

# 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

<u>Mathematics</u> (4 hours)	Math 4545 (4)	Survey of Topics in Analysis [tentative title]
<u>Core Statistics</u> (39 hours)	6801 (4), 6802 (4) 6860 (2) 6910 (4), 6950 (4) 7201 (3) 7301 (3), 7302 (3) 7410 (3) 7540 (3) 7730 (3) 8625 (3)	Statistical Theory I & II Foundations of the Linear Model Applied Statistics I & II Theory of Probability Advanced Statistical Theory I & II Theory of the Linear Model Theory of Stochastic Processes Advanced Computational Statistics Statistical Methods for Analyzing Genetic Data
<u>Core Biostatistics</u> (8 hours)	PubHBio 7215 / Stat 6615 (2) PubHBio 8230 / Stat 7470 (3) PubHBio 8235 (3)	Design and Analysis of Clinical Trials  Advanced Longitudinal Data Analysis  Advanced Regression Modeling of Time-to-Event Data
<u>Consulting</u> (2 hours)	PubHBio 7245 / Stat 7755 (2)	Biostatistical Collaboration
<u>Electives</u> (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**

<u>First Year</u>	<b>Autumn</b> Stat 6801 Stat 6910 Math 4545	<b>Spring</b> Stat 6802 Stat 6950 Stat 6860 PubHBio 7215 / Stat 6615
<u>Second Year</u>	<b>Autumn</b> Stat 7201 Stat 7301 Stat 7410	<b>Spring</b> Stat 7540 Stat 7302 PubHBio 8230 / Stat 7470*
<u>Third Year</u>	<b>Autumn</b> Stat 8625  Stat 7730 PubHBio 8235*	<b>Spring</b> PubHBio 7245 / Stat 7755 Elective Elective

\* These courses are currently offered in alternating years.

**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.

<b>QuarterCourse</b>	<b>Quarter Credits</b>	<b>Semester Course</b>	<b>Semester Credits</b>
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
<b>QuarterCourse</b>	<b>Quarter Credits</b>	<b>Semester Course</b>	<b>Semester Credits</b>
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)*

<u>First Year</u> <u>(Quarters)</u>	<b>Autumn</b> Stat 620 (4) Stat 645 (5) Math 547 (3)	<b>Winter</b> Stat 621 (4) Stat 641 (4) Math 548 (3)	<b>Spring</b> Stat 622 (4) Elective (5) Math 549 (3)
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<u>Second Year</u> <u>(Quarters)</u>	<b>Autumn</b> Stat 722 (4) Stat 742 (4) Stat 820 (3)	<b>Winter</b> Stat 723 (4) Stat 743 (3) Stat 821 (3) Stat 832 (3) Biostat 709 (2)	<b>Spring</b> Elective (3) Elective (3) Elective (4)
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<u>Third Year</u> <u>(Semesters)</u>	<b>Autumn</b> Stat 6615 (2) Stat 8625 (3) Elective (3)	<b>Spring</b> PubHBio 8235 (3) PubHBio 8230 / Stat 7470 (3) Elective (2)
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*First Year under Quarter System, Subsequent Years under Semester System  
(Students starting Autumn Quarter 2011)*

<u>First Year</u> <u>(Quarters)</u>	<b>Autumn</b> Stat 620 (4) Stat 645 (5) Math 547 (3)	<b>Winter</b> Stat 621 (4) Stat 641 (4) Math 548 (3)	<b>Spring</b> Stat 622 (4) Stat 881 (2) Math 549 (3) Elective (3)
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<u>Second Year</u> <u>(Semesters)</u>	<b>Autumn</b> Stat 7201 (3) Stat 7301 (3) Stat 7410 (3)	<b>Spring</b> Stat 7302 (3) Stat 7540 (3) Elective (3)
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<u>Third Year</u> <u>(Semesters)</u>	<b>Autumn</b> Stat 6615 (2) Stat 7430 (3) Stat 8625 (3) Elective (2)	<b>Spring</b> PubHBio 7245 / Stat 7755 (2) PubHBio 8230 / Stat 7470 (3) PubHBio 8235 (3) Elective (2)
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