

University of Montana

ScholarWorks at University of Montana

University of Montana Course Syllabi, 2021-2025

Spring 2-1-2022

ECNS 513.01: Macroeconomics and Forecasting

Douglas Dalenberg

University of Montana, Missoula, doug.dalenberg@umontana.edu

Follow this and additional works at: <https://scholarworks.umt.edu/syllabi2021-2025>

Let us know how access to this document benefits you.

Recommended Citation

Dalenberg, Douglas, "ECNS 513.01: Macroeconomics and Forecasting" (2022). *University of Montana Course Syllabi, 2021-2025*. 641.

<https://scholarworks.umt.edu/syllabi2021-2025/641>

This Syllabus is brought to you for free and open access by ScholarWorks at University of Montana. It has been accepted for inclusion in University of Montana Course Syllabi, 2021-2025 by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

UNIVERSITY OF MONTANA
ECNS 513: Macroeconomics and Forecasting

Course Information:

Semester: Spring 2022
Section: Section 01
Meeting time and Classroom: MWF 2:00-2:50 in LA 337
Credits: 3 credits
CRN: 30460

Instructor Information:

Instructor: Douglas Dalenberg
Office: LA 413
Email: doug.dalenberg@mso.umt.edu
Phone: 406-243-4406 (message only – email will get a faster response).
Office hours: MWF 1:00-1:50, W 3:00-4:00 or by appointment.

Course Description:

Modern macroeconomics is a broad and deep field. We will approach this course from an empirical perspective by focusing on the forecasting tools that are often applied by macroeconomists. Statistical software will be used to assist us in handling of complex empirical problems and to demonstrate the use of statistical software in forecasting. The ultimate objective of the course is to familiarize the student with the tools used in forecasting by economists.

Prerequisites:

A statistics course such as STAT 216.

Required Text:

Hyndman, Rob J. and George Athanasopoulos, (2020), *Forecasting Principles and Practice*, third edition available online as an open source text at <http://otexts.com/fpp3/>

Software:

R and *RStudio*. These are free, open source software. I will show you how to download it. If you do not have a computer on which to install this, you will have to use a University computer lab such as FA 210. You are required to wear a mask in University labs.

Course Moodle Page:

The course Moodle page will contain the course documents and data sets we use.

Learning Outcomes:

Students who successfully complete ECNS 513 will be able to:

1. explain the issues associated with time series data.
2. create forecasts and perform the relevant associated tests of forecasting models.
3. demonstrate proficiency with the R statistical software program in the realm of forecasting.
4. articulate the issues and challenges associated with making a forecast.

Assessment:

Assignment	Weight	Date (Subject to change)
13 Homework	80%	Every Friday except 1/21, 3/25, 5/6.
Take-home Final Exam	20%	Wednesday, 5/11 by 5:20 PM

I will use plus/minus grading so 100-92=A, 91-90=A-, 89-88=B+, 87-82=B, 81-80=B-, 79-78=C+, 77-72=C, 71-70=C-, 69-68=D+, 67-60=D, 59 and below=F.

Policies:

Health

1. I will be following the University Covid-19 recommendations for classrooms. Currently they require a mask in class, labs, and indoors. The mask policy can be found on the [Student Affairs](http://www.umt.edu/student-affairs/community-standards/) website (<http://www.umt.edu/student-affairs/community-standards/>). Please make sure your mask covers your mouth and nose and is worn properly.
2. If my office hours conflict with your schedule, contact me for an appointment (in-person or Zoom). I will require masks in my office. If that does not work for you, we will meet over Zoom or outside.
3. Although attendance is not part of your course grade, attending class is important for your learning. I will be taking attendance and making a seating chart to assist with contact tracing but it is not a direct component of your grade.
4. Let's keep our classroom a healthy environment. Do not come to class if you are sick. If you feel sick and/or are exhibiting COVID-19 symptoms, please don't come to class and contact the Curry Health Center at (406) 243-4330. If you are a close contact with someone who tests positive, we will follow University policies. If I must miss class, I will notify you via email.
5. If you are required to isolate or quarantine, I will work with you to be sure you have access to the recordings and handouts and I will meet with you over Zoom for questions you have.
6. UM (and I) recommend you get the COVID-19 vaccine and booster. Please direct your questions or concerns about vaccines to Curry Health Center.

Classroom

1. In order to keep us safe, please no food or drinks in the classroom.
2. I will be recording the classes and posting the recordings on Moodle. The recordings are not a perfect substitute for attending class and there are some things such as class activities that the recording will miss but they can be a good resource.
3. Late homework is penalized with a deduction of points reflecting the cost it imposes on me to grade and record. Homework is considered late if I receive it after I have finished grading those assignments handed in on time. I waive the late penalty for excused absences, but you are still responsible for doing the homework.
4. A classroom is a community, so I trust you will act as a mature and responsible citizen and treat each other with respect and courtesy. As one courtesy to your classmates, please set your cell phones to vibrate and leave the class if you must take a call.

University

1. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Office of Disability Equity, please contact them in Lommasson Center 154. I will

work with you and the Office of Disability Equity to provide an appropriate modification. For more information, visit the [Office of Disability Equity](https://www.umt.edu/disability/) website (<https://www.umt.edu/disability/>).

2. All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the [Student Conduct Code](http://www.umt.edu/student-affairs/community-standards/) (<http://www.umt.edu/student-affairs/community-standards/>). Academic dishonesty will result in a score of zero for the work in question and possible university sanctions.
3. The University sets deadlines for adding classes, dropping classes, changing grade options, and changing to or from audit status. These policies can be found at the [Registrar's web page](https://www.umt.edu/registrar/students/drop-add/default.php) (<https://www.umt.edu/registrar/students/drop-add/default.php>) while the actual dates for this term can be found on the [Registrar's calendar](https://www.umt.edu/registrar/calendar/spring-2022.php) (<https://www.umt.edu/registrar/calendar/spring-2022.php>).
4. UM has a Cultural and Ceremonial Leave Policy which states: "Cultural or ceremonial leave allows excused absences for cultural, religious, and ceremonial purposes to meet the student's customs and traditions or to participate in related activities. To receive an authorized absence for a cultural, religious or ceremonial event the student or their advisor (proxy) must submit a formal written request to the instructor. This must include a brief description (with inclusive dates) of the cultural event or ceremony and the importance of the student's attendance or participation. Authorization for the absence is subject to approval by the instructor. Appeals may be made to the Chair, Dean or Provost. The excused absence or leave may not exceed five academic calendar days (not including weekends or holidays). Students remain responsible for completion or make-up of assignments as defined in the syllabus, at the discretion of the instructor."

Calendar:

This schedule of topics is subject to modification. All changes will be announced in class.

Wk	Date	Topic	Reading	Assignments
1	1/17 1/19 1/21	<i>Holiday</i> Background R and R Studio	HA chapter 1	
2	1/24 1/26 1/28	R tools for TS Graphs Variance and covariance	HA chapter 2 Reading 1	Homework 1 due
3	1/31 2/2 2/4	Terminology Very Simple Forecasts Process	HA chapter 3 Reading 2	Homework 2 due
4	2/7 2/9 2/11	Transformations Stationarity Stationarity	HA chapters 4 and 5 Reading 3	Homework 3 due
5	2/14 2/16 2/18	Stationarity Regression Seasonality	HA chapter 7	Homework 4 due
6	2/21 2/23 2/25	<i>Holiday</i> Seasonality ts objects	Reading 4. Reading 5	Homework 5 due
7	2/28 3/2 3/4	ts objects Missing and Outliers ETS	HA chapter 13.9 HA chapter 8	Homework 6 due
8	3/7 3/9 3/11	ETS ETS Model Comparison		Homework 7 due
9	3/14 3/16 3/18	ARIMA intro ARIMA summary ARIMA math	HA chapter 9.1-9.5	Homework 8 due
10	3/21 3/23 3/25	<i>Spring Break</i> <i>Spring Break</i> <i>Spring Break</i>		
11	3/28 3/30 4/1	ARIMA process ARIMA details ARIMA details	HA chapter 9.6-9.8	Homework 9 due
12	4/4 4/6 4/8	ARIMA details ARIMA forecasting ARIMA logs		Homework 10 due
13	4/11 4/13 4/15	Drift Seasonal ARIMA Seasonal ARIMA	HA chapter 9.9-9.10	Homework 11 due
14	4/18 4/20 4/22	Aggregation Forecast Combinations Forecast Combinations	HA chapter 13.5 HA chapter 13.4	Homework 12 due
15	4/25 4/27 4/29	Dynamic Regressions Dynamic Regressions Other Methods	HA chapter 10.1-10.4 HA chapter 6	Homework 13 due
16	5/2 5/4 5/6	VAR Issues Big picture	HA chapter 12.3	
17	5/11 (Wed)	Take-home Final Exam due Wednesday by 5:20 PM		Take-home Final due

* HA refers to Hyndman and Athanasopoulos, 3rd edition.

Reading #s:

1. Wickham, Hadley, (2010) "A Layered Grammar of Graphics", *Journal of Computational and Graphical Statistics*, 19(1):3-28.
2. Excerpt from Silver, Nate, (2012), *The Signal and the Noise*, NY: The Penguin Press.
3. Nelson, Charles R., and Charles I. Plosser, (1982), "Trends and Random Walks in Macroeconomic Time Series", *Journal of Monetary Economics*, 10: 139-162.
4. Australian Bureau of Statistics, "Time Series Analysis: Seasonal Adjustment Methods", online.
5. Excerpt from Wickham, Hadley and Garrett Grolemund, *R for Data Science*, chapter 16 online.