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# Program Guide to Undergraduate and Graduate Studies in Statistics and Biostatistics

**Semester Conversion Edition**

Version 3, Revised August 17, 2012

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For the most updated version of this document, please see the Department of Statistics website at www.stat.osu.edu.

# UNDERGRADUATE MINOR IN STATISTICS PROGRAM
## Semester Curriculum

A demonstrated knowledge and working understanding of basic statistical techniques and methods has become a critical element for students in many disciplines including business, engineering, life sciences and social sciences. The undergraduate minor in statistics is designed as a valuable asset to enhance most undergraduate majors and their career opportunities. Students with a statistics minor may also be eligible to obtain a Master of Applied Statistics with one additional academic year of coursework.

**Course Requirements Under Semesters**

To achieve the statistics minor, the student must successfully complete the requirements listed in (1.) and (2.) below. A minimum of 15 semester credit hours is required for the statistics minor.

(1.) Take and pass with a grade of C- or above in each of the required courses.

| | |
|---|---|
| Stat 4201 (4) | Introduction to Mathematical Statistics I |
| Stat 4202 (4) | Introduction to Mathematical Statistics II |
| Stat 5301 (4) | Intermediate Data Analysis I |
| Stat 5302 (3) | Intermediate Data Analysis II |

(2.) Maintain a minimum cumulative grade point average of 2.00 in the statistics minor.

(3.) Stat 4201 is not required for Math students with credit for Math 4530 (Probability) or Math 5530H (Rigorous Probability). However, Math 4530 or Math 5530H cannot be counted for credit in the Statistics minor or as a GEC in Data Analysis. Students with Math 4530 or Math 5530H but not Stat 4201 will have to take 4 semester hours of electives (see next note for a list of possible electives).

(4.) In addition to the required courses, it is recommended but not usually required that the student take one or more electives from such specialized courses as Statistical Foundations of Survey Research (5510), Introduction to SAS Software (5740), Applied Nonparametric Statistics (6610), Environmental Statistics (6620), Discrete Data Analysis (6650), Data Management and Presentation (6740), or Design and Analysis of Clinical Trials (Stat 6615). Other electives may be selected with the approval of the Undergraduate Minor Coordinator.

**Sample Undergraduate Minor in Statistics Programs**

| | SAMPLE PROGRAM A | |
|---|---|---|
| | **Autumn** | **Spring** |
| **Year 1** | 5301 | 5302 |
| **Year 2** | 4201 | 4202 |

| SAMPLE PROGRAM B | |
|---|---|
| **Autumn** | **Spring** |
| 4201 | 4202 |
| 5301 | 5302 |



rev. 8/17/12

**Undergraduate Minor in Statistics 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 of their expected date of graduation.

We believe that the best solution for smooth transition is to proactively advise students in advance that they finish either of the core sequences (Mathematical Statistics, Stat 420-421, and Data Analysis, Stat 528-529-530) completely under quarters. Then by completing any unfinished sequences under semesters, they can fulfill all the requirements for the minor without taking any bridge courses.

For the Mathematical Statistics sequence (Stat 4201 and Stat 4202), we do not see a need for developing a bridge course. In the first two years under semesters the content of Stat 4202 will be slightly altered so that students taking Stat 420 can take Stat 4202 without problem.

For the Data Analysis 528-529-530 sequence, the material of the 3 credit second course (Stat 529) will be split into Stat 5301 (2 credits) and Stat 5302 (1 credit) under semesters. If needed, a 2 credit hour bridge course between 528 and 5302 (Stat 5299) will be offered during the first two years after transition to semesters (a reading course will be offered instead of Stat 5299 if there are a small number of students). Those who take Stat 528 and Stat 529 under quarters can take Stat 5302 (the second semester course) to complete the requirement for the data analysis sequence.

**Sample Undergraduate Minor in Statistics Transition Programs**

| | **SAMPLE PROGRAM A** | | |
|---|---|---|---|
| | **Autumn** | **Winter** | **Spring** |
| **Year 1 (Quarters)** | 528 | 529 | 530 |
| **Year 2 (Semesters)** | 4201 | — | 4202 |

| | **SAMPLE PROGRAM B** | | |
|---|---|---|---|
| | **Autumn** | **Winter** | **Spring** |
| **Year 1 (Quarters)** | 420 | 421 | |
| **Year 2 (Semesters)** | 5301 | — | 5302 |

| | **SAMPLE PROGRAM C** | | |
|---|---|---|---|
| | **Autumn** | **Winter** | **Spring** |
| **Year 1 (Quarters)** | 420 | 421<br>528 | |
| **Year 2 (Semesters)** | 5299 | — | 5302 |

# GRADUATE MINOR IN STATISTICAL DATA ANALYSIS PROGRAM
## Semester Curriculum

**Prerequisites:** High school-level algebra

**Course Requirements Under Semesters**

A grade of B or better or S in each course comprising the graduate minor is required per Section VIII.4 of the Graduate School Handbook.

| | | |
|---|---|---|
| Required | 5301 (4) | Intermediate Data Analysis I |
| | 5302 (3) | Intermediate Data Analysis II |
| Electives (5 hours) | At least **5 additional credit hours** at the 6000-level (from among courses in Group A). Courses at the 6000-level from Group B or courses at a higher level can be substituted as an alternative with appropriate permission. | |
| Group A Electives | 6510 (3) | Survey Sampling Methods |
| | 6610 (3) | Applied Nonparametric Statistics |
| | 6620 (2) | Environmental Statistics |
| | 6640 (3) | Principles of Statistical Quality Control |
| | 6650 (2) | Discrete Data Analysis |
| | 6615 (2) | Design and Analysis of Clinical Trials |
| Group B Electives (permission required to use these toward minor requirements) | 6520 (3) | Applied Statistical Analysis with Missing Data |
| | 6530 (2) | Introduction to Spatial Statistics |
| | 6540 (3) | Applied Stochastic Processes |
| | 6550 (2) | Statistical Analysis of Time Series |
| | 6560 (3) | Applied Multivariate Analysis |
| | 6570 (2) | Applied Bayesian Analysis |
| | 6605 (3) | Applied Survival Analysis |
| | 6690 (1-5) | Graduate Topics in Statistics |

**Sample Graduate Minor in Statistical Data Analysis Program**

| | Autumn | Spring |
|---|---|---|
| **Year 1** | 5301 | 5302 |
| **Year 2** | Elective | Elective |

**Graduate Minor in Statistical Data Analysis 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 of their expected timing of graduation.

We believe that the best solution for smooth transition is to proactively advise students in advance that they finish the core sequence of Data Analysis, Stat 528-529-530 completely under quarters. Then they can fulfill all the requirements for the minor without taking any bridge courses.

For the Data Analysis 528-529-530 sequence, the material of the 3 credit second course (Stat 529) will be split into Stat 5301 (2 credits) and Stat 5302 (1 credit) under semesters. If needed, a 2 credit hour bridge course between 528 and 5302 (Stat 5299) will be offered during the first two years after transition to semesters. Those who take Stat 528 and Stat 529 under quarters can take Stat 5302 (the second semester course) to complete the requirement for the data analysis sequence.

**Sample Graduate Minor in Statistical Data Analysis Transition Program**

| | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| **Year 1 (Quarters)** | 528 | 529 | 530 |
| **Year 2 (Semesters)** | Elective | — | Elective |

# GRADUATE MINOR IN STATISTICS PROGRAM
# Semester Curriculum

**Prerequisites:** College-level Linear Algebra (Math 2568.01) and Calculus (Math 2153.XX)

## Course Requirements Under Semesters

A grade of B or better or S in each course comprising the graduate minor is required per Section VIII.4 of the Graduate School Handbook.

| | | |
|---|---|---|
| Required | 6201 (4) | Introduction to Probability and Mathematical Statistics |
| | 6410 (4) | Design and Analysis of Experiments |
| | 6450 (4) | Applied Regression Analysis |
| Electives (5 hours) | At least **2 additional credit hours** at the 6000-level from among the courses listed below. Higher level courses can be substituted as an alternative with appropriate permission. | |
| Approved Electives | 6510 (3) | Survey Sampling Methods |
| | 6520 (3) | Applied Statistical Analysis with Missing Data |
| | 6530 (2) | Introduction to Spatial Statistics |
| | 6540 (3) | Applied Stochastic Processes |
| | 6550 (2) | Statistical Analysis of Time Series |
| | 6560 (3) | Applied Multivariate Analysis |
| | 6570 (2) | Applied Bayesian Analysis |
| | 6605 (3) | Applied Survival Analysis |
| | 6610 (3) | Applied Nonparametric Statistics |
| | 6615 (2) | Design and Analysis of Clinical Trials |
| | 6620 (2) | Environmental Statistics |
| | 6640 (3) | Principles of Statistical Quality Control |
| | 6650 (2) | Discrete Data Analysis |
| | 6690 (1-5) | Graduate topics in Statistics |
| | 6730 (2) | Introduction to Computational Statistics |

## Sample Graduate Minor in Statistics Program

| | Autumn | Spring |
|---|---|---|
| **Year 1** | 6201 | 6410 |
| **Year 2** | 6450 | Elective |

## Graduate Minor in Statistics 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.

Under semesters, Stat 6201 replaces the requirement of Stat 610 and Stat 623 under quarters. 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). This will fulfill the Stat 6201 requirement. Also, the new Stat 6301-6302 sequence (the statistical theory sequence for the MAS program) will be an acceptable alternative to 6201, but will only count for 4 semester hours toward the fulfillment of the requirements for the minor.

Stat 641 under quarters will be counted for Stat 6410 under semesters, and Stat 645 under quarters will be counted for Stat 6450 under semesters. Similarly 600-level quarter-based elective courses can be counted with a 2/3 conversion to 6000-level elective credits under semesters.

**Sample Graduate Minor in Statistics Transition Program**

| | Autumn | Winter | Spring |
|---|---|---|---|
| **Year 1 (Quarters)** | 610 | 623 | 641 |
| **Year 2 (Semesters)** | 6450 | — | Elective |

# MASTER OF APPLIED STATISTICS PROGRAM
## Semester Curriculum

The goal of the Master of Applied Statistics (MAS) 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 by the beginning of their third semester 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 departmental MAS graduation application form to the Graduate Studies Committee prior to approval of the Graduate School form. Finally, they must submit an Application to Graduate form to the Graduate School by the published deadline of the Graduate School. (Under the quarter system, this is/was the second Friday of the quarter of intended graduation. Please consult the Graduate School website for the appropriate deadline under the semester system.)

**Course Requirements Under Semesters**

| | | |
|---|---|---|
| Core | 6301 (3) | Probability for Statistical Inference |
| (28 hours) | 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 |
| | 6610 (3) | Applied Nonparametric Statistics |
| | 6650 (2) | Discrete Data Analysis |
| | 6730 (2) | Introduction to Computational Statistics |
| | 6750 (2) | Statistical Consulting |
| Electives (5 hours) | | Any 5 hours of **approved** elective courses (usually statistics courses) |

**MAS Examination**

The MAS Examination is given in the spring semester and May session, 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 MAS Program**

| First Year | **Autumn** | **Spring** |
|---|---|---|
| | 6301 | 6302 |
| | 6610 | 6410 |
| | Elective | 6450 |

| Second Year | **Autumn** | **Spring** |
|---|---|---|
| | 6560 | 6570 |
| | 6730 | 6650 |
| | Elective | 6750 |

**Notes**

1. Required MAS 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 MAS 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 may 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.

**MAS 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 the expected timing of graduation. The Graduate Studies Chair is the advisor for all MAS students. Students are also assigned a faculty mentor with whom they meet every quarter. This level of support will continue under semesters. Students will meet with a faculty mentor every semester.

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

Additionally:

1. Statistics 610 under quarters will be counted for Statistics 6301 under semesters.
2. Statistics 623 under quarters will be counted for Statistics 6302 under semesters.
3. Statistics 641 under quarters will be counted for Statistics 6410 under semesters.
4. Statistics 645 under quarters will be counted for Statistics 6450 under semesters.
5. Statistics 656 under quarters will be counted for Statistics 6560 under semesters.
6. Statistics 661 under quarters will be counted for Statistics 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 may make up their required credit hours with other elective courses).

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

**Sample MAS Transition Program (Students starting Autumn Quarter 2011)**

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | 610 | 623 | 661 |
| | 645 | 641 | Elective(s) |

| Second Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | 6560 | 6570 |
| | 6730 | 6650 |
| | Elective | 6750 |

# MASTER OF SCIENCE IN STATISTICS PROGRAM
## Semester Curriculum

The Master of Science (MS) degree is awarded by two different routes: Thesis or Non-thesis

The MS degree, under either route, may be either a terminal degree or a steppingstone to the PhD degree. The requirements for this degree are more theoretical than those for the MAS Students in this program will generally be in residence for two academic years, or more if continuing for the PhD This may result in the student accumulating more than the required number of hours or at times being able to take a lighter load. This degree program is flexible enough to provide preparation for a career in applied statistics or it can be composed primarily of the first two years of coursework for either the Statistics PhD program or the methodology specialization of the Biostatistics PhD program.

**Course Requirements Under Semesters**

| | | | | |
|---|---|---|---|---|
| Core | | 6801 (4), 6802 (4) | Statistical Theory I & II | |
| (25 hours) | | 6860 (2) | Foundations of the Linear Model | |
| | | 6910 (4), 6950 (4) | Applied Statistics I & II | |
| | | 7410 (3) | Theory of the Linear Model | |
| | one of | 6570 (2) | Applied Bayesian Analysis | or |
| | | 6615 (2) | Clinical Trials | |
| | and | | | |
| | one of | 6750 (2) | Statistical Consulting | or |
| | | 7755 (2) | Biostatistical Collaboration | |
| Electives | | | 11 hours of **approved** elective courses appropriate to | |
| (11 hours) | | | the Thesis or Non-Thesis option as described in (2a) | |
| | | | or (2b) below | |

(1) All Courses – Must be taken and passed with a grade of B- or above in a letter-graded course and with a grade of S in a S/U course.

(2a) Thesis Option – Write a thesis and pass an oral examination in defense of this thesis. At most 4 hours of thesis preparation under Statistics 7998 or Statistics 7999 may be counted among the 11 hours of electives.

Electives*(11 hours): Letter graded Statistics courses at the 6000-level or above, excluding Statistics 6030, 6040, 6060, 6193, 6194, 6201, 6301, 6302, 6410, 6450, 7193, 7194, 8010, 8193, 8194, 8895, 8999. Thesis research under Statistics 7998 or Statistics 7999. Neither 6750 nor 7755 may be counted for elective credit.

(2b) Non-thesis Option – Pass a written examination that is offered at the same times as the PhD Qualifier I Examination. The examination will cover material from the first year of the PhD coursework. Statistics 7998 and Statistics 7999 may not be counted as elective hours for a non-thesis option degree.

Electives*(11 hours): Letter graded Statistics courses at the 6000-level or above, excluding Statistics 6030, 6040, 6060, 6193, 6194, 6201, 6301, 6302, 6410, 6450, 7193, 7194, 7998, 7999, 8010, 8193, 8194, 8895, 8999. Neither 6750 nor 7755 may be counted for elective credit.

* Students may also 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 3 hours) from another department in place of an elective. The course must have appropriate content for a statistics degree, and must not duplicate the material covered in any course available from the Department of Statistics.

## Sample MS in Statistics Program

| First Year | **Autumn** | **Spring** |
|---|---|---|
| | 6801 | 6802 |
| | 6910 | 6950 |
| | Elective | 6860 (1st half sem.) |
| | | 6570 (2nd half sem.) |

| Second Year | **Autumn** | **Spring** |
|---|---|---|
| | 7410 | 6750 |
| | Elective | Elective |
| | Elective | Elective |

The department views either the thesis or non-thesis option as acceptable. However, the department does not view either option as an alternative once the other option has resulted in failure. To this end, a student should declare his/her intentions to the Graduate Studies Committee at the end of his/her first year of study.

Since most students in recent years have elected to take the MS degree via the non-thesis option, a few words about the MS degree with thesis are in order. Some professors have problems that are suitable for masters' theses. These topics can range from the very mathematical to applications in other fields. Some thesis topics could be direct extensions of problems arising in the Statistical Consulting Service. A thesis written on such a problem converts the degree to an applied degree, in substance, if not in name. A student wishing to learn more about the thesis option, should talk with his/her advisor.

Any student who anticipates obtaining the MS degree in the course of his/her academic career should file the MS Plan of Study form by the end of his/her first year of study. He/she must also submit an Application to Graduate form to the Graduate School by the published deadline of the Graduate School. (Under the quarter system, this is/was the second Friday of the quarter of intended graduation. Please consult the Graduate School website for the appropriate deadline under the semester system.)

## MS in Statistics 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 the expected timing of graduation. The Graduate Studies Chair is the advisor for all MS students. Students are also assigned a faculty mentor with whom they meet every quarter. This level of support will continue under semesters. Students will meet with a faculty mentor every semester.

Requirements for the quarter-based MS degree include a one-year sequence on Statistical Theory (Statistics 620-621-622), and applied courses on Experimental Design (Statistics 641) and Regression (Statistics 645). The Statistical Theory sequence (6801-6082) is a straight conversion of the quarter-based sequence. Nearly all MS students take this sequence in one year. However, if a student already has credit for Statistics 620, but not for Statistics 621, then the student will have the option of taking a two-

hour reading course (Statistics 6193 or Statistics 6194) to complete the equivalent of Statistics 6801; if a student already has credit for Statistics 620 and Statistics 621, but not Statistics 622, the student will take Statistics 6802.

Additionally:

1. Statistics 620-621-622 under quarters will be counted for Statistics 6801-6802 under semesters.
2. Statistics 641 under quarters will be counted for Statistics 6910 under semesters.
3. Statistics 645 under quarters will be counted for Statistics 6950 under semesters.
4. Statistics 742 under quarters will be counted for Statistics 7410 under semesters.
5. Statistics 600 under quarters will be counted for Statistics 6750 under semesters, and Biostatistics 709 under quarters will be counted for Statistics 7755 under semesters.

Students who started the MS program under quarters are encouraged to take the Foundations of the Linear Model course (Statistics 6860), and either the Applied Bayesian course (Statistics 6570) or the Clinical Trials course (Statistics 6615) to complete their program, but this is not required. The requirement for the Foundations of the Linear Model may be waived, and the two semester-credit-hours for the Applied Bayesian/Clinical Trials course can be made up with other elective courses.

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

**Sample MS in Statistics Transition Program (Students starting Autumn Quarter 2011)**

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | 620 (4) | 621 (4) | 622 (4) |
| | 645 (5) | 641 (5) | Elective (5) |

| Second Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | 7410 (3) | 6750 (2) |
| | Elective (3) | 6570 (2) |
| | Elective (3) | Elective (2) |

# PHD IN STATISTICS PROGRAM
# Semester Curriculum

The PhD program in statistics presupposes a mathematical background which includes linear algebra and advanced calculus. The core of the PhD program consists of coursework in mathematical statistics, applied statistics, and computational methods.

(1) The student must take and pass the coursework described below with a grade of B- or above in a letter-graded course and with a grade of S in a S/U course.

(2) The student must pass examinations as described below.

(3) The student must satisfy university rules on residency and total credit hours. A minimum of 80 credit hours is required, which typically includes a considerable number of hours of Statistics 8999 (PhD Research).

**Course Requirements Under Semesters**

| | | | |
|---|---|---|---|
| Mathematics | | | As required for individual students to reach the mathematical maturity necessary to be successful in the Statistics courses 7201, 7301, 7302, 7303, and 7540. Minimum requirements should be the equivalent of a strong undergraduate course in Advanced Calculus or Real Analysis and Math 4545 (4) (tentative course number) |
| Core | | 6570 (2) | Applied Bayesian Analysis |
| (48 hours) | | 6801 (4), 6802 (4) | Statistical Theory I & II |
| | | 6860 (2) | Foundations of the Linear Model |
| | | 6910 (4), 6950 (4) | Applied Statistics I & II |
| | | 7201 (3) | Theory of Probability |
| | | 7301 (3), 7302 (3) | Advanced Statistical Theory I & II |
| | | 7303 (3) | Bayesian Analysis and Decision Theory |
| | | 7410 (3) | Theory of the Linear Model |
| | | 7540 (3) | Theory of Stochastic Processes |
| | | 7730 (3) | Advanced Computational Statistics |
| | | 8410 (3) | Capstone Applications |
| | | 8750.xx (1) | Research Group |
| | | 8750.xx (1) | Research Group |
| | one of | 6750 (2) | Statistical Consulting or |
| | | 7755 (2) | Biostatistical Collaboration |
| Electives* | | | At least 9 credits of letter-graded Statistics at the |
| (9 hours) | | | 6000-level or higher, of which at least 6 credits must be at the 7000-level or higher** |

* Students may also 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 3 hours) from another department in place of an elective. The course must have appropriate content for a statistics degree, and must not duplicate the material covered in any course available from the Department of Statistics.

** Excludes Statistics 6030, 6040, 6060, 6193, 6194, 6201, 6301, 6302, 6410, 6450, 6750, 7193, 7194, 7755, 7998, 7999, 8010, 8193, 8194, 8750.xx, 8891, 8895, and 8999.

**Sample PhD in Statistics Program**

| First Year | **Autumn** | **Spring** |
|---|---|---|
| | 6801 | 6802 |
| | 6910 | 6950 |
| | Math 4545 | 6860 (1st half sem.) |
| | | 6570 (2nd half sem.) |

| Second Year | **Autumn** | **Spring** |
|---|---|---|
| | 7201 | 7302 |
| | 7301 | 7303 |
| | 7410 | 7540 |
| | 8750.xx | 8750.xx |

| Third Year | **Autumn** | **Spring** |
|---|---|---|
| | 7730 | 6750 |
| | 8410 | Elective |
| | Elective | Elective |
| | | Elective |

**Examinations (None of these examinations may be taken more than twice.)**

1. Qualifier I: This written examination covers material from the first year of coursework.

2. Qualifier II: This is a comprehensive written examination testing knowledge acquired in the first two years of study and the ability to integrate and apply such knowledge. It will cover material from the first two years of coursework. It may not be attempted until Qualifier I has been passed.

   Note on all exams: students are expected to take exams on the usual schedule as they complete coursework in order for funding (if applicable) to continue.

   After passing Qualifier II, the student chooses a dissertation advisor, who must be a Category P graduate faculty member. Category P faculty have been approved by the university to formally supervise PhD dissertations. After the dissertation advisor is chosen, the student also forms a PhD Examination Committee, consisting of at least four graduate faculty members from the Statistics Department or other departments consistent with the student's interests. This committee is responsible for approving a Plan of Study to be filed with the Graduate Studies Committee within two semesters after passing Qualifier II.

3. PhD Candidacy Examination: After completion of all required courses (as specified by the student's PhD Examination Committee), the candidate's PhD Examination Committee will administer and grade a PhD Candidacy Examination. The examination consists of two parts. A written portion covers material on some area in the statistical literature as agreed upon by the student and the Examination Committee. This portion will be administered within two years of the student's passing Qualifier II and will discuss open research topics in this area and possible research methodology for solving these problems. This portion will ordinarily be a thesis proposal, but the

student is not obliged to follow through with a thesis in this area, and the examination need not be repeated if the thesis topic is changed at a later date. After the Examination Committee accepts the written portion, they will administer a two-hour oral examination over this material. **The student has two weeks to complete the written portion of the exam. The oral exam is scheduled at least two weeks after the due date for the written portion of the exam.** See the Graduate School website for the appropriate Graduate School form and policies (Doctoral Notification of PhD Candidacy Examination).

4. Final Oral Examination/Thesis Defense: Once the student has made sufficient progress (as judged by the PhD Dissertation Committee) on his/her PhD dissertation to warrant holding the Final Oral Examination, the Doctoral Draft Approval/Notification of Final Oral Examination form (again see the Graduate School website for the appropriate form) must be filed with the Graduate School at least two weeks prior to the actual Final Oral Examination/Thesis Defense. The PhD Dissertation Committee then conducts a two-hour oral examination in which the candidate discusses/defends his/her thesis. The student must file the Application to Graduate Form (again see the Graduate School website for the appropriate form) with the Graduate School by the published deadline of the Graduate School. (Under the quarter system, this is/was the second Friday of the quarter of intended graduation. Please consult the Graduate School website for the appropriate deadline under the semester system.)

## PhD in Statistics 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. The Graduate Studies Chair is the advisor for all PhD students upon entry to the program. Students are also assigned a faculty mentor with whom they meet every quarter. This level of support will continue under semesters: Each student will meet with a faculty mentor every semester. When a student selects an advisor for dissertation work (typically during year three of the program), this advisor will replace the assigned faculty mentor.

The transition plan for the MS degree details how students who have completed portions of the first-year coursework will be able to fulfill the first-year coursework requirements. Much of the MS transition plan is relevant here:

Requirements for the quarter-based MS degree include a one-year sequence on Statistical Theory (Statistics 620-621-622), and applied courses on Experimental Design (Statistics 641) and Regression (Statistics 645). The Statistical Theory sequence is a straight conversion of the quarter-based sequence. If a student already has credit for Statistics 620, but not for Statistics 621, then the student will have the option of taking a two-hour reading course (Statistics 6193 or Statistics 6194) to complete the equivalent of Statistics 6801; if a student already has credit for Statistics 620 and Statistics 621, but not Statistics 622, the student will take Statistics 6802.

Additionally:

1. Statistics 620-621-622 under quarters will be counted for Statistics 6801-6802 under semesters.
2. Statistics 641 under quarters will be counted for Statistics 6910 under semesters.
3. Statistics 645 under quarters will be counted for Statistics 6950 under semesters.
4. Statistics 742 under quarters will be counted for Statistics 7410 under semesters.
5. Statistics 600 under quarters will be counted for Statistics 6750 under semesters, and Biostatistics 709 under quarters will be counted for Statistics 7755 under semesters.

Requirements for the quarter-based PhD degree, beyond those for the MS degree, include a one-year sequence on Statistical Inference (Statistics 820-821-822), a two-quarter sequence on Probability (Statistics 722-723), a course on Applied Probability Models (Statistics 832), and electives. Courses will be matched on the one-for-one basis as shown below, with the exception of the probability sequence. Nearly all PhD students take this sequence during a single academic year. However, if a student already has credit for Statistics 722, but not for Statistics 723, then the student will have the option of taking a two-hour reading course (Statistics 8193 or Statistics 8194) to complete the equivalent of Statistics 7201.

Additionally:

6. Statistics 820 under quarters will be counted for Statistics 7303 under semesters.
7. Statistics 821 under quarters will be counted for Statistics 7302 under semesters.
8. Statistics 822 under quarters will be counted for Statistics 7301 under semesters.
9. Statistics 722-723 under quarters will be counted for Statistics 7201 under semesters.
10. Statistics 832 under quarters will be counted for Statistics 7540 under semesters.

Several of the above-mentioned courses are currently three credit hours under quarters and will transition to three semester-credit-hour courses. In addition to taking specific courses, a student will be required to complete the missing hours as electives, under a conversion of one quarter-hour equals 2/3 semester-hour, with the overall fraction rounded to the nearest integer. As an example of the calculation, a student who takes the quarter courses listed in points one through six above would have completed 20 quarter-hours. The semester versions of the courses consist of 15 semester-hours. The deficit is 15 - 20 x 2/3 = 1 2/3 semester-hours, and the student would be expected to complete an additional two hours of electives.

As with the MS degree, students who started the PhD program under quarters will be encouraged to take the Foundations of the Linear Model course (Statistics 6860), and the Applied Bayesian course (Statistics 6570) to complete their program, but this will not be required. The requirement for the Foundations of the Linear Model will be waived, and the two semester-credit-hours for the Applied Bayesian course can be made up with other elective courses. Students who started the PhD program under quarters will be encouraged to take the Research Group courses (Statistics 8750.XX), the Advanced Computational Statistics Course (Statistics 7730), and the Capstone Applications Course (Statistics 8410), but these courses will not be required. These eight semester-hours can be made up with six semester-hours of other elective courses. These extra elective courses do not add any additional burden compared to a student in the quarter-based program.

Additionally, a two-quarter-hour special topics course in Applied Statistics (Statistics 881) will be offered in Spring 2012 for Biostatistics and Statistics PhD students. This course will cover the material that is not in the quarter-based Statistics 641 and Statistics 645, but will be in the semester versions of these courses.

Also, 600-level and above quarter-based elective courses can be counted with a 2/3 conversion to 6000-level and above elective credits under semesters. The content of qualifying examinations from 2012 through 2014 will be adjusted to match the content of coursework taken by those who began the program under quarters.

**Sample PhD in Statistics Transition Programs**

***First and Second Years under Quarter System, Subsequent Years under Semester System (Students starting Autumn Quarter 2010)***

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | 620 (4) | 621 (4) | 622 (4) |
| | 645 (5) | 641 (5) | Elective (5) |
| | Math 547 (3) | Math 548 (3) | Math 549 (3) |

| Second Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | 722 (4) | 723 (4) | 600 (2) |
| | 742 (4) | 821 (3) | 822 (3) |
| | 820 (3) | 832 (3) | Elective (5) |

| Third Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | 7730 (3) | Elective (3) |
| | 8410 (3) | Elective (3) |
| | Elective (3) | Elective (3) |

***First Year under Quarter System, Subsequent Years under Semester System (Students starting Autumn Quarter 2011)***

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | 620 (4) | 621 (4) | 622 (4) |
| | 645 (5) | 641 (5) | 881 (2) |
| | Math 547 (3) | Math 548 (3) | Math 549 (3) |
| | | | Elective (3) |

| Second Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | 7201 (3) | 7302 (3) |
| | 7301 (3) | 7303 (3) |
| | 7410 (3) | 7540 (3) |
| | 8750 (1) | 8750 (1) |

| Third Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | 7730 (3) | Elective (3) |
| | 8410 (3) | Elective (3) |
| | Elective (3) | Elective (3) |

# PHD IN BIOSTATISTICS PROGRAM
# METHODOLOGY SPECIALIZATION
## Semester Curriculum

The basic philosophy of the PhD program in biostatistics is to provide trained personnel, not only to the academic profession, but also to industry and government. The goal is to develop a student's ability to create new methodologies as well as to address applied questions that arise in the biomedical sciences. Although programs are individually designed to suit the needs of particular students, there is a core curriculum that every student follows. This core curriculum includes courses in theoretical and applied statistics and biostatistics including Statistical Genetics and Survival Analysis.

After they declare their specialization preference following their successful passing of the QI examination, students in the Biostatistics PhD degree program who choose the Methodology Specialization should select a faculty adviser from the Biostatistics faculty (Note: the adviser could be from the Department of Statistics or the Division of Biostatistics within the College of Public Health). This document serves as a resource to be used by the student and the adviser in planning the program of study for the Methodology specialization.

Note: The Biostatistics PhD program presupposes a mathematical background that includes linear algebra and advanced calculus.

**Course Requirements Under Semesters**

| | | |
|---|---|---|
| Mathematics (4 hours) | Math 4545 (4) | Survey of Topics in Analysis [tentative title] |
| Core Statistics (39 hours) | 6801 (4), 6802 (4) | Statistical Theory I & II |
| | 6860 (2) | Foundations of the Linear Model |
| | 6910 (4), 6950 (4) | Applied Statistics I & II |
| | 7201 (3) | Theory of Probability |
| | 7301 (3), 7302 (3) | Advanced Statistical Theory I & II |
| | 7410 (3) | Theory of the Linear Model |
| | 7540 (3) | Theory of Stochastic Processes |
| | 7730 (3) | Advanced Computational Statistics |
| | 8625 (3) | Statistical Methods for Analyzing Genetic Data |
| Core Biostatistics (8 hours) | PubHBio 7215 / Stat 6615 (2) | Design and Analysis of Clinical Trials |
| | PubHBio 8230 / Stat 7470 (3) | Advanced Longitudinal Data Analysis |
| | PubHBio 8235 (3) | Advanced Regression Modeling of Time-to-Event Data |
| Consulting (2 hours) | PubHBio 7245 / Stat 7755 (2) | Biostatistical Collaboration |
| Electives (11 hours) | | As approved by the student's PhD Examination Committee (generally chosen from courses at the 7000-level and above in PubHBio or at the 6000-level and above in Statistics). |

**TOTAL COURSE HOUR REQUIREMENTS:** The doctoral program requires a minimum of 80 semester-hours including the 64 semester-hours of courses described in the five groups of courses listed above. A grade of B- or better is required in all courses in the PhD program.

**Sample PhD in Biostatistics Program with a Methodology Specialization**

| First Year | **Autumn** | **Spring** |
|---|---|---|
| | Stat 6801 | Stat 6802 |
| | Stat 6910 | Stat 6950 |
| | Math 4545 | Stat 6860 |
| | | PubHBio 7215 / Stat 6615 |

| Second Year | **Autumn** | **Spring** |
|---|---|---|
| | Stat 7201 | Stat 7540 |
| | Stat 7301 | Stat 7302 |
| | Stat 7410 | PubHBio 8230 / Stat 7470 |

| Third Year | **Autumn** | **Spring** |
|---|---|---|
| | Stat 8625 | Elective |
| | Stat 7730 | Elective |
| | PubHBio 8235 | Elective |

**Examinations (None of these examinations may be taken more than twice)**

1. Qualifier I: This written examination covers material from the first year of coursework. This exam is the same for both the Statistics and Biostatistics PhD.

   After passing Qualifier I, the student will elect to follow either the Methodology or the Public Health specialization by completing the Specialization Declaration Form available at http://biostatprograms.osu.edu.

2. Qualifier II: Each Biostatistics specialization has a separate Qualifier II exam. In both cases, it is a comprehensive written examination testing knowledge acquired in the first two years of study and the ability to integrate and apply such knowledge. It will cover material from the first two years of coursework. It may not be attempted until Qualifier I has been passed. More details about these exams can be found at http://biostatprograms.osu.edu.

   After passing the Qualifier II, the student chooses a dissertation adviser, who must be a Category P Biostatistics graduate faculty member. The student also forms a PhD Examination Committee, consisting of at least four graduate faculty members from the Department of Statistics, College of Public Health Division of Biostatistics, or other departments consistent with the student's interests. This committee is responsible for approving a Plan of Study to be filed with the Graduate Studies Committee within two semesters after passing Qualifier II. The Plan of Study form is available at http://biostatprograms.osu.edu.

3. PhD Candidacy Examination: After completion of all required courses (as specified by the student's PhD Examination Committee), the candidate's PhD Examination Committee will administer and grade a PhD Candidacy Examination. Specific details are available at http://biostatprograms.osu.edu.

   After passing the Candidacy Exam, the student forms a Dissertation Committee. The student should meet with the committee at least twice a year to report his/her progress.

4. Final Oral Examination/Thesis Defense: Once the student has made sufficient progress (as judged by the Dissertation Committee) on his/her dissertation to warrant holding the Final Oral Examination, the Doctoral Draft Approval/Notification of Final Oral Examination form must be filed with the Graduate School at least two weeks prior to the actual Final Oral Examination/Dissertation Defense (form available on the Graduate School website). The PhD Dissertation Committee then conducts a two-hour oral examination in which the candidate discusses/defends his/her dissertation. The student must file the Application to Graduate Form (form available on the Graduate School website) with the Graduate School by the published deadline of the Graduate School. Students should consult the Graduate School website for the appropriate deadline.

   Students must pass the Final Oral Examination and submit a final, approved copy of the dissertation to the Graduate School within five years of being admitted to candidacy.

**PhD in Biostatistics with a Methodology Specialization 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. The Graduate Studies Chair is the advisor for all PhD students upon entry to the program. Students are also assigned a faculty mentor with whom they meet every quarter. This level of support will continue under semesters: Each student will meet with a faculty mentor every semester. When a student selects an advisor for dissertation work (typically during year three of the program), this advisor will replace the assigned faculty mentor.

Requirements for the quarter-based Biostatistics PhD degree include a one-year sequence on Statistical Theory (Statistics 620-621-622). The Statistical Theory sequence is a straight conversion of the quarter-based sequence. If a student already has credit for Statistics 620, but not for Statistics 621, then the student will have the option of taking a two-hour reading course (Statistics 6193 or Statistics 6194) to complete the equivalent of Statistics 6801; if a student already has credit for Statistics 620 and Statistics 621, but not Statistics 622, the student will take Statistics 6802.

Students will be held to the requirements of the program in the year they matriculated; i.e., students entering under quarters will follow the quarter-based PhD curriculum, with the option to elect the semester-based curriculum. In particular, for the Methodology specialization, students entering under quarters will not be required to take Statistics 7730 (Advanced Statistical Computing) or Statistics 6860 (Foundations of the Linear Model), though taking these courses as electives will be encouraged. Methodology specialization students typically take the probability sequence Statistics 722-723 during a single academic year. However, if a student already has credit for Statistics 722, but not for Statistics 723, then the student will have the option of taking a two-hour reading course (Statistics 8193 or Statistics 8194) to complete the equivalent of the sequence. Students entering under quarters who do not start the sequence until semesters will take only Statistics 7201.

The content of qualifying examinations from 2012 through 2014 will be adjusted to match the content of coursework taken by those who began the program under quarters.

Courses will be matched on the one-for-one basis as shown below, with the exception of the statistical theory sequence (Statistics 620-621-622) and the probability sequence (Statistics 722-723), discussed above.

| QuarterCourse | Quarter Credits | Semester Course | Semester Credits |
|---|---|---|---|
| Biostat 615 | 3 | Stat 6615 | 2 |
| Biostat 709 | 2 | PubHBio 7245 / Stat 7755 | 2 |
| PubHBio 606 | 4 | PubHBio 7220 | 3 |
| PubHBio 701 | 4 | PubHBio 6210 | 3 |
| PubHBio 702 | 4 | PubHBio 6211 | 3 |
| PubHBio 703 | 4 | PubHBio 6212 | 3 |
| PubHBio 706 | 4 | PubHBio 8235 | 3 |
| PubHBio 786 | 3 | PubHBio 7245 / Stat 7755 | 2 |
| PubHBio / Biostat 605 | 4 | PubHBio 7235 / Stat 6605 | 3 |
| PubHBio /STAT 651 | 4 | PubHBio 7225 / Stat 6510 | 3 |
| PubHBio /STAT 652 | 4 | PubHBio 7240 / Stat 6520 | 3 |
| PubHBio /STAT 726 | 4 | PubHBio 8230 / Stat 7470 | 3 |
| PubHEpi 710 | 4 | PubHEpi 6410 or 6430.01 | 3 |
| Stat 620-621-622 | 3+3+3 | Stat 6801-6802 | 4+4 |
| Stat 641 | 5 | Stat 6910 | 4 |
| Stat 645 | 5 | Stat 6950 | 4 |
| **QuarterCourse** | **Quarter Credits** | **Semester Course** | **Semester Credits** |
| Stat 722-723 | 4+4 | Stat 7201 | 4 |
| Stat 742 | 4 | Stat 7410 | 3 |
| Stat 743 | 3 | Stat 7430 | 3 |
| Stat 773 | 3 | Stat 7730 | 3 |
| Stat 822 | 3 | Stat 7301 | 3 |
| Stat 821 | 3 | Stat 7302 | 3 |
| Stat 832 | 3 | Stat 7540 | 3 |
| Stat 833 | 3 | Stat 8625 | 3 |

**Sample PhD in Biostatistics with a Methodology Specialization Transition Programs**

***First and Second Years under Quarter System, Subsequent Years under Semester System (Students starting Autumn Quarter 2010)***

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | Stat 620 (4) | Stat 621 (4) | Stat 622 (4) |
| | Stat 645 (5) | Stat 641 (4) | Elective (5) |
| | Math 547 (3) | Math 548 (3) | Math 549 (3) |

| Second Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | Stat 722 (4) | Stat 723 (4) | Elective (3) |
| | Stat 742 (4) | Stat 743 (3) | Elective (3) |
| | Stat 820 (3) | Stat 821 (3) | Elective (4) |
| | | Stat 832 (3) | |
| | | Biostat 709 (2) | |

| Third Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | Stat 6615 (2) | PubHBio 8235 (3) |
| | Stat 8625 (3) | PubHBio 8230 |
| | Elective (3) | / Stat 7470 (3) |
| | | Elective (2) |

***First Year under Quarter System, Subsequent Years under Semester System (Students starting Autumn Quarter 2011)***

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | Stat 620 (4) | Stat 621 (4) | Stat 622 (4) |
| | Stat 645 (5) | Stat 641 (4) | Stat 881 (2) |
| | Math 547 (3) | Math 548 (3) | Math 549 (3) |
| | | | Elective (3) |

| Second Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | Stat 7201 (3) | Stat 7302 (3) |
| | Stat 7301 (3) | Stat 7540 (3) |
| | Stat 7410 (3) | Elective (3) |

| Third Year (Semesters) | **Autumn** | **Spring** |
|---|---|---|
| | Stat 6615 (2) | PubHBio 7245 |
| | Stat 7430 (3) | / Stat 7755 (2) |
| | Stat 8625 (3) | PubHBio 8230 |
| | Elective (2) | / Stat 7470 (3) |
| | | PubHBio 8235 (3) |
| | | Elective (2) |

# PHD IN BIOSTATISTICS PROGRAM
# PUBLIC HEALTH SPECIALIZATION
## Semester Curriculum

The basic philosophy of the PhD program in biostatistics is to provide trained personnel, not only to the academic profession, but also to industry and government. The goal is to develop a student's ability to create new methodologies as well as to address applied questions that arise in the biomedical sciences. Although programs are individually designed to suit the needs of particular students, there is a core curriculum that every student follows. This core curriculum includes courses in theoretical and applied statistics, as well as required coursework in a biological area such as genetics, medicine, or physiology.

After they declare their specialization preference during their second year, students in the Biostatistics PhD degree program who choose the Public Health Specialization will be assigned faculty advisers from the Biostatistics faculty (Note: the adviser could be from the Department of Statistics or the Division of Biostatistics with the College of Public Health). This document serves as a resource to be used by the student and the adviser in planning the program of study for the Public Health specialization. For additional information about PhD requirements, students are directed to the College of Public Health (CPH) *Student Handbook* and to the *Graduate School Handbook* (both resources are available online).

Note: The Biostatistics PhD program presupposes a mathematical background that includes linear algebra and advanced calculus.

**Course Requirements Under Semesters**

| | | |
|---|---|---|
| Statistics and Public Health-Biostatistics Courses (40 hours) | PubHBio 7245 / Stat 7755 (2) | Biostatistical Collaboration |
| | PubHBio 8230 / Stat 7470 (3) | Advanced Longitudinal Data Analysis |
| | PubHBio 8235 (3) | Advanced Regression Modeling of Time-to-Event Data |
| | Stat 6801 (4), 6802 (4) | Statistical Theory I & II |
| | Stat 6910 (4), 6950 (4) | Applied Statistics I & II |
| | Stat 6540 (3) | Applied Stochastic Processes |
| | *Or Stat 7540 (3)* | *(or Theory of Stochastic Processes)* |
| | Stat 6615 / PubHBio 7215(2) | Design & Analysis of Clinical Trials |
| | Stat 7410 (3) | Theory of the Linear Model |
| | Stat 7430 (3) | Generalized Linear Models |
| | Stat 7730 (3) | Advanced Computational Statistics |
| | Stat 6860 (2) | Foundations of the Linear Model |
| Epidemiology Course (4 hours) | PubHEpi 6430 (4) | Epidemiology I |
| Cognate Courses (6 hours) | At least 6 semester-hours outside of statistics/biostatistics, in a health-related field, as approved by the student's PhD Examination Committee. | |
| Electives (12 hours) | As approved by the student's PhD Examination Committee (generally chosen from courses at the 7000-level and above in PubHBio or 6000-level and above in Statistics). A grade of B- or better is required. | |

**TOTAL COURSE HOUR REQUIREMENTS:** The doctoral program requires a minimum of 80 semester-hours or 50 semester-hours beyond a master's degree. A maximum of 30 semester-hours of master's degree work may be applied to PhD requirements if approved by the faculty adviser. A grade of B- or better is required in all courses in the PhD program.

**Sample PhD in Biostatistics Program with a Public Health Specialization**

| First Year | **Autumn** | **Spring** |
|---|---|---|
| | Stat 6801 | Stat 6802 |
| | Stat 6910 | Stat 6860 |
| | PubHEpi 6430 | Stat 6950 |
| | Math 4545+ | PubHBio 7215 / Stat 6615 |

| Second Year | **Autumn** | **Spring** |
|---|---|---|
| | Stat 6540 | Stat 7430 |
| | Stat 7410 | PubHBio 8230 |
| | PubHBio 8235* | / Stat 7470* |
| | PubHEpi 6430 | Elective/Cognate |

| Third Year | **Autumn** | **Spring** |
|---|---|---|
| | Stat 7730 | PubHBio 7245 |
| | Electives/Cognates | / Stat 7755 |
| | | Electives/Cognates |

\+ Required for the Methodology Specialization, but not for the Public Health Specialization.

* These courses are offered in alternating years. In the year when one course is not offered, it is recommended that the student take the 7000-level version of the course as an elective (7235, 7230). This does not, however, serve as a substitute for the 8000-level required course.

**Examinations (None of these examinations may be taken more than twice)**

1. Qualifier I: This written examination covers material from the first year of coursework. This exam is the same for both the Statistics and Biostatistics PhD.

   After passing Qualifier I, the student will elect to follow either the Methodology or the Public Health specialization by completing the Specialization Declaration Form available at http://biostatprograms.osu.edu.

2. Qualifier II: Each Biostatistics specialization has a separate Qualifier II exam. In both cases, it is a comprehensive written examination testing knowledge acquired in the first two years of study and the ability to integrate and apply such knowledge. It will cover material from the first two years of coursework. It may not be attempted until Qualifier I has been passed. More details about these exams can be found at http://biostatprograms.osu.edu.

   After passing the Qualifier II, the student chooses a dissertation adviser, who must be a Category P Biostatistics graduate faculty member. The student also forms a PhD Examination Committee, consisting of at least four graduate faculty members from the Department of Statistics, College of Public Health Division of Biostatistics, or other departments consistent with the student's interests.

This committee is responsible for approving a Plan of Study to be filed with the Graduate Studies Committee within two semesters after passing Qualifier II. The Plan of Study form is available at http://biostatprograms.osu.edu.

3. PhD Candidacy Examination: After completion of all required courses (as specified by the student's PhD Examination Committee), the candidate's PhD Examination Committee will administer and grade a PhD Candidacy Examination. Specific details are available at http://biostatprograms.osu.edu.

   After passing the Candidacy Exam, the student forms a Dissertation Committee. The student should meet with the committee at least twice a year to report his/her progress.

4. Final Oral Examination/Thesis Defense: Once the student has made sufficient progress (as judged by the Dissertation Committee) on his/her dissertation to warrant holding the Final Oral Examination, the Doctoral Draft Approval/Notification of Final Oral Examination form must be filed with the Graduate School at least two weeks prior to the actual Final Oral Examination/Dissertation Defense (form available on the Graduate School website). The PhD Dissertation Committee then conducts a two-hour oral examination in which the candidate discusses/defends his/her dissertation. The student must file the Application to Graduate Form (form available on the Graduate School website) with the Graduate School by the published deadline of the Graduate School. Students should consult the Graduate School website for the appropriate deadline.

   Students must pass the Final Oral Examination and submit a final, approved copy of the dissertation to the Graduate School within five years of being admitted to candidacy.

**PhD in Biostatistics with a Public Health Specialization 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. The Graduate Studies Chair is the advisor for all PhD students upon entry to the program. Students are also assigned a faculty mentor with whom they meet every quarter. This level of support will continue under semesters: Each student will meet with a faculty mentor every semester. When a student selects an advisor for dissertation work (typically during year three of the program), this advisor will replace the assigned faculty mentor.

Requirements for the quarter-based Biostatistics PhD degree include a one-year sequence on Statistical Theory (Statistics 620-621-622). The Statistical Theory sequence is a straight conversion of the quarter-based sequence. If a student already has credit for Statistics 620, but not for Statistics 621, then the student will have the option of taking a two-hour reading course (Statistics 6193 or Statistics 6194) to complete the equivalent of Statistics 6801; if a student already has credit for Statistics 620 and Statistics 621, but not Statistics 622, the student will take Statistics 6802.

Students will be held to the requirements of the program in the year they matriculated; i.e., students entering under quarters will follow the quarter-based PhD curriculum, with the option to elect the semester-based curriculum. For students in the Public Health specialization, those entering under quarters will not be required to take Statistics 6540 (Applied Stochastic Processes), Statistics 6860 (Foundations of the Linear Model), or PUBHEPI 6430.02 (Lab for Epidemiology I), though taking these courses as electives will be encouraged. For the Public Health specialization, the semester-based PhD has a requirement of 6 credits in a cognate area that will be waived for students who matriculate under quarters.

The content of qualifying examinations from 2012 through 2014 will be adjusted to match the content of coursework taken by those who began the program under quarters. Courses will be matched on the one-

for-one basis, with the exception of the statistical theory sequence (Statistics 620-621-622) and the probability sequence (Statistics 722-723), discussed in the "PhD in Biostatistics with a Methodology Specialization Transition Policy" section of this document.

**Sample PhD in Biostatistics with a Public Health Specialization Transition Programs**

***First and Second Years under Quarter System, Subsequent Years under Semester System***

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | Stat 620 (4) | Stat 621 (4) | Stat 622 (4) |
| | Stat 645 (5) | Stat 641 (5) | PubHBio 703 (4) |
| | PubHBio 701 (4) | PubHBio 702 (4) | |
| **Second Year (Quarters)** | **Autumn** | **Winter** | **Spring** |
| | Stat 773 (3) | Stat 743 (3) | PubHBio 786 (3) |
| | PubHBio / | PubHBio 606 (4) | Elective (4) |
| | Stat 652 (4) | PubHBio / | Elective (3) |
| | PubHEpi 710 (4) | Biostat 605 (4) | |
| **Third Year (Semesters)** | **Autumn** | **Spring** | |
| | Stat 8625 (3) | Stat 6615 (2) | |
| | PubHBio 7225 | PubHBio 8230 | |
| | / Stat 6510 (3) | / Stat 7470 (3) | |
| | PubHBio 8235 (3) | Elective (2) | |

***First Year under Quarter System, Subsequent Years under Semester System***

| First Year (Quarters) | **Autumn** | **Winter** | **Spring** |
|---|---|---|---|
| | Stat 620 (4) | Stat 621 (4) | Stat 622 (4) |
| | Stat 645 (5) | Stat 641 (5) | PubHBio 703 (4) |
| | PubHBio 701 (4) | PubHBio 702 (4) | Elective (2) |
| **Second Year (Semesters)** | **Autumn** | **Spring** | **May** |
| | Stat 7410 (3) | Stat 6615 (2) | PubHBio 7220 (3) |
| | PubHBio 7235 | PubHBio 7245 | |
| | / Stat 6605 (3) | / Stat 7755 (2) | |
| | PubHBio 7240 | PubHEpi 6410 (3) | |
| | / Stat 6520 (3) | Electives | |
| **Third Year (Semesters)** | **Autumn** | **Spring** | |
| | Stat 7730 (3) | Stat 8625 (3) | |
| | PubHBio 7225 | PubHBio 8230 | |
| | / Stat 6510 (3) | / Stat 7470 (3) | |
| | PubHBio 8235 (3) | Electives | |