**Agricultural Econometrics (0605750)**

**Second Semester 2014-2015**

**Time of the lectures: 14:00-16:00 Mon. and Wed.**

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| Credit hours | 3 | Level | MSc. Level, **(605750)** | Pre-requisite |  |
| Coordinator/ Lecturer | **Prof. Dr . Emad Al-Karablieh** | Office number | 285 | Office phone | 22477 |
| Course website |  | E-mail | **karablie@ju.edu.jo** | Place | Seminar Room |

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| **Office hours: or by appointment** | | | | | |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
| **Day** |  | **\*\*\*** |  | **\*\*\*** | **JV** |
| **Time** |  | **11:00-12:00** |  | **11:00-12:00** |  |

**Course Description**

Theory of mathematical statistics and classical simple and multiple linear regression models in context of economic application. Topics include multi-variate hypothesis, extensions of multiple regression, problems of estimation, and simultaneous equation methods. Econometric model building, including evaluation, forecasting, econometric simulation, and computer applications are included. Therefore, this course will present an advanced treatment of econometric principles for cross-sectional, panel and time-series data sets. While concentrating on linear models, some non-linear cases will also be discussed, notably limited dependent variable models and generalized methods of moments. The course will focus on modern econometric techniques, addressing both technical derivations and practical applications. Applications in the areas of microeconomics, macroeconomics and finance will be considered

**Prerequisites**

The prerequisite courses include Introduction to Statistical Methods in Economics or equivalent. Students should be familiar with basic concepts in probability theory and statistical inference. The course includes a brief statistics review.

**Learning Objectives**

1. The course aims at explaining the different methods of data analysis by using statistical and economical concept.
2. This course aims at providing the modern methods of analyzing data used in economics, business and many other social sciences.
3. To develop a knowledge and understanding of analyzing the data and choosing and testing mathematical model to explain the relationships between different variables. .

**Intended Learning Outcomes (ILOs):**

Successful completion of the course should lead to the following outcomes:

1. **Knowledge and Understanding:** Student is expected to

**A1**-Be able to discuss/ explain the importance of a wide range of models and quantitative tools**.**

**A2-** Be able to use econometric, statistical, and economic models as a basis for estimating key economic parameters, testing economic hypotheses, and predicting economic outcomes.

**A3-** Demonstrate basic knowledge on data analysis and choosing the suitable model.

**A4-** Demonstrate basic knowledge on using software of data analysis.

1. **Intellectual Analytical and Cognitive Skills:** Student is expected to

**B1**- Employ analytical skills to be used for data analysis.

**B2**-test the significance of the parameters in the built models.

**B3**-using the built models in forecasting for the future.

**B4-** Identify a range of statistical, economic, and econometric models and evaluate and justify them through suitable proposed solutions

1. **Subject- Specific Skills:** Students is expected to

**C1**- Apply and analyze different methods of building models.

**C2**- using the computer in his/her analysis.

**C3**- Use appropriate econometric support tools.

**C4**: Use the econometric scientific literature effectively.

1. **Transferable Key Skills:** Students is expected to

**D1**-Gain advanced knowledge in data analysis and building and testing the models.

**D2**- Create self-reliance and team work when necessary.

**D3**- Display personal responsibility to the course requirements

**D4**- Prepare and deliver structural verbal and written technical reports or assignments

# ILOs: Learning and Evaluation Methods

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| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| A. Knowledge and Understanding (A1-A4) | Lectures and Discussions | Exam, Quizzes and Exercises. |
| B. Intellectual Analytical and Cognitive Skills (B1-B3) | Lectures and Discussions | Exam, Quizzes and Exercises. |
| C. Subject Specific Skills (C1-C4) | Lectures and Discussions, using the computer | Exam, Quizzes and Exercises by using computer. |
| D. Transferable Key Skills (D1-D3) | Lectures and Discussions | Exam, Quizzes and Exercises. |

**Course Contents**

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| ***WEEK*** | ***SUBJECT*** | **Sources** | **ILOs** |
| ***1*** | **INTRODUCTION TO ECONOMETRICS**:  Introduction to econometrics, the nature of statistics, The methodology of econometrics. Reviewing descriptive and basic statistics, testing hypothesis | Gujarati, D. N., 1992 | **A-1** |
| ***2*** | **SIMPLE REGRESSION MODEL**   * The two variable linear model * The ordinary least - square method * Test of significance of parameter estimates * Test of goodness of fit and correlation * Properties of the error term | Maddala, G. S., 2001 | **A-3**  **B-2**  **C-1, C-3, C-4**  **D-1, D-2, D-3** |
| ***3*** | **MULTIPLE LINEAR REGRESSION MODEL**   * The three - variable model * Tests of significance of parameter estimates * The coefficient of multiple determination * Test of overall significance of regression * Partial – correlation coefficients * Predictions | Gujarati, D. N., 1995 | **A-3**  **B-2**  **C-1, C-3, C-4**  **D-1, D-2, D-3** |
| ***5*** | **SELECTING THE BEST REGRESSION EQUATION:**  t-test, F- test, Durbin-Watson test ( D.W. test ), the coefficient of determination ( R2 ), and the a priori economic criteria ( the sign and size of the parameters of the regression model | Wonnacott 1979,  Johnston, 1972 | **A-4**  **B-1**  **C-2 , C-4**  **D-1, D-2, D-3** |
| ***5*** | Using the common software for analyzing the data, Excel, SPSS, TSP, EVIEW, and STATA application by using computer. | TSP® manual, STATA® Manual,  SPSS Manual | **A-4**  **B-1**  **C-2 , C-4**  **D-1, D-2, D-3** |
| ***6*** | **VIOLATIONS OF THE ASSUMPTIONS OF THE LRM**:  Multicolinearity, autocorrelation, errors in variables, and heteroscedasticity. Serial correlation in time series | Gujarati, D. N., 1995 | **A-2**  **B-1**  **C-3, C-4**  **D-2, D-3** |
| ***7*** | **FURTHER TECHNIQUES in RA**  Applications in regression analysis  Selection of Functional form  Dummy Variables, | Gujarati, D. N., 1995 | **A-2, A-3**  **B-2, B-3**  **C-1, C-3, C-4**  **D-2, D-3** |
| ***8*** | **DISCRETE CHOICE MODEL, BINARY CHOICE MODEL**  Logit model  Probit model  Tobit model  Ordered Probit & logit model | Maddala 2001, Maddala, 1983 | **A-2, A-3**  **B-2, B-3**  **C-1, C-3, C-4**  **D-2, D-3** |
| ***9 & 10*** | **INSTRUMENTAL VARIABLES, SIMULTANEOUS EQUATIONS MODELS,**  Using IV to solve omitted-variables problems  Measurement error (Time-permitting)  Regression-discontinuity designs (Time-permitting) | Gujarati, D. N., 1995 | **A-2, A-3**  **B-2, B-3**  **C-1, C-3, C-4**  **D-2, D-3** |
| ***11 & 12*** | **SIMULTANEOUS EQUATION MODELS**  The use of structural models  Simultaneous equations bias  The identification problem  The structure and the reduced form  Indirect least squares  IV for the SEM  Two-stage least squares  Sampling variance of 2SLS estimate | Greene, 2011, ch.9,  Maddala 2001 | **A-2, A-3**  **B-2, B-3**  **C-1, C-3, C-4**  **D-2, D-3** |
| ***13 &14*** | Nonlinear regression and Least Squares Estimation (NLS),  Optimization methods | Davidson R. and J.G. MacKinnon (2003) ch.7 | **A-1, A-3**  **B-1, B-3**  **C-2, C-3, C-4**  **D-2, D-3** |
| ***15 &16*** | Maximum Likelihood Estimation (ML) and tests, Generalized Least Squares (GLS) | Davidson R. and J.G. MacKinnon (2003) ch.10 | **A-3, A-3**  **B-2, B-3**  **C-3, C-4**  **D-2, D-3** |

**Learning Methodology**

The course will be structured in lectures, discussions, working group and exercises. The course comprises overviews, from general understanding to expert knowledge on key topics, and learning is based on lectures as well as independent learning through exercises and examples. Actual participation in class work is a very important part of students learning experience in this course. So students are expected to come and to be prepared to do the work, ask questions and fully engaged with the course.

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| **Evaluation** | **Grade 100%** | **Date** |
| **Midterm Exam** | 30% | 14/04/2015 |
| **Project and presentation** | 30% |  |
| **Final Exam** | 40% | Will be announcing from JU register. |

**Text Books**

Maddala, G. S.: Introduction to Econometrics, John Wiley & Sons, 3d ed., New York, 2001

Johnston, J. “ Econometric Methods “, 2nd Edition, McGraw-Hill Book Co., New York, 1972.

Salvatore, D. “ Theory and Problems of Statistics and Econometrics “, Schaum’s Outline Series in Economics, McGraw-Hill Book Company, New York, 1982.

Gujarati, D. N., “ Basic Econometrics “, 3rd ed., McGraw-Hill Company Inc., New York, 1995.

Gujarati, D. N., “ Essentials of Econometrics “, McGraw-Hill Company Inc., New York, 1992.

Wonnacott, R. J., and T. H. Wonnacott, “ Econometrics “, 2nd ed., John Wiley & Sons, New York, 1979.

Greene, W. H. *Econometric Analysis*, (7th edition), Pearson Prentice Hall (2011).

Maddala, G. S.: (1983). Limited Dependent and Qualitative Variables in Econometrics, Cambridge.

Davidson R. and J.G. MacKinnon (2003), Econometric Theory and Methods, Oxford University Press, 2003

**References and Other Reading Material**

1. Gujarati, D. N., “ Essentials of Econometrics “, McGraw-Hill Company Inc., New York, 1992.
2. Series in Economics, McGraw-Hill Book Company, New York, 1982.
3. Jabarin, A. S. and *E. K. Al-Karablieh* (2011). Estimating the Fresh Vegetables Demand System in Jordan: A Linear Approximate Almost Ideal Demand System. *Journal of Agricultural Science and Technology*. Volume 5, No.3, pp. 322-331
4. Amer Z. Salman, *Emad K. Al-Karablieh* (2001). An early warning system for wheat production in low rainfall areas of Jordan. *Journal of Arid Environment*. Volume 49 (3), pp 631-642.
5. *Al-Karablieh, Emad*., Ahmad Sh. Al-Rimawi and Doukhi A, Hunaiti (2009). Logit Models for Identifying the Factors that Influence the Adoption of Barley Production Technologies in Low Rainfall Areas. Jordan Journal of Agricultural Sciences. Volume 5, No. (3): 251-265
6. *Al-Karablieh Emad* and M. Salem (1999). "Measuring the Bias of New Production Technologies of Barley in Jordan”. Dirasat, Agricultural Sciences, Volume 26, No. (1). p. 106-113.
7. *Al-Karablieh Emad* and M. Salem (1996). "Sequential Adoption of divisible Technologies in Barley Production in Jordan”. Dirasat, Agricultural Sciences, Volume 23, No. 1. p. 55-67.

**Notes:**

* Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For final complaints, there will be a committee to review grading the final exam.
* For more details on University regulations please visit:

<http://www.ju.edu.jo/rules/index.htm>

**Department Policy:**

Students guilty of knowingly using, or attempting to use, another person’s work as though that work were their own, and students guilty of knowingly permitting, or attempting to permit, another student to use their work, will receive a grade of “F” for the course. Such conduct may also constitute grounds for dismissal from the University. Students who are unfamiliar with the University’s policy on plagiarism should consult the most recent edition of laws and regulation of JU. Students who are uncertain regarding what actions constitute plagiarism should consult the instructor.

**METHOD OF EVALUATION:**

1. **HOMEWORK and QUIZZES:**

Homework is essential to this course. Homework will be assigned, collected and reviewed by the instructor. Homework and quizzes constitutes 30% of the final grade. The purposes of the homework assignments are: a.) insure students are exposed to a representative selection of problems that both demonstrate and illustrate the concepts, theories and methodologies presented in class and b.) Insure students understand the material presented in class and are keeping up with the course material. Homework must be both complete and neat – work that is either incomplete or sloppy will not be accepted. LATE WORK WILL NOT BE ACCEPTED.

1. **EXAMINATIONS:**

There will be one midterm exam counting for 30% of the course grade and final exam counting 40% of the course grade. The exam may be an in-class exam, take-home exam or a combination of in-class and take-home examination.

**ATTTENDANCE POLICY:**

Students are expected to attend scheduled classes. If an absence is unavoidable the student should contact the instructor prior to the class. If a student is absent it is their responsibility to make arrangements with another student to get the notes and assignments for the class they miss. If a student misses more than 10% of the course schedule time without prior approval they will be encouraged to drop the course. If a student misses more than six classes they will be dropped from the course automatically.

* Attendance: student is not allowed to be absent from more than (15%) Of credit hours for the course and will deprive students who exceed their absences for no reason and if the student is absent more than (15%) as well as the late attendance are not allowed on the start date of the class in this case he/she is absent. Both absent with an excuse for the announced test date above the result (zero) if there is no proof of excuse within three days from the date of demise of the excuse, if your excuse is accepted, this excuse will be a compensation exam next week.
* Tools: it is necessary to bring a calculator with each student; it is not allowed to use your cell phone during the lecture or during the exam.
* Job is or projects on time agreed, and both failed to apply on time is considered to be a result (zero) in that activity.
* Cheat in exam or participation, initiation or submission of draft of the work of others or copy other people's work or scientific robbery, breach of examination system or calm the student who commits any of the disciplinary measures provided for in the laws and regulations of the University.
* Will display the results of the work of the chapter to students 50% of the final mark on a given period to allow withdrawal of the course in the legal time limit.