Kuwait University
College of Business Administration
Master of Science in Economics Program

Course Syllabus
Spring 2025
ECON 520 – Applied Econometrics
Dr. Dhari Alrasheed

Class Time and Location

Lecture: Sun.; 5:00pm – 7:50pm; C3-1007

Contact Information

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Course Description

Advanced econometrics methods for different data structures and economic applications. Overview of estimators. Simultaneous and seemingly unrelated equations models. Time series: autoregression and moving average, vector autoregression and error correction models, and volatility models. Panel data: fixed and random effects. Causal inference: randomized control trials, instrumental variables, difference-in-differences, and regression discontinuity. Limited dependent variable models: discrete choice, censored data, sample selection, and count data. Structural model calibration and simulation. Duration, spatial, and missing data.

The course may cover applied econometrics for all data structures and economic applications or emphasize specific branches of applied econometrics tailored to students' interests. Applications are illustrated through reading and discussing empirical journal articles. Students apply their preferred method through empirical assignments, a replication paper, a term paper, or a research proposal

Course Learning Objectives (CLOs)

Upon successful completion of the course, students will be able to:
CLO1. Survey advanced models and estimators relevant to various data structures.
CLO2. Specify appropriate models and formulate estimation and forecasting strategies.
CLO3. Develop identification strategies for causal inference in program evaluation.
CLO4. Develop reading skills necessary for evaluating and synthesizing the empirical literature.
CLO5. Survey a wide range of topics in the applied economics and empirical literature.
CLO6. Carry out an empirical research project; communicate methodological strategy & empirical findings effectively.

CLO Mapping to Master Program Student Learning Outcomes (SLO)*

CLO	Competency Goal				
	Economic Theory	Quantitative Reasoning	Critical Thinking	Contextual Knowledge	Communication Skills
1	A	R	R		
2	A	R	R		
3	A	R	R		
4		A	R		
5	R	R	R		
6	A	A	A		R

* Master Program Student Learning Outcomes (SLO) can be found at the end of this document

Type of Emphases:
- **(I)ntroduce:** Students will be introduced to the skill and their grasp of it assessed in the course.
- **(A)pply:** The course will not cover the skill. Students should have a high-level grasp of the skill & are required to apply it in the course.
- **(R)einforce:** Students should have an introductory-level grasp of the skill & the course will improve their mastery to a higher level.

Pre-Requisites

1030531; 1030541; 1030552.

Required Material

Textbook: No required textbook, but the following are recommended:

- Applied Econometric Time Series by Enders (Macro)
- Mastering `Metrics by Angrist and Pischke (Micro)
- The Effect by Huntington-Klein (Micro)
- Causal Inference: The Mixtape by Cunningham (Micro)
- Discrete Choice Methods with Simulation by Train (Discrete Data)
- Principles of Econometrics by Carter-Hill, Griffiths, and Lim (General)
- Introductory Econometrics: A Modern Approach by Wooldridge (General)
- Econometric Analysis by Greene (General)
- Econometric Analysis of Cross-Section and Panel Data by Wooldridge (Micro)

Additional Material: Lecture notes provided by the instructor.
E-Learning System: MS Teams and Moodle.
Course Website : https://moodle.ku.edu.kw

Course Requirements

- **Participation:** read the assigned papers and participate in class discussion.
- **Reading Briefs:** summarize the assigned papers in short briefs, written in bullet-point style, covering the following: research question, motivation, motivation, contribution, data, econometric methodology, main quantitative results and qualitative findings, policy implications, and your own thoughts and critiques about the paper's econometric methodology.
- **Presentation:** each assigned paper is presented by a student in 15 minutes followed by discussion. The presentation should cover the same items in the reading brief. Each student is expected to present 1-2 papers.
- **Research Ideas:** think of 3 ideas and write half-page summaries about them covering the research question, motivation, data needs, and econometrics. Grading is based on completeness, and I will provide you with written feedback that points you in directions where you can develop the ideas further. The purpose of this exercise is to get you in the habit of generating ideas, help you develop empirical strategies to answer research questions of interest to you, and hopefully lead to a research proposal or term paper.
- **Proposal Outline:** 2-page outline of a research proposal on a well-developed idea. It should clearly and specifically formulate the research question, explain the motivation and policy relevance, identify which literatures it fits in, describe the ideal data and variables needed, and discuss econometric & identification challenges.
- **Proposal Presentation:** Present the research proposal in 15 minutes followed by a 5-minute discussion. The presentation is a more developed version of the outline that is backed by some literature review, has a model and convincing identification strategy, and is practically feasible. Having data, quantitative analysis, or results is a plus but not required. Half the grade is for the research idea and design and the other half is for the presentation. This exercise is your change to receive feedback from your classmates and me.
- **Written Proposal (Optional):** expand your proposal in writing with an introduction and motivation, complete literature review, identified data source and description of variables, a model, and a discussion of econometric challenges and identification strategy to overcome them. Data, quantitative analysis, or results will improve your proposal greatly but are not required.
- **Term Paper (Optional):** write a complete term paper that expands on the proposal with quantitative analysis, explains results, draws conclusions, and discusses policy implications.

* NOTE: Your proposal and/or term paper can be a continuation of your master project, thesis, or a project you started in a previous class, in which case you must turn in the latest version of it by March 6th (week 5).

Course Policies

- **Communication:** all class communication will be via MS Teams. Assignments are posted & submitted on Moodle.
- **Research Resources:** use the KU library website to access the literature (https://eresources.ku.edu.kw). Google Scholar (https://scholar.google.com/) is also a great resource. If you cannot find or access an item, let me know.
- **Attendance and Participation:** students must abide by the KU-CGS by-laws regarding attendance (https://cgs.ku.edu.kw/cgs-by-laws/, Article 20).
- **Cheating and Plagiarism:** Every student in this course must abide by the KU-CGS by-laws regarding cheating and plagiarism ((https://cgs.ku.edu.kw/cgs-by-laws/, Article 20). Please carefully note all sources and assistance when you turn in your work. Under no circumstances should you take credit for work that is not yours. You should neither receive nor give any unauthorized assistance on any deliverable. If you have any questions about what constitutes "unauthorized assistance" please email me before the deliverable is submitted.
- **Late Submission:** Accommodation may be made for the written proposal and term paper in agreement with the instructor. Late submission of other assignments is accepted but considered unsatisfactory, thus negatively affecting the overall course grade.
- **Class Etiquette**: avoid distractions. If you are late, walk in quietly and take the first seat available. Refrain from using phones or taking pictures of the board. Beverages are allowed, but not food.
- **Learning**: This course is dense. The best way to learn is by training your eyes, ears, and hands to collectively receive, store, and retrieve information. This is accomplished by reading in advance, paying attention in class, asking questions, and taking extensive notes. Refrain from taking pictures of the board as it is distracting and ineffective.
- **Disability:** inform me if you have a disability and need assistance or accommodation.
- **CGS Rules:** you are responsible for familiarizing yourself with the College of Graduate Studies rules: https://cgs.ku.edu.kw/cgs-by-laws/
- **Values:** this syllabus is a contract between you and me. I promise you trust, respect, fairness, and honesty. I expect the same from you.

Grading

Grading of assignments is based more on effort and completeness than on correctness. The main outcome of this course is a research proposal. The more developed your proposal is, the higher the grade you can attain by going down the following list cumulatively:

Item #	Requirement	Deadline	Accumulated Course Grade
1	Participation & Attendance	Every class.	
2	Reading Briefs	As assigned	
3	Presentations	As assigned	
4	1st Research Idea	Week 2: Feb. 15	$\leq C$
5	2nd Research Idea	Week 3: Feb. 22	$\leq C+$
6	3rd Research Idea	Week 4: Mar. 1	$\leq B-$
7	Proposal Outline	Week 7: Mar. 22	$\leq B$
8	Proposal Presentation	Week 12: Apr. 20	$\leq B+$
9	Written Proposal (Optional)	Week 14: May 10	$\leq A-$
10	Term Paper (Optional)	Finals week: May 27	$\leq A$

In other words, completing the items 1—8 will guarantee you a maximum of a B+ grade. To have a chance for A-, you must complete items 1—9. For an A, you must complete all 10 items. To pass with a C, you must complete items 1—4. Anything less will result in an F grade. All of the above is conditional on satisfactory completion of the items.

Course Outline

The following outline shows the full suite of topics that may be covered. Choice and emphasis of topics depends on course progress and students' interests. Additional topics may be covered if desired by students.

Title	Topics	Weeks
Introduction & Review	- Linear & matrix algebra - OLS & maximum likelihood estimation	1
Part I: System of Equations	- Seemingly unrelated regression (SUR) - Simultaneous equations model	2
Part II: Time Series	- ARMA; VEC; VAR; SVAR - ARCH; GARCH; stochastic volatility - Optional topics: state space, factor models, structural breaks, time-varying parameters, and regime switching	3-4
Part III: Panel Data	- Pooled regression; random and fixed effects - Correlated random effects; random coefficients; panel dynamics	5-6
Part IV: Causal Inference and Program Evaluation	- DAGs; Randomized control trials; instrumental variables; difference-in-differences; regression discontinuity	7-10
Part V: Limited Dependent Variable	- Discrete choice: binary, ordinal, and multinomial outcomes - Censored data; count data; sample selection - Discrete panel data	11-12
Part VI: Other Topics	- Missing data; duration models; spatial models	13-14

Master of Science in Economics Program Student Learning Outcomes

1. **Economic Theory:** Develop a solid grounding in economic theory and apply it to complex economic problems, business decisions, and policy questions.
   1.1. Construct microeconomic and macroeconomic theoretical models to explain behavioral and economic phenomena and analyze the functioning of markets, institutions, and economies.
   1.2. Apply theoretical models to derive equilibrium solutions, perform comparative statics analysis, and generate predictions from policy simulations.
2. **Quantitative Reasoning:** Master advanced mathematical and statistical methods to construct economic models, specify and estimate appropriate econometric models, draw credible causal inferences, and produce reliable predictions and forecasts.
   2.1. Specify appropriate econometric models and statistical techniques to estimate behavioral and economic relationships and forecast macroeconomic variables.
   2.2. Develop credible identification strategies to estimate causal effects in microeconomic applications.
   2.3. Characterize empirical strategies employed in the literature and assess their validity.
3. **Critical Thinking:** analyze complex economic models, evaluate their assumptions critically, test their predictions and policy prescriptions, and distinguish between causal relationships and spurious correlations.
   3.1. Analyze theoretical economic models and evaluate their assumptions and predictions.
   3.2. Assess economic arguments against their theoretical underpinnings and the empirical evidence.
   3.3. Question and formulate the economic rationale of policy interventions and their consequences.
   3.4. Assess the credibility of econometric methodologies for identifying causal relationships separate spurious correlations.
4. **Contextual Knowledge:** attain a comprehensive knowledge of the history and issues related to the economies of Kuwait, the Arabian Gulf, and the Middle East and North Africa Region.
   4.1. Develop a working knowledge of the history and issues related to the local and regional economies.
   4.2. Characterize local and regional socioeconomic issues, phenomena, and policies within sound theoretical and empirical frameworks.
5. **Communication Skills:** write clear, rigorous, and coherent high-level research papers and communicate their methodologies and findings effectively and persuasively through presentations.
   5.1. Produce high-quality research papers written clearly, rigorously, and coherently.
   5.2. Interpret and communicate methodological techniques and quantitative results effectively.
   5.3. Deliver coherent and effective research and practical presentations.