

UMBC UGC New Course Request: ECON 310 Data Analysis for Economics

Date Submitted: 9/13/2018

Proposed Effective Date: Fall 2020

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COURSE INFORMATION:

Course Number(s)	310
Formal Title	Data Analysis for Economics
Transcript Title (≤30c)	Data Analysis for Economics
Recommended Course Preparation	
Prerequisite NOTE: Unless otherwise indicated, a prerequisite is assumed to be passed with a "D" or better.	ECON 101, ECON 102, (MATH 151 or MATH 155), all with C or better.
# of Credits Must adhere to the UMBC Credit Hour Policy	3
Repeatable for additional credit?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Max. Total Credits	3 <small>3This should be equal to the number of credits for courses that cannot be repeated for credit. For courses that may be repeated for credit, enter the maximum total number of credits a student can receive from this course. E.g., enter 6 credits for a 3 credit course that may be taken a second time for credit, but not for a third time. Please note that this does NOT refer to how many times a class may be retaken for a higher grade.</small>
Grading Method(s)	<input checked="" type="checkbox"/> Reg (A-F) <input type="checkbox"/> Audit <input type="checkbox"/> Pass-Fail

PROPOSED CATALOG DESCRIPTION (Approximately 75 words in length. Please use full sentences.):

This courses surveys theoretical and applied statistical tools relevant to empirical economics. Students will gain an understanding of measures of central tendency and dispersion, hypothesis testing, correlation, and regression analysis. The use of computer software for statistical analysis will be illustrated. Additional topics may include identifying data sources, obtaining data, interpreting the results of empirical research, and carrying out a basic empirical research project.

RATIONALE FOR NEW COURSE:

Both of the Economics Department majors (BA in Economics and BS in Financial Economics) have an introductory statistics requirement that can be satisfied with STAT 350/351/355/451 or CMPE 320. The proposed ECON 310 will provide an additional option for satisfying this requirement. For the reasons described below, ECON 310 will be a preferable option for ECON and FIEC students. That stated, STAT 350/351/355/451 and CMPE 320 will continue to be accepted for the ECON BA and FIEC BS degrees.

Content

The content of ECON 310 will differ substantially from the content of STAT 350/351/355/451 and CMPE 320. As indicated by the attached proposed ECON 310 syllabus, approximately one-third of the course (weeks 10-14) will be devoted to univariate and multivariate regression analysis, a topic generally not covered at all in the other courses. Regression analysis is a fundamental technique in empirical economic analysis. The ability to interpret regression results is a necessary skill for economics students to acquire in order to understand journal articles and

other economics publications, and to produce their own research in economics. ECON 310 will provide ECON and FIEC majors with an opportunity to acquire that skill earlier in their academic careers in a course that is integrated with other basic statistical concepts. Currently, many of our ECON and FIEC students must rapidly pick up an understanding of regression analysis in advanced topics courses that use economics journal articles as teaching texts. ECON 310 will provide an opportunity for students to enter those courses with a firm grasp of the technique already established, while also preparing them to produce their own original research earlier in their academic careers.

An additional content difference between ECON 310 on the one hand and STAT 350/351/355/451 and CMPE 320 on the other is an emphasis on standard data sources used within economics. STAT 350/351/355/451 and CMPE 320 of course cannot be expected to emphasize such data sources given that they do not cater specifically to economics students. As with regression analysis, we think that a dedicated presentation of such data sources, rather than picking up this information piecemeal in various advanced topics courses, will better prepare our majors to produce original research as undergraduates.

Staffing

One other contrast between ECON 310 and STAT 350/351/355/451 and CMPE 320 is that full time Economics Department faculty will teach ECON 310. As described above, the content differences between ECON 310 and the other courses are geared toward improving our majors' abilities to understand and produce empirical economic research. We feel strongly that full time Economics Department faculty, who are active in research as well as teaching, are much better suited to teaching those skills than adjunct faculty who, although often excellent teachers, are generally not active researchers. For at least the past several semesters, STAT 350/351/355/451 and CMPE 320 has been taught mostly by adjunct faculty.

We expect to offer one section of ECON 310 each spring and fall semester, with the possibility of a summer or winter section if student demand warrants.

Consistency with peers

ECON 310 will also be consistent with the Economics Department's ongoing effort to update our curriculum to stay current with our peers. The economics departments that we use as peers require an "in-house" introductory statistics course. For the reasons described above, the model in which the introductory statistics requirement is met with a service course in a statistics department (as we currently do) has fallen out of favor with economics departments in general. (For evidence, see page 153 of the attached *Journal of Economic Education* article, which finds that, as of 2014, more than three-fourths of economics departments used an in-house course for their statistics requirement.)

Acceptance across Departments

As noted above, if ECON 310 is approved, we intend to update the ECON and FIEC program requirements to accept ECON 310 for the introductory statistics requirement. We will continue to accept STAT 350/351/355/451 and CMPE 320 for both the ECON and FIEC degrees. This maintains scheduling flexibility (both for students and the department), and accommodates students who are double majors, who are pursuing a minor, or who switch the ECON or FIEC from another department and have already completed one of the other introductory statistics courses.

While we will continue to accept STAT 350/351/355/451 and CMPE 320, we have no expectation that other departments must accept ECON 310 as an equivalent to the other introductory statistics courses. As described above, we think there are substantial and important differences in content between ECON 310 and the other courses, and have no desire to impose the economics-focused content of ECON 310 on other departments'

programs. Other departments can choose whether it is in their students' interest to pursue changes to their programs through the UGC to include ECON 310. Similarly, we have no expectation that a student who takes ECON 310 will be forbidden from also receiving credit for STAT 350/351/355/451 or CMPE 320, or vice versa. That stated, if the UGC or other departments feel that ECON 310 should be mutually exclusive with the other courses, the Economics Department would not object to that condition.

ATTACH COURSE SYLLABUS (mandatory):

See separate document.

ECONOMICS 310 – DATA ANALYSIS FOR ECONOMICS

Fall 2020

[Class day, time, and room TBD]

Instructor: TBD
Office: TBD
E-mail: TBD
Phone: TBD
Office Hours: TBD

Course description

This course surveys theoretical and applied statistical tools relevant to empirical economics. Students will gain an understanding of measures of central tendency and dispersion, hypothesis testing, correlation, and regression analysis. The use of computer software for statistical analysis will be illustrated. Additional topics may include identifying data sources, obtaining data, interpreting the results of empirical research, and carrying out a basic empirical research project.

Prerequisites

Students must have completed ECON 101, ECON 102, and either MATH 151 or MATH 155, all with a “C” or better.

Required Materials

- *Essential Statistics, Regression, and Econometrics*, 2nd ed., Gary Smith, Elsevier, 2015.
- Calculator – Students will need a calculator to be successful on the exams and homework assignments. Graphing or other programmable calculators are acceptable, but students will be required to clear the memory in the presence of the instructor immediately before receiving an exam.

Grading

Course grades will be determined based on two midterm exams (each worth 20% of the course grade), a cumulative final exam (30% of the course grade), and six homework assignments (each worth 5% of the course grade). The grading scale is 90% for an A, 80% for a B, 70% for a C, 60% for a D, and anything less than 60% is an F. All cutoffs must be reached without rounding (i.e., 89.9% is a B).

Exams will require students to perform empirical analyses as well as respond to short essay questions designed to gauge students’ understanding of the concepts underlying the empirical techniques. Homework assignments will place greater emphasis on empirical analysis, but some conceptual questions may be included.

Course Outline:

Week 1: Course overview and expectations

Week 2: Data – Smith, Ch. 1

Week 3: Displaying Data – Smith, Ch. 2

Week 4: Descriptive Statistics – Smith, Ch. 3; homework assignment 1 due

Week 5: Probability – Smith, Ch. 4

Week 6: Review and Exam 1; homework assignment 2 due

Week 7: Sampling – Smith, Ch. 5

Week 8: Estimation – Smith, Ch. 6

Week 9: Hypothesis Testing – Smith, Ch. 7; homework assignment 3 due

Week 10: Univariate Regression, Part 1 – Smith, Ch. 8

Week 11: Review and Exam 2; homework assignment 4 due

Week 12: Univariate Regression, Part 2 – Smith, Ch. 9

Week 13: Multivariate Regression – Smith, Ch. 10

Week 14: Multivariate Regression (continued) – Smith, Ch. 10; homework assignment 5 due

Week 15: Modeling – Smith, Ch. 11

Week 16: Review for Final Exam; homework assignment 6 due

Academic Integrity

“By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook or the UMBC Policies section of the UMBC Directory.”

Student Disability Services (SDS)

The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that would allow students with disabilities to have equal access and

inclusion in all courses, programs, and activities at the University. If you have a documented disability and need to request academic accommodations, please refer to the SDS website at sds.umbc.edu for registration information and to begin the process, or alternatively you may visit the SDS office in the Math/Psychology Building, Room 212. For questions or concerns, you may contact SDS through email at disAbility@umbc.edu or phone (410) 455-2459.

Continuity of Course Should Campus Close

It is possible that circumstances can lead to the closure of campus but continuation of courses. In that case, students are expected to monitor their e-mail and continue work as instructed, typically via Connect and Blackboard. Continuation activities may involve course readings, submitting assigned material electronically, accessing recorded lectures online, participating in real time electronic discussions during normal class times, or other methods as may be appropriate. It may also become necessary to alter the course grading system, particularly if in-class exams become problematic.

FEATURES AND INFORMATION

Undergraduate Coursework in Economics: A Survey Perspective

John J. Siegfried and William B. Walstad

Survey results from a large sample of economics departments describe offerings for principles courses, coursework requirements for economics majors, and program augmentations such as capstone courses, senior seminars, and honors programs. Findings are reported for all institutions, and institutions are subdivided into six different categories based on public or private control and the highest economics degree offered. The coursework required for the economics major typically consists of ten courses, five in a required core and five electives. The most conspicuous curriculum change over the past 30 years is the rise of econometrics as a required course, now mandatory at about half of major programs. The authors estimate that about 40 percent of students who matriculate as first-year undergraduates take at least one economics course before they leave.

Keywords course requirements, economics majors, principles course, undergraduate economics

JEL code A22

The American Economic Association (AEA) annually administers its Universal Academic Questionnaire (UAQ) to economics departments at colleges and universities. The UAQ collects information from different types of institutions about economics faculty (salaries, employment conditions, and distribution by rank), the characteristics of economics graduate programs (applications and enrollments), and the number of degrees awarded at various levels (doctorate, masters, and bachelors). For the 2013 survey, we added a set of supplementary questions seeking information about the offering of principles courses and the requirements for and opportunities available in the undergraduate economics major. Here, we report the responses to five questions: (1) How many undergraduates take at least one economics course before they graduate? (2) How is the introductory course organized at various institutions? (3) What are the typical course

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requirements for the economics major? (4) What additional non-coursework requirements must economics majors satisfy? (5) What special educational opportunities are available to economics majors?

The sample consists of the 337 U.S. economics departments at four-year colleges and universities that responded to the 2013 UAQ. Although the response rate is only 43 percent of institutions offering a major in economics, the sample accounts for about 70 percent of those students who earn a bachelor's degree in economics because larger programs responded more frequently to the survey. We classified the responding institutions into six categories based on institutional control and the highest economics degree offered (sample size in parentheses): public economics PhD-granting universities (72), public economics master's-granting universities (36), public bachelor's-granting institutions (78), private economics PhD-granting universities (29), private selective liberal arts colleges (66), and other private colleges and universities (65). Significant findings are reported for the total sample and also for six institution types so as to provide an appropriate benchmark for economics departments wishing to compare their experience to others that operate under corresponding conditions at similar types of institutions.¹

EXPOSURE TO INTRODUCTORY ECONOMICS

In 2011, there were approximately 1.8 million first-time, degree-seeking students enrolled at four-year public and private colleges and universities (National Center for Education Statistics [NCES] 2012, Table 232). Undergraduates across many different majors at colleges and universities will take one, or perhaps a few, economics courses as part of their required coursework or as a general elective, indicating its centrality to the education of many undergraduates. An initial measure of the importance of economics across campuses would be the percentage of new undergraduates who eventually take at least one economics course before they graduate from a four-year college or university or leave the institution without earning a degree. Obviously, the course taken most often would be introductory economics, either as a single-semester course, a two-semester sequence of principles of microeconomics and principles of macroeconomics, or at least half of the two-course sequence.

We estimate that about 40 percent of new undergraduates eventually receive formal undergraduate instruction in economics in some type of introductory course. This estimate is derived from two calculations. First, four-year institutions that offer an undergraduate economics major enroll 64 percent of full-time, first-time, degree-seeking undergraduates at four-year colleges and universities.² Our survey results reveal a weighted (by enrollment) average estimate of 42 percent of students taking an economics course at the 337 responding institutions. Assuming our respondents are a random sample of the 800 colleges and universities that offer a major in economics, we use 42 percent of first-year students as the exposure rate for colleges and universities that offer a major in economics. The exposure rate varies by type of institution. Relatively more students take at least one economics course at private economics PhD-granting universities (62 percent) and selective private liberal arts colleges (46 percent) than at either public or private institutions where a bachelor's is the highest degree offered (37 percent). The percentages for public master's- and PhD-granting institutions fall inside that range.

We do not have any survey data about the economics exposure rate for the 625 or so four-year colleges and universities that do not offer a major in economics and are attended by about 36