

# The Master of Science in Applied Economics and Statistics: Graduate Student Handbook for 2017-2018

## I. Overview

Students who earn a Master of Science (MS) in Applied Economics and Statistics (AES) learn to apply economic theory, design experiments or surveys, estimate econometric models, and test hypotheses with inferential statistics to analyze human behavior, business practice, or government policy. The behavior, practice, or policy might relate to agriculture, banks, credit markets, environmental or natural resource management, forestry, health care, insurance, marketing, property rights, regional economic growth, regulation, stock markets, sports businesses, or sustainable development.

The faculty endeavor to create an environment conducive for learning, scholarship, and career preparation. Economic faculty from the Department of Agricultural Sciences, the John E. Walker Department of Economics, and statisticians from the Dept. of Mathematical Sciences teach the required and most of the elective courses. The Department of Agricultural Sciences is the administrative home of the program. The graduate program coordinator is David Willis, can be contacted at [willis9@clemson.edu](mailto:willis9@clemson.edu) or 864-656-5790.

Graduates of the program have used their skills to fill increasingly valuable niches for data analyses and management in the public or private sector. Employers of recent graduates include these: Ag-South Farm Credit, Archer Daniels Midland, BB&T Bank, BBDO Atlanta, Black Book, Bureau of Labor Statistics, Cardlytics, Cardno Entrix, Delta Airlines, Ducks Unlimited, Epic, Florida Farm Bureau, Fractal Analytics, Hanesbrand Inc., Impact DataSource, Intercontinental Hotels Group, Ipsos, Greenville Technical College, Medical University of South Carolina, National Golf Foundation, Resurgent Capital Services, SAG Corporation, Tri-County Technical College, U.S. Forest Service, USAA Federal Savings Bank, and Vision Recycling. Other graduates subsequently earn doctorates in economics, agricultural and applied economics, data analytics, or statistics.

## II. Curriculum

The curriculum of the MS in Applied Economics and Statistics is relatively flexible. There is a thesis option and a non-thesis option. Students must maintain a Grade Point Average of 3.0 or better, on a scale of 0 to 4, in order to earn a graduate degree from Clemson University.

### A. Required Core Courses

Students must earn 12 credits in four core courses in applied microeconomics, macroeconomics or public-policy economics, econometrics or regression analysis, and statistics or advanced econometrics. In particular, the core courses are these:

1. Microeconomics for Public Policy (ECON 8230), offered in fall semester.
2. Public Policy Economics (APEC 8220) or Macroeconomic Theory (ECON 8050) both offered in spring semester.
3. Introduction to Econometrics (ECON 6050) or approved substitute course.
4. Advanced Econometrics (ECON 6060), Sampling (STAT 8040), Design and Analysis of Experiments (STAT 8050), Multivariate Statistics (STAT 8170), or Time-Series Econometrics (ECON 9090)

The econometrics courses, which integrate economic theory and statistics, are critically important. Regression and Least Squares Analysis (STAT 8030) can be substituted for ECON 6050 if its undergraduate relative, ECON 4050, or as similar course, has been taken by the student in their undergraduate program. STAT 8030 is often selected elective course taken by students desiring additional training in basic regression analysis.

Intermediate microeconomics (ECON 3140) or Microeconomics for Public Policy (ECON 8230) or its equivalent is a pre-requisite for APEC 8220. Intermediate macroeconomics (ECON 3150) or its equivalent is a pre-requisite for ECON 8050.

Statistical Methods (STAT 8010), an equivalent graduate course, or an undergraduate introduction to probability and statistics, is a pre-requisite for ECON 6050, STAT 8030, STAT 8040, STAT 8050, and STAT 8170. STAT 8010 is offered each summer session, in addition to being offered in the fall and spring semesters. Students needing to take STAT 8010 may include the course credits in their degree program.

## **B. Elective Courses**

Students must earn at least 18 additional graduate credit hours beyond the 12 hour core requirement to complete the degree program. For students pursuing the thesis option, six of the additional required credit hours are thesis credit hours and the other 12 hours would be selected from elective courses. Students pursuing the non-thesis option are required to take an at least 18 additional elective credit hours. Elective courses cover a wide array of topics such as: 1) benefit-cost analysis, 2) economic or regional development, 3) environmental economics, 4) natural resource economics, 5) agribusiness, 6) commodities and futures, 7) financial economics, 8) international economics, 9) industrial organization, 10) labor economics, 11) mathematical economics, 12) monetary economics, 13) public finance, anti-trust policy and regulation 14) sampling, 15) multivariate statistics, 16) spatial statistics, 17) experimental design and 18) sports economics. Students may also take, with approval of their advisory committee, at most two non-economic or non-statistical but relevant elective courses, such as Geographical Information Systems (GIS) or financial mathematics.

## **C. Thesis Option**

The thesis option provides additional training in the use of economic theory, econometrics, and statistics to analyze real world economic issues. Students who choose this option often plan to pursue a PhD degree or a career that requires a high level of research competence. An acceptable Master's thesis will include a problem specific theoretical section that generates testable economic hypothesis and an empirical section that tests the validity of the economic hypothesis.

Students who choose the thesis option must take at least 24 credit hours of course work and 6 units of thesis research (ECON 8910 or APEC 8910) to earn the minimum 30 credits. A student must earn at least 12 of the 24 credits in 8000-level or 9000-level courses for this option. Well-prepared, full-time students in this option can earn their degree in one calendar year but most take 1.5 to two years to finish the course and thesis requirements. Completion of a thesis is often a prerequisite to most Ph.D. graduate programs in Economics or Applied Economics.

## **D. Non-Thesis Option**

The non-thesis option provides practical training in applied economics, econometrics, and data analysis for business or government. The program provides additional technical skills for business- or public-service-oriented students. A technical, or professional, paper is required. An acceptable technical paper is similar to a project report or paper for a capstone course and could be used as the

basis for a grant proposal or, with substantial extra work, could be publishable.

Students who choose the non-thesis option must earn at least 30 credit hours of course work. A student must earn at least 15 of the 30 credits in 8000-level or 9000-level courses for this option. Well-prepared, full-time students in this option can earn their degree in one calendar year (academic year plus summer semester), but generally take longer to finish.

### E. One-Year Schedule of Courses for MS in Applied Economics and Statistics

Semester	Course	Credits
Fall	Microeconomics for Public Policy (ECON 8230)	3
Fall	Introduction to Econometrics (ECON 6050) or other pre-approved econometrics course, e.g., Regression and Least Squares Analysis (STAT 8030)	4 or 3
Fall	Elective 6000- or 8000-level ECON, APEC, STAT, or AGRB courses	6
Fall	An elective 6000- or 8000-level ECON, APEC, STAT, AGRB or other pre-approved course	3
	Subtotal for Fall	16 or 15
Spring	Public Policy Economics (APEC 8220) or Macroeconomic Theory (ECON 8050)	3
Spring	Advanced Econometrics (ECON 6060), Sampling (STAT 8040), Design and Analysis of Experiments (STAT 8050), Multivariate Statistics (STAT 8170), Time-Series Econometrics (ECON 9090) or other pre-approved econometrics or statistics course	3
Spring	Elective 6000- or 8000-level ECON, APEC, STAT, or AGRB courses	6
Spring	An elective 6000- or 8000-level ECON, APEC, STAT, AGRB or other pre-approved course	3
	Subtotal for Spring	15

Check course availability through iRoar at <https://casauth.clemson.edu/>. Use Public Access to the Syllabus Repository at <https://etpr.app.clemson.edu/repository/> to download previous syllabi.

### III. Administrative Requirements: Procedures and Forms

The Graduate School has many procedures to follow and forms to be filled out and filed in a timely fashion to ensure that an applicant is considered for admission and a student graduates on time. Some of the procedures and forms are discussed in this section. However, students are responsible for meeting administrative requirements and also keeping track of any subsequent changes. Students must consult the Graduate School Announcements and updates on the Graduate School's website. Forms for enrolled students are available at [www.grad.clemson.edu/forms/index.php](http://www.grad.clemson.edu/forms/index.php).

#### A. Application and Admission to Program

To apply to the MS in Applied Economics and Statistics program follow the instructions at [www.grad.clemson.edu/admission/index.php](http://www.grad.clemson.edu/admission/index.php) and complete the online application. Applications should be completed by February 1 to guarantee a decision and notification before April 15 for the fall. Applications submitted after Feb. 1 will be reviewed as time permits. Students with inadequate or exceptional backgrounds may apply for the spring semester but should notify the graduate coordinator ([willis9@clemson.edu](mailto:willis9@clemson.edu)) if they do. International students who apply for the spring semester should have completed their applications no later than September 15.

An applicant's grades, GRE scores, statement of purpose, two letters of recommendation, reputation of his or her alma mater, academic background, and relevant work or personal experience are the criteria for an admission decision. There is no minimum grade point average or minimum GRE score. However, admitted students usually have earned an A or B grades, or equivalent scores, for their courses economics, statistics, and other mathematics. The respective median scores of recently enrolled students on the verbal, quantitative, and analytical writing parts of the GRE are approximately 154, 152, and 4.0.

Admitted international students have a cumulative TOEFL iBT score in the range of 90 to 100 with a minimum of 20 for listening and 20 for speaking. Reading and writing scores of admitted applicants are usually higher than 20. Otherwise, the successful applicant has earned at least 7.0 on the IELTS, if she did not take the TOEFL. An applicant with a low TOEFL or IELTS score can be admitted conditional on completing Level 112 of an ELS course and, if necessary, retaking the GRE. International applicants who have studied abroad for at least two years in the U.S. or other English-speaking country and completed their undergraduate education there are not required to retake the TOEFL or IELTS. However, they should report their most recent scores in the online application.

Successful applicants have normally passed undergraduate courses in univariate and multivariate calculus, introductory probability and statistics, and intermediate microeconomics. An undergraduate course in intermediate macroeconomics is highly recommended. Students who majored in economics or agricultural economics and took econometrics or who majored in statistics but took intermediate microeconomics typically have an adequate background. Exceptional students with inadequate backgrounds may be admitted but required to take extra, co-requisite courses during their first semester. Domestic students with inadequate backgrounds may also apply as non-degree seekers, take co-requisite courses, and then apply to the program.

The number of applicants who are accepted each year varies. The acceptance rate varies from 1/3 to 2/3 of all applications. Over the last six years the number of accepted students who enrolled in the program has averaged seven students per year.

## **B. Tuition and Fees**

Tuition and fees are set by Board of Trustees during their July meeting for the upcoming academic year. The MS in AES program is a Tier 3 program for purposes of tuition. In 2016-2017 full-time graduate students in the program will pay tuition of \$3,836 per semester if they are residents and \$8,057 per semester if they are non-residents. All full-time students will pay \$428 per semester in fees. A student must take at least nine-credit hours in each of the Fall and Spring semesters to be full time. Part-time students will pay \$471 per credit hour if they are residents and \$942 per credit hour if they are non-residents. Part-time students also pay additional fees. Check for changes in tuition and fees at <http://www.clemson.edu/graduate/finance-tuition/index.html>. Teaching or research assistantships are not offered to MS students in the AES program.

All graduate students are required to have health insurance. Students who are already covered by policies that meet the University's requirements are eligible for waivers. All others are covered by the Clemson University Student Insurance Plan. Fees for health insurance are included with tuition and fees for Fall and Spring semesters (summer premium is included in the Spring semester) and students are automatically enrolled. Fees for the Clemson University Student Insurance are subsidized by the Graduate School.

### **C. Plan of Study, Major Advisor, and the Advisory Committee**

The courses that a student chooses and whether to write a thesis are important choices because they can impact opportunities for employment or doctoral education. Core courses, elective courses, any undergraduate, co-requisite course that addresses a deficiency in background are listed in the Clemson GS2 form. The student is expected to file their GS2 (Plan of Study) before the start of their second semester. Refer to [www.clemson.edu/graduate/students/gs2-hints.html](http://www.clemson.edu/graduate/students/gs2-hints.html) for information about how to fill out the form. The exact date by when the GS2 must be filed is specified by Enrolled Services and can be found at [www.grad.clemson.edu/deadlines.php](http://www.grad.clemson.edu/deadlines.php).

Prior to submitting their GS2 form, the student is expected to have selected their major advisor, generally referred to as your graduate committee chair. A faculty member from the Department of Agricultural Sciences must be selected as either your Committee Chair or Co-Chair. However, a Co-Chair can also be selected from faculty in the John E. Walker Dept. of Economics, or a statistician from the Department of Mathematical Sciences. The major advisor assists the student in course selection, submission of the GS2 Plan of Study, and supervises thesis or technical paper research. Students are encouraged to select their major professors as soon as possible and the regularly meet with their major advisor to expedite their academic progress. The graduate program coordinator serves as the interim advisor until the student selects a major advisor.

The student and major advisor choose at least two other faculty members to complete the student's advisory committee. Members of the advisory committee review and sign the GS2, review and approve the thesis or technical paper, and participate in a final oral examination.

### **D. Final Examination: Thesis or Technical Paper and Oral Examination**

The final examination of a student who earns a MS in Applied Economics and Statistics consists of two parts: 1) the thesis or technical paper and 2) an oral examination. The oral examination is primarily a student's defense of her thesis or technical paper but might also include questions that any member of the advisory committee might ask to ascertain that the student can competently apply economics and statistics. The thesis or technical paper must be successfully defended at least three to four weeks prior to graduation. Written notification of the defense is due in Enrolled Services at least 10 days prior to the defense. The information must include the student's name, program of study, title of thesis or technical paper, major advisor, date, time, and location. The student arranges the date, time, and place for the defense in consultation with the major advisor and other members of the advisory committee. Copies of the thesis or technical paper must be delivered to the student's advisory committee at least two weeks before the defense. The student's major professor and advisory committee conduct the oral examination, but all faculty members are invited to attend. After the defense, revisions in the thesis or technical paper by the student must be approved by the major advisor and committee members. Students may have two attempts to pass the exam. A GS7 must be signed and submitted no later than the end of the penultimate week of the fall or spring semester to indicate passage of the final examination. The exact date by when the GS7 must be filed can be found at [www.grad.clemson.edu/deadlines.php](http://www.grad.clemson.edu/deadlines.php). The defense must be scheduled early enough to allow time for committee-required revisions to the thesis or technical paper before the GS7 deadline. A two-week review period is normally expected before the final defense.