

# STATISTICS

## Integrated Undergrad-Grad Programs

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

Requirements listed here are in addition to requirements listed in GCAC-210 Integrated Undergraduate-Graduate (IUG) Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-210-integrated-undergraduate-graduate-degree-programs/>).

The Integrated Undergraduate-Graduate (IUG) degree with B.A./B.S. in Mathematics 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 graduate levels in addition to an undergraduate degree in Mathematics. The M.A.S. degree is a professional master's degree that emphasizes applications. The degree prepares students with interests in mathematics, computation, and the quantitative aspects of science for careers in industry and government as statistical analysts. 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.

#### Admission Requirements

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

The number of openings in the integrated B.A./B.S. and M.A.S. program is limited. Students must apply to the program via the Graduate School application for admission (<http://www.gradschool.psu.edu/prospective-students/how-to-apply/>), and must meet all the admission requirements of the Graduate School and the Applied Statistics graduate program for the Master of Applied Statistics degree, listed on the Admission Requirements tab. Admission will be based on specific criteria and the recommendation of faculty. Before applying to the Graduate School, students must have completed entrance to their undergraduate major, have completed no less than 60 credits, and be admitted no later than the end of the second week of the semester preceding the semester of expected conferral of the undergraduate degree. Transfer students must have completed at least 15 credits at Penn State to enroll in an IUG. Applicants to the integrated program:

- Must be enrolled in the Mathematics B.A./B.S. program.
- Must have completed at least 60 credits of the undergraduate degree program including the two courses: STAT 414 and STAT 415.
- Must submit a transcript and a statement of purpose.
- Must present a departmental approved plan of study in the application process in consultation with the M.A.S. program director. The plan should cover the entire time period of the integrated program, and it should be reviewed periodically with an adviser as the student advances through the program.

- Must be recommended by the chair of Mathematics Department's undergraduate program committee. Two additional recommendation letters must be sent to the M.A.S. admissions committee.
- Must be accepted to the M.A.S. program in Statistics.

#### Degree Requirements

Students must fulfill all degree requirements for each degree in order to be awarded that degree, subject to the double-counting of credits as outlined below. Degree requirements for the Bachelor of Arts and Bachelor of Science in Mathematics are listed in the Undergraduate Bulletin (<https://bulletins.psu.edu/undergraduate/>). Degree requirements for the Master of Applied Statistics in Applied Statistics degree are listed on the Degree Requirements tab.

Up to 12 credits may be double-counted towards the degree requirements for both the graduate and undergraduate degrees; a minimum of 50% of the double-counted courses must be at the 500 or 800 level. Independent study courses and credits associated with the culminating experience for the graduate degree cannot be double-counted. The courses that will double count for both degrees are:

Code	Title	Credits
<b>Courses Eligible to Double Count for Both Degrees</b>		
STAT 414	Introduction to Probability Theory	3
STAT 415	Introduction to Mathematical Statistics	3
STAT 501	Regression Methods	3
STAT 502	Analysis of Variance and Design of Experiments	3
<b>Total Credits</b>		<b>12</b>

Students must sequence their courses so all undergraduate degree requirements are fulfilled before taking courses to count solely towards the graduate degree. Students are expected to complete the undergraduate degree requirements within the typical time to degree for the undergraduate major. In the semester in which the undergraduate degree requirements will be completed, IUG students must apply to graduate, and the undergraduate degree should be conferred at the next appropriate Commencement. If students accepted into the IUG program are unable to complete the M.A.S. degree, they are still eligible to receive their undergraduate degree if all the undergraduate degree requirements have been satisfied.

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

Requirements listed here are in addition to requirements listed in GCAC-210 Integrated Undergraduate-Graduate (IUG) Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-210-integrated-undergraduate-graduate-degree-programs/>).

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 analysts. 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.

### Admission Requirements

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

The number of openings in the integrated B.S./M.A.S. program is limited. Students must apply to the program via the Graduate School application for admission (<http://www.gradschool.psu.edu/prospective-students/how-to-apply/>), and must meet all the admission requirements of the Graduate School and the Applied Statistics graduate program for the Master of Applied Statistics degree, listed on the Admission Requirements tab. Admission will be based on specific criteria and the recommendation of faculty. Before applying to the Graduate School, students must have completed entrance to their undergraduate major, have completed no less than 60 credits, and be admitted no later than the end of the second week of the semester preceding the semester of expected conferral of the undergraduate degree. Transfer students must have completed at least 15 credits at Penn State to enroll in an IUG. Applicants to the integrated program:

- Must be enrolled in the Statistics B.S. program.
- Must have completed at least 60 credits of the undergraduate degree program, including the two courses: STAT 414 and STAT 415.
- Must submit a transcript and a statement of purpose.
- Must present a departmental approved plan of study in the application process in consultation with the M.A.S. program director. The plan should cover the entire time period of the integrated program, and it should be reviewed periodically with an adviser as the student advances through the program.
- Must be recommended by the chair of the department's undergraduate program committee.
- Must be accepted into the M.A.S. program in Statistics.

### Degree Requirements

Students must fulfill all degree requirements for each degree in order to be awarded that degree, subject to the double-counting of credits as outlined below. Degree requirements for the Bachelor of Science in Statistics are listed in the Undergraduate Bulletin (<https://bulletins.psu.edu/undergraduate/>). Degree requirements for the Master of Applied Statistics in Applied Statistics degree are listed on the Degree Requirements tab.

Up to 12 credits may be double-counted towards the degree requirements for both the graduate and undergraduate degrees; a minimum of 50% of the double-counted courses must be at the 500 or 800 level. Independent study courses and credits associated with the culminating experience for the graduate degree cannot be double-counted. The courses that will double count for both degrees are:

Code	Title	Credits
<b>Courses Eligible to Double Count for Both Degrees</b>		
STAT 414	Introduction to Probability Theory	3
STAT 415	Introduction to Mathematical Statistics	3
STAT 501	Regression Methods	3

### Total Credits 12

Students must sequence their courses so all undergraduate degree requirements are fulfilled before taking courses to count solely towards the graduate degree. Students are expected to complete the undergraduate degree requirements within the typical time to degree for the undergraduate major. In the semester in which the undergraduate degree requirements will be completed, IUG students must apply to graduate, and the undergraduate degree should be conferred at the next appropriate Commencement. If students accepted into the IUG program are unable to complete the M.A.S. degree, they are still eligible to receive their undergraduate degree if all the undergraduate degree requirements have been satisfied.

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

This Integrated Undergraduate/Graduate (IUG) degree program combines the B.S. in Data Sciences with the M.A.S. in Applied Statistics offered at the following campuses:

#### Undergraduate Degree

- University Park

#### Graduate Degree

- University Park
- World Campus

Requirements listed here are in addition to requirements listed in GCAC-210 Integrated Undergraduate-Graduate (IUG) Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-210-integrated-undergraduate-graduate-degree-programs/>).

The Integrated Undergraduate-Graduate (IUG) degree with B.S. in Data Sciences 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 rather than 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 analysts. 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.

### Admission Requirements

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

The number of openings in the integrated B.S./M.A.S. program is limited. Students must apply to the program via the Graduate School

application for admission, and must meet all the admission requirements of the Graduate School and the Applied Statistics graduate program for the Master of Applied Statistics degree, listed on the Admission Requirements tab. Admission will be based on specific criteria and the recommendation of faculty. Before applying to the Graduate School, students must have completed entrance to their undergraduate major and have completed no less than 60 credits. Students must be admitted to the IUG no later than the end of the second week of the semester preceding the semester of expected conferral of the undergraduate degree. Transfer students must have completed at least 15 credits at Penn State to enroll in an IUG. Applicants to the integrated program:

- Must be enrolled in the Data Sciences B.S. program.
- Must have completed at least 60 credits of the undergraduate degree program, including STAT 414.
- Must submit a transcript and a statement of purpose.
- Must present an approved plan of study in the application process in consultation with the M.A.S. program director. The plan should cover the entire time period of the integrated program, and it should be reviewed periodically with an adviser as the student advances through the program.
- Must have three references, one of which is an approval letter from a representative on the Data Sciences' undergraduate program/ curriculum committee.
- Must be accepted into the M.A.S. program in Statistics.

**Degree Requirements**

Students must fulfill all degree requirements for each degree in order to be awarded that degree, subject to the double-counting of credits as outlined below. Degree requirements for the Bachelor of Data Sciences are listed in the Undergraduate Bulletin. Degree requirements for the Master of Applied Statistics in Applied Statistics degree are listed on the Degree Requirements tab.

Up to 12 credits may be double-counted towards the degree requirements for both the graduate and undergraduate degrees; a minimum of 50% of the double-counted courses must be at the 500 or 800 level. Independent study courses and credits associated with the culminating experience for the graduate degree cannot be double-counted. The courses that will double count for both degrees are:

Code	Title	Credits
<b>Courses Eligible to Double Count for Both Degrees</b>		
STAT 414	Introduction to Probability Theory	3
STAT 415	Introduction to Mathematical Statistics	3
STAT 501	Regression Methods <sup>1</sup>	3
STAT 502	Analysis of Variance and Design of Experiments <sup>2</sup>	3
STAT 503	Design of Experiments	3
STAT 504	Analysis of Discrete Data	3
STAT 505	Applied Multivariate Statistical Analysis	3
STAT 506	Sampling Theory and Methods <sup>3</sup>	3
STAT 508	Applied Data Mining & Statistical Learning	3

<sup>1</sup> If STAT 300 is taken for the BS degree, then STAT 501 cannot be double counted.  
<sup>2</sup> If STAT 400 is taken for the BS degree, then STAT 502 cannot be double counted.  
<sup>3</sup> If STAT 466 is taken for the BS degree, then STAT 506 cannot be double counted.

Students must sequence their courses so all undergraduate degree requirements are fulfilled before taking courses to count solely towards the graduate degree. Students are expected to complete the undergraduate degree requirements within the typical time to degree for the undergraduate major. In the semester in which the undergraduate degree requirements will be completed, IUG students must apply to graduate, and the undergraduate degree should be conferred at the next appropriate Commencement. If students accepted into the IUG program are unable to complete the M.A.S. degree, they are still eligible to receive their undergraduate degree if all the undergraduate degree requirements have been satisfied.