

# MS in Applied Statistics and Data Science

The MS in Applied Statistics and Data Science (<https://www.apu.edu/clas/programs/applied-statistics-masters/>) program provides professional preparation for careers involving the use of data analysis to inform decisions. The program includes required courses providing a foundation in statistical methods and theory, and electives that allow students to emphasize biostatistics or business analytics and explore a variety of statistical models and techniques for analyzing data. Expertise in the use of statistical software packages is developed. In keeping with the mission of Azusa Pacific University, this program encourages an active conversation about the role of a Christian perspective in the field of applied statistics, particularly in terms of ethical issues prevalent in data science.

## Requirements

| Code                          | Title   | Units     |
|-------------------------------|---|-----------|
| <b>Core Courses</b>           |   |           |
| STAT 501                      | Introduction to Modeling with Probability               | 3         |
| STAT 511                      | Applied Regression Analysis                             | 3         |
| STAT 521                      | Statistical Computing and Programming                   | 3         |
| STAT 542                      | Applied Logistic Regression and Survival Analysis       | 3         |
| STAT 592                      | Ethics in Data Analytics                                | 2         |
| <b>Culminating Experience</b> |   |           |
| STAT 596                      | Practicum   | 1         |
| STAT 597                      | Statistical Consulting Practicum                        | 4         |
| STAT 598                      | Culminating Project                                     | 4         |
| <b>Elective Courses</b>       |   |           |
| MATH 199                      | Calculus Fundamentals for Statistics <sup>1</sup>       |           |
| MATH 299                      | Linear Algebra Fundamentals for Statistics <sup>1</sup> |           |
| STAT 502                      | Mathematical Statistics                                 |           |
| STAT 512                      | Analysis of Variance and Design of Experiments          |           |
| STAT 541                      | Epidemiology Research Methods                           |           |
| STAT 543                      | Advanced Modeling for Data Science                      |           |
| STAT 551                      | Data Visualization                                      |           |
| STAT 552                      | Time Series Analysis and Forecasting                    |           |
| STAT 553                      | Data Mining   |           |
| STAT 571                      | Applied Multivariate Analysis                           |           |
| STAT 572                      | Applied Bayesian Analysis                               |           |
| STAT 573                      | Applied Nonparametric Statistics                        |           |
| STAT 574                      | Discrete Data Analysis                                  |           |
| STAT 575                      | Applied Survey Sampling                                 |           |
| STAT 595                      | Special Topics in Applied Statistics                    |           |
| CS 532                        | Machine Learning  |           |
| <b>Total Units</b>            |   | <b>32</b> |

<sup>1</sup> Does not count toward elective credit; required if not taken previously.

## Admission

University graduate admission and program-specific requirements must be met before an application is complete (see Admission to the University (<http://catalog.apu.edu/admissions/>)). **Program-specific application requirements are available online (<https://www.apu.edu/graduateprofessional/apply/>).**

International students should contact Graduate and Professional Admissions (<https://www.apu.edu/graduateprofessional/apply/>) for application procedures.

## **Program Learning Outcomes**

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Students who successfully complete this program shall be able to:

1. Master fundamental probability models and the statistical theory and methodology required to draw appropriate inferences from data.
2. Demonstrate the ability to analyze data by appropriately fitting, assessing, and interpreting a variety of statistical models in real-world interdisciplinary problems.
3. Employ appropriate statistical software for the management and analysis of data.
4. Communicate the results of statistical analyses effectively both orally and in writing to a broad audience.
5. Critically assess the appropriateness and validity of the statistical applications and methodology involved in published studies.
6. Effectively function in an interdisciplinary collaborative environment using the skills of a professional statistician to support decision making.
7. Articulate ethical issues in data analysis and how Christian perspectives relate to the profession of statistics.