Economic Analysis with Excel

L11 Econ 4941

Fall 2019

Instructor:	:	Zdinak, Michael
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Time	:	5:30—7:00PM TH
Location	:	Seigle Hall L016
Office Hours	:	5:00—5:30PM & 7:00—7:30PM TH
	:	By Appointment
Website	:	2019-Econ-4941

Course Description

This half-semester course offers students the opportunity to master the advance functionality of Microsoft Excel, and to apply those skills to common economic, statistical, and financial problems. Even those familiar with the basic functioning of Excel may be surprised to learn how little of its full capability most users access. Though basic functions will be covered, our focus will be on leveraging Excel's more advanced functions, analytical tools, reporting templates, and linking features to manage multiple workbooks, manipulate data across files, automate tasks, and produce publication quality charts, tables, and graphs.

In addition to providing hands-on experience using Excel's more advanced capabilities, the course is designed to serve as a bridge between introductory econometrics and practical work with real-world datasets. The course will be held in the computer classroom so that students can obtain practical experience preparing data, managing workflow, and presenting results. Added emphasis throughout the course will be placed on examples with applications in economics.

Prerequisites: prior completion of, or concurrent enrollment in, Econ 413 (or equivalent).

Upon completion of this course, students should be able to:

- Plan, design, create and manage multiple worksheets
- Construct formulas using relative, absolute and mixed cell references
- Manage large volumes of data using tables, pivot tables, and advanced queries
- Construct, revise, and update appropriate charting styles to represent a variety of data
- Analyze data using various mathematical and statistical functions
- Link excels workbooks to manage and combine data sets
- Import data from external and online data sources

Textbook – Optional

Barreto, Humberto, and Frank M. Howland. *Introductory econometrics: using Monte Carlo simulation with Microsoft Excel*. Cambridge New York: Cambridge University Press, 2006.
ISBN-13: 978-0521843195
ISBN-10: 0521843197

Barreto, Humberto. *Intermediate microeconomics with Microsoft Excel*. Cambridge New York: Cambridge University Press, 2009.
ISBN-13: 978-0521899024
ISBN-10: 0521899028

Barreto, Humberto. Teaching macroeconomics with Microsoft Excel. New York, NY: Cambridge University Press, 2016.
ISBN-13: 978-1107584983
ISBN-10: 1107584981

Drop/Add Policy & Grade Options

This course must be taken for a letter grade. The P/F and audit grade options are NOT available. The last day to add the course is October 22; the last day to drop the course (with a "D") is October 24, 2019. There is no option to withdraw (with a "W") from this course. Exceptions have only been made in the case of illness or emergency. Students cannot use Webstac to add, drop, or withdraw from this course after the first session. All requests for changes in the grade option must be directed to Dorothy Petersen (dottie@wustl.edu).

Academic Integrity

The homework and the final project are to be your own work. Evidence to the contrary will result in a failing grade, and academic disciplinary action. If you ever feel that these standards of academic integrity are not being met, please notify me or an undergraduate advisor immediately. If you are uncertain about the policies regarding academic integrity at Washington University, please refer to the following link.

Computer Software – Required

Office 365 Pro Plus provides current Washington University faculty, staff, and students with access to download and activate Microsoft Office apps for computers and mobile devices. Each user can install and activate the Microsoft Office Apps on up to 5 personally-owned devices. Here is a link to the campus plans: https://it.wustl.edu/home/how-to/office-2016/office-for-home/.

Grading

The following weights will be used to determine your course grade:

4	Homework Assignments:	30%
10	Quizzes:	40%
1	Final Project:	30%

Homework

Homework is an integral part of this course. The best way to learn how to use Excel is to do it. For Weeks 1–6 (see tentative outline, below), the assigned homework exercises will consist of 3–5 questions requiring application of the tools we'll cover in class to find, download, clean and analyze the real-world datasets most commonly used by economists. Each assignment will be due one week after it is assigned. The submitted files will be graded and returned, and sample solutions will be provided. No previous programming experience is required, but familiarity with computers and basic statistics is assumed.

Quizzes

Evaluation is also an integral part of the course. Lectures will begin with a short quiz over the material covered in previous lectures. Students will have time in class to work on each quiz. First individually, and then in small groups. At the end of the evaluation period, one group will be selected to present their solution.

To facilitate information sharing, students will be sorted at random into small groups. One group will then be selected at random to present their solution. All selection will be with replacement. Students are required to submit their own work to receive full credit. Attendance is not mandatory, but students will not be given credit for any quiz they do not complete.

Final Project

The purpose of the Final Project is to provide students with the opportunity to estimate, test, and interpret an economic model by utilizing the data analysis and Excel skills learned throughout the course. Students should be surprised to learn they have the skills to replicate the empirical results in a peer-reviewed article from a professional economics journal with these tools.

Economic Datasets Used in this Course

Panel Study of Income Dynamics (PSID), Integrated Public Use Microdata Series (IPUMS), Current Population Survey (CPS), Survey of Consumer Finances (SCF), National Income and Product Accounts (NIPA) series, Federal Reserve Economic Data (FRED), Wharton Research Data Services (WRDS), and Bloomberg Financial Data (BBD).

Tentative Course Calendar

The following calendar is tentative and subject to change.

Monday	Tuesday	Wednesday	Thursday	Friday
14th **October**	15th *Fall Break*	16th	17th **Lab 0**	18th
21st	22nd **Lab 1**	23rd	24th **Lab 2**	25th
28th	29th **Lab 3**	30th	31st **Lab 4**	1st **November**
4th	5th **Lab 5**	6th	7th **Lab 6**	8th
11th	12th **Lab 7**	13th	14th **Lab 8**	15th
18th	19th **Lab 9**	20th	21st *Thanksgiving*	22nd
25th	26th **Lab 10**	27th	28th **Lab 11**	29th
2nd **December**	3rd **Lab 12** **Final due**	4th	5th **Open Lab**	6th *Reading Week*

Tentative Outline

Week 1 – 2: Introduction to Excel—Simple Formulas, Summary Stats, & Analysis

- Basic formulas: row & column manipulation, dynamic cell references, lists, tables, and formatting, paste & linking values, & common keyboard shortcuts
- Conditional formulas: arithmetic, comparison, & reference operators, combined with IF statements, nested IFs, SUMIF, AND, OR statements
- Homework 1: Excel file; download, format, & make table summarizing CPS/IPUMS data

Week 2 – 3: Intermediate Excel—Cell/Multi-Cell Array Formulas, Filters, & Pivot Tables

- Text, date, & time manipulation: Find, search, len, and trim functions (+Left, right, & mid, upper & proper, text & value), text to columns & removing duplicates
- Pivot Tables: dynamic & advanced filtering options
- Multi-Cell Array formulas: tradeoffs in performance & flexibility
- Homework 2: Excel file; Use date/time formulas; clean, format, & graph BBD/NIPA data Filter, summarize, and graph the data using a Pivot Table & Chart

Week 3 – 4: Intermediate Excel—Data Visualization, Tables, & Lookup Functions

- Data Visualization: advanced charting options, linking tables, pivot tables, more charts
- Cell, List, Table References & Lookups: Vlookup, Hlookup, Index, Match, Match-Match, Index-Match-Match, Choose, Fuzzy Matching, Offset, & Indirect
- Homework 3a: Excel file; Index-Match-Match & Fuzzy Matching—names & addresses
- Homework 3b: Excel file; Offset & Indirect—combine, summarize, & graph PSID data

Week 4 – 5: Advanced Excel—Introduction to VBA programming & Scenario Building

- VBA & Excel Macros, Choose, data validation, goal seek & solver techniques
- What-IF analysis & scenario building, data tables & sensitivity analysis
- Homework 4a: Excel file; Automate downloading & summarizing using VBA macros. Write a custom VBA function—ex. estimate implied volatility from option prices
- Homework 4b: Excel file; Test for selection bias using probit model & What-IF analysis

Week 6 – 7: Advanced Excel II—Financial & Statistical Modeling in Excel

- Discounted cash flow models—XNPV, XIRR and/or Annuity modeling—PMT, IPMT
- Multivariate & logistic regression models—confidence intervals, SEs, etc.
- Animation, Interaction and Dynamic Excel Charts
- Project Final 1: Replicate paper summary statistics and graphics (described above)
- Project Final 2: Excel, Word, PowerPoint—Present analysis across multiple applications