GRSC6023 Basic Quantitative Research Methods (The Sciences & Related Disciplines)

Content:

Basics of quantitative research methods including sufficient statistical concepts to allow students to make good sense of the statistical figures and numbers they are exposed to in daily life. The following topics will be covered in the courses:

- Basics of quantitative research including the key types of research designs

- Presentation of data - a brief discussion on different types of data and data collection process; summarizing the data using tabulation methods such as frequency table and stem-and-leaf display; graphical presentation techniques such as bar chart, pie chart, histogram and boxplot;

- Measures of central tendency and dispersion and their interpretation - mean, median, mode, range, quartile and standard deviation;

- Probability and its applications - a brief review of the concept of probability which is a basis of statistical inference;

- Standard probability distributions - binomial distribution, normal distribution and standard normal distribution;

- Concepts of statistical inference, estimation and hypothesis testing - inference on population based on sample; sampling distributions; point estimate and interval estimate for a mean and a proportion; setting up statistical hypothesis; testing a statistical hypothesis; hypothesis testing concerning means;

- Categorical data and contingency table - estimation and hypothesis testing concerning a proportion; Chi-square goodness of fit test; testing of independency in a 2-way contingency table.

This course is designed for students who are conducting research in lab-based disciplines, including the Sciences and Technology. Students from non lab-based disciplines are recommended to take the parallel course designed for them.

Organization:
Each offering of the module comprises a total of twelve hours over four weekly sessions.

Enrollment:
Enrollment is restricted to students who have no, or a very limited background in statistics. There is no formal limit to the number of students who can enroll in this module. In the academic year 2013-14, this course will not be offered.

Assessment:
Pass/Fail: Continuous assessment of weekly assignments

Outcome:

At the end of the course, students should understand the basics of quantitative research and be able to critically review simple statistical analysis.