

BIOSTATISTICS

Graduate Program Head	Cheryl Thompson
Program Code	BIOST
Campus(es)	Hershey (Ph.D.)
Degrees Conferred	Doctor of Philosophy (Ph.D.)
The Graduate Faculty	View (https://secure.gradsch.psu.edu/gpms/?searchType=fac&prog=BIOST)

Biostatistics is the science that applies statistical theory and mathematical principals to research in medicine, biology, environmental science, public health, and related fields. Biostatisticians working in the area of public health develop and use mathematical and scientific methods to:

1. determine risk factors for disease and injuries, and
2. identify health trends within communities.

Biostatisticians working in the area of medicine develop and use mathematical and scientific methods to design and analyze:

1. clinical trials to investigate new therapies for treating acute and chronic illness,
2. observational studies to understand disease onset and progression,
3. basic science studies to determine the mechanisms of disease, and
4. human genetics studies to investigate the inherited susceptibility to disease.

Career opportunities are available in universities, academic medical centers, government, and private industry. The demand for individuals with graduate-level degrees in biostatistics is extremely high.

Admission Requirements

Applicants apply for admission to the program via the Graduate School application for admission (<https://gradschool.psu.edu/graduate-admissions/how-to-apply/>). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions Policies (<https://gradschool.psu.edu/graduate-education-policies/>).

The language of instruction at Penn State is English. English proficiency test scores (TOEFL/IELTS) may be required for international applicants. See GCAC-305 Admission Requirements for International Students (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-305-admission-requirements-international-students/>) for more information.

Applicants must complete prior to admission:

1. A two-semester graduate-level course in applied statistics from a recognized graduate program. The comparable courses offered by the Department of Statistics are STAT 511 and STAT 512.
2. A two-semester graduate-level course in mathematical statistics from a recognized graduate program. The comparable courses offered by the Department of Statistics are STAT 513 and STAT 514.

Prospective applicants must demonstrate:

3. For admission to the Graduate School, all applicants must have received from a regionally accredited institution a baccalaureate degree earned under residence and credit conditions substantially

equivalent to those required by Penn State. International applicants must hold the equivalent of an American four-year baccalaureate degree.

4. Results from one of the following standardized tests taken within the past five (5) years:
 - a. Graduate Record Examination (GRE)
 - b. Graduate Management Admission Test (GMAT)
 - c. Medical College Admission Test (MCAT)
 - d. Law School Admission Test (LSAT)
 - e. (This requirement is waived for applicants who have an advanced degree in a related field beyond the baccalaureate.)
5. Completion of the Graduate School application (<http://gradschool.psu.edu/prospective-students/how-to-apply/>), which includes three (3) letters of recommendation and a Curriculum Vitae or resume.
6. Payment of the application fee.
- 3.

Degree Requirements

Doctor of Philosophy

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

Each student in the Biostatistics Ph.D. program is expected to acquire knowledge in the disciplines of Biostatistics.

Each student must complete a total of 31 credits of graduate level course work, the majority of which are 500 level courses, specifically:

- 22 credits in required courses
- 6 additional credits in Epidemiology or Health Services Research
- 3 credits in elective courses, plus
- Dissertation

After the completion of the first year of course work, each student is required to take a qualifying examination, based on the coursework in PHS 523, PHS 524, PHS 525, PHS 526 and PHS 527. The decision to allow the student to continue in the program will be made by a committee of Graduate Faculty in the Biostatistics program. In addition, a comprehensive examination is administered at the completion of all course work, followed by the final oral examination in defense of the Ph.D. dissertation.

Courses

Code	Title	Credits
Required Courses		
PHS 500	Research Ethics for Clinical Investigators	1
PHS 523	Multivariate Analysis	3
PHS 524	Longitudinal Data Analysis	3
PHS 526	Categorical Data Analysis	3
PHS 527	Survival Analysis	3
PHS 528	Bayesian Methods	3
PHS 580	Clinical Trials: Design and Analysis	3
STAT 553	Asymptotic Tools	3
Select 6 credits of the following:		6
PHS 535	Quality of Care Measurement	

PHS 536	Health Survey Research Methods	
PHS 550	Principles of Epidemiology	
PHS 551	Advanced Epidemiological Methods	
PHS 552	Molecular Epidemiology of Chronic Disease	
PHS 570	Health Economics and Economic Evaluation	
Electives		
Select 3 credits of the following:		3
PHS 516	Statistical Genetics	
STAT 561	Statistical Inference I	
STAT 562	Statistical Inference II	
Total Credits		31

Minor

A graduate minor is available in any approved graduate major or dual-title program. The default requirements for a graduate minor are stated in Graduate Council policies listed under GCAC-600 Research Degree Policies (<https://gradschool.psu.edu/graduate-education-policies/>) and GCAC-700 Professional Degree Policies (<https://gradschool.psu.edu/graduate-education-policies/>), depending on the type of degree the student is pursuing:

- GCAC-611 Minor - Research Doctorate (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-611-minor-research-doctorate/>)
- GCAC-641 Minor - Research Master's (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-641-minor-research-masters/>)
- GCAC-709 Minor - Professional Doctorate (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-709-professional-doctoral-minor/>)
- GCAC-741 Minor - Professional Master's (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-741-masters-minor-professional/>)

Student Aid

Graduate assistantships available to students in this program and other forms of student aid are described in the Tuition & Funding (<https://gradschool.psu.edu/graduate-funding/>) section of The Graduate School's website. Students on graduate assistantships must adhere to the course load limits (<https://gradschool.psu.edu/graduate-education-policies/gsad/gsad-900/gsad-901-graduate-assistants/>) set by The Graduate School.

Courses

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Public Health Sciences (PHS) Course List (<https://bulletins.psu.edu/university-course-descriptions/graduate/phs/>)

Contact

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Director of Graduate Studies (DGS) or Professor-in-Charge (PIC)	Arthur Berg
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Program Website	View (http://med.psu.edu/biostatistics-phd/)