STATISTICS, B.S.

Begin Campus: Any Penn State Campus
End Campus: University Park

Program Description
This major helps prepare students with interests in mathematics, computation, and the quantitative aspects of science for careers in industry and government as statistical analysts, or for further graduate training in statistics. The major includes five options:

1. An Actuarial Statistics Option for students interested in working as actuaries in the insurance or business fields;
2. An Applied Statistics Option for students interested in a cross-disciplinary program, such as econometrics, or psychometrics;
3. A Biostatistics Option for students interested in pursuing careers with pharmaceutical companies, research hospitals or other fields in which biological data is analyzed;
4. A Graduate Study Option for students planning to go to graduate school in a statistics-related field; and
5. A Statistics and Computing Option for students wishing to combine statistical expertise with programming skills.

What is Statistics?
Statistics is the field of study of that uses mathematics, computing, and analysis, to organize and understand data. Statisticians use critical and abstract thinking through the application of mathematical principles to statistical problems, and combine modeling with computational skills to analyze data.

You Might Like This Program If...
• You enjoy working with numbers and data.
• You are a problem solver who enjoys figuring out how things work or what data means.
• You enjoy applying reasoning and analysis to make sense of information.

Entrance to Major
In order to be eligible for entrance into the Statistics major, a student must have:

1. Attained at least a 2.00 cumulative grade point average.
2. Completed MATH 140 and MATH 141; and earned a grade of C or better in each of these courses.

Degree Requirements
For the Bachelor of Science degree in Statistics, a minimum of 124 credits is required:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>80-95</td>
</tr>
</tbody>
</table>

6-15 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 0-9 credits of GN courses; 6 credits of GQ courses, 0-6 credits of GS courses.

General Education
Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (http://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)
• Quantification (GQ): 6 credits
• Writing and Speaking (GWS): 9 credits

Knowledge Domains
• Arts (GA): 6 credits
• Health and Wellness (GHW): 3 credits
• Humanities (GH): 6 credits
• Social and Behavioral Sciences (GS): 6 credits
• Natural Sciences (GN): 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)
• Inter-Domain or Approved Linked Courses: 6 credits

University Degree Requirements
First Year Engagement
All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement
6 credits are required and may satisfy other requirements
• United States Cultures: 3 credits
• International Cultures: 3 credits

Writing Across the Curriculum
3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits
A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.
Quality of Work
Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition
The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 [http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80](http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.

Requirements for the Major
To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 [http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44](http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).

Common Requirements for the Major (All Options)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Courses: Require a grade of C or better</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 140</td>
<td>Calculus With Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 141</td>
<td>Calculus with Analytic Geometry II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 220</td>
<td>Matrices</td>
<td>2-3</td>
</tr>
<tr>
<td>MATH 230</td>
<td>Calculus and Vector Analysis</td>
<td>4</td>
</tr>
<tr>
<td>STAT 184</td>
<td>Introduction to R</td>
<td>1</td>
</tr>
<tr>
<td>STAT 200</td>
<td>Elementary Statistics</td>
<td>4</td>
</tr>
<tr>
<td>STAT 380</td>
<td>Data Science Through Statistical Reasoning and Computation</td>
<td>3</td>
</tr>
<tr>
<td>STAT 414</td>
<td>Introduction to Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>STAT 415</td>
<td>Introduction to Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 461</td>
<td>Analysis of Variance</td>
<td>3</td>
</tr>
<tr>
<td>STAT 462</td>
<td>Applied Regression Analysis</td>
<td>3</td>
</tr>
<tr>
<td>STAT 470</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Courses: Require a grade of C or better
Select 1-3 credits from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 480</td>
<td>Introduction to SAS</td>
<td>1-3</td>
</tr>
<tr>
<td>STAT 481</td>
<td>Intermediate SAS for Data Management</td>
<td></td>
</tr>
<tr>
<td>STAT 482</td>
<td>Advanced Topics in SAS</td>
<td></td>
</tr>
<tr>
<td>STAT 483</td>
<td>Statistical Programming in SAS</td>
<td></td>
</tr>
</tbody>
</table>

Requirements for the Option
Select an option

Requirements for the Option
Actuarial Statistics Option (53 credits)
Students who major in statistics with the actuarial statistics option and who wish to complete a concurrent major in mathematics may not choose the actuarial mathematics option in mathematics. Any other option in mathematics is acceptable.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 102</td>
<td>Introductory Microeconomic Analysis and Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 104</td>
<td>Introductory Macroeconomic Analysis and Policy</td>
<td>3</td>
</tr>
<tr>
<td>Prescribed Courses: Require a grade of C or better</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCTG 211</td>
<td>Financial and Managerial Accounting for Decision Making</td>
<td>4</td>
</tr>
<tr>
<td>FIN 301</td>
<td>Corporation Finance</td>
<td>3</td>
</tr>
<tr>
<td>RM 302</td>
<td>Risk and Insurance</td>
<td>3</td>
</tr>
<tr>
<td>RM 410</td>
<td>Financial Mathematics for Actuaries</td>
<td>3</td>
</tr>
<tr>
<td>RM 411</td>
<td>Actuarial Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>RM 412</td>
<td>Actuarial Mathematics II</td>
<td>3</td>
</tr>
<tr>
<td>STAT 463</td>
<td>Applied Time Series Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Additional Courses: Require a grade of C or better
Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMPSC 101</td>
<td>Introduction to Programming</td>
<td>3</td>
</tr>
<tr>
<td>CMPSC 102</td>
<td>Introduction to Visual Programming</td>
<td></td>
</tr>
<tr>
<td>CMPSC 121</td>
<td>Introduction to Programming Techniques</td>
<td></td>
</tr>
<tr>
<td>CMPSC 200</td>
<td>Programming for Engineers with MATLAB</td>
<td></td>
</tr>
<tr>
<td>CMPSC 201</td>
<td>Programming for Engineers with C++</td>
<td></td>
</tr>
<tr>
<td>CMPSC 202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Select three of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE 434</td>
<td>Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>IE 436</td>
<td>Six Sigma Methodology</td>
<td></td>
</tr>
<tr>
<td>MATH 436</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>or MATH 441Matrix Algebra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>Numerical Computations</td>
<td></td>
</tr>
<tr>
<td>or MATH 459Introduction to Numerical Analysis I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT 416</td>
<td>Stochastic Modeling</td>
<td></td>
</tr>
<tr>
<td>STAT 440</td>
<td>Computational Statistics</td>
<td></td>
</tr>
<tr>
<td>STAT 464</td>
<td>Applied Nonparametric Statistics</td>
<td></td>
</tr>
<tr>
<td>STAT 466</td>
<td>Survey Sampling</td>
<td></td>
</tr>
</tbody>
</table>

Supporting Courses and Related Areas
Select 13 credits from department list

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT 416</td>
<td>Stochastic Modeling</td>
<td>3</td>
</tr>
</tbody>
</table>

Applied Statistics Option (47 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Courses: Require a grade of C or better</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMPSC 101</td>
<td>Introduction to Programming</td>
<td>3</td>
</tr>
<tr>
<td>CMPSC 121</td>
<td>Introduction to Programming Techniques</td>
<td></td>
</tr>
<tr>
<td>CMPSC 201</td>
<td>Programming for Engineers with C++</td>
<td></td>
</tr>
<tr>
<td>CMPSC 202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Select four of the following:

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE 434</td>
<td>Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>IE 436</td>
<td>Six Sigma Methodology</td>
<td></td>
</tr>
<tr>
<td>MATH 436</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>or MATH 441Matrix Algebra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>Numerical Computations</td>
<td></td>
</tr>
<tr>
<td>or MATH 459Introduction to Numerical Analysis I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT 416</td>
<td>Stochastic Modeling</td>
<td></td>
</tr>
</tbody>
</table>
Supporting Courses and Related Areas

Select 32 credits from department list, including a minor in a supporting field other than Mathematics.

1 Neither the mathematics major nor the six sigma minor, nor the risk management major with the actuarial science option may be used to satisfy the minor/concurrent major requirement. If a student wants to work in a supporting field that does not have a minor, he or she can propose a list of six appropriate courses and petition the Statistics Department for approval. It is the student’s responsibility to justify the appropriateness of the proposed list. Students must receive a grade of C or better in each of these six courses.

Biostatistics Option (56–57 credits)

Code | Title | Credits
--- | --- | ---
BIOL 110 | Biology: Basic Concepts and Biodiversity | 4
CHEM 110 | Chemical Principles I | 3
CHEM 111 | Experimental Chemistry I | 1

Additional Courses

Additional Courses: Require a grade of C or better

Select one of the following:
- CMPSC 101 Introduction to Programming
- CMPSC 121 Introduction to Programming Techniques
- CMPSC 201 Programming for Engineers with C++
- CMPSC 202

Select three of the following:
- BIOL 220W Biology: Populations and Communities
- BIOL 222 Genetics
- BIOL 230W Biology: Molecules and Cells
- BIOL 240W Biology: Function and Development of Organisms

Select 6 credits from 400-level BIOL courses

Select four of the following:
- IE 434 Statistical Quality Control
- IE 436 Six Sigma Methodology
- MATH 436 Linear Algebra
- MATH 456 Introduction to Numerical Analysis II
- MATH 468 Mathematical Coding Theory

Supporting Courses and Related Areas

Select 19-20 credits from department list

Statistics and Computing Option (47 credits)

Code | Title | Credits
--- | --- | ---
CMPSC 121 | Introduction to Programming Techniques | 3
CMPSC 201 | Programming for Engineers with C++ | 3
CMPSC 202 | | 3

Supporting Courses and Related Areas

Select 14 credits from department list

Statistics and Computing Option (47 credits)

Code | Title | Credits
--- | --- | ---
CMPSC 360 | Discrete Mathematics for Computer Science | 3

Graduate Study Option (47 credits)

A student completing the Graduate Study option will have earned a minor in mathematics in addition to a B.S. in Statistics. However, a student must fill out and submit the appropriate paperwork to the Mathematics Department in order for this minor to be officially recognized.

Code | Title | Credits
--- | --- | ---
MATH 312 | Concepts of Real Analysis | 3
MATH 403 | Classical Analysis I | 3
MATH 404 | Classical Analysis II | 3

Additional Courses

Additional Courses: Require a grade of C or better

Select one of the following:
- CMPSC 101 Introduction to Programming
- CMPSC 121 Introduction to Programming Techniques
- CMPSC 201 Programming for Engineers with C++
- CMPSC 202

Select three of the following:
- MATH 310 Elementary Combinatorics
- MATH 311W Concepts of Discrete Mathematics
- MATH 421 Complex Analysis (does not require a grade of C or better)
- MATH 422 Wavelets and Fourier Analysis: Theory and Applications
- MATH 426 Introduction to Modern Geometry (does not require a grade of C or better)
- MATH 429 Introduction to Topology (does not require a grade of C or better)
- MATH 456 Introduction to Numerical Analysis II
- MATH 468 Mathematical Coding Theory

Select four of the following:
- IE 434 Statistical Quality Control
- IE 436 Six Sigma Methodology
- MATH 436 Linear Algebra
- MATH 456 Introduction to Numerical Analysis II
or MATH 311W Concepts of Discrete Mathematics

Select 9 credits of the following:  

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMPSC 221</td>
<td>Object Oriented Programming with Web-Based Applications</td>
<td></td>
</tr>
<tr>
<td>400-level CMPSC (other than CMPSC 451/MATH 451 or CMPSC 455/MATH 455)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Select four of the following:  

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE 434</td>
<td>Statistical Quality Control</td>
<td></td>
</tr>
<tr>
<td>IE 436</td>
<td>Six Sigma Methodology</td>
<td></td>
</tr>
<tr>
<td>MATH 436</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>or MATH 441</td>
<td>Linear Algebra</td>
<td></td>
</tr>
</tbody>
</table>

Select 9 credits of the following:  

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 451</td>
<td>Numerical Computations</td>
<td></td>
</tr>
<tr>
<td>or MATH 455</td>
<td>Numerical Computations</td>
<td></td>
</tr>
<tr>
<td>STAT 414</td>
<td>Stochastic Modeling</td>
<td></td>
</tr>
<tr>
<td>STAT 440</td>
<td>Computational Statistics</td>
<td></td>
</tr>
<tr>
<td>STAT 463</td>
<td>Applied Time Series Analysis</td>
<td></td>
</tr>
<tr>
<td>STAT 464</td>
<td>Applied Nonparametric Statistics</td>
<td></td>
</tr>
<tr>
<td>STAT 466</td>
<td>Survey Sampling</td>
<td></td>
</tr>
</tbody>
</table>

Select 14 credits from department list

### Integrated B.S. in Statistics and Master of Applied Statistics (M.A.S.)

The Integrated Undergraduate-Graduate (IUG) degree with B.S. in Statistics and Master of Applied Statistics (M.A.S.) is designed to be completed in five years. This integrated degree will enable a select number of highly qualified and career-oriented students to obtain training in statistics focused on developing data analysis skills and exploration of core areas of applied statistics at the undergraduate and graduate levels. The M.A.S. degree is a professional master’s degree that emphasizes applications and does not provide as much training in the mathematical and statistical theory. The degree prepares students with interests in mathematics, computation, and the quantitative aspects of science for careers in industry and government as statistical analyst. Research divisions in the pharmaceutical industry, quality control and quality engineering divisions in manufacturing companies, clinical research units, corporate planning and research units, and other data-intensive positions require persons with training in mathematics, computation, database management, and statistical analysis, which this program will provide.

### Application Process

The number of openings in the integrated B.S./M.A.S. program is limited. Admission will be based on specific criteria and the recommendation of faculty.

Applicants to the integrated program:

1. Must be enrolled in the Statistics B.S. program.
2. Must have completed at least 60 credits of the undergraduate degree program including the two courses: STAT 414 and STAT 415, and the students must apply to the program prior to completing 110 credits.
3. Must submit a transcript and a statement of purpose.
4. Must present a departmental-approved plan of study in the application process in consultation with the M.A.S. program director.
5. Must be recommended by the chair of the department’s undergraduate program committee.
6. Must be accepted into the M.A.S. program in Statistics.

For the IUG B.S./M.A.S. degree, 120 credits are required for the B.S. and 30 credits for the M.A.S. The following twelve graduate-level credits can apply to both B.S. and M.A.S. degrees; six of these are at the 500 level:

### Degree Requirements

IUG Statistics B.S. prescribed Statistics courses: See above, but note that students in IUG Statistics B.S. take STAT 501 and STAT 502 instead of STAT 460 and STAT 462.

IUG Statistics M.A.S. requirement (30 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 414</td>
<td>Introduction to Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>STAT 415</td>
<td>Introduction to Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT 501</td>
<td>Regression Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT 502</td>
<td>Analysis of Variance and Design of Experiments</td>
<td>3</td>
</tr>
<tr>
<td>STAT 580</td>
<td>Statistical Consulting Practicum I</td>
<td>2</td>
</tr>
<tr>
<td>STAT 581</td>
<td>Statistical Consulting Practicum II</td>
<td>1</td>
</tr>
</tbody>
</table>

**Electives**

Select 15 credits of STAT 503-STAT 510 and the departmental list of additional courses for the M.A.S. program with the approval of the adviser

For all students in the M.A.S. program, the STAT 581 course will have a comprehensive written project report required as part of the course, which serves as the culminating experience.

### Academic Advising

The objectives of the university’s academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee’s unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy)
University Park
Undergraduate Statistics Office
Academic Advising
323 Thomas Building
University Park, PA 16802
814-865-1348
stat-advising@psu.edu

Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2019-20 academic year. To access previous years’ suggested academic plans, please visit the archive (http://bulletins.psu.edu/undergraduate/archive) to view the appropriate Undergraduate Bulletin edition (Note: the archive only contain suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

Applied Option at University Park Campus

The course series listed below provides only one of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 140‡**</td>
<td>4</td>
<td>MATH 141‡#†</td>
<td>4</td>
</tr>
<tr>
<td>STAT 200†</td>
<td>4</td>
<td>STAT 380*</td>
<td>3</td>
</tr>
<tr>
<td>STAT 184*</td>
<td>1</td>
<td>ENGL 15, 30, or ESL 15‡</td>
<td>3</td>
</tr>
<tr>
<td>First Year Seminar</td>
<td>1</td>
<td>General Education Course</td>
<td>3</td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Education Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 220†</td>
<td>2</td>
<td>STAT 414*</td>
<td>3</td>
</tr>
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Third Year

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Fourth Year

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* Course requires a grade of C or better for the major
† Course requires a grade of C or better for General Education
# Course is an Entrance to Major requirement
‡ Course satisfies General Education and degree requirement

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Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

All incoming Schreyer Honors College first-year students at University Park will take ENGL/CAS 137 in the fall semester and ENGL/CAS 138 in the spring semester. These courses carry the GWS designation and replace both ENGL 30 and CAS 100. Each course is 3 credits.

Program Notes:

The applied statistics option requires that the student complete the requirements for a supporting minor or concurrent major. Neither the mathematics major/minor nor the six sigma minor, nor the risk management major with the actuarial science option may be used to satisfy the minor/concurrent major requirement. If a student wants to work in a supporting field that does not have a minor, he or she can propose a list of six appropriate courses and petition the Statistics Department for approval. It is the student’s responsibility to justify the appropriateness of the proposed list. Students must receive a grade of C or better in each of these six courses.

Actuarial Option at University Park Campus

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in policies, procedures, educational offerings, and requirements at any
time. This plan should be used in conjunction with your degree audit
(accessible in LionPATH as either an Academic Requirements or What If
report). Please consult with a Penn State academic adviser on a regular
basis to develop and refine an academic plan that is appropriate for you.

**First Year**

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**Second Year**

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**Third Year**

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**Fourth Year**

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Total Credits 124

* Course requires a grade of C or better for the major
† Course requires a grade of C or better for General Education

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in the spring semester. These courses carry the GWS designation and
replace both ENGL 30 and CAS 100. Each course is 3 credits.

**Biostatistics Option at University Park Campus**

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ways to move through this curriculum. The University may make changes
in policies, procedures, educational offerings, and requirements at any
time. This plan should be used in conjunction with your degree audit
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**Second Year**

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**Third Year**

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**Fourth Year**

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Total Credits 124

* Course is an Entrance to Major requirement
† Course satisfies General Education and degree requirement

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## Computing Option at University Park Campus

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### First Year

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<td>CMPSC 121 or 131&lt;sup&gt;‡&lt;/sup&gt;</td>
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<td>CMPSC 122 or 132&lt;sup&gt;‡&lt;/sup&gt;</td>
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### Second Year

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<tr>
<td>STAT 200&lt;sup&gt;‡&lt;/sup&gt;</td>
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<td>STAT 380&lt;sup&gt;‡&lt;/sup&gt;</td>
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<td>STAT 184&lt;sup&gt;‡&lt;/sup&gt;</td>
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<td>Supporting course (consult with an academic advisor for options)</td>
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### Third Year

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Total Credits 122-124

- Course requires a grade of C or better for the major
- Course requires a grade of C or better for General Education
- Course is an Entrance to Major requirement
- Course satisfies General Education and degree requirement

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Supporting course (consult with an academic adviser for options) | 3 |
---|---|

14.5 | 15 |

Total Credits 123

**Graduate Studies Option at University Park Campus**

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Total Credits 16

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<td><strong>General Education Course</strong></td>
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<tr>
<td>MATH 220‡</td>
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<td>MATH 230</td>
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<td>CMPSC 121 or 131‡</td>
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<tr>
<td>General Education Course</td>
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<tr>
<td>General Education Course</td>
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<tr>
<td>General Education Course (GHW)</td>
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Total Credits 16

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<th>Third Year</th>
<th>Credits</th>
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<th>Fall</th>
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<td><strong>General Education Course</strong></td>
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<td>STAT 415</td>
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<td>STAT 464 or 466</td>
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<tr>
<td>CAS 100, 100A, 100B, or 100C‡</td>
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<td>MATH 311W</td>
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<td>Supporting course (consult with an academic adviser for options)</td>
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Total Credits 15

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<th>Fourth Year</th>
<th>Credits</th>
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<th>Fall</th>
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<tr>
<td><strong>General Education Course</strong></td>
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<td>MATH 480</td>
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<td>MATH 463</td>
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<td>MATH 404</td>
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Total Credits 15

**University Requirements and General Education Notes:**

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of "C" or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

All incoming Schreyer Honors College first-year students at University Park will take ENGL/CAS 137 in the fall semester and ENGL/CAS 138 in the spring semester. These courses carry the GWS designation and replace both ENGL 30 and CAS 100. Each course is 3 credits.

**Career Paths**

Statistics can be applied in a broad range of fields, including business, agriculture, finance, public policy, and many more. As data in all forms become more easily stored and accessed, so does the demand and opportunity for statisticians to help others discern what can (or cannot) be learned from the information available. In fact, statisticians are also frequently sought after for their disciplined approach to problem solving and critical thinking, even when no formal data analysis is needed.

**Careers**

Statisticians in the pharmaceutical industry work with doctors and research scientists to design and execute experiments and clinical trials. - Statisticians at technology and manufacturing companies work to advance product development from ensuring reliability and quality of hardware components to software development. - Statisticians collaborate with epidemiologists and public health agencies like the NIH and CDC to study infectious disease dynamics among threatened populations. - Statisticians at government agencies like the U.S. Department of Education, Census Bureau, and Department of Labor help inform public policy and assess impact of legislative changes. - And much more...
MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE STATISTICS PROGRAM (http://thisisstatistics.org/jobs-in-statistics)

Professional Resources
• The American Statistical Association (http://www.amstat.org)

Contact
University Park
DEPARTMENT OF STATISTICS
326 Thomas Building
University Park, PA 16802
814-865-1348
stat-advising@psu.edu

http://stat.psu.edu/about-us/contact-us