

DEMS 5052 (Research Design and Quantitative Methods)

Required Textbook:

“Straightforward Statistics” by Chieh-Chen Bowen (2016)

SAGE Publication

Much of the course material will be derived from the textbook, with supplementary material as needed.

It is up to each student to become familiar with the usage of MYSTAT, or any other applications software for statistical data analysis. You can download it free of charge from the SYSTAT website (or any other software programs like SPSS or Excel)

This course focuses on statistical reasoning and applications of inferential statistics to the analysis and interpretation of data in the social sciences, with special emphasis on hypothesis testing using different types of t-tests, correlation, regression, ANOVA and Chi-squares.

By the end of this course, you will be able to take a set of data, determine the best way(s) to describe the data, and conduct the appropriate analyses in order to extract useful information out of the data. Furthermore, given a research question about whether two variables are related (either your own question or a question given to you), you should be able to name the appropriate statistical test for answering this question, explain the steps for conducting the test, and actually calculate the necessary statistics. Finally, given a research question and the results from a statistical test, you should be able to interpret the statistical outcomes in terms of the research question (i.e., how do the statistics answer the research question). This state of knowledge and skill will be developed through a series of assignments, a mid-term test and a group project.

Course Evaluation:

Assignments:

There are 4 assignments during the semester, each worth 10%, totalling 40% of the course mark.

Mid-term test:

There will be a short mid-term test worth 15%.

Group project presentation:

During the last lecture period, members of each project group will be required to give a summary presentation of their research project. This is worth 5%.

Group project report:

As a group project, with each group composed of 2-3 students, students will mine data from internet and conduct statistical analysis appropriate to the research question. The project report should be around 5,000 words (not including figures, tables and references). The report is worth 40%.

Lectures (subject to change):

Lecture 1

A brief introductory discussion – concept of probability and statistics

Lecture 2

Numerical descriptive measures and probability

Lecture 3

Discrete random variables and their probability distributions

Continuous random variables and the normal distribution

Lecture 4

Sampling Distributions

Lecture 5

Estimation of the mean and proportion

Hypothesis test about the mean and proportion

Lecture 6

Estimation and hypothesis testing and Chi-square tests

Lecture 7

Analysis of variance and simple linear regression

Lecture 8

Simple linear regression

Lecture 9

Multiple linear regression

Lecture 10

Non-parametric statistics

Lecture 11

Introduction to the concept of extreme value statistics

Lecture 12

Group Project Presentations