

STATISTICS, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

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.