Textbook: There is NO required textbook for the course. Lecture notes will be provided for most topics.

Recommended:

No readings will be required from this text, but you may find this interesting later in the future (excellent discussions of applications in econometrics, eg chapters 2-3, 6-9).

Here are several good standard textbooks, but you are not expected to read any of these for this course:


Course Description:
Econometrics as applied to food, agriculture, agribusiness and resources. Econometric applications cover ordinary and generalized least squares, maximum likelihood, instrumental variables, nonstationary and dynamic models, and panel data. Lectures include critiques of selected applications especially in agriculture. Students will conduct an applied econometric study in one of these areas (food, agriculture, agribusiness and resources), or in another area after discussion with instructor.
Grading

<table>
<thead>
<tr>
<th>Grading</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Midterm</td>
<td>30 percent of course grade*</td>
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<tr>
<td>Final Exam</td>
<td>30 percent of course grade*</td>
</tr>
<tr>
<td>Paper (application)</td>
<td>40 percent of course grade</td>
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Notes:
1. The midterm will be scheduled prior to the voluntary withdrawal deadline.
2. Students will not be permitted to write makeup tests, except for documented medical or compassionate reasons.
3. Students appealing any term work (whether it be an informal or formal appeal) must appeal their term work within 10 working days of receiving their mark.

Statement on Academic Integrity

Students should acquaint themselves with University policy on plagiarism and cheating. See the Academic Integrity section of the University of Manitoba Graduate Academic Calendar. Ignorance of policies is not a valid excuse for violating them.

During online exams, each student must complete the exam independently – any discussion with others (or use of services in answering exams) will be considered as plagiarism and cheating.

Lecture Topics:
1. Ordinary Least Squares
2. Maximum Likelihood
3. Generalized Least Squares
4. Instrumental Variables
5. Nonstationary Models
6. Dynamic Models
7. Panel Data Models
Course Outline

1. Ordinary Least Squares (OLS) Model
   - assumptions
   - derivation of OLS estimator and cov(bOLS)
   - unbiasedness and normality
   - Gauss-Markov theorem (proof)
   - hypothesis testing: t and F tests (skip proofs)
   - specification errors, direction and magnitude of biases due to omitted variables
   - dummy variables
   - multicollinearity

2. Asymptotic Theory
   - properties of plim's (simple proofs)
   - consistency of OLS estimator (proofs)
   - asymptotic distribution of OLS estimator without normality of disturbance (Lindberg-Feller central limit theorem), and related asymptotic distributions of t-tests and modified F tests (proofs)

3. Maximum Likelihood (ML) Model
   - assumptions
   - estimators
   - asymptotic properties (proofs)
   - hypothesis testing: likelihood ratio test

4. Generalized Least Squares (GLS)
   - general approach
   - heteroskedasticity (including White HAC, introduction to ARCH/GARCH models - GLS and ML estimation)
   - autocorrelation (including test for common factor restrictions)
   - feasible GLS for both het and auto (proofs of consistency and asymptotic normality, specification problems)
   - seemingly unrelated regressions (SUR)

5. Instrumental Variables (IV)
   - simultaneous equations, identification
   - simple IV, two stage LS (2SLS) (proofs of consistency and asymptotic normality, truncation)
   - weak instruments
   - 3SLS
   - Wu-Hausman specification tests (proofs)
   - testing for causality within framework of IV and specification tests

6. Nonstationary Models
   - spurious regressions
- unit roots (consequences, differencing)
- tests for unit roots (Dickey-Fuller, KPSS)
- cointegration
- error correction models
- tests for cointegration

7. Dynamic Models
- autoregressive distributed lag (ADL) models
- general to specific modelling

8. Panel Data Models
- fixed effects versus random effects
- dynamic models: first differences and instrumental variables
Term Paper for Course

You are to present a paper (approximately 15-20 pages, excluding computer print outs) applying econometric methods to data. The paper will generally be related to agriculture, agricultural economics, agribusiness or resource economics. Other topics may be approved in discussion with the instructor. Note: this cannot be a paper on consumer demand (since most students will be preparing such a paper for Abiz/Econ 7950 Advanced Agricultural Demand Analysis in the same term).

In applying econometrics to your data, you may use any reasonably sophisticated econometric or statistical package. An introduction to STATA will be provided in conjunction with Abiz/Econ 7950, but any other sophisticated package is acceptable. It is recommended that you become familiar with a package more advanced than Excel.

The paper should include the following sections:
1. Introduction - briefly explain the problem or issue and why it is important
2. Data - briefly describe your data, data sources and limitations (possible measurement errors) in your data
3. Present a particular multivariate regression model and clearly explain why it is important in terms of understanding your particular problem or issue
4. Discuss any important variables omitted from the study due to inadequate data and how this is likely to bias estimation and hypothesis testing
5. Explain carefully your methodology for specifying and estimating the regression model and testing hypotheses
6. Carry out your methodology, explaining and interpreting results carefully, and modifying your methodology as appropriate
7. Explain how your econometric results help (or do not help) you understand the problem or issue at hand
8. Provide a candid assessment of the limitations of your study and how future research might try to address these.

Note: a brief written description of parts 1 and 2 above (introduction, data) is due in class by October 13.
Readings on Applied Econometrics in Agriculture

Note: this is intended as a brief introductory list of applied econometric studies. Some of these may be of value to you as background reading for your paper. I do not expect you to read any particular articles for this course (unless indicated otherwise in class).

Production

Consumption

Risk

Dynamics

Business and Finance

Development

International Trade