# STATISTICS

## Learning Outcomes

### Master of Applied Statistics (M.A.S.)

1. Graduates shall demonstrate conceptual and practical knowledge of the broad aspects of Statistical analysis techniques. The core areas of Applied Statistics (Regression Analysis, Design of Experiment, Analysis of Variance, Analysis of Discrete Data, MANOVA, and many more) will be explored.

2. Graduates will be able to apply the statistical analysis techniques they learn to real problems. They will demonstrate proficiency in the working with others as a data analyst in a team setting, as well as in broad areas of data processing, data visualization, statistical analysis and interpretation of the statistical results.  Students will also demonstrate adequate professional preparation for drawing sound conclusions and creating reports to aid in making decisions as data analysts and applied statisticians.

3. Graduates will demonstrate skills in communicating statistical findings and reports in a group setting and through oral presentations. They will be trained on development of recommendation reports, and discussion of consulting solutions.

4. Graduates will be able to demonstrate critical thinking skills when reviewing scientific papers, literature and numerical reports. They will be trained to have a firm grasp of statistical thinking and sound understanding of statistical conclusions.

5. Graduates will demonstrate knowledge of interpersonal working dynamics, ethical professional conduct and the ability to perform in a team environment. They will participate in professional networking, and engagement in professional activities and organizations serving the discipline and the industry.

### Master of Science (M.S.) and Doctor of Philosophy (Ph.D.)

1. Graduates shall demonstrate in-depth and advanced knowledge and understanding in statistics core areas of  probability, statistical inference, modeling and computing. The core demonstration will include the application of these principles to problems in various contexts such as genetics, medicine, biology, environmental studies, and social and behavioral sciences, that are crucial for the practice of modern statistics.

2. Graduates shall demonstrate, at a level appropriate to a departmental colloquium, (i) knowledge of several outstanding problems or questions in diverse sub-fields of statistics, (ii) the experimental and theoretical origins of these problems, and (iii) the principle efforts proposed or underway to address them, including demonstrating critical thinking skills when reviewing scientific papers, literature and numerical reports.

3. Graduates shall demonstrate the ability to communicate professionally, in written and oral form, research work and conclusions of statistical findings to statistical experts and non-expert audiences.

4. Graduates shall demonstrate (i) knowledge and understanding of professional standards of ethics and conduct, (ii) the ability to analyze situations to identify the standards that should apply including performing in a team environment, and (iii) describe how they may be appropriately acted upon. They will participate in professional networking, and engagement in professional activities and organizations serving the discipline and the broader scientific community and the industry.

5. Graduates shall have a specialty area within the broad domain of statistics, within which they shall demonstrate (i) advanced knowledge and understanding of the primary literature, (ii) the ability to analyze and judge new contributions to the primary literature, (iii) the ability to pose complex research problem(s) and identify the knowledge and methodologies required to address them, and (iv) the ability to apply that knowledge and those methodologies to create new knowledge and/or develop new theories and methods that advance (or show the potential to advance) knowledge and understanding within the specialty area, and to another discipline where their findings are applicable.