days from the time of the download (and you cannot download it again to the same computer). The Final Exam is on Friday, July 26; I recommend that you hold off downloading the 30-day free trial until the end of the first week of class.
   o Minitab 19 is PC software. (You will need an emulator to run Minitab 19 on a Mac.)
   o **Do not get Minitab Express.** (It does not have the functionalities of Minitab 19 which are needed for this course.)

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 or https://ods.gmu.edu. I will cooperate with ODS to the greatest extent possible to accommodate a student’s special needs.

**Inclement weather and 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 MasonAlert. Students sign up for the Mason Alert system to provide emergency information of various sorts at https://alert.gmu.edu. Check the Bb course website if a closure occurs for details. An emergency poster exists in each classroom explaining what to do in the event of crises and that further information about emergency procedures exists on http://www.gmu.edu/service/cert
Student Resources
- Counseling Center: George Mason University has a counseling center that can provide assistance if you find yourself overwhelmed by life, want training in academic or life skills, or the like. More information is available at http://www.gmu.edu/departments/csdc/.
- There are a number of additional resources available to you on the School of Business website. In addition, University Life has many resources available to students. You should explore these offerings and take advantage of every one of these you can.

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
All communications from me to you will be directed via e-mail or through Bb. I will address all of my e-mails and replies ONLY to your Mason (@gmu.edu) e-mail address because of privacy and confidentiality. If you use another e-mail account as your primary e-mail, please be sure to forward your GMU e-mail to and from that account.
1. I will not reply to voice mail messages left on my GMU office telephone.
2. For security and confidentiality, I will only reply only to Mason 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.
4. Expect a response to an e-mail within 1 to 2 days after I read it.
5. I only respond to e-mail during business hours Monday to Friday; I do not respond to e-mail after business hours. I do not respond to email on the weekends.

Class Etiquette
Be courteous to and respectful of others in the class. Please refer to the document “Classroom Etiquette” posted in the “Course Information” folder on the Course Content page of the Blackboard course website.

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 (Bb)
1. Login to 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 (Bb) course website for OM 452 C01 comprises separate folders containing this syllabus, announcements and assignments, PowerPoint presentations, supplemental notes, and sample tests. Student grades are also available on Bb.
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 three times a week (before class).**

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. 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. Grades are determined by the number of points accumulated during course up to a maximum of 1150 points.

3. The maximum possible score for the course is 1240 points. A numerical final course total score is calculated as the sum of scores earned on:
   - all three (3) exams (1000 points max).
   - all five (4) quizzes (25 points per quiz for 100 points max).
   - all four (4) submitted and graded problem sets/case studies (25 points per set for 100 points max).
   - in-class exercises/class participation (10 points each for 40 points max).

4. 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 selected 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 unless with previous notice and with documentation.)

**Quizzes**
1. Four (4) 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.)**

**Exams**
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 Monday, 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 Monday, July 22.
  - Date subject to change.
  - Maximum point value = 250 points.

- Final Exam: Regression of time series and ARIMA.
  - Final Exam date is set for Friday, July 26.
    - 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 26 (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.

**Grading Summary**
The grading system is listed below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework (4)</td>
<td>100</td>
</tr>
<tr>
<td>Quizzes (4)</td>
<td>100</td>
</tr>
<tr>
<td>Midterm Exam #1</td>
<td>250</td>
</tr>
<tr>
<td>Midterm Exam #2</td>
<td>250</td>
</tr>
<tr>
<td>Final Exam</td>
<td>500</td>
</tr>
<tr>
<td>Class participation (4)</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1240</strong></td>
</tr>
</tbody>
</table>
School of Business Standards of Behavior
The mission of the School of Business at George Mason University is to create and deliver high quality educational programs and research. Students, faculty, staff, and alumni who participate in these educational programs contribute to the well-being of society. High quality educational programs require an environment of trust and mutual respect, free expression and inquiry, and a commitment to truth, excellence, and lifelong learning. Students, program participants, faculty, staff, and alumni accept these principles when they join the School of Business community. In doing so, they agree to abide by the following standards of behavior:

- Respect for the rights, differences, and dignity of others
- Honesty and integrity in dealing with all members of the community
- Accountability for personal behavior

Integrity is an essential ingredient of a successful learning community. Ethical standards of behavior help promote a safe and productive community environment, and ensure every member the opportunity to pursue excellence. School of Business can and should be a living model of these behavioral standards. To this end, community members have a personal responsibility to integrate these standards into every aspect of their experience at the School of Business. Through our personal commitment to these Community Standards of Behavior, we can create an environment in which all can achieve their full potential.

Academic Integrity
George Mason University shares in the tradition of an honor system that has existed in Virginia since 1842. The Honor Code is an integral part of university life. On the application for admission, students sign a statement agreeing to conform to and uphold the Honor Code. Students are responsible, therefore, for understanding the provisions of the code. In the spirit of the code, a student's word is a declaration of good faith acceptable as truth in all academic matters. Cheating and attempted cheating, plagiarism, lying, and stealing of academic work and related materials constitute Honor Code violations. To maintain an academic community according to these standards, students and faculty must report all alleged violations of the Honor Code to the Honor Committee. Any student who has knowledge of, but does not report, an Honor Code violation may be accused of lying under the Honor Code. All students are expected to adhere to this code. In summary:

1. Students are obligated to strict adherence to the University honor system and code as described in the 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. The complete honor code can be found at [http://oai.gmu.edu/the-mason-honor-code-2/](http://oai.gmu.edu/the-mason-honor-code-2/).

Specifically:
- All work submitted for a grade, including tests, quizzes, and homework, are to be completed individually, on your own, and alone. Study groups are encouraged but all work submitted for a grade must be your own individual effort.
- Communication and collaboration, or suspicion thereof, of any kind between students on any graded work (e.g., exams, quizzes, and homework) is strictly and absolutely forbidden.
- Any use in any way and by any means of any external sources, including but not limited to the Internet, is strictly and absolutely forbidden.
- Copying a quiz or an exam or any part thereof and promulgating it in any way, by any means, including but not limited to or over the Internet, 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.
3. Any violations of the honor code will result in an immediate filing of formal charges with the Office of Academic Integrity (OIA) 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.
5. School of Business recommended sanctions will be enforced. See the table below. (At http://business.gmu.edu/media/com_managedlists/72/honor-code-violation-recommendations.pdf.)

<table>
<thead>
<tr>
<th>Type of Violation</th>
<th>First Offense</th>
<th>Second Offense</th>
</tr>
</thead>
<tbody>
<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>
<td>An F in the class; multiple visits to the Writing Center required; Academic Integrity Seminar Attendance; dismissal from the program; and possible suspension or expulsion</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>
<td>An F in the class; multiple visits to the Writing Center required; Academic Integrity Seminar Attendance; dismissal from the program; and possible suspension or expulsion</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>
<td>Expulsion</td>
</tr>
<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>
<td>Expulsion</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>
<td>Expulsion</td>
</tr>
</tbody>
</table>

Note: The Academic Integrity Seminar used by the Office of Academic Integrity costs $100.

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. This course requires a minimum grade of C to satisfy School of Business degree requirements, and students will not be permitted to make more than three attempts to achieve a C or higher in this course. Registration in this course will be prohibited beyond three attempts that resulted in a grade lower than C.
3. 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.
4. Final course grades will be assigned as whole letters, WITH plus and minus as appropriate.
5. **Final total point scores are NOT “bumped” or rounded up to the next higher letter grade.** (E.g., a final total point score of 892 will be assigned a course grade of C- and not C).

6. **There is no “extra credit” of any kind, for any reason.**

7. Final course letter grade assignments on the 1240 point system are given in the table below. That table will be adhered to strictly and without deviation or compromise.

<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>1215</td>
<td>1240</td>
</tr>
<tr>
<td>1153</td>
<td>1214</td>
</tr>
<tr>
<td>1116</td>
<td>1152</td>
</tr>
<tr>
<td>1091</td>
<td>1115</td>
</tr>
<tr>
<td>1029</td>
<td>1090</td>
</tr>
<tr>
<td>992</td>
<td>1028</td>
</tr>
<tr>
<td>967</td>
<td>991</td>
</tr>
<tr>
<td>893</td>
<td>966</td>
</tr>
<tr>
<td>868</td>
<td>892</td>
</tr>
<tr>
<td>744</td>
<td>867</td>
</tr>
<tr>
<td>0</td>
<td>743</td>
</tr>
</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, vacation plans, or failure to deal with a situation earlier in the semester will not be accepted as reasons for an incomplete.

**Schedule**
1. There is no class on Friday, July 5, because of the Independence Day observance.
2. The last regular class is on Wednesday, July 24, from 7:00 to 10:00 PM.
4. 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 to move the Final Exam because of medical or family emergencies can only be resolved through the OACS (and not me) at least one week prior to the date of the final with the appropriate paperwork and documentation. The deadline is strictly enforced.
   - Requests to move the Final Exam to accommodate vacation plans, regardless of who made them or when, will be denied automatically. Make all arrangements or rearrangements **ASAP (meaning NOW)** for taking the Final Exam on **Friday, July 26, 2019**, at the assigned place and at the assigned time.
**Topics**
The tentative list of topics is given below, which generally follows the basic order of topics in the required text. 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>• Naive 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, 7, supplement</td>
</tr>
<tr>
<td>• Simple linear regression</td>
<td></td>
</tr>
<tr>
<td>• Multiple linear regression</td>
<td></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 &amp; supplement</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 &amp; supplement</td>
</tr>
</tbody>
</table>