ECON 2040 – Quantitative Methods in Economics

Syllabus

Welcome to ECON 2040! In this course you will learn a variety of quantitative tools. By working through textbook examples, practice exercises, and assignments you will become comfortable applying the quantitative tools to inform decisions in Economics. I hope that you enjoy the course!

Course description

The University of Manitoba Undergraduate Calendar describes this course as follows:
"*An introduction to statistical methods relevant to Economics, which include: descriptive statistics; probability and probability distributions; hypothesis testing; and ordinary least squares regression. The use of contemporary econometric software is required. Students may not hold credit for both ECON 2040 and the former ECON 3170 (018.317). Prerequisite: a grade of "C" or better in six credit hours of 1000 level Economics."*

Course goals

- Explore and describe data used to inform decisions in economics

- Review basic concepts of probability and random variables

- Understand behaviour and conditions of counts and proportions

- Draw conclusions about a population or process from sample data

- Model a response based on one or several explanatory variables

- Perform quantitative analysis in the econometric software program gretl.

Course materials

This course requires the following resources:
- Textbook: *The Practice of Statistics for Business and Economics*, Fourth Edition, by Moore, McCabe, Alwan, and Craig. The University of Manitoba Bookstore sells a customized version for the University of Manitoba at a reduced price.

- Online homework system: LaunchPad by Macmillan Education (A six-month access code for LaunchPad is included with the purchase of the customized version of the textbook.)

- Software: gretl (This econometric software program is free and available for PC or Mac users.)

- Calculator: A non-programmable calculator is required for the final examination. A non-programmable calculator cannot: store functions, formula, text, equations; create graphs; solve equations; or connect to the internet. Follow this link for one example of a non-programmable calculator.

Learning Activities

Learning activities are organized by units. Students should complete one unit per week. The 'road-map' for each unit's learning include the following types of activities: reading sections of textbook, completing LearningCurve in LaunchPad, exploring Statistical Applets in LaunchPad, and practicing assigned short- and long-answer exercises.

Evaluation and Grading

Mark Allocation

LearningCurve	24
Assignments	24
Final Examination	52
Total	100

LearningCurve: LearningCurve is a component of units two through thirteen. Each LearningCurve is worth 2% of your final grade.

NOTE 1: Late assignments will be assigned a grade of zero.

NOTE 2: UM Learn Dropbox submissions not submitted as a PDF will be assigned a grade of zero.

NOTE 3: There will be no make-up marks for LearningCurve. If you miss an assignment for a documented medical or compassionate reason the weight will be added to the final examination.

Assignments: There are six assignments that include a combination of multiple choice, short-, and long-answer questions. Each assignment is worth 4% of your final grade. Assignments will be posted on the UM Learn news feed two weeks prior to the assignment deadline. Assignments are submitted through LaunchPad and a UM Learn Dropbox.

NOTE 1: Late assignments will be assigned a grade of zero.

NOTE 2: There will be no make-up marks for the assignments. If you miss an assignment for a documented medical or compassionate reason the weight will be added to the final examination.

NOTE 3: The assignments are to be completed individually. Students are not allowed to discuss or share their assignment answers with any person (whether face-to-face or virtually) until after the assignment deadline has passed.

Final Examination: The final examination is invigilated and is to be written at the University of Manitoba Fort Garry campus or at an approved off-campus location. The date and time of the final examination will be scheduled by the Registrar's Office. The only items you can bring into the final examination are your student card, pens/pencils, eraser, ruler, and non-programmable calculator. A formula sheet will be provided. The examination will follow the same format as assignments and include multiple choice, short-, and long-answer questions.

NOTE 1: Students needing to write at an off-campus location must declare a location by the specified deadline date (see off-campus declaration and policy under Student Resources on course homepage). Students writing at the University of Manitoba Fort Garry campus do not need to declare an exam location.

Topics and Assignment Due Dates

The textbook sections covered in ECON 2040 are divided into thirteen units. Students should complete one unit per week. LearningCurve and assignment due dates are included below.

Unit One   Read course syllabus and watch instructor video
Access LaunchPad
Install gretl

Practice Assignment due on Friday, September 15, 2017 by 4:30 PM CST.

Unit Two   Producing Data (Sections 3.1, 3.2, 3.3, and 3.4)
Data (Section 1.1)

Unit Three   Displaying Distributions with Graphs (Section 1.2)
Scatterplots (Section 2.1)

LearningCurve Unit Two, LearningCurve Unit Three, and Assignment One due on Friday, September 22nd, 2017 by 4:30 PM CST

Unit Four   Describing Distributions with Numbers (Section 1.3)
Density Curves and Normal Distributions (Section 1.4)

Unit Five   Randomness (Section 4.1)
Probability Models (Section 4.2)
The Binomial Distributions (Section 5.1)

LearningCurve Unit Four, LearningCurve Unit Five, and Assignment Two due on Friday, October 6th, 2017 by 4:30 PM CST

Unit Six   General Probability Rules (Section 4.3)
The Poisson Distributions (Section 5.2)

Unit Seven   Toward Statistical Inference (Section 5.3)

LearningCurve Unit Six, LearningCurve Unit Seven, and Assignment Three due on Friday, October 20th, 2017 by 4:30 PM CST

Unit Eight   Continuous Random Variables (Section 4.4)
Means and Variances of Random Variables (Section 4.5)

Unit Nine   The Sampling Distribution of a Sample Mean (Section 6.1)
Estimating with Confidence (Section 6.2)

LearningCurve Unit Eight, LearningCurve Unit Nine, and Assignment Four due on Friday, November 3rd, 2017 by 4:30 PM CST

Unit Ten   Tests of Significance (Section 6.3)
Using Significance Tests (Section 6.4)
Power and Inference as a Decision (Section 6.5)

Unit Eleven   Inference for the Mean of a Population (Section 7.1)
Comparing Two Means (Section 7.2)
Inference for a Single Proportion (Section 8.1)

LearningCurve Unit Ten, LearningCurve Unit Eleven, and Assignment Five
due on Friday, November 17rd, 2017 by 4:30 PM CST

Unit Twelve   Least Squares Regression (Section 2.3)
                  Cautions about Correlation and Regression (Section 2.4)

Unit Thirteen   Inference about the Regression Model (Section 10.1)

                  LearningCurve Unit Twelve, LearningCurve Unit Thirteen and Assignment Six due by
                  Friday, December 8th, 2017 by 4:30 PM CST

Other Important Information

Contacting your instructor: For information on contacting your instructor as well as other important
information from your instructor see the instructor video in UM Learn.

Plagiarism, cheating, and examination impersonation: You should acquaint yourself with the
University's policy on plagiarism, cheating, and examination impersonation as detailed in the General
Academic Regulations and Policy section of the University of Manitoba *Undergraduate Calendar*. Note:
These policies are also located in your *Distance and Online Education Student Handbook* or you may
refer to Student Affairs at http://www.umanitoba.ca/student.

Accessibility: The University of Manitoba is committed to providing all students with equal access to
learning opportunities. Student Accessibility Services (SAS) is the office that works with students who
have permanent, chronic, or temporary disabilities to provide and/or arrange reasonable
accommodations. Students who believe they may need such accommodations should contact Student
Accessibility Services at 520 University Centre to arrange a confidential discussion with one of their
Accessibility Advisors at 204-474-7423, 204-474-9790 (TTY), or student_accessibility@umanitoba.ca.
Schedule A [Link to Schedule A]: This policy and resource document contains important information
about academic supports available to students, such as: writing and learning support; a statement
regarding physical and mental health that includes referral information; a notice with respect to copyright,
and a statement directing students to University of Manitoba policies, procedures, and supplemental
information available on-line.

Acknowledgements

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Dr. Janelle Mann has a PhD from Queen's University and has been teaching quantitative methods and
econometrics at the University of Manitoba since 2012. She researches the development and application
of cutting-edge quantitative techniques for time series data with the purpose of providing evidence based
policy recommendations to decision makers in the areas of commodity markets, environmental
economics, and most recently health economics.

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