## 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 crossdisciplinary 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 problem solving and creative thinking.
- You have a passion for turning information into decisions, discoveries, and insight.
- You want to develop a skillset in high demand across a variety of fields in science, technology, finance, risk analysis, manufacturing, research, and industry.


## 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 120 credits is required:

| Requirement | Credits |
| :--- | :--- |
| General Education | 45 |
| Electives | $0-1$ |
| Requirements for the Major | $81-94$ |

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.

## 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 (https://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) |  |  |
| :--- | :--- | ---: |
| Code Title | Credits |  |
| Prescribed Courses |  |  |
| Prescribed Courses: | Require a grade of C or better |  |
| MATH 140 | Calculus With Analytic Geometry I | 4 |
| MATH 141 | Calculus with Analytic Geometry II | 4 |
| MATH 220 | Matrices | $2-3$ |
| MATH 230 | Calculus and Vector Analysis | 4 |
| STAT 184 | Introduction to R | 2 |
| STAT 200 | Elementary Statistics | 4 |
| STAT 300 | Statistical Modeling I | 3 |
| STAT 380 | Data Science Through Statistical Reasoning and | 3 |
|  | Computation |  |
| STAT 400 | Statistical Modeling II | 3 |
| STAT/MATH 414 | Introduction to Probability Theory | 3 |
| STAT/MATH 415 | Introduction to Mathematical Statistics | 3 |
| STAT 470W | Capstone for Statistics Major--Problem Solving | 3 |
|  | and Communication in Applied Statistics |  |

Additional Courses
Additional Courses: Require a grade of $C$ or better

| Select 1-3 credits from: | $1-3$ |
| :--- | :--- | :--- |
| STAT 480 | Introduction to SAS |
| STAT 481 | Intermediate SAS for Data Management |
| STAT 482 | Advanced Topics in SAS |
| STAT 483 | Statistical Programming in SAS |

Requirements for the Option
Select an option
42-52

## Requirements for the Option

## Actuarial Statistics Option (48 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.
Code Title Credits

## Prescribed Courses

| ECON 102 | Introductory Microeconomic Analysis and Policy | 3 |
| :--- | :--- | :--- |
| ECON 104 | Introductory Macroeconomic Analysis and Policy | 3 |
| Prescribed Courses: Require a grade of C or better |  |  |
| ACCTG 211 | Financial and Managerial Accounting for Decision | 4 |
|  | Making | 3 |
| FIN 301 | Corporation Finance | 3 |
| RM 302 | Risk and Insurance | 3 |



| RM 415 | Modeling for Actuarial Science |
| :--- | :--- |
| RM 420 | Property, Casualty, and Health Insurance |
| STAT/MATH | Stochastic Modeling |
| 416 |  |
| STAT 440 | Computational Statistics |
| STAT 463 | Applied Time Series Analysis |
| STAT 464 | Applied Nonparametric Statistics |
| STAT 466 | Survey Sampling |

## Supporting Courses and Related Areas

Select 27 credits from department list, including a minor in a supporting field other than Mathematics ${ }^{1}$

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 (50-52 credits)

Code Title Credits
Prescribed Courses
Prescribed Courses: Require a grade of $C$ or better
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 3 credits from the following:
CMPSC 101 Introduction to Programming
CMPSC 121 Introduction to Programming Techniques
CMPSC 131 Programming and Computation I: Fundamentals
CMPSC 201 Programming for Engineers with C++
Select 7-8 credits from 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 12 credits from the following:
BBH/HPA 440 Principles of Epidemiology
CMPSC 448 Machine Learning and Algorithmic AI
IE 434 Statistical Quality Control
IE 436 Six Sigma Methodology
MATH 436 Linear Algebra
or MATH 441Matrix Algebra
MATH/CMPSC Numerical Computations
451
or MATH/ Introduction to Numerical Analysis I CMPSC 455
RM 415 Modeling for Actuarial Science
RM $420 \quad$ Property, Casualty, and Health Insurance

| STAT/MATH | Stochastic Modeling |
| :--- | :--- |
| 416 |  |
| STAT 440 | Computational Statistics |
| STAT 463 | Applied Time Series Analysis |
| STAT 464 | Applied Nonparametric Statistics |
| STAT 466 | Survey Sampling |
| Supporting Courses and Related Areas |  |
| Select $14-15$ credits from department list | $14-15$ |

## Graduate Study Option (42 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 |
| :--- | :--- | :--- |
| Prescribed Courses |  |  |
| Prescribed Courses: Require a grade of C or better |  |  |
| 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 3 credits from the following:
CMPSC 101 Introduction to Programming
CMPSC 121 Introduction to Programming Techniques
CMPSC 131 Programming and Computation I: Fundamentals
CMPSC 201 Programming for Engineers with C++
Select 9 credits from 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
$\begin{array}{ll}\text { MATH } 426 & \text { Introduction to Modern Geometry }{ }^{1} \\ \text { MATH } 429 & \text { Introduction to Topology }{ }^{1}\end{array}$
MATH/CMPSC Introduction to Numerical Analysis II
456
MATH 468 Mathematical Coding Theory
Select 12 credits from the following:
BBH/HPA 440 Principles of Epidemiology
CMPSC 448 Machine Learning and Algorithmic AI
IE 434 Statistical Quality Control
IE 436 Six Sigma Methodology
MATH 436 Linear Algebra
or MATH 441Matrix Algebra
MATH/CMPSC Numerical Computations
451
or MATH/ Introduction to Numerical Analysis I CMPSC 455
RM 415 Modeling for Actuarial Science
RM 420 Property, Casualty, and Health Insurance
STAT/MATH Stochastic Modeling
416

| STAT 440 | Computational Statistics |
| :--- | :--- |
| STAT 463 | Applied Time Series Analysis |
| STAT 464 | Applied Nonparametric Statistics |
| STAT 466 | Survey Sampling |

## Supporting Courses and Related Areas

Select 9 credits from department list
${ }^{1}$ Course does not require a grade of C or better


## Additional Courses

Additional Courses: Require a grade of $C$ or better
CMPSC 360 Discrete Mathematics for Computer Science 3
or MATH 311W Concepts of Discrete Mathematics
Select 9 credits of the following:
CMPSC 221 Object Oriented Programming with Web-Based Applications
400-level CMPSC (other than CMPSC 451/MATH 451 or CMPSC 455/MATH 455)
Select 12 credits from the following:
BBH/HPA 440 Principles of Epidemiology
CMPSC 448 Machine Learning and Algorithmic AI
IE 434 Statistical Quality Control
IE $436 \quad$ Six Sigma Methodology
MATH 436 Linear Algebra
or MATH 441Matrix Algebra
MATH/CMPSC Numerical Computations
451
or MATH/ Introduction to Numerical Analysis I CMPSC 455
RM 415 Modeling for Actuarial Science
RM 420 Property, Casualty, and Health Insurance
STAT/MATH Stochastic Modeling
416
STAT 440 Computational Statistics
STAT 463 Applied Time Series Analysis
STAT 464 Applied Nonparametric Statistics
STAT 466 Survey Sampling

## Supporting Courses and Related Areas

Select 9 credits from department list
9

## 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 (https://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 and Inter-Domain courses do not meet this requirement.)

- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits


## Breadth in the Knowledge Domains (Inter-Domain courses do not

 meet this requirement.)- Arts (GA): 3 credits
- Health and Wellness (GHW): 3 credits
- Humanities (GH): 3 credits
- Social and Behavioral Sciences (GS): 3 credits
- Natural Sciences (GN): 3 credits


## Integrative Studies

- Inter-Domain Courses (Inter-Domain): 6 credits


## Exploration

- GN, may be completed with Inter-Domain courses: 3 credits
- GA, GH, GN, GS, Inter-Domain courses. This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher: 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 (https://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.

## Integrated B.S. in Statistics and M.A.S. in Applied Statistics

Requirements for the Integrated B.S. in Statistics and M.A.S. in Applied Statistics can be found in the Graduate Bulletin (https://bulletins.psu.edu/graduate/programs/majors/statistics/ \#integratedundergradgradprogramstext).

## Program Learning Objectives

- Statistical methods and theory: Graduates will be prepared to design studies, use graphical and other means to explore data, build and assess statistical models, employ a variety of formal inference procedures (including resampling methods), and draw appropriate scope of conclusions from the analysis. They will have knowledge and experience applying a variety of statistical methods, assessing their appropriateness, and communicating results. They will have a foundation in theoretical statistics principles for sound analyses.
- Data management and computation / data science: Graduates will be facile with professional statistical software and other appropriate tools for data exploration, cleaning, validation, analysis, and communication. They will be able to program in a higher-level language, to think algorithmically, to use simulation-based statistical techniques, and to undertake simulation studies. Graduates will be prepared to manage and marshal data, including joining data from different sources and formats and restructuring data into a form suitable for analysis. Graduates will be prepared to undertake analyses in a well-documented and reproducible way.
- Mathematical foundations: Graduates will be prepared to apply mathematical ideas from linear algebra and calculus to statistics, and to set up and apply probability models.
- Statistical practice: Graduates will be prepared to write clearly, speak fluently, and construct effective visual displays and compelling written summaries. Graduates will be prepared collaborate in teams and to organize and manage projects. They will be prepared to communicate complex statistical methods in basic terms to managers and other audiences and visualize results in an accessible manner.
- Discipline-specific knowledge for application domain: Graduates will be prepared to apply statistical reasoning to domain-specific questions. This capacity includes translating research questions into statistical questions and communicating results appropriate to different disciplinary audiences.

Source: American Statistical Association Undergraduate Guidelines
Workgroup (2014). 2014 curriculum guidelines for undergraduate programs in statistical science. Alexandria, VA: American Statistical Association.

## 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 (https://senate.psu.edu/ policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

## University Park

Andrea Brandimarte
Undergraduate Academic Adviser
323E Thomas Building
University Park, PA 16802
814-863-0355
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 2023-24 academic year. To access previous years' suggested academic plans, please visit the archive (https:// bulletins.psu.edu/undergraduate/archive/) to view the appropriate Undergraduate Bulletin edition (Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

## Actuarial Option: Statistics, B.S. 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

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH 140 (GQ) ${ }^{\text {*\#\# } \dagger}$ | 4 MATH 141 (GQ) ${ }^{\text {* } \ddagger \# \dagger}$ | 4 |
| STAT 200 (GQ) ${ }^{\text {* }}$ | 4 STAT 300* | 3 |
| STAT 184* | 2 ECON 104 (GS) ${ }^{\dagger}$ | 3 |
| PSU 16 | 1 ACCTG $211^{*}$ | 4 |
| ECON 102 (GS) ${ }^{\dagger}$ | 3 General Education Course (GN) | 3 |
| General Education Course (GHW) | 1.5 |  |
|  | 15.5 | 17 |

## Second Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH $220{ }^{\text {* }}$ | 3 STAT 414* | 3 |
| MATH 230* | 4 STAT 400* | 3 |
| STAT 380* | 3 General Education Course (GH) | 3 |
| CMPSC $131{ }^{\text {* }}$ | 3 FIN 301* | 3 |
| ENGL 15 or ESL 15 (GWS) ${ }^{\ddagger}$ | $3 \mathrm{RM} \mathrm{302*}$ | 3 |
|  | 16 | 15 |
| Third Year |  |  |
| Fall | Credits Spring | Credits |
| STAT 415* | 3 STAT 463* | 3 |
| RM 410* | 3 RM 411 or 420* | 3 |
| ENGL 202C (GWS) ${ }^{\ddagger}$ | 3 STAT 440 (Adv Stat)* | 3 |
| CAS 100 (GWS) ${ }^{\ddagger}$ | 3 General Education Course (GN) | 3 |
| General Education Course(GA) | 3 General Education Course (US) | 3 |
|  | 15 | 15 |
| Fourth Year |  |  |
| Fall | Credits Spring | Credits |
| RM 420 or $411^{*}$ | 3 STAT 470W* | 3 |
| STAT 466 (Adv Stat)* | 3 RM 412 or 422* | 3 |
| General Education Course (GA) | 3 STAT 480 | 1 |
| General Education Course (GH) | 3 Supporting course (check with advising) | 3 |
| General Education Course (IL) | 3 General Education Course (GN) | 3 |
|  | General Education Course (GHW) | 1.5 |
|  | 15 | 14.5 |

## Total Credits 123

* Course requires a grade of $C$ or better for the major
$\ddagger$ 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


## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).
$\mathrm{W}, \mathrm{M}, \mathrm{X}$, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of ' $C$ ' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and

ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

## Applied Option: Statistics, B.S. at University Park Campus

Note: a supporting program is required for this program (e.g., minor or concurrent major); consultation with an academic adviser is recommended.

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 |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| MATH 140 (GQ) ${ }^{\text {*\#\#† }}$ | 4 MATH 141 (GQ) ${ }^{\text {* }}$ \# ${ }^{\text {¢ }}$ | 4 |
| STAT 200 (GQ) ${ }^{\text {* }}$ | 4 STAT 300 | 3 |
| STAT 184* | 2 ENGL 15 or ESL 15 (GWS) ${ }^{\ddagger}$ | 3 |
| PSU 16 | 1 General Education Course (GH) | 3 |
| General Education Course (GA) | 3 General Education Course (GN) | 3 |
| General Education Course (GHW) | 1.5 |  |
|  | 15.5 | 16 |


| Second Year |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| MATH $220{ }^{*}+$ | 3 STAT 414* | 3 |
| MATH 230* | 4 STAT 463* | 3 |
| CMPSC 131* ${ }^{\text {* }}$ | 3 CAS 100 (GWS) ${ }^{\ddagger}$ | 3 |
| STAT 380* | 3 Supporting Course | 3 |
| General Education Course (GS) | 3 General Education Course (GA) | 3 |

## Third Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 415* | 3 STAT 440* | 3 |
| STAT 400* | 3 STAT 416* | 3 |
| ENGL 202C (GWS) ${ }^{\ddagger}$ | 3 Supporting Course | 3 |
| Supporting Course | 3 General Education Course <br> (IL) | 3 |
| General Education Course (GH) | 3 General Education Course (GS) | 3 |

Fourth Year

| Fall | Credits Spring | Credits |
| :--- | :--- | ---: |
| STAT $464^{*}$ | 3 STAT 470W* | 3 |
| STAT $466^{*}$ | 3 STAT 480* | 1 |
| Supporting Course | 3 Supporting Course | 3 |
| Supporting Course | 3 Supporting Course | 3 |
| General Education Course | 3 General Education Course | 3 |
| (GN) | (US) |  |


| General Education Course | 1.5 |
| :--- | :--- |
| (GHW) |  |

15
14.5

Total Credits 122

* Course requires a grade of $C$ or better for the major
$\ddagger$ 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


## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).
$\mathrm{W}, \mathrm{M}, \mathrm{X}$, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C 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.

## Applied Option (MATH 26): Statistics, B.S. at University Park Campus

Note: a supporting program is required for this program (e.g., minor or concurrent major); consultation with an academic adviser is recommended.

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 |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| MATH 26, 40, or 41 (GQ) | 3 MATH 140 (GQ) ${ }^{\text {#\# }}$ | 4 |
| STAT 200 (GQ) ${ }^{\text {* }}$ | 4 STAT 300* | 3 |
| STAT 184* | 2 ENGL 15 or ESL 15 (GWS) ${ }^{\ddagger}$ | 3 |
| PSU 16 | 1 General Education Course (GH) | 3 |
| General Education Course (GA) | 3 General Education Course (GN) | 3 |
| General Education Course (GHW) | 1.5 |  |
|  | 14.5 | 16 |


| Second Year |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| MATH $220{ }^{*}+$ | 3 MATH 230* | 4 |
| MATH $141{ }^{*} \ddagger+$ | 4 STAT 464* | 3 |
| CMPSC 131* ${ }^{*}$ | 3 CAS 100 (GWS) ${ }^{\ddagger}$ | 3 |
| STAT 380* | 3 Supporting Course | 3 |
| General Education Course (GS) | 3 General Education Course (GA) | 3 |


| Third Year |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| STAT 414* | 3 STAT 466* | 3 |
| STAT 400* | 3 STAT 415* | 3 |
| ENGL 202C (GWS) ${ }^{\ddagger}$ | 3 Supporting Course | 3 |
| Supporting Course | 3 General Education Course <br> (IL) | 3 |
| General Education Course (GH) | 3 General Education Course (GS) | 3 |

15
Fourth Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 463* | 3 STAT 470W* | 3 |
| STAT 440* | 3 STAT 480* | 1 |
| Supporting Course | 3 Supporting Course | 3 |
| Supporting Course | 3 Supporting Course | 3 |
| General Education Course (GN) | 3 General Education Course (US) | 3 |

General Education Course 1.5
(GHW)

15
14.5

Total Credits 122

* Course requires a grade of C or better for the major
$\ddagger$ 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


## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).
$\mathrm{W}, \mathrm{M}, \mathrm{X}$, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C 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.

## Biostatistics Option: Statistics, B.S. 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

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH 140 (GQ) ${ }^{\text {¹\#\# }}$ | 4 MATH 141 (GQ) ${ }^{\text {#\# }}$ | 4 |
| STAT 200 (GQ) ${ }^{\text {* }}$ | 4 STAT 300* | 3 |
| STAT 184* | 2 ENGL 15 or ESL 15 (GWS) ${ }^{\ddagger}$ | 3 |
| PSU 16 | 1 CHEM 110 (GN) ${ }^{*+}$ | 3 |
| BIOL 110 (GN) ${ }^{\text {* }}$ | 4 CHEM 111 (GN) ${ }^{*+}$ | 1 |
|  | General Education Course (GHW) | 1.5 |
|  | 15 | 15.5 |

## Second Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH $220{ }^{\text {* }}$ | 3 STAT 414* | 3 |
| MATH $230{ }^{*}$ | 4 BBH/HPA 440* | 3 |
| BIOL 220W (GN) ${ }^{\text {* }}$ | 4 CAS 100 (GWS) ${ }^{\ddagger}$ | 3 |
| STAT 380* | 3 CMPSC 131 ${ }^{\text {* }}$ | 3 |
| General Education Course (GA) | 3 General Education Course (GH) | 3 |

17
15

## Third Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT $415{ }^{*}$ | 3 STAT 463* | 3 |
| STAT 400* | 3 STAT 416* | 3 |
| ENGL 202C (GWS) ${ }^{\ddagger}$ | 3 400-level BIOL * | 3 |
| BIOL 222, 230W, or 240 W | 3 General Education Course <br> (IL) | 3 |
| General Education Course (GS) | 3 General Education Course <br> (IL) | 3 |
|  | 15 | 15 |

## Fourth Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 440* | 3 STAT 470w* | 3 |
| STAT 466* | 3 STAT 464* | 3 |
| $400-\mathrm{level}$ BIOL* | 3 STAT 480* | 1 |
| Supporting Course | 3 Supporting Course | 3 |
| General Education Course (GN) | 3 General Education Course (US) | 3 |
|  | General Education Course (GHW) | 1.5 |

## Total Credits 122

[^0]† Course satisfies General Education and degree requirement

## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and $G Q$ ) require a grade of ' $C$ ' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30 H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

## Graduate Studies Option: Statistics, B.S. 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

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH 140 (GQ) ${ }^{\text {*)\# }}$ | 4 MATH 141 (GQ) ${ }^{\text {#\# }}$ | 4 |
| STAT 200 (GQ) ${ }^{\text {T }}$ | 4 STAT 300* | 3 |
| STAT 184* | 2 ENGL 15 or ESL 15 (GWS) ${ }^{\ddagger}$ | 3 |
| PSU 16 | 1 General Education Course (GH) | 3 |
| General Education Course (GA) | 3 General Education Course (GN) | 3 |
| General Education Course (GHW) | 1.5 |  |
|  | 15.5 | 16 |
| Second Year |  |  |
| Fall | Credits Spring | Credits |
| MATH $220{ }^{\text {* }}$ | 3 STAT 414* | 3 |
| MATH $230{ }^{*}$ | 4 MATH $312{ }^{*}$ | 3 |
| CMPSC 131 ${ }^{\text {* }}$ | 3 CAS 100 (GWS) ${ }^{\ddagger}$ | 3 |
| STAT 380* | 3 MATH 310* | 3 |
| General Education Course (GS) | 3 General Education Course (GA) | 3 |

Third Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 415* | 3 STAT 440* | 3 |
| STAT 400* | 3 STAT 416* | 3 |
| ENGL 202C ${ }^{\ddagger}$ | 3 MATH 404* | 3 |
| MATH $403{ }^{*}$ | 3 MATH $311 W^{*}$ | 3 |
| General Education Course (GH) | 3 General Education Course (GS) | 3 |

15
15
Fourth Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 463* | 3 STAT 470w* | 3 |
| MATH 429* | 3 STAT 480* | 1 |
| MATH 436* | 3 MATH 451* | 3 |
| General Education Course (IL) | 3 General Education Course (GN) | 3 |
| General Education Course (GN) | 3 General Education Course (US) | 3 |
|  | General Education Course (GHW) | 1.5 |
|  | 15 | 14.5 |

## Total Credits 122

[^1]$\ddagger$ Course requires a grade of C or better for General Education
\# Course is an Entrance to Major requirement
$\dagger$ Course satisfies General Education and degree requirement

## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).
$\mathrm{W}, \mathrm{M}, \mathrm{X}$, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of ' $C$ ' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

## Statistics and Computing Option: Statistics, B.S. 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

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH 140 (GQ) ${ }^{\text {*)\# }}$ | 4 MATH 141 (GQ) ${ }^{\text {#\# }}$ | 4 |
| STAT 200 (GQ) ${ }^{\text {T }}$ | 4 STAT 300* | 3 |
| STAT 184* | 2 ENGL 15 or ESL 15 (GWS) ${ }^{\ddagger}$ | 3 |
| PSU 16 | 1 General Education Course (GH) | 3 |
| General Education Course (GA) | 3 General Education Course (GN) | 3 |
| General Education Course (GHW) | 1.5 |  |
|  | 15.5 | 16 |
| Second Year |  |  |
| Fall | Credits Spring | Credits |
| MATH $220{ }^{\text {* }}$ | 3 STAT 414* | 3 |
| MATH $230{ }^{*}$ | 4 STAT $463{ }^{*}$ | 3 |
| CMPSC 131 ${ }^{\text {* }}$ | 3 CAS 100 (GWS) ${ }^{\ddagger}$ | 3 |
| STAT 380* | 3 CMPSC 132 ${ }^{\text {* }}$ | 3 |
| General Education Course (GS) | 3 General Education Course (GA) | 3 |

## Third Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT $415{ }^{*}$ | 3 STAT 440* | 3 |
| STAT 400* | 3 CMPSC 465* | 3 |
| ENGL 202C (GWS) ${ }^{\ddagger}$ | 3 CMPSC 360* | 3 |
| CMPSC $221{ }^{*}$ | 3 General Education Course <br> (IL) | 3 |
| General Education Course (GH) | 3 General Education Course (GS) | 3 |

## Fourth Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| CMPSC 448* | 3 STAT 470W* | 3 |
| STAT 466* | 3 STAT 480* | 1 |
| CMPSC 442* | 3 CMPSC 455* | 3 |
| Supporting Course | 3 Supporting Course | 3 |
| General Education Course (GN) | 3 General Education Course (US) | 3 |
|  | General Education Course (GHW) | 1.5 |
|  | 15 | 14.5 |

## Total Credits 122

[^2]$\ddagger$ 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

## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).
$\mathrm{W}, \mathrm{M}, \mathrm{X}$, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of ' $C$ ' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

## Actuarial Option: Statistics, B.S. at Commonwealth Campuses

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

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| $\begin{aligned} & \text { MATH } 140 \\ & (\mathrm{GQ})^{* \neq \# t} \end{aligned}$ | $\begin{aligned} & 4 \text { MATH } 141 \\ & (\mathrm{GQ})^{\star \ddagger \# t} \end{aligned}$ | 4 |
| $\begin{aligned} & \text { STAT } 200 \\ & (\mathrm{GQ})^{*+} \end{aligned}$ | 4 General Education Course (GA) | 3 |
| $\begin{aligned} & \text { ENGL } 15 \text { or ESL } \\ & 15(\mathrm{GWS})^{\ddagger} \end{aligned}$ | 3 ECON 104 (GS) ${ }^{\dagger}$ | 3 |
| First-Year <br> Seminar | 1 ACCTG 211* | 4 |
| ECON $102(G S){ }^{\dagger}$ | 3 General Education Course (GN) | 3 |
| Education Course (GHW) |  |  |
|  | 16.5 | 17 |

Second Year

| Fall | Credits Spring | Credits Summer | Credits |
| :---: | :---: | :---: | :---: |
| MATH $220{ }^{\text {* }}$ | 3 STAT 414 (or <br> Supporting Course) | 3 STAT 414 (if not taken during the 4th semester) | 3 |
| MATH 230 * | $\begin{aligned} & 4 \text { ENGL } 202 \mathrm{C} \\ & \text { (GWS) }^{\ddagger} \end{aligned}$ | 3 |  |
| CAS 100A (GWS) ${ }^{\ddagger}$ | 3 FIN 301* | 3 |  |
| CMPSC $131{ }^{\text {*+ }}$ | 3 General Education Course (GH) | 3 |  |
| General <br> Education <br> Course (GN) | 3 General Education Course (US) |  |  |
|  | 16 | 12 | 0 |

Third Year

| Fall | Credits Spring | Credits |
| :--- | :---: | ---: |
| STAT $415^{*}$ | 3 STAT $463^{*}$ | 3 |
| RM $410^{*}$ | 3 RM 411 or $420^{*}$ | 3 |
| STAT $184^{*}$ | 2 STAT $380^{*}$ | 3 |
| STAT $300^{*}$ | 3 RM $302^{*}$ | 3 |
| General | 3 General | 3 |
| Education | $\quad$ Education |  |
| Course (GA) | Course (GN) |  |
|  | $\mathbf{1 4}$ | $\mathbf{1 5}$ |


| Fall | Credits Spring | Credits |
| :--- | :--- | ---: |
| RM 420 or $411^{*}$ | 3 STAT $470 W^{*}$ | 3 |
| STAT $400^{*}$ | 3 RM 412 or $422^{*}$ | 3 |
| STAT $466^{*}$ | 3 STAT $480^{*}$ | 1 |
| STAT $440^{*}$ | 3 STAT $463^{*}$ | 3 |
| General | 3 General | 3 |
| Education | Education <br> Course (IL) |  |
| Course (GH) | General <br> Education <br> Course (GHW) | 1.5 |
|  | $\mathbf{1 5}$ | $\mathbf{1 4 . 5}$ |

## Total Credits 120

* Course requires a grade of $C$ or better for the major
$\ddagger$ 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


## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ ) require a grade of ' C ' or better.

## Applied Option: Statistics, B.S. at Commonwealth Campuses

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

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH 140 ${ }^{\text {* }} \ddagger$ \# $\dagger$ | 4 MATH 141 ${ }^{\text {*\#\# } \dagger}$ | 4 |
| STAT $200{ }^{\text {* }}$ | 4 ECON $104{ }^{\dagger}$ | 3 |
| PSU 16 | 1 General Education Course | 3 |
| ECON $102{ }^{+}$ | 3 ENGL 15 (or General Education Course) ${ }^{\ddagger}$ | 3 |
| Education Course) ${ }^{\ddagger}$ |  |  |
|  | 15 | 16 |
| Second Year |  |  |
| Fall | Credits Spring | Credits |
| MATH $220{ }^{*+}$ | 2 STAT 414 (or Supporting Course) ${ }^{*}$ | 3 |
| MATH $230{ }^{*}$ | 4 ENGL 202C ${ }^{\ddagger}$ | 3 |
| CAS 100A ${ }^{\ddagger}$ | 3 CMPSC 121 or 131 ${ }^{\text {*t }}$ | 3 |
| Course for required minor ${ }^{*}$ | 3 Course for required minor ${ }^{*}$ | 3 |
| General Education Course | 3 General Education Course | 3 |
|  | 15 | 15 |

## Third Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 184* | 2 STAT 380* | 3 |
| STAT 414 (or Supporting Course (if not taken in 4th semester)) ${ }^{*}$ | 3 STAT 415* | 3 |
| STAT 461* | 3 STAT 462* | 3 |
| Course for required minor ${ }^{*}$ | 3 STAT 480* | 1 |
| General Education Course | 3 Course for required minor ${ }^{*}$ | 3 |
| General Education Course | 3 General Education Course | 3 |
|  | 17 | 16 |

Fourth Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 416* | 3 STAT 470W* | 3 |
| STAT 466* | 3 MATH 451* | 3 |
| General Education Course (GHW) | 1.5 STAT 416* | 3 |
| Course for required minor* | 3 Course for required minor* | 3 |
| Course for required minor* | 3 Course for required minor* | 3 |
| General Education Course | 3 General Education Course (GHW) | 1.5 |
|  | 16.5 | 16.5 |

## Total Credits 127

[^3]\# Course is an Entrance to Major requirement
† Course satisfies General Education and degree requirement

## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and $G Q$ ) require a grade of ' $C$ ' or better.

## 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.

## Biostatistics Option: Statistics, B.S. at Commonwealth Campuses

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 |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| MATH $140{ }^{\text {a }} \ddagger$ | 4 MATH 141 ${ }^{\text {* } \ddagger \# \dagger}$ | 4 |
| STAT 200* ${ }^{\text {* }}$ | 4 CHEM 110* | 3 |
| PSU 16 | 1 CHEM 111* ${ }^{\text {¢ }}$ | 1 |
| BIOL $110^{*+}$ | 4 ENGL 15 (or General Education Course) ${ }^{\ddagger}$ | 3 |
| Education Course) ${ }^{\ddagger}$ |  |  |
|  | 16 | 14 |
| Second Year |  |  |
| Fall | Credits Spring | Credits |
| MATH $220{ }^{\text {* }}$ | 2 STAT 414 (or Supporting Course) ${ }^{*}$ | 3 |
| MATH $230{ }^{*}$ | 4 ENGL 202C ${ }^{\ddagger}$ | 3 |
| CAS 100A ${ }^{\ddagger}$ | 3 CMPSC 121 or 131 ${ }^{\text {*t }}$ | 3 |
| BIOL 220W, 222, 230W, or $240 \mathrm{~W}^{*+}$ | 3-4 BIOL 220W, 222, 230W, or $240 \mathrm{~W}^{*+}$ | 3-4 |
| General Education Course | 3 General Education Course | 3 |
|  | 15 | 16 |

Third Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 184* | 2 STAT 380* | 3 |
| STAT 414 (or Supporting Course (if not taken in 4th semester))* | 3 STAT 415* | 3 |
| STAT 461* | 3 STAT 462* | 3 |
| BIOL 400-Level Selection ${ }^{*}$ | 3 STAT 480* | 1 |
| Supporting Course | 3 Supporting Course | 3 |
| General Education Course | 3 General Education Course | 3 |
|  | 17 | 16 |

## Fourth Year

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| STAT 416* | 3 STAT 470W* | 3 |
| STAT 466* | 3 MATH 451* | 3 |
| BIOL 400-Level Selection* | 3 STAT 416* | 3 |
| Supporting Course | 3 Supporting Course | 3 |
| Supporting Course | 3 Supporting Course | 3 |
| General Education Course (GHW) | 1.5 General Education Course (GHW) | 1.5 |
|  | 16.5 | 16.5 |

## Total Credits 127

[^4]\# Course is an Entrance to Major requirement
† Course satisfies General Education and degree requirement

## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and $G Q$ ) require a grade of ' $C$ ' or better.

## Graduate Studies Option: Statistics, B.S. at Commonwealth Campuses

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

| Fall | Credits Spring | Credits |
| :--- | :--- | ---: |
| MATH $140^{\star \ddagger \# \dagger}$ | 4 MATH $141^{\star \ddagger \# \dagger}$ | 4 |
| STAT $200^{\star+}$ | 4 ENGL $15^{\ddagger}$ | 3 |
| PSU 16 | 1 General Education Course | 3 |
| General Education Course | 3 General Education Course | 3 |
| General Education Course | 3 General Education Course | 3 |
|  | $\mathbf{1 5}$ | $\mathbf{1 6}$ |

## Second Year

Fall

| MATH $220^{\star \dagger}$ | 2 STAT 414 (or Supporting <br> Course) | 3 |
| :--- | :--- | ---: |
| MATH $230^{\star}$ | 4 ENGL $202 C^{\ddagger}$ | 3 |
| CAS $100 A^{\ddagger}$ | 3 CMPSC 121 or $131^{\star+}$ | 3 |
| MATH 311 W $^{\star}$ | 3 MATH $312^{\star}$ | 3 |
| General Education Course | 3 General Education Course | 3 |
|  | $\mathbf{1 5}$ | $\mathbf{1 5}$ |


| Third Year |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| STAT 184* | 2 STAT 380* | 3 |
| STAT 414 (or Supporting Course (if not taken in 4th semester)) ${ }^{*}$ | 3 STAT 415* | 3 |
| STAT 461* | 3 STAT 462* | 3 |
| MATH 403* | 3 MATH 404* | 3 |
| General Education Course | 3 Supporting Course | 3 |
| General Education Course | 3 General Education Course | 3 |
|  | 17 | 18 |


| Fourth Year |  |  |
| :---: | :---: | :---: |
| Fall | Credits Spring | Credits |
| STAT 416* | 3 STAT 470W* | 3 |
| STAT 466* | 3 MATH 400-Level Selection* | 3 |
| MATH 436* | 3 MATH 310* | 3 |
| STAT 480* | 1 MATH 451* | 3 |
| General Education Course | 3 Supporting Course | 3 |
| General Education Course (GHW) | 1.5 General Education Course (GHW) | 1.5 |
|  | 14.5 | 16.5 |

## Total Credits 127

[^5]† Course satisfies General Education and degree requirement

## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity 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.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ ) require a grade of ' C ' or better.

## Statistics and Computing Option: Statistics, B.S. at Commonwealth Campuses

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

| Fall | Credits Spring | Credits |
| :---: | :---: | :---: |
| MATH 140 ${ }^{\text {*\#\# } \dagger}$ | 4 MATH 141 ${ }^{\text {*\#\# } \dagger}$ | 4 |
| STAT $200{ }^{*+}$ | 4 CMPSC 122 or $132{ }^{*+}$ | 3 |
| PSU 16 | 1 General Education Course | 3 |
| CMPSC 121 or $131^{*+}$ | 3 ENGL 15 (or General Education Course) ${ }^{\ddagger}$ | 3 |
| Education Course) ${ }^{\ddagger}$ |  |  |
|  | 15 | 16 |
| Second Year |  |  |
| Fall | Credits Spring | Credits |
| MATH $220{ }^{*+}$ | 2 STAT 414 (or Supporting Course) ${ }^{*}$ | 3 |
| MATH $230{ }^{*}$ | 4 ENGL 202C ${ }^{\ddagger}$ | 3 |
| CAS 100A ${ }^{\ddagger}$ | 3 CMPSC 221* | 3 |
| General Education Course | 3 Supporting Course | 3 |
| General Education Course | 3 General Education Course | 3 |
|  | 15 | 15 |
| Third Year |  |  |
| Fall | Credits Spring | Credits |
| STAT 184* | 2 STAT 380* | 3 |
| STAT 414 (or Supporting Course (if not taken in 4th semester)) ${ }^{\star}$ | 3 STAT 415* | 3 |
| STAT 461* | 3 STAT 462* | 3 |
| MATH 311W or CMPSC 360* | 3 STAT 480* | 1 |
| Supporting Course | 3 Supporting Course | 3 |


| General Education Course | 3 General Education Course | 3 |
| :---: | :---: | :---: |
|  | 17 | 16 |
| Fourth Year |  |  |
| Fall | Credits Spring | Credits |
| STAT 416* | 3 STAT 470W* | 3 |
| STAT $466{ }^{*}$ | 3 MATH 451* | 3 |
| CMPSC 465* | 3 STAT 416* | 3 |
| CMPSC 400-Level Selection ${ }^{*}$ | 3 CMPSC 400-Level Selection ${ }^{*}$ | 3 |
| General Education Course (GHW) | 1.5 Supporting Course | 3 |
| General Education Course | 3 General Education Course (GHW) | 1.5 |
|  | 16.5 | 16.5 |

## Total Credits 127

* Course requires a grade of C or better for the major
$\ddagger$ 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


## University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).
$\mathrm{W}, \mathrm{M}, \mathrm{X}$, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ ) require a grade of ' $C$ ' or better.

## 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 (https://thisisstatistics.org/ jobs-in-statistics/)

## Professional Resources

- The American Statistical Association (https://www.amstat.org/)


## Contact

University Park
DEPARTMENT OF STATISTICS
323 Thomas Building
University Park, PA 16802
814-863-0355
stat-advising@psu.edu
https://science.psu.edu/stat (https://science.psu.edu/stat/)


[^0]:    * Course requires a grade of C or better for the major
    $\ddagger$ Course requires a grade of C or better for General Education
    \# Course is an Entrance to Major requirement

[^1]:    * Course requires a grade of C or better for the major

[^2]:    * Course requires a grade of C or better for the major

[^3]:    * Course requires a grade of C or better for the major
    $\ddagger$ Course requires a grade of C or better for General Education

[^4]:    * Course requires a grade of C or better for the major
    $\ddagger$ Course requires a grade of $C$ or better for General Education

[^5]:    * Course requires a grade of C or better for the major
    $\ddagger$ Course requires a grade of C or better for General Education
    \# Course is an Entrance to Major requirement

