Economic Analytics

ECON 2050

**An On-Line Course**

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# Overview

This course introduces basic economic measures and computations such as index numbers, cost relationships, time-value of money, rates and growth, seasonal adjustment, forecasting and measures of inequality. We will introduce the use of Solver in Excel in the context of economic models such as demand-supply and linear programming. You will learn basic data management, data transformation, and graphing using the features of Excel.

Case study 1: A student in this course worked for the Winnipeg Jets as a spotter. He used Excel to create an entire system of analytics to track the performance of individual players

In addition to mastering the core measures of economics, by taking this course you will gain proficiency in Excel, the most important analytical tool used in business and government. It is also a powerful method for supporting data analysis and economic modelling in more advanced economics courses and business courses. After taking this course, you will have a library of Excel procedures that support common economics and business measurements/calculations.

# Excel is power

Taking this course will give you confidence in managing and analyzing data. You will see the value right at the first module, when you learn how to get information from the internet, process the data to produce new insights, and then create graphs to communicate this understanding.

From there you will learn increasingly powerful methods to process data and gain insight. One very useful feature of Excel is solving economic and business problems using optimization procedures such as linear programming or “LP”, which is foundation of what is known as operations research.

# Course objectives

Case study 2: A student in a summer job reorganized very large data files that no one else had been able to accomplish. This allowed her employer to gain understanding of what was important to that business. The student received significant recognition his abilities.

Because I find Excel so useful in research and consulting, I want to share with you its ability to put you in control of your data. By taking this course you will:

* Learn how to apply economic and business analytics to a wide range of common challenges faced by researchers as used in academia, industry, and government research;
* Understand how Excel can support the development of economic and business models/metrics to support performance measurement, forecasting, and simulation;
* Gain confidence in teaching yourself more advanced excel techniques to manage complex data and to develop solutions to unique problems.

In brief, the core objective of this course is to give you the tools to solve new problems and teach yourself more advanced techniques.

**This is an on-line course with no lectures. This is part of the training needed to become an independent learner**.

You will become an independent learner and maintain your own learning schedule.

* There are no formal lectures and no time the entire class meets in one place except for the tests shown in the [learning schedule](#_Course_Schedule).
* You can decide to learn everything at once by going through all the coursed materials, ***but….***
* Most of you will find it better to following the learning schedule.

At the end of this course you will have the ability and confidence to tackle more complex problems in economics and business. You will also learn how to analyze and present information that places you in front of your colleagues in other courses.

My job is to help you succeed in reaching these objectives

# What do you need to start?

You need to have completed six credit hours of economics at the first-year level (ECON1010, ECON1020, ECON1210, or ECON1220) or equivalent. You also need to remember your high school algebra.

You will need access to the internet at a reasonable speed (not dial-up). You can use the [common area computer labs](http://umanitoba.ca/computing/ist/connect/labs) around campus. Most of you will have your own PC or Mac. This will make learning more convenient, but it is not necessary; you can use the labs on campus.

While you can participate in the course through any computer that can access the internet, Students will find it convenient to have their own PC or Mac. You will need to install Office on your computer, which you may purchase on-line from [Computers on Campus](http://umanitoba.ca/campus/bookstore/computers/softwaredownloads.html)) for less than $20.

Caution: The Mac implementation of Office (and therefore Excel) is good but not perfect. Since, all you will write all tests using computers the common lab areas, those using Mac to complete this course should gain some practice on a PC in one of the common areas.

You do not need to know Excel to take this course.

You should know your way around a computer, either a PC or a Mac

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# Bona Fide Academic Requirement

The course introduces you to the work style common in business and advanced academic work.  Most important, you need to develop the skill and confidence to be able to teach yourselves more advanced Excel techniques. This requires practice, practice, and more practice at a computer.

Therefore, this course requires you have the physical ability to use a standard PC or Mac (notebook or desktop), which means the ability to "keyboard", visualize detailed information on screen, navigate to web sites, and input complex alphanumeric information within specified time constraints of the tests.

If believe you may have trouble doing this, please consult with [Student Accessibility Services](http://umanitoba.ca/student/saa/accessibility/) to determine whether accommodations are possible.

# How is this course different from a conventional course?

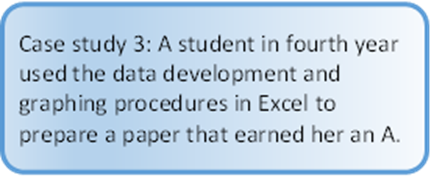
There are no formal lectures. All course materials are on-line. This course runs through [UMLearn](https://universityofmanitoba.desire2learn.com/d2l/login). Once you register for this course, and have a valid University of Manitoba e-mail account you will be able to access course materials and tests.

On the course site, you will find course will direct you through the learning, which comprises modules, Voice over PowerPoint, videos, examples, exercises and answers.

Students must know the procedures and processes used by UMLearn. You may learn this system using the [Instructional videos](https://universityofmanitoba.desire2learn.com/d2l/le/content/6606/Home?itemIdentifier=D2L.LE.Content.ContentObject.ModuleCO-647229). (You must have a valid account at the University of Manitoba to access this material. Contact [Information Services and Technology](http://umanitoba.ca/computing/ist/help/index.html) for assistance.

**It is your responsibility to learn**

**how to use UMLearn**

Term tests and examinations occur at set times in one of the open area computer labs on campus. You will download the tests and exams within the Dropbox/Assignment facility within UMLearn. You must master this: video instruction appears on the course UMLearn course website to guide you through this. Registered will see the ECON2050 that will open to the course content.

Mac users may need to download and install [VLC Media Player](http://www.videolan.org/vlc/download-macosx.html) to see the videos properly.

# How will we communicate?

My job is to help you learn, even though we do not meet in a lecture. Here are the ways you can meet me and discuss any aspect of this course.

* E-mail is my far the best way to contact me. Please use [gregory.mason@umanitoba.ca](mailto:gregory.mason@umanitoba.ca). **I will only communicate with you using the university approved e-mail system. Do not contact me using your personal e-mail, I will ignore these messages**. I do not use Twitter or Facebook for university courses. Note: that I typically try to respond to e-mail quickly, but my response may be slower between 6 pm Friday and 10:00 am Sundays
* The course site also has a discussion board where you can post questions of other students
* My office hours are 12:00 – 2:00 on Tuesdays, starting September 5. Please visit me if you are having any problems or concerns about the course.

# Additional Resources

You should consider purchasing an advanced Excel manual such as: *Excel 2013: the missing manual*, Matthew MacDonald, O’Reilley Press. This will be a handy reference for several years.

There are many YouTube videos on Excel some good, others not so much.

# Test Format

All tests and the final exam occur exactly at the date and time specified in the [learning schedule](#_Learning_Schedule). Exams/tests are open and downloaded from UMLearn. You will be able to bring any notes and books to class, consult all the material for this course under UMLearn and use any internet resource to answer questions on the tests and exam.

* The test is available only on the specified date and within the time.
* The tests and final exam are downloaded from the UMLearn Dropbox. You must learn how to do this – a video explains how to do this.
* The tests can only be completed at the assigned terminals in the common area labs on the Fort Garry campus. You will be assigned to a specific room and seat number prior to each term test and the final. This will be your place for all tests and the final exam.
* Plan to arrive at your assigned terminal 10 – 15 minutes early to make sure it is working properly. This includes verifying that Excel works, it has the add-ins needed and that you can download and upload the practice test.
* You cannot use your own computer to complete and submit a test or final exam.
* You cannot consult (talk, text, or e-mail) with anyone during the test – this will result in a score of 0.
* You cannot use your phone during the exam for any reason – this will result in an immediate score of 0.
* I will allow only conventional calculators so you can check your work
* Make sure you understand the [University policy on cheating and plagiarism](http://umanitoba.ca/student/resource/student_advocacy/cheating_plagiarism_fraud.html).

Under no conditions will I accept a test or final exam outside the test/exam period or outside the Drobox/Assignment process in UMLearn

If you fail to upload your exam within the set time, you will get 0. I will not accept the test by e-mail.

Save and upload at several times in the test/exam period

Academic integrity:

Each student must read and understand university regulations regarding academic integrity as described in the General Calendar.

* [Plagiarism and Cheating](http://umanitoba.ca/student/resource/student_advocacy/cheating_plagiarism_fraud.html)
* [Personation at an examination](http://crscalprod1.cc.umanitoba.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=240&chapterid=2310&topicgroupid=15446)

Claims that these regulations were not understood will not be accepted.

During the term tests and final exam, you must not communicate with anyone by any means or share your test.

We have security processes to detect such cheating.

# Assessing your performance

The final mark will be based on 60 minute in-class term tests (best 3 out of 5), and a final examination.

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| Component | Marks |
| Term Tests (Best 3 out of 5) | 50 |
| Final exam (2 hours) (In formal exam period) | 50 |
| Total | 100 |
| Numerical grade conversion: A+ (>90), A (>80), B+ (>75), B (>70), C+ (>65), C  (>60), D (>50), F(<50) | |

I use table above to determine the final grade. But to give you the best chance of getting a good mark, I also use the following rule:

Provided you submit three term tests, if the mark on the final is higher than the cumulative score on the term tests, I will only use the final exam to create the letter grade.

If the final exam has a lower score than your cumulative score on the tests, I will combine the term tests and final exam using the above mark allocation to obtain the final numerical grade.

You must take and submit at least three term tests to benefit from this offer.

* Example 1: *Hua* completed 4 term tests with an average mark of 26/50 on the best 3. But she studied hard and the final was much better – she scored 42/50. Hua received an A.
* *Example 2*: *Alexander* wrote all 5 term tests and the best three had an average of 43/50, but his final was much weaker and received a score of 25/50 (which is a D). The term tests and final were combined to give a total score of 68/100 and a letter grade of C+.
* *Example 3:* *Jennife*r only wrote 2 term tests with scores of 27/50 and 41/50. Her final exam was 31/50. Her term tests totalled (0/50+27/50+41/50)/3 = 22/50. Add this to the final of 31, and the numerical total is 53/100 which is a D. Her failure to complete at least three term tests degraded her final mark.

**Plan to take all five terms tests. This is how you know whether you understand the course material.**

# Policy on missed term tests and final exam

You cannot repeat a missed term test … therefore only 3 of 5 term tests count toward the final mark. Please do not ask for an exception for any reason.

If you miss the final exam, you must apply to the Dean’s office for permission to write a deferred exam. Only valid medical reasons (with a note from a health practitioner) are usually accepted as the basis for such a deferral.

# How to succeed in this course

The term tests anchor the course, the first of which occurs after two weeks. The material is cumulative and you will not be able to master the material the night before.

Here is how to succeed:

* Work through the lectures and watch the videos according to learning schedule
* Review and repeat
* Try the exercises before looking at the answers… this is how you can know whether you understand the material
* Form a study group with colleagues in the class. I will help you set these up through UMLearn
* Retain all your work including previous term tests in your UMLearn Locker. This will be available to you in the tests and exam.

# Learning Schedule

Use the dates in the course schedule to manage your learning. Set aside a fixed time each week to work on this course, just as if you were taking lectures. For some this may be challenging. With the flexibility of an on-line course, comes the need for self-discipline.

| Module Outline (Subject to change) | | |
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| **Progress**  Use these dates to check your progress | | Set aside 3 – 4 hours each week to learn the modules, watch videos, try the exercises, and practice on a computer. Everyone should also practice at a terminal in the Dafoe computer labs to make sure you understand how to use those systems. |
| Module 1 | Sept 15 | ***Module Content: Navigating the spread sheet.*** *Work sheets, copying/pasting data, and using formulas/functions*  Excel: Formulas and Functions, Graphing data and formulas, SUM, |
| Module 2 | Sept 22 | ***Module Content: Measuring change****. Percent change, log percent change, per capita measures, index numbers)*  Excel: Using price indexes and moving averages. SUMPRODUCT, Naming Sheets, Formulas with Sheets |
| **Test 1**  **(Mod 1 – 2)** | **Sep 28** | **6:00 pm – 7:pm, in your assigned room (You will receive an e-mail)** |
| Module 3 | Oct 3 | ***Module Content: Statistics*** *Measures of central tendency, variation, and unusual observations*  Excel: AVERAGE, MEDIAN, RANGE, VAR.P, STDEV, IF, COUNT |
| Module 4 | Oct 7 | ***Module Content:******Basic probability distributions***  Excel: STANDARDIZE, MIN, MAX, BINOMIAL.DIST, NORMAL.DIST, LOGNORMAL.DIST |
| ***Caution: The pace picks up. Learning is cumulative… each tests exams material to date*** | | |
| **Test 2**  **(Mod 1 – 4)** | **Oct 10** | **6:00 pm – 7:pm, in your assigned room (You will receive an e-mail)** |
| Module 5 | Oct 17 | ***Module Content:******Regression 1*** *The principle of least squares*  Excel: Data analysis, FORECAST, TREND, LINES, Array functions |
| Module 6 | Oct 24 | ***Module Content: Regression 2*** *Seasonal adjustment and trends*  Excel: Data analysis, Regression model of Data Analysis |
| **Test 3**  **(Mod 1 – 6)** | **Oct 31** | **6:00 pm – 7:pm, in your assigned room (You will receive an e-mail)** |
| Module 7 | Nov 4 | ***Module Content:******Time Value of Money*** *– present/future values, loans, mortgages*  Excel: Financial formulas PV, FV, PMT, PPMT |
| Module 8 | Nov 12 | ***Module Content:******Economic decisions, C****apital budgeting, internal rate of return, depreciation, and cost-benefit analysis*  Excel: IRR DB, DDB and “What-if analysis” and GOAL SEEK |
| **Test 4**  **(Mod 1 – 8)** | **Nov 14** | **6:00 pm – 7:pm, in your assigned room (You will receive an e-mail)** |
| Module 9 | Nov 24 | ***Module Content: Introduction to economic and business models*** *– Demand and Supply*  Excel: Using SOLVER |
| Module 10 |  | ***Module Content: Measures of inequality***  Excel – Logical functions in Excel (IF, AND, OR, nested IF, NOT, IFERROR, IS functions, VLOOKUP) |
| **Test 5**  **(Mod 1 – 10)** | **Nov 28** | **6:00 pm – 7:pm, in your assigned room (You will receive an e-mail)** |
| Module 11 | Dec 1 | ***Module Content: Taxation****:**Creating a tax table, average and marginal tax rates; modeling the impact of a tax change on income inequality*  Excel – Lorenz and Gini functions in Excel |
| Module 12 | Dec 5 | ***Module Content: Linear Programming*** *as the foundation of operations research. Translating common economic and business problems into the LP format*  Excel: SOLVER |
| ***Caution: The material in the last two models is a little more difficult. Be prepared to spend some extra time learning it.*** | | |
| **The Registrar will schedule the Final Exam during the normal exam period.**  **The Final Exam will test you understanding of all.** | | |