

Utah State University

DigitalCommons@USU

---

Educational Policies Committee

Faculty Senate

---

2-28-2011

## Educational Policies Committee Program Proposal, College of Agriculture and Applied Sciences, February 28, 2011

Utah State University

Follow this and additional works at: [https://digitalcommons.usu.edu/fs\\_edpol](https://digitalcommons.usu.edu/fs_edpol)

---

### Recommended Citation

Utah State University, "Educational Policies Committee Program Proposal, College of Agriculture and Applied Sciences, February 28, 2011" (2011). *Educational Policies Committee*. Paper 389.  
[https://digitalcommons.usu.edu/fs\\_edpol/389](https://digitalcommons.usu.edu/fs_edpol/389)

This Program Proposal is brought to you for free and open access by the Faculty Senate at DigitalCommons@USU. It has been accepted for inclusion in Educational Policies Committee by an authorized administrator of DigitalCommons@USU. For more information, please contact [digitalcommons@usu.edu](mailto:digitalcommons@usu.edu).



**Executive Summary**  
**Master of Science in Economics and Statistics**  
**Utah State University**

**Program Description**

The proposed Master of Science in Economics and Statistics (MS-ES), a research-oriented degree, will be administered jointly by the Department of Applied Economics (APEC) in the College of Agriculture and the Department of Mathematics and Statistics (Math/Stat) in the College of Science. The curriculum for this degree will consist of two courses each in microeconomic theory, mathematical economics, mathematical statistics, and econometrics, plus electives. The proposed degree will make use of existing courses in these two departments and therefore, will require no new courses. The degree fills a void created by the split of the former Department of Economics by establishing an MS degree that is tightly connected to the Economics research program that exists within APEC.

**Role and Mission Fit**

As the state's Land Grant institution, Utah State University's mission includes research and graduate education. The proposed research-oriented Master of Science in Economics and Statistics degree advances the core values of the institution by providing the opportunity for learning and discovery, as well as individual development. This degree complements an ongoing Ph.D. graduate program in Economics, as well as fosters interdisciplinary collaboration in teaching and research among two USU departments.

**Faculty**

Five APEC faculty members will take responsibility for instruction in the six required economics courses and they will also provide leadership on the research projects undertaken by the MS students in their second year. Instructional responsibility for the two required probability and statistics courses will be rotated among eight Math/Stat faculty members. Up to three elective courses will be selected by students from existing APEC and Math/Stats offerings.

	Tenure	Contract	Adjunct
Number of faculty with Doctoral degrees	13	0	0
Number of faculty with Master's degrees	0	0	0
Number of faculty with Bachelor's degrees	0	0	0
Other Faculty	0	0	0

**Market Demand**

According to the 2010-11 Occupational Outlook Handbook (OOH) job growth for economists is predicted to be 6% for the 2008-2018 decade, whereas growth in the field of statistics is projected to be 13%. Median annual salaries for economists are estimated to be about \$84,000; for statisticians it is about \$73,000.

**Student Demand**

Student demand for this program is estimated to be about 5-8 students per year, based on the number of students enrolled in the former MS-Economics degree which was offered at USU until the restructuring of the Department of Economics. However, given the career opportunities available for graduates of the combined Economics and Statistics degree, the number of degree-seeking students is anticipated to grow modestly. Total students accepted into the program will be determined by the capacity of faculty who can successfully direct the research portion of the degree.

**Statement of Financial Support**

The program will be supported using funds provided by the USU Office of the Executive Vice President and Provost, and funds available from the Utah Agricultural Experiment Station, grants, and contracts.

- Legislative Appropriation .....
- Grants ..... X
- Reallocated Funds ..... X
- Tuition dedicated to the program.....
- Other ..... X

**Similar Programs Already Offered in the USHE**

The University of Utah offers a professional, inter-department degree entitled "MS-Statistics, Econometrics Track", awarded by the U of U Department of Economics; no other USHE institutions offer a similar degree. Although the degree requirements are somewhat similar, the proposed MS-ES will require more credits of economics relative to the U of U MS program, whereas the U of U degree places greater emphasis on statistics. In contrast with the U of U degree (which is a terminal, professional degree), the proposed MS-ES degree is a research degree targeted at students who want to pursue placement in research-based environments or want to continue their education through the pursuit of a PhD degree. Thus, there are clear differences between the U of U M-Statistics, Econometrics track and the USU MS-ES degrees in both educational training and career paths, meaning that the two degrees are unlikely to compete for students.

**Master of Science in Economics and Statistics  
Utah State University**

**I. Request**

Utah State University (USU) requests approval to offer a Master of Science in Economics and Statistics effective Fall Semester 2011. This proposal was approved by the USU Board of Trustees on January 7, 2011.

**II. Program Description**

**Complete Program Description**

The Master of Science in Economics and Statistics is a research-based degree. The program will be jointly administered by the Department of Applied Economics in the College of Agriculture and the Department of Mathematics and Statistics in the College of Science. The degree will use existing courses. The degree highlights the connection between economic theory, mathematics, and statistics. Graduates will have a firm grasp of microeconomic theory, mathematical economics, probability, and statistical inference. The proposed program strengthens research degree programs in Economics at USU, and creates new interdisciplinary connections amongst USU departments and faculty.

**Purpose of Degree**

The proposed degree will be administered jointly by the Department of Applied Economics and the Department of Mathematics and Statistics. The Department of Applied Economics (APEC) was created in 2008 when the former Department of Economics was dissolved into two units. The research, teaching and extension foci of APEC include Food & Agricultural Economics, Environmental & Natural Resource Economics, and Regional Economics & Community Development. In the administrative restructuring, APEC was assigned BS degrees in Agribusiness and Agricultural Economics, the MS in Applied Economics which has emphases in each of the three foci outlined above, and the Ph.D. in Economics.

The Department of Mathematics and Statistics (Math/Stat) offers BS and BA degrees in Mathematics, Statistics (each with Actuarial Science Options), and Mathematics and Statistics Education. At the graduate level, the Department offers MS programs in Mathematics, Statistics, and Industrial Mathematics, and a Master of Mathematics (MMath) program in Mathematics Education. The PhD in Mathematical Sciences has four specializations: Pure and Applied Mathematics, Statistics, College Teaching, and Interdisciplinary Studies.

The purpose of the proposed MS-Economics and Statistics (MS-ES) degree is two-fold: first, the proposed degree is part of a re-positioning of the APEC graduate programs following the dissolution of the former Department of Economics (which was jointly administered by the College of Agriculture and the Huntsman School of Business.) The Huntsman School is reorienting itself so as to focus on "professional" degree programs at the graduate level. This proposal assists in that

distinction between the two new economics-based departments, while strengthening APEC's research graduate degree offerings.

Second, the proposed degree is designed for students who want a research-based graduate degree but who may not be interested in a Ph.D. career path, at least immediately. A similar program, the MS-Economics degree was available through the former Department of Economics, and similar to the proposed MS-ES degree, that program shared the same first-year curriculum with the PhD-Economics degree. An MS-Financial Economics degree, proposed to be awarded through the Department of Economics and Finance in the Huntsman School of Business, is a terminal, professional-based degree, leaving USU without a MS-level research degree with heavy emphasis on mathematics and statistics. The proposed MS-ES degree offered through the Department of Applied Economics will re-establish that educational opportunity for students.

### **Institutional Readiness**

The Department of Applied Economics consists of 11 faculty members holding the rank of Assistant Professor or higher, and one Extension Specialist holding an MS degree. Four faculty members have been hired since 2009. All faculty members holding the PhD degree teach one or more graduate level courses or supervise numerous theses and/or dissertations.

Five APEC faculty members will be responsible for teaching the six economics courses in the proposed MS-ES core curriculum, as well as directing the research projects of the enrolled students (Appendix C). These faculty will also conduct the research exams required by the students at the conclusion of their degree program.

The Department of Mathematics and Statistics comprises 25 tenured and tenure-track faculty and three lecturers. Eight Math/Stat faculty members will alternate teaching the two probability and statistics courses in the proposed degree program (Appendix C). Other faculty members from both APEC and Math/Stat may choose to be involved in the supervision of theses and projects (Appendix C).

### **Faculty**

Five APEC faculty members will take responsibility for instruction in the six required economics courses and they will also provide leadership on the research projects undertaken by the MS students in their second year. Instructional responsibility for the two required probability and statistics courses will be rotated among eight Math/Stat faculty members. Up to three elective courses will be selected by students from existing APEC and Math/Stats offerings.

The comprehensive plan for splitting the Department of Economics into two departments effective Fall Semester 2008 included several changes pertinent to this request for the MS-ES degree in APEC. Since Fall 2009, APEC has staffed four of the eight courses that constitute the curriculum for the MS-Economics offered by the Department of Economics and Finance in the Huntsman School of Business (HSB) and HSB faculty have taught two of the courses needed for the MS-ES degree offered by APEC. However, as previously agreed upon, APEC and HSB will no longer cross-list courses beginning in Fall Semester, 2011, and each department will become responsible for staffing its own classes. This separation of curriculum allows courses to be specifically

orientated to the needs of the two Economics departments, with students in the departments enrolling in different sections and taught by different faculty members. Separate and distinct learning experiences can be effectively delivered across all undergraduate and graduate degrees of the two Economics departments. In keeping with this agreement, the curriculum of the MS-ES degree will be the responsibility of APEC and Math/Stat departments. Of the eight required courses in the new degree, APEC will teach six whereas Math/Stat will teach two. In addition to students pursuing the MS-ES degree, other students from both APEC and Math/Stats, as well as students outside these two departments, will be enrolled in the MS-ES required courses, with enrollments in the courses expected to exceed 15 students.

### **Staff**

It is anticipated that the number of students in the MS-ES program will approximate numbers in the former MS-Economics program and therefore, no additional professional staff will be required. Advising of students will be covered by APEC faculty.

### **Library and Information Resources**

No additional library resources are necessary to support the degree. The space in the present computer lab is inadequate, but the current computer arrangement is temporary. Graduate student computer space in the College of Agriculture building under construction will be adequate to serve all APEC graduate programs. The Department of Mathematics and Statistics maintains its own computer lab for graduate students. The lab has eight PCs connected to two Solaris servers and may be used for statistical computation. Graduate students and faculty also use Utah State University's High Performance Computing facility for highly-computational projects.

### **Admission Requirements**

The admission requirements of MS-ES will be consistent with the existing USU School of Graduate Studies (SGS) admission requirements, which includes a minimum grade point average (GPA) of 3.0 (4.0 = A) for the last 60 semester credits earned prior to applying for the program. The Graduate Record Examination (GRE) will also be required; School of Graduate Studies requirements of scores at or above the 40<sup>th</sup> percentile in the quantitative and verbal sections of the exam will be applied. Per USU admissions policy, an appropriate TOEFL score will be required of all students whose native language is not English.

Specific educational requirements will include previous bachelors (BA or BS)-level (or above) courses in an economics-related discipline, or math or statistics. Similar to current admission policies, undergraduate transcripts will be examined for successful completion of intermediate microeconomic theory, mathematics (calculus) and statistics or econometrics. Admission decisions will be made by a committee composed of faculty from APEC and Math/Stat. A student whose prior academic performance warrants admission, although some prerequisite courses have not been taken, may be admitted provisionally.

## **Student Advisement**

APEC has a designated Graduate Program Director, elected according to faculty bylaws. In recent years the compensation for this departmental service has been a one course reduction in assigned teaching load. The graduate director will chair a Graduate Education and Research Committee composed of members appointed by the APEC and Math/Stat department heads. The committee will be responsible for admissions decisions. The Graduate Program Director, in consultation with a student's major professor, will be responsible for student advising. If a major professor has not yet been selected, advisement responsibility is assigned to the Director. The proposed degree will require no additional resources for student advisement.

## **Justification for Graduation Standards and Number of Credits**

The MS-Economics and Statistics will be offered as a Plan A (24 credit hours of academic course work and six credit hours of research credits), Plan B (27 hours coursework and three hours research) or Plan C (33 hours coursework). Appendix A provides the curricula of the proposed master's degree. Per the School of Graduate Studies standards, the minimum overall GPA for successful completion of the degree is 3.0.

## **External Review and Accreditation**

Given the tight connection between the curriculum for the proposed MS-ES degree and the Ph.D. degree, the recent National Research Council rankings of doctoral programs are germane. The NRC rankings of doctoral programs for 2006/07 show that the Utah State University Economics doctoral program improved by 30 places since 1995. The USU Ph.D. in Economics is now ranked approximately equivalent to our peers at North Carolina State University, Texas A&M University, and Washington State University, but behind our peers at Iowa State University, University of California-Davis, Penn State University, and Oregon State University.

The discipline of Economics has no accrediting body. Instead, the former Department of Economics has been periodically reviewed by the USDA. APEC plans to maintain these regular external institutional reviews. According to the USDA, the agency conducts reviews,

...at the request of cooperating institutions, facilitates reviews of institutions, departments, programs, or issues...Institutions identify the purpose, objectives, and scope of the review activity based on their own needs and internal planning processes. Preparation of a forward looking planning document by the reviewed entity is an integral part of the review activity. Generally, the internal review process is followed by an in depth on-site visit by an external team of well qualified peers lasting two or more days, depending on the scope and complexity of the activity as determined by the institution. The external team of reviewers can help the institution project future needs and directions for the reviewed entity for some

definitive time frame into the future based on the self-study document and the site visit.<sup>1</sup>

There is no accreditation in mathematics or statistics. The mathematics and statistics education programs are currently accredited by the Teacher Education Accreditation Council (TEAC) and previously by the National Council for Accreditation of Teacher Education (NCATE), but neither of these are relevant to the proposed degree.

### **Projected Enrollment**

The courses required for the MS-ES degree will also include students from both APEC and Math/Stats, as well as students outside these two departments. Because the student-faculty ratios below include only the MS-ES students (as per instructions) and not the additional students enrolled in the MS-ES courses, which are taught by individual faculty members, a lower student-faculty ratio is presented than what actually exists. For example, we anticipate an average student-faculty ratio of about 15:1 in courses required for the MS-ES degree. In addition, the student-faculty ratio does not accurately reflect the multitude of assignments that are taken on by APEC and Math/Stat faculty beyond the instruction of required MS-ES courses.

<b>Year</b>	<b>Student Headcount*</b>	<b># Faculty (FTE/Semester)</b>	<b>Student-Faculty Ratio</b>
2011/12	5	1	5
2012/13	5	1	5
2013/14	5	1	5
2014/15	5	1	5
2015/16	5	1	5

\* Headcount reflects only MS-ES students and not PhD students who are enrolled in the same courses and also mentored by APEC faculty.

Historically, about five students were admitted to the MS-Economics program each year. A decline in admissions from AY07-08 through AY09-10 was the result of a decision not to admit graduate students, primarily PhD students, until the future of graduate programs was resolved following the dissolution of the former Department of Economics.

### **Expansion of Existing Program**

Although a new MS degree is created, this proposal does not represent a significant expansion of current programs.

---

<sup>1</sup> [http://www.nifa.usda.gov/about/prog\\_reviews.html](http://www.nifa.usda.gov/about/prog_reviews.html)



### III. Need

#### Program Need

APEC currently offers two graduate degrees, an MS in Applied Economics, focused on applied issues within agriculture, natural resources and rural economic development, and a Ph.D. in Economics, which emphasizes mathematical and statistical concepts. Under this degree structure for APEC, the department has no option for students who desire a research-based, math/stats-intensive program but are not interested in pursuing a PhD degree. The proposed Master of Science in Economics and Statistics will provide an educational experience for these students. Although the MS-ES and PhD students will be jointly enrolled in the same APEC courses in the first year, the two degrees will diverge in the second year, with the MS-ES students conducting research appropriate for a thesis and the PhD students continuing on with course work. Also, the proposed degree enhances both the educational and research missions of APEC and Math/Stat by creating additional opportunities for collaboration both within and outside the classroom.

#### Labor Market Demand

According to the 2010-11 Occupational Outlook Handbook job growth for economists is predicted to be 6% for the 2008-2018 decade. With regard to wages, the OOH finds that:

Median annual wage and salary wages of economists were \$83,590 in May 2008. The middle 50 percent earned between \$59,390 and \$113,590. In March 2009, the average annual salary for economists employed by the Federal Government was \$108,010.

These salaries do not include economists employed at colleges or universities, which are included in the statistics for the post-secondary education sector. The job growth for economists is somewhat slower than other sectors, but the report notes an important caveat on the demand for economists:

The demand for workers who have knowledge of economics is projected to grow faster, but these workers will commonly find employment in fields outside of economics, such as business, finance, or insurance. Job prospects for economists will be best for those with graduate degrees in economics.

The proposed degree's focus on the statistical skills complements knowledge of economics, and therefore, is a strength of the proposed MS-ES degree program. The OOH finds that job growth in the field of statistics is projected to be 13%, equivalent to the average for all occupations. This job category has a mean income of \$72,600 (May 2008); statisticians in Federal government positions earn \$92,300 while mathematical statisticians earn \$107,000 (March 2009). The 2009 American Statistical Association survey of salaries for non-academic statisticians yielded the following information. For statisticians with MS degrees, the median salaries were \$113K for the Federal Government, \$76K for State and Local Government, \$115K for Business and Industry, \$126K for private consultants, and \$80K for non-Profit organizations.

## **Student Demands**

A relatively small but steady demand in the program is anticipated, with estimated numbers (about 5/year) based on enrollment in the former MS-Economics degree program. Some of the students pursuing an MS degree in economics will undoubtedly choose the new MS-Financial Economics program offered through the Economics and Finance Department in the USU Huntsman School of Business. However, students interested in a research-based degree and/or those who would like to continue on for a PhD in Economics will select the MS-ES degree.

## **Collaboration with and Impact on other USHE Institutions and Benefits to the USHE**

The University of Utah offers a professional, inter-department degree entitled "M-Statistics, Econometrics Track", awarded by the Department of Economics; no other USHE institutions offer a similar degree. The degree requirements at the University of Utah are somewhat similar to those of the proposed degree: the University of Utah degree requires six hours of PhD level Econometrics classes and nine hours of mathematical statistics. The M-Statistics, Econometrics track also requires three credit hours each of microeconomic and macroeconomics theory, both taught at the MS level. In contrast, the proposed MS-ES would require six hours each of microeconomic theory, mathematical economics, and econometrics, along with six hours of statistical theory.

The MS-ES degree is a research degree which will provide training for those interested in research-directed careers in economics or students who would like to continue their education by pursuing a PhD in Economics at any institution in the country or abroad. It is unlikely to compete with the University of Utah M-Statistics, Econometrics Track degree for three reasons.<sup>2</sup> First, the proposed MS-ES degree is a research degree, not a professional degree; second, the proposed MS-ES degree has a greater proportion of courses in core economic theory and mathematical economics than the M-Statistics, Econometrics Track; and third, the anticipated number of students (5/year) in the MS-ES program is relatively small. Even if some students are drawn from the Wasatch Front, the MS-ES degree is unlikely to place the University of Utah program in jeopardy.

## **Benefits**

The MS-ES degree reorients APEC graduate programs following the dissolution of the former Department of Economics, while allowing the USU Huntsman School of Business the curricular independence they desire. Thus, this proposal assists the Huntsman School, while strengthening APEC's research degree programs. The proposed degree will establish a tight relationship between APEC's PhD and MS degrees, with the MS-ES designed as a stand-alone degree or used as a PhD preparatory track.<sup>3</sup> Courses in the first year of the MS-ES are jointly offered to students enrolled in the first year of the PhD degree. By the second semester, students must intentionally choose either the MS path, with graduation after completion of a research thesis, or continue on for their PhD degree.

---

<sup>2</sup> Telephone communication with Dr. Richard Fowles, Dept. of Economics, University of Utah. October 6, 2010.

<sup>3</sup> The proposed program is very similar to the MS-Economics doctoral preparatory degree offered by our peer institution, North Carolina State University.

## **Consistency with Institutional Mission**

As the state's Land Grant institution, Utah State University has a focus on research and graduate education. The proposed degree meets this goal of the institution through its design to (1) strengthen graduate education in economics at USU and (2) strengthen and encourage research collaboration amongst APEC and Math/Stat faculty.

The proposed degree program is consistent with the Department of Mathematics and Statistics role, which includes interdisciplinary research and education. The Department already has interdisciplinary programs at the graduate level: the M-Math program, the MS program in Industrial Mathematics, and the Interdisciplinary Specialization of the PhD in Mathematical Sciences. The MS-ES degree is closely supervised by faculty involved in research in economics, and is consistent with the research mission of the department and the College of Agriculture.

## **IV. Program and Student Assessment**

### **Program Assessment and Student Performance Standards.**

The proposed master's program is designed as a research degree. Students who successfully complete the degree will be well-placed to assume research support staff position in research organizations or pursue doctoral education at institutions of higher education. We anticipate maintaining the rigor and standards of the MS-Economics degree which was formerly available to Economics students. The success of students in the former program is impressive; graduates have gone on to professional success primarily on the basis of their quantitative skills coupled with knowledge of microeconomic theory. APEC and Math/Stat aim to continue this tradition, with intentional inclusion of math and statistics in the students' training. Secondly, the disciplines of economics, mathematics, and statistics are tightly connected; this jointly administered degree will strengthen the interdisciplinary contacts between the two departments

## **V. Finances**

### **Budget**

The two MS degrees proposed to become available in the two USU Economics departments, respectively, will be clearly differentiated through the educational objectives and scope of the curriculums. Two courses that were formerly cross-listed and taught by faculty in the Huntsman School of Business (HSB) will now be offered in both departments. Separate sections of these courses will be specifically and intentionally tailored to meet the distinct needs of the two departments. All courses in the MS-ES degree program will be open to students in other programs, such as the PhD in Economics, the MS-Applied Economics program, and graduate degrees in Math-Stats.

In order to adequately cover courses within the APEC Department, as well as supervision of research theses and dissertation projects and other assignments appropriate for a faculty member, the Provost has indicated that funding for an additional faculty member will be forthcoming to APEC in FY13. The College of Agriculture will cover the faculty position in FY12 using vacant

position funds, after which time the reallocation from the Provost Office will be completed. Selected students will be funded through ongoing operating funds from the Agricultural Experiment Station, Graduate Teaching Assistantship resources (Math/Stat), and grant funding.

**Utah State University  
Masters of Applied Economics and Statistics**

**Financial Analysis Form for All R401 Documents**

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
<b>Students</b>					
Projected FTE Enrollment <sup>1</sup>	5	5	5	5	5
Cost per FTE	\$ 28,380	\$ 28,380	\$ 28,380	\$ 28,380	\$ 28,380
Student/Faculty Ratio <sup>1</sup>	5:1	5:1	5:1	5:1	5:1
Projected Headcount <sup>1</sup>	5	5	5	5	5

<b>Projected Tuition</b>					
Gross Tuition	45,794	47,625	49,530	51,512	53,572
Tuition to Program					

<b>5 Year Budget Projection</b>					
	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
<b>Expense</b>					
Salaries & Wages	80,000	80,000	80,000	80,000	80,000
Benefits	35,200	35,200	35,200	35,200	35,200
Total Personnel	115,200	115,200	115,200	115,200	115,200
Current Expense	1,500	1,500	1,500	1,500	1,500
Assistantships	25,200	25,200	25,200	25,200	25,200
Capital					
Library Expense					
Total Expense	141,900	141,900	141,900	141,900	141,900

<b>Revenue</b>					
Legislative Appropriation					
Grants & Contracts	25,200	25,200	25,200	25,200	25,200
Donations					

Reallocation <sup>3</sup>	115,200	115,200	115,200	115,200	115,200
Tuition to Program					
Lab Fees	1,500	1,500	1,500	1,500	1,500
Total Revenue	141,900	141,900	141,900	141,900	141,900

<b>Difference</b>					
Revenue - Expenses	0	0	0	0	0

### **Comments**

<sup>1</sup> Numbers represent MS-ES students in the program per year but do not reflect additional students from other majors who are enrolled in the economics, mathematics and statistics courses required for MS-ES students. It should also be noted that faculty are assigned other responsibilities beyond teaching these MS-ES students, such as research, extension and service, as well as supervision of other research theses and dissertations.

<sup>2</sup> Gross tuition generated by students in the program.

<sup>3</sup> Year 1 funded by vacant position savings, years 2-5 through allocations from the Provost's Office.

### **Budget Comments**

Gross tuition calculated based on 50% resident and 50% non-resident students taking 10 credit hours each semester. The 2010-11 tuition-fee schedule was used, with a 4% increase calculated each year.

Salary based on 1 FTE faculty at \$80,000 per year.

Benefits calculated at 44% of base salary.

Current expenses are lab fees used to maintain/upgrade computer facilities.

Assistantships for MS students calculated for three students at \$8400 per year. The Utah Agricultural Experiment Station and Grants & Contracts will be the source of student assistantships.

The reallocation assumes additional resources equivalent to 1 faculty FTE transferred to the APEC Department as per discussions with the Office of the Provost.

### **Funding Sources**

The proposal will rely upon standard E&G funding resources, as well as resources associated with the Agricultural Experiment Station, grants, and contracts.

### **Reallocation**

The proposal does not require reallocation of existing resources within the APEC and Math/Stat departments. The Provost's Office has committed to reallocation of a faculty line from general university funds (see Section V, part A).

### **Impact on Existing Budgets**

Two courses that were formerly cross-listed and taught by faculty in the Huntsman School of Business (HSB) will now be taught in separate sections by faculty in both HSB and APEC. These courses will be targeted towards distinct and separate learning objectives specific to the MS-Economics and MS-ES degrees, respectively. The Provost Office will provide funding for an additional faculty member in APEC beginning in FY13. This new faculty line is an investment in the overall program, and will contribute to the teaching, research and service mission within the APEC Department.

## Appendix A: Curriculum

### Curriculum for proposed Masters of Science in Economics and Statistics

Course Prefix and Number	Title	Credit Hours
<i>Core Courses</i>		
APEC 7130	Microeconomic Theory I	3
APEC 7310	Econometrics I	3
APEC 7350	Mathematical Economics I	3
MATH 5710	Intro to Probability	3
APEC 7140	Microeconomic Theory II	3
APEC 7320	Econometrics II	3
APEC 7360	Mathematical Economics II	3
MATH 5720	Intro to Math/Stat	3
	Sub-Total	24
<i>Elective Courses</i>		
See Appendix B		0, 3, or 9

Plan A (30 credits total)

Six thesis credits, 24 hours required coursework

Plan B (30 hours total)

Three thesis credits, 24 hours required coursework, three hours elective coursework

Plan C (33 hours total)

24 hours required coursework, nine hours elective coursework

Potential Elective Courses: See Appendix B

No new courses will be required.

## Appendix B: Program Schedule

### *Required Courses*

#### Fall Semester (12 credits)

APEC 7130	Microeconomic Theory I	3
APEC 7310	Econometrics I	3
APEC 7350	Mathematical Economics I	3
Math 5710	Intro to Probability	3

#### Spring Semester (12 credits)

APEC 7140	Microeconomic Theory II	3
APEC 7320	Econometrics II	3
APEC 7360	Mathematical Economics II	3
MATH 5720	Intro to Math/Stat	3

### *Elective Courses*

APEC 6300	Quantitative Analysis for Business and Policy Decisions	STAT 6100	Advanced Regression Analysis
APEC 6500	Intro to Natural Resource Economics	STAT 6180	Time Series
APEC 6510	Intro to Environmental Economics	STAT 6190	Wavelet Methods for Time Series
APEC 6700	Regional and Community Economic Development	STAT 6410	Applied Spatial Statistics
APEC 6710	Community Planning and Impact Analysis	STAT 6530	Modern Nonparametric Statistics
APEC 6970	Thesis Research	STAT 6710	Mathematical Statistics I
APEC 7330	Econometrics III	STAT 6720	Mathematical Statistics II
APEC 7400	International Trade and the Environment	STAT 6740	Bayesian Statistics
APEC 7500	Resource Economics		
APEC 7510	Environmental Economics		



### Appendix C: Faculty

Name	Degree/Institution	Field(s) of Expertise
<i>Applied Economics Faculty*</i>		
Ryan Bosworth	Ph.D., Economics, University of Oregon, 2005	Environmental Economics, Mathematical Economics, Econometrics
Arthur Caplan	Ph.D., Economics, University of Oregon, 1996	Environmental Economics, Microeconomic Theory
Paul Jakus	Ph.D., Economics, North Carolina State University, 1992	Environmental Economics, Statistics
Reza Oladi	Ph.D., Economics, McGill University, 2000	International Trade Theory, Microeconomic Theory
Charles Sims	Ph.D., Economics, University of Wyoming, 2009	Natural Resource Economics, Mathematical Economics, Econometrics, Programming
<i>Mathematics and Statistics Faculty**</i>		
Christopher Corcoran	Sc.D., Biostatistics, Harvard University, 1999.	Computational biostatistics, genetic epidemiology
Daniel Coster	Ph.D., Statistics, University of California, Berkeley, 1986	Linear models, experimental design, applied statistics.
Adele Cutler	Ph.D., Statistics, University of California, Berkeley, 1988	Statistical computing, machine learning.
Richard Cutler	Ph.D., Statistics, University of California, Berkeley, 1988	Ecological statistics, experimental design
Piotr Kokoszka	Ph.D., Probability, Boston University, 1993	Probability, time series, functional data analysis.
Kady Schneider	Ph.D., Mathematical Sciences, Utah State University, 2004	Mathematics and statistics education
John Stevens	Ph.D., Statistics, Purdue University, 2005	Bioinformatics, meta-analysis, applied statistics
Juergen Symanzik	Ph.D., Statistics and Computer Science, Iowa State University, 1996	Computational statistics and statistical visualization.

\*Caplan, Jakus, and Oladi have taught courses in the MS-Economics and Ph.D. programs of APEC, Economics and Finance, and the former Dept. of Economics. Jakus (2002-2006) served as Director of Graduate Programs for the former Dept. of Economics; Caplan has been APEC Director of Graduate Programs since 2008. Caplan, Jakus and Oladi have been major professors for MS and Ph.D. students.

\*\*All statistics faculty have been major professors for MS students, and six of the eight have been major professors of Ph.D. students that have completed their degrees.