

<b>Fiscal Unit/Academic Org</b>	Statistics - D0694
<b>Administering College/Academic Group</b>	Arts And Sciences
<b>Co-administering College/Academic Group</b>	
<b>Semester Conversion Designation</b>	Re-envisioned with significant changes to program goals and/or curricular requirements (e.g., degree/major name changes, changes in program goals, changes in core requirements, structural changes to tracks/options/courses)
<b>Current Program/Plan Name</b>	Statistics
<b>Proposed Program/Plan Name</b>	Statistics
<b>Program/Plan Code Abbreviation</b>	STAT-MAS
<b>Current Degree Title</b>	Master of Applied Statistics

## Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		50	33.3	33	0.3
Required credit hours offered by the unit	Minimum	50	33.3	33	0.3
	Maximum	50	33.3	33	0.3
Required credit hours offered outside of the unit	Minimum	0	0.0	0	0.0
	Maximum	0	0.0	0	0.0
Required prerequisite credit hours not included above	Minimum	0	0.0	0	0.0
	Maximum	3	2.0	3	0.0

## Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

### Program Learning Goals

## Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? No

## Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

## Pre-Major

Does this Program have a Pre-Major? No

**Attachments**

- MAS Attachments.pdf: Attachments from the Department of Statistics  
*(Program Proposal. Owner: Craigmile, Peter F)*

**Comments****Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Craigmile, Peter F	11/04/2010 09:53 PM	Submitted for Approval
Approved	Craigmile, Peter F	11/04/2010 09:53 PM	Unit Approval
Pending Approval	Andereck, Claude David	11/04/2010 09:53 PM	College Approval



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November 5, 2010

To: Office of Academic Affairs

Re: Proposed Semester Conversion of the Master of Applied Statistics (MAS)  
degree program

Please find attached our proposal for the **Master of Applied Statistics** degree program under semesters. The ad-hoc Master of Applied Statistics conversion committee put this proposal together, with continual feedback from the entire faculty. It was approved unanimously in a faculty meeting on October 12, 2010.

Sincerely,

A handwritten signature in cursive script that reads 'Douglas A. Wolfe'.

Douglas A. Wolfe,  
Professor and Chair

## **Proposed Masters of Applied Statistics (MAS)**

### **Rationale for Changes**

The changes to the program are intended to modernize this degree program:

1. Stat 641, Design and Analysis of Experiments, a 5 quarter hours required course, becomes Stat 6410, a 4 semester hours required course with added topics. This modified course expands the coverage of fractional factorial experiments and adds important topics that have not been able to be covered in the quarter version, Stat 641, due to lack of time. (Latin squares, Nested designs, Split-plot designs, Response surface designs.)
2. Stat 645 Applied Regression Analysis, a 5 quarter hours required course, becomes Stat 6450, a 4 semester hours required course. The move to more hours allows for adequate coverage of topics in diagnostics and remedies, model selection methods, and logistic regression.
3. Stat 625 Applied Bayesian Analysis, a 4 quarter hours elective course, becomes Stat 6570, a 2 semester hours required course. The rationale for requiring this course is that Bayesian analysis has become an essential part of statistical practice.
4. Stat 665 Discrete Data Analysis, a 4 quarter hours elective course, becomes Stat 6650, a 2 semester hours required course. Again the rationale for requiring this course is that the discrete data analysis has become an essential part statistical practice.

As a result of these changes, the total number of semester hours for the core required courses is 28, an increase of approximately 3 semester hours from the original 37 quarter hours for the core required courses. However, by adjusting the number of elective hours, the total number of semester hours needed for an MAS degree is at least 33 semester hours, essentially unchanged from the original minimum of 50 quarter hours.

**Proposed Master in Statistics (MAS)  
List of Semester courses**

**Math prerequisite (or equivalent)**

Under Semesters			Under Quarters		
Code	Credits	Title	Code	Credits	Notes
4547	3	Introductory Analysis	547, 548		Required for 6301

**Core Required Courses**

Under Semesters			Under Quarters		
Code	Credits	Title	Code	Credits	Notes
6301	3	Probability for Statistical Inference	610	5	Straight conversion
6302	3	Theory of Statistical Analysis	623	5	Straight conversion
6410	4	Design and Analysis of Experiments	641	5	Material added to modernize the course
6450	4	Applied Regression Analysis	645	5	Material added to modernize the course
6560	3	Applied Multivariate Analysis	656	5	Straight conversion
6570	2	Applied Bayesian Analysis	625	4	Re-envisioned as a two semester hour required course for MAS/PhD - material was removed
6610	3	Applied Nonparametric Statistics	661	5	Straight conversion
6650	2	Discrete Data Analysis	665	5	Re-envisioned as a two semester hour required course for MAS degree - material was removed
6730	2	Introduction to Computational Statistics	673	3	Straight conversion
6750	2	Statistical Consulting	600/601	2+2	Re-envisioned as a two semester hour course. Material was removed.

**Elective Courses (at least 5 credits of the following)**

Under Semesters			Under Quarters		
Code	Credits	Title	Code	Credits	Notes
6510	3	Survey Sampling Methods	651	4	Material removed
6520	3	Applied Statistical Analysis with Missing Data	652	4	Material removed
6530	2	Introduction to Spatial Statistics	631	3	Straight conversion
6540	3	Applied Stochastic Processes	632	3	Material added to modernize the course. It is now required in one track of Biostatistics PhD
6550	2	Statistical Analysis of Time Series	635	3	Straight conversion
6605	3	Applied Survival Analysis	BIOSTAT 605	5	Straight conversion
6615	2	Design and Analysis of Clinical Trials	BIOSTAT 615	3	Straight conversion
6620	2	Environmental Statistics	662	3	Straight conversion
6640	3	Principles of Statistical Quality Control	664	5	Straight conversion
6690	1-5	Graduate topics in Statistics			New general topics course

## MAS PLAN OF STUDY

Submit this form to the Graduate Studies Committee (By way of your advisor) at the beginning of your third quarter of enrollment. This program should include all past, present, and future course.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<b>Core Courses</b>	<b>Credit Hrs</b>	<b>Quarter Taken or Planned</b>
6301	3	_____
6302	3	_____
6410	4	_____
6450	4	_____
6560	3	_____
6570	2	_____
6610	3	_____
6650	2	_____
6730	2	_____
6750	2	_____
<b>Total Core Hours</b>	<b>28</b>	

<b>Elective Courses</b>	<b>Credit Hrs</b>	<b>Quarter Taken or Planned</b>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
<b>Total Elective Hours*</b>	_____	

\* Must be a minimum of 5 credit hours. Attach course description(s) for courses outside the department.

Advisor's approval: \_\_\_\_\_ Date: \_\_\_\_\_

Graduate Studies  
Committee Approval: \_\_\_\_\_ Date: \_\_\_\_\_

Chairperson

The Ohio State University  
Department of Statistics

## M.A.S. PLAN OF STUDY

Submit this form to the Graduate Studies Committee (by way of your Advisor) at the beginning of your third quarter of enrollment. This program should include all past, present, and proposed future courses.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

<u>Core Courses</u>	<u>Credit Hours</u>	<u>Quarter Taken or Planned</u>
600	2	_____
601	2	_____
610	5	_____
623	5	_____
641	5	_____
645	5	_____
656	5	_____
661	5	_____
673	3	_____
<b>Total Core Hours:</b>	<b>37</b>	

<u>Elective Courses</u>	<u>Credit Hours</u>	<u>Quarter Taken or Planned</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
<b>Total Elective Hours*:</b>	_____	

\* Must be a minimum of 13 credit hours. Attach course description(s) for courses outside the dept.

Advisor's Approval: \_\_\_\_\_

Date: \_\_\_\_\_

Graduate Studies  
Committee Approval: \_\_\_\_\_

Date: \_\_\_\_\_

Chairperson

## Proposed Master of Statistics (MAS) Program

### Transition Policy

**Students who began their degree under quarters will not be penalized as the university moves to semesters, either in terms of progress towards their degree or their expected timing of graduation.**

Except for Stat 6410, Stat 6450, Stat 6570, and Stat 6650, the courses proposed under semesters are straight conversions of their quarter-based versions. If a student already has credit for Stat 610, but not for Stat 623, then it is recommended that the student take Stat 6302 (The straight conversion of Stat 623).

Additionally:

1. Stat 610 under quarters will be counted for Stat 6301 under semesters.
2. Stat 623 under quarters will be counted for Stat 6302 under semesters.
3. Stat 641 under quarters will be counted for Stat 6410 under semesters.
4. Stat 645 under quarters will be counted for Stat 6450 under semesters.
5. Stat 656 under quarters will be counted for Stat 6560 under semesters.
6. Stat 661 under quarters will be counted for Stat 6610 under semesters.

Students who started the MAS program under quarters will be encouraged to take the Applied Bayesian course (Stat 6570) and the Discrete Data course (Stat 6650) to complete their program, but this will not be required (they can make up their required credit hours with other elective courses).

Also, 600 level quarter-based elective courses can be counted with a 2/3 conversion to 6000 level elective credits under semesters.

#### Example transition:

	Au	Wi	Sp
Year 1 (Quarters)	Stat 610 (5) Stat 645 (5)	Stat 623 (3) Stat 641 (4)	Stat 661 (5) Elective (3)
Year 2 (Semesters)	Stat 6560 (3) Stat 6730 (3) Elective (3)		Stat 6570 (2) Stat 6650 (2) Stat 6750 (2)



# MASTER OF APPLIED STATISTICS

The goal of the Master of Applied Statistics (M.A.S.) is to prepare graduate students to enter positions in applied statistics in business, industry, or government. The program has a minimum of at least 33 hours of coursework, of which 28 hours are required courses. Students without sufficient background in mathematics may be required by the Graduate Studies Committee to take additional courses to correct these deficiencies.

All students are required to submit to the Graduate Studies Committee Chair the Plan of Study form at the beginning of their third quarter of enrollment in the program. Any subsequent modifications in this Plan of Study will require approval of the Graduate Studies Committee. Students are also required to submit the M.A.S. graduation application form to the Graduate Studies Committee no later than the second Friday of the semester in which they plan to graduate. Finally, they must submit an Application to Graduate form (see sample forms at the end of this Guidelines booklet) to the Graduate School by the end of the second week of their semester of graduation.

## Program Course Requirements

<u>Core</u> (28 hours)	6301(3)	Probability for Statistical Inference
	6302(3)	Theory of Statistical Analysis
	6410(4)	Design and Analysis of Experiments
	6450(4)	Applied Regression Analysis
	6560(3)	Applied Multivariate Analysis
	6570(2)	Applied Bayesian Analysis
	6650(2)	Discrete Data Analysis
	6610(3)	Applied Nonparametric Statistics
	6730(3)	Introduction to Computational Statistics
	6750(2)	Statistical Consulting
<u>Electives</u> (5 Hours)	Any 5 hours of <b>approved</b> elective courses (usually statistics courses)	

## M.A.S. Examination

The M.A.S. Examination is given in the Autumn and Spring Semesters, and is administered in two sessions: (1) a two-hour period covering the concepts and techniques presented in Statistics 6301 and 6302, and (2) a three-hour period covering material in Statistics 6410, 6450, 6560, and 6610. Both parts of the examination are open book. A passing score on this exam is required for graduation. **A student is permitted a maximum of two attempts at successful completion of the examination.**

## Sample program

### First Year

Autumn	Spring
<b>6301</b>	<b>6302</b>
<b>6610</b>	<b>6410</b>
<b>Elective</b>	<b>6450</b>

### Second Year

<b>6560</b>	<b>6570</b>
<b>6730</b>	<b>6650</b>
<b>Elective</b>	<b>6750</b>

## Notes

1. Required M.A.S. courses taken as an undergraduate at OSU must be replaced with approved graduate elective hours. Upon petition to the Graduate Studies Committee, required courses may be omitted if there is evidence of substantially equivalent study elsewhere, but they must be replaced with approved electives. Such modifications to required courses do not affect the content of the M.A.S. examination.
2. Courses with a grade below B- do not count toward the degree and must be replaced by courses approved upon petition to the Graduate Studies Committee.
3. Electives: No additional hours of Statistics 6750 (beyond the two required hours) may be counted as electives. Satisfactory completion of Statistics 6801 and 6802 can be used to replace Statistics 6301 and 6302. All other letter-graded 6000 level statistics courses (except 6030, 6060, and 6740) including their cross-listed equivalents are approved electives. In addition, upon special approval of the Graduate Studies Committee, some 7000 and 8000 level courses may be counted as electives. Students may, with approval of the Graduate Studies Committee, substitute one course (up to 3 hours) from another department in place of an elective. The course must have appropriate content for a statistics degree, but may not duplicate the material covered in any course available from the Department of Statistics.

# MASTER OF APPLIED STATISTICS

The goal of the Master of Applied Statistics (M.A.S.) is to prepare graduate students to enter positions in applied statistics in business, industry, or government. The program has a minimum of at least 50 hours of coursework, of which 37 hours are required courses. Students without sufficient background in mathematics may be required by the Graduate Studies Committee to take additional courses to correct these deficiencies.

All students are required to submit to the Graduate Studies Committee Chair the Plan of Study form at the beginning of their third quarter of enrollment in the program. Any subsequent modifications in this Plan of Study will require approval of the Graduate Studies Committee. Students are also required to submit the M.A.S. graduation application form to the Graduate Studies Committee no later than the second Friday of the quarter in which they plan to graduate. Finally, they must submit an Application to Graduate form (see sample forms at the end of this Guidelines booklet) to the Graduate School by the end of the second week of their quarter of graduation.

## Program Course Requirements

<u>Core</u> (37 hours)	600(2)	Statistical Consulting I (graded S/U)
	601(2)	Statistical Consulting II (graded S/U)
	610(5)	Probability for Statistical Inference
	623(5)	Theory of Statistical Analysis
	641(5)	Design and Analysis of Experiments
	645(5)	Applied Regression Analysis
	656(5)	Applied Multivariate Analysis
	661(5)	Applied Nonparametric Statistics
	673(3)	Introduction to Statistical Computing

Electives  
(13 Hours) Any 13 hours of **approved** elective courses (usually statistics or biostatistics courses)

## Suggested Options

The following sequences of elective courses represent reasonable strategies to prepare for potential employment areas:

<b>Biostatistics Option:</b>	Biostatistics 605, Biostatistics 615, and Statistics 665
<b>Government Option:</b>	Statistics 635, 651, and 665
<b>Industrial Option:</b>	Statistics 635, 663, 664, 674, and 675
<b>Modeling Option:</b>	Statistics 632, 635, and 662.

Please note that these are just some suggested options, so you do not have to follow any of these options exactly. Some students create an actuarial science option by

choosing appropriate courses from Mathematics and Business. A Computational Science option is also possible.

### **M.A.S. Examination**

The M.A.S. Examination is given in the Autumn and Spring Quarters, and is administered in two sessions: (1) a two-hour period covering the concepts and techniques presented in Statistics 610 and 623, and (2) a three-hour period covering material in Statistics 641, 645, 656, and 661. Both parts of the examination are open book. A passing score on this exam is required for graduation. **A student is permitted a maximum of two attempts at successful completion of the examination.**

### **Sample programs**

#### First Year

Summer	Autumn	Winter	Spring
602	<b>610</b>	<b>623</b>	<b>600</b>
603	<b>645<sup>^</sup></b>	<b>641<sup>^</sup></b>	<b>656</b>
Applied Elective or <b>661<sup>^</sup></b>			<b>661<sup>^</sup></b> or Elective

#### Second Year (including possible elective sequences for the options listed previously):

	<b>673</b>	<b>601</b>	
Biostatistics Option:	B615 PH786	B605	665
Government Option:	635	651	665
Industry Option:	635 664	674	663* 675
Modeling Option:	635	632	662*

- Notes:
- Public Health 786 can be substituted for 601 but not for 600 (see also page 20).
  - Bold face courses are required in the MAS program.
  - Enrollment in the Summer Quarter of the first year is optional, but encouraged.

Course Offerings: All required courses are offered once every year with the following exceptions:

- <sup>^</sup> Statistics 641 and Statistics 661 are typically offered twice a year, and Statistics 645 is offered three times a year.
- \* Statistics 662 and Statistics 663 are offered in alternate years, with Statistics 662 being offered in the Academic Year 2011-12.

## **Notes**

1. Required M.A.S. courses taken as an undergraduate at OSU must be replaced with approved graduate elective hours. Upon petition to the Graduate Studies Committee, required courses may be omitted if there is evidence of substantially equivalent study elsewhere, but they must be replaced with approved electives. Such modifications to required courses do not affect the content of the M.A.S. examination.
2. Courses with a grade below B- do not count toward the degree and must be replaced by courses approved upon petition to the Graduate Studies Committee.
3. Electives: No additional hours of Statistics 600 or Statistics 601 (beyond the four required hours) may be counted as electives. Satisfactory completion of Statistics 620, 621, and 622 can be used to replace Statistics 610 and 623. All other letter-graded 600 level statistics and biostatistics courses (except 602 and 603) are approved electives. Statistics 674 and 675 as approved electives are limited to one credit hour per course. In addition, upon special approval of the Graduate Studies Committee, some 700 and 800 level courses may be counted as electives. Students are also encouraged to take appropriate graduate courses outside the Statistics Department to meet the elective requirements. Students may, with approval of the Graduate Studies Committee, substitute one course (up to 5 hours) from another department in place of an elective. The course must have appropriate content for a statistics degree, but may not duplicate the material covered in any course available from the Department of Statistics.