Course Syllabus: Data Modelling and Forecasting
College of Business Administration
ECON 5143 Section 270
Spring 2026, M 7-9:50pm, DCOBA 121

Contact Information

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Welcome

Welcome to ECON 5143. It is a graduate course. MBA students are no longer undergraduate students. MBA students are treated as managers who are critical thinkers and problem solvers.

Course Description

This course gives students an introduction to forecasting methods using R. It helps students learn about graphing time series, time series decomposition, time series features, using forecasting tools, time series regression models, exponential smoothing, ARIMA models, dynamic regression models, forecasting hierarchical and grouped time series, advanced forecasting methods, and practical forecasting issues. In addition, this course requires students to use R to solve problems. It would be ideal to have a class that teaches R programming, but this is not possible due to the MBA program structure. This class is not required to teach R programing; however, the instructor will be pleased to help students with learning R.

Textbook & Instructional Materials

Hyndman, R.J., and Athanasopoulos, G. 2021. *Forecasting: Principles and practice*. 3rd edition. OTexts: Melbourne, Australia. OTexts.com/fpp3. (Required). The book is free online and can be accessed at Textbook.

Supplemental Texts:
Wickhman, H. and Grolemund. 2017. G. *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*. 1st Edition. O'Reilly: California, USA. The book is free online and can be accessed at Rfordatascience.

Wickman, H., Navarro, D., and Pedersen, T. Nodate. *Ggplot2: Elegant graphics for data analysis*. 3rd edition. Springer. The book is free online and can be accessed at Ggplot2.

Copyright

The class materials associated with this course are provided to facilitate student learning and are protected by the United States copyright laws. Dissemination or sale of the class material (including the World Wide Web) is not permitted. The class material is only available to students enrolled in the course that requires the use of the corresponding textbook. Students should abide by these restrictions. The publisher of the textbook owns the copyright for the class materials associated with this course.

Software Requirements

This course requires students to use R. The instructions on how to download R and install it in your computer are in the Appendix of the textbook, which can be accessed at AppendixUsingR. Download and install R and RStudio. We will use RStudio.

Learning R:
The course introduces students to using R. The supplemental texts explain the R code used in the required text. One way to learn R programming is to run the chapters' programs, use the supplemental texts as reference, ask questions to the instructor, and invest enough time on it. The ideal scenario would be to take an R programming class first and then take this class, but there is no time for this. Therefore, students must invest enough time into learning R programming.

Computer Operating System

The instructor uses Microsoft computer operating system. Students are responsible for submitting assignment documents/files that can be managed with the Microsoft operating system. The instructor will not be able to help students who use Mac computers due to different computer operating systems. I recommend you use a Microsoft operating system computer.

Suggestions for students

ECON 5143 is a graduate course, which is a higher-level course and different from undergraduate courses. To be successful in this class, students must spare at least two days a week to read the class materials, run and understand the chapter R-program, and do the homework. The instructor will be pleased to help you with any questions you may have. Do not hesitate to contact the instructor if you need help, Dr. Garcia-Fuentes's goal is to help students be successful.

Course Learning Goals

The main goal of this course is to help students learn about modelling time series data and forecasting.

A. General Learning Goals:

1. Leadership. By engaging students in the analysis of time series data and forecasting, this course aims to contribute to developing students' ability to make more effective business decisions.
2. Critical Thinking. The students will demonstrate their critical thinking abilities by conducting analysis of time series data.
3. Communication skills. By engaging students in the analysis of time series data, this course aims to contribute to developing students' ability to communicate their analyses in a professional manner.

4. Integrate knowledge across business disciplines. By engaging students in the analysis of time series data, this course aims to contribute to developing students' ability to integrate data modelling and forecasting methods with other business disciplines.
5. Personal Responsibilities. The students will demonstrate their abilities in connecting choices, actions, and consequences that are related to economic reasoning and ethical decision-making when conducting analysis of time series data.

These general learning goals either represent or are related to those established by the Dillard College of Business Administration. The learning goals represent the skills that graduates will carry with them into their careers. While assessing student performance in obtaining these general learning goals, the College seeks to assess its programs. The assessments will assist us in improving our curriculum and curriculum delivery.

B. Course Specific Learning Goals:

- Learn about graphing time series data.
- Learn about time series decomposition.
- Learn about time series features.
- Learn about forecasting tools.
- Learn about time series regression models.
- Learn about exponential smoothing.
- Learn about exponential smoothing.
- Learn about ARIMA models.
- Learn about dynamic regression models.
- Learn about forecasting hierarchical and grouped time series.
- Learn about advanced forecasting methods.
- Learn about practical forecasting issues.
- Learn about R programing and applications to data modelling and forecasting.

Teaching Method

The method to present the class material will be based on lectures and discussions. The student is allowed to ask questions at any time during the lecture on a point that is not understood. The instructor has academic freedom to bring in class material and technology to the class in his own way. In this class, you will use the internet to access D2L to have access to the class materials. D2L will be used for posting announcements and scores, and perhaps bonuses.

Course Policies

A. Attendance Policy

Students are expected to attend all scheduled classes for this course given the university attendance policy. Attendance is important because of announcements of specific course requirements, instructions for assignments, and more detailed discussions of critical material that are covered in class. Entering class late or departing early is not appropriate (please be respectful and fair to your classmates). To avoid disturbing the class, you are not to walk in and out of the classroom during class except for an emergency. I may also consider your tendency of class participation in favor of a better grade if you only miss a higher score by a narrow margin.

Attendance will also be checked through assignment submissions. Missing 2 classes from 01/20/2026 to 05/08/2026 is considered excessive by the instructor; therefore, students who reach this level of missed classes will be dropped by the instructor with a grade of "F", given the university attendance policy. Additionally, missing 2 two assignments during the semester is also excessive; therefore, students who reach this level of missed assignments will get a final grade of "F", given the university attendance policy, as shown in the Student Handbook and Activities Calendar which may be found at Handbook.

B. Other Policies

Graduate Course:
Econ 5143 is a graduate course and students are treated as graduate students and managers. This is different from being an undergraduate student. Therefore, students should comply with the course policies.

Academic Integrity:
Regarding academic honesty, students are referred to the "Student Honor Creed" (See the Student Handbook).

Assignment submissions that do not represent students' own work will receive zero credits. Be careful when using ChatGPT/AI.

Exam Policies:
Exam policies are related to academic integrity and can also be stated on the first page of the test.

Dillard Building Classroom Policy:
No food or drink is allowed in the classroom.

Syllabus Change Policy:
This syllabus is a guide for the course and is subject to change.

Correspondence:
All correspondence regarding class issues must be conducted in person or by email using your Midwestern State University (MSU) email only. I will not return answers to questions to other email accounts. Grades will be posted on D2L and on MSU Banner. I will not discuss grades or class standing over the phone or by emails. Since email is often the most convenient means of communication, it is recommended that students use and regularly monitor their MSU email account. Grades will not be transmitted electronically (e.g., emails).

Please link your D2L email with your MSU email, so the messages sent through D2L will be delivered to your MSU email. To do this,

- Log in to D2L.
- Click on your name on the right upper corner of the screen.
- Click on "account settings".
- Click on "email".
- Check "Forwarding incoming messages to an alternate email account" and enter your email in the box.
- Click on "save and close".

Netiquette: Communication Courtesy Code:
Students are expected to follow rules of common courtesy in all email messages, class discussions, lecture hall posts, chats, etc. If I consider any of them to be inappropriate or offensive, I will forward the message to the Chair of the department and the online administrators and appropriate actions will be taken.

Deadlines:
We cannot totally rely on cyberspace—emails get lost, and servers disconnect temporarily. Do not wait for the last hour to do your homework. Reply and check for replies on every email sent and received. The student is responsible for checking deadlines on D2L and submitting the work to the instructor on time. *I will not reply to emails regarding homework issues during the last 7 hours prior to the deadline*.

Proctoring of exams:
In case the course changes to online mode, the course can use online proctoring such as ProtorU or a similar software, and students will be required to pay the proctoring fees when taking the exams. In addition, students will be required to have a webcam.

Webcams:
In case the course changes to online mode, students will be required to have access to a web cam.

Classroom decorum:

- Free discussion, inquiry, and expression are encouraged in this class.
- Classroom behavior that the instructor considers interferes with either (a) the instructor's ability to conduct the class or (b) the ability of students to benefit from the instruction is not allowed.
- Routinely entering class late or departing early is not allowed. This will cause the student to lose his/her attendance.
- Use of cellular phones is not allowed in this class. Cellular phones must be turned off and away from your desk. In the event of a situation where a student legitimately needs to carry a cellular phone to class, prior notice and approval of the instructor is required.
- The first time a student violates any of the above rules, the instructor will give the student a verbal warning. The second time a student violates any of these rules, the instructor will ask the student to leave the room and a 20-point penalty on the final score will be assessed.
- *A 20-point penalty on the student's final score will be assessed for violating each of these rules*.
- Classroom behavior which is deemed inappropriate and cannot be resolved by the student and the faculty member will be handled as per the Code of Student Conduct as shown in the Student Handbook.

Student Handbook

Refer to: Student Handbook

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.
Office of Student Conduct

Exams, Assignments and Grading

Exams: During the semester, there will be a midterm exam and a comprehensive final exam (200 points each). The exams can be take-home exams. The final exam can also be a course project. The two-exam scores will be for 400 points or 66.7% of your course grade. The exam's instructions and policies will be stated on the first page of the exam. The instructor has academic freedom to include any type of question in the exams.

If a student misses an exam without prior approval from the instructor, please do not expect a make-up exam. With the instructor's prior approval, you may take a make-up exam during the week of finals. If you anticipate a valid reason for missing an exam, please inform the instructor in advance by email. An unexcused absence from an exam will result in a score of zero on that exam and may be compensated for by counting your final exam in its place with the instructor's approval, and a 20% penalty on that exam's score will be assessed. The exam dates are noted in the Tentative Course Schedule in this syllabus. Any changes to those dates will be announced as soon as possible and posted prominently on D2L.

Assignments: There will be 11 assignments corresponding to the chapters that will be covered during the semester. The assignments will be submitted through D2L. The instructor has academic freedom to include any type of question in the assignments. There will be no make-up assignments under any circumstances. The student is responsible for having an appropriate internet connection. If you do not have an appropriate internet connection and fail to submit an assignment, do not expect a make-up assignment. You are expected to complete each assignment by the deadline. You will have an adequate amount of time for each assignment, and you must not fall behind. If you miss an assignment, you will earn zero credits. Your score for all assignments will be 190 points. Assignment deadlines are posted on D2L.

In addition, students are required to attend a live or watch an on-demand SAS Institute webinar on any business analytics topic at SASwebinar. Students must submit screenshots of the beginning and ending times on the D2L.

Table 1. Course Grading

Course work	N/A	Grade Scale	Percentages	N/A
SAS webinar	10 pts	540-600 pts	90% & above	A
Assignments (11)	190 pts	480-539 pts	80%-89%	B
Exam 1	200 pts	420-479 pts	70%-79%	C
Exam 2/Course project	200 pts	360-419 pts	60%-69%	D
Total	600 pts	below 360 pts	below 60%	F
N/A	N/A	N/A	N/A	N/A

Notes: Percentages are only given for relative levels. Your final score is a total of all your exams, quiz, and homework scores with any bonus points added separately. Therefore 89% is not 1 point short of an A. 89% is 534 points which is 6 points short of an A.

Moffett Library

Moffett Library provides resources and services to support student's studies and assignments, including books, peer-reviewed journals, databases, and multimedia materials accessible both on campus and remotely. The library offers media equipment checkout, reservable study rooms, and research assistance from librarians to help students effectively find, evaluate, and use information. Get

started on this Moffett Library webpage to explore these resources and learn how to best utilize the library.

Desire-to-Learn (D2L)

Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into D2L through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Online Computer Requirements

Taking an online class requires you to have access to a computer (with Internet access) to complete and upload your assignments. It is your responsibility to have (or have access to) a working computer in this class. **Assignments and tests are due by the due date, and personal computer technical difficulties will not be considered reason for the instructor to allow students extra time to submit assignments, tests, or discussion postings.* Computers are available on campus in various areas of the buildings as well as the Academic Success Center. *Your computer being down is not an excuse for missing a deadline!! There are many places to access your class! Our online classes can be accessed from any computer in the world which is connected to the internet. Contact your instructor immediately upon having computer trouble If you have technical difficulties in the course, there is also a student helpdesk available to you. The college cannot work directly on student computers due to both liability and resource limitations however they are able to help you get connected to our online services. For help, log into D2L**.**

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Student Wellness Center, (940) 397-4140. Current documentation of a disability will be

required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to Disability Support Services.

College Policies

Campus Carry Rules/Policies

Refer to: Campus Carry Rules and Policies

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Campus Carry

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes has prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit Campus Carry.

Active Shooter

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit MSUReady – Active Shooter. Students are encouraged to watch the video entitled "*Run. Hide. Fight.*" which may be electronically accessed via the University police department's webpage: *"Run. Hide. Fight."*

Grade Appeal Process

Update as needed. Students who wish to appeal a grade should consult the Midwestern State University MSU Catalog

Course Schedule

Table 2. Outline of the course

Week and dates	Chapter	Topic
Week 1 (Jan 20)	3*	Data visualization; Syllabus and D2L. Install R and do chapter 3* on your own.
Week 2 (Jan 26)	2	Time series graphics
Week 3 (Feb 2)	3	Time series decomposition
Week 4 (Feb 9)	4	Time series features
Week 5 (Feb 16)	5	Forecaster's toolbox
Week 6 (Feb 23)	7	Time series regression models
Week 7 (Mar 2)	Exam 1	Exam 1: chapters 2, 3, 4, 5, and 7, Due on 03/08/2026 at 11:59pm
Week 8 (Mar 9)	Break	Spring break
Week 9 (Mar 16)	8	Exponential smoothing
Week 10 (Mar 23)	9	ARIMA Models
Week 11 (Mar 30)	10	Dynamic regression models
Week 12 (Apr 6)	11	Forecasting hierarchical and grouped time series
Week 13 (Apr 13)	12	Advanced forecasting methods
Week 14 (Apr 20)	13	Practical forecasting issues
Apr 29, 2026	W day	Last day for "W" at 4:00pm. Drops after this deadline receive an "F".
Apr 30, 2026	SAS webinar	SAS webinar due on 4/30/26 at 11:59pm
Week 15 (Apr 27)	Final exam	Chapters: 8, 9, 10, 11, 12, and 13
Week 16	Final exam	Due on 05/10/2026 at 11:59pm

Notes: Subject to changes and additional readings. Chapter 3* is chapter 3 from "Wickhman, H. and Grolemund. 2017. G. *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*. 1st Edition. California: O'Reilly Media, Inc." Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.