Semester 2 Statistics Short courses

Course: STAA0001 - Basic Statistics
Blackboard Site: STAA0001

Dates: Sat 10th Sept and 22 Oct 2016 (9 am – 5 pm)
Room EN409

Assumed Knowledge: None

Software used: SPSS

Maximum 20 students

Day 1: Exploratory Data Analysis  Sat 10th Sept (9 am – 5 pm)

- Levels of measurement of data
- Graphical Analysis: bar charts, pie charts, boxplots, histogram, stem and leaf, scatterplot, clustered and stacked barcharts
- Descriptive Statistics: mode, mean, median, standard deviation, range, IQR, Pearson’s r

Day 2: Introduction to Inference 22 Oct 2016 (9 am – 5 pm)

Introduction to the basic concepts of inference: confidence interval, significance, p-values, effect size statistics
- Sampling distribution of the mean
- z-test and confidence interval for the mean when the population standard deviation is known
- t-tests: one sample, paired and independent
- chi-square

Online quizzes will be available for self-assessment.
Course: STAA0002 - Simple Linear Regression and ANOVA

Blackboard Site: STAA0002

Dates: Sat 17th Sept and 15th Oct (9 am – 5 pm)

Room EN409

Assumed Knowledge: Basic Statistics (STAA0001)

Software used: SPSS

Maximum 20 students

Course Description:

Statistical techniques as listed below will be covered with an emphasis on the interpretation and reporting of these results.

**Day 1: Simple Linear Regression** Sat 17th Sept (9 am – 5 pm)
- Correlation: Pearson, Spearman and Kendall’s tau-b
- Power Analysis for Pearson correlation
- Simple linear regression analysis
- Assumptions and inference for regression
- Common pitfalls of regression
- Data transformations

**Day 2: ANOVA** Sat 15th Oct (9 am – 5 pm)
- One way analysis of variance (ANOVA)
- Repeated measures analysis of variance
- Factorial analysis of variance
- Reporting of ANOVA results
- Power analysis and effect size statistics such as eta squared and omega squared

Online quizzes will be available for self-assessment.
Course: STAA0003A - Intro to SPSS

Blackboard Site: STAA0003

Dates: Sun 4th Sept (9 am – 5 pm)

Room EN409

Assumed Knowledge: None

Software used: SPSS

Maximum 20 students

Course Description:

On completion of this course, students should be able to use the menus in the data analysis package IBM SPSS Statistics to take data such as that obtained from questionnaires and administrative records or from existing electronic formats and establish appropriate computer files from which basic statistical summaries, graphs and reports can be produced. It will also show the importance of integrating the development of your data collection instrument, such as a questionnaire, with your computer program.

Topics covered will include

■ Introduction to IBM SPSS Statistics
■ IBM SPSS Statistics data definition
■ Establishing an SPSS data file from a questionnaire.
■ Basic data analysis in SPSS
■ Computing new variables in SPSS
■ Recoding, selecting data in SPSS
■ Graphing in SPSS

Online quizzes will be available for self-assessment.
Course: STAA0003B - Further SPSS

Blackboard Site: STAA0003

Dates: Sun 16th Oct (9 am – 5 pm)

Room EN409

Assumed Knowledge: Intro to SPSS (STAA0003A)

Software used: SPSS

Maximum 20 students

Course Description:

On completion of this course, students will become more efficient in their use of SPSS and expand their knowledge of SPSS data handling procedures.

Topics covered will be chosen from:
- An introduction to SPSS syntax
- Computing, recoding and selecting data in SPSS using syntax.
- Dates in SPSS
- Merging files
- Managing complex data files
- SPSS Tables
Course: STAA0004A - Survey Design

Blackboard Site: STAA0004

Dates: Sat 24\textsuperscript{th} Sep (9 am – 5 pm)

Room EN409

Assumed Knowledge: Basic Statistics

Software used: None

Course Description:

You will acquire skills and knowledge in the collection of survey, observational, experimental and secondary data; developing a questionnaire, and writing of descriptive reports.

Topics will include:
- Introduction to survey research
- The basics of survey sampling
- How to collect survey data
- Making the most of secondary data
- Developing a questionnaire
- Introduction to scale development
- Coding and cleaning survey data

Online quizzes will be available for self-assessment.
Course: STAA0004B - Research Design

Blackboard Site: STAA0004

Dates: Sun 23rd Oct (9 am – 4 pm)

Room EN409

Assumed Knowledge: Basic Statistics

Software used: Excel and SPSS

Course Description:

You will acquire skills and knowledge in observational and experimental studies, designing an experiment, incidence and prevalence statistics, different types of study designs including Cohort and Case-control studies.

Topics will include

- The basic concepts of experimental designs
- Common designs used in health statistics and elsewhere
- Incidence, prevalence and fertility statistics
- Mortality Statistics and Standardisation of rates
- Randomized trials and Cohort studies
- Case control studies

Online quizzes will be available for self-assessment.
Course: STAA0005A - Multiple Linear Regression

Blackboard Site: STAA0005

Dates: 8 & 9 Oct. in Room BA513

Room BA513

Assumed Knowledge: ANOVA and Simple Linear Regression

Software used: SPSS

Maximum 20 students

Course Description:

In Multiple Regression you will look at simple linear regression and multiple regression using three different strategies (standard regression, stepwise regression and hierarchical regression). Particular attention is paid to report writing, assumption checking, outlier checking and tests for mediation. Make sure that you have access to SPSS and please revise the relevant material for the simple linear regression and ANOVA short course beforehand.

Online quizzes will be available for self-assessment.
Course: STAA0005B - Factor Analysis and MANOVA

Blackboard Site: STAA0005

Dates: 22-23 Oct. (9.00 pm – 5.00 pm)

Room BA513

Assumed Knowledge: ANOVA and Simple Linear Regression

Software used: SPSS

Maximum 20 students

Course Description:

Factor Analysis covers exploratory factor analysis (EFA). The various methods for extracting and rotating factors are discussed as are the interpretation of factors and the creation of factor scores and summated scales. EFA is a descriptive technique. That is, it is designed to help us understand and explain patterns in the data, without making any formal predictions about what results will look like. However, it is not our data’s job to tell us what its underlying structure is and a sound factor analytic study will begin with a great deal of prior thinking about the nature of the concept that we want to understand, appropriate indicators of that concept, appropriate population, and how results of factor analysis will be used. So even before we begin data collection, let alone data analysis, we will have an expectation about what the results might look like. The job of the data is then to show us how well our expectations are reflected in the ‘real world’. The results of exploratory factory analysis can then be used inform future hypotheses. These hypotheses are subsequently tested using confirmatory factor analysis (CFA), which is conducted within the structural equation modelling framework (not covered in this subject).

MANOVA examines between subjects, within subjects and mixed multivariate analysis of variance. Particular attention is paid to assumption checking, the testing of specific contrasts and report writing. Make sure that you have access to SPSS and please revise the relevant material for the ANOVA and Simple Linear Regression short course beforehand.

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Online quizzes will be available for self-assessment.
Course: STAA0007 - Forecasting (18 hrs)

Blackboard Site: STAA0013

Dates: Tues 30/8, 6/9, 13/9, 20/9, 27/9, 4/10 (5:30 pm – 8:30 pm)

Room: EN409

Assumed Knowledge: ANOVA and Simple Linear Regression. Also some basic knowledge about the use of SPSS package is required.

Software used: EXCEL and SPSS

Maximum 20 students

Course Description

This unit aims to introduce students to various forecasting methods and their application in business and industry using time series data. The advantages and disadvantages of naïve, moving average, exponential smoothing and decomposition forecasts will be covered. Participants who successfully complete this Unit should be able to:

- extract time series data from web sites
- compute indices based on time series data
- plot time series and describe their characteristics
- understand the time series and identify the properties like trend, seasonality or cyclic behaviour relevant to the time series under investigation
- use various methods to obtain short-term forecasts
- compare the accuracy of these forecasts using appropriate measures.

Online quizzes will be available for self-assessment.
Course: **STAA0009A** - Introductory Structural Equation Modelling with AMOS (15 hrs)

**Blackboard Site:** STAA0009

**Dates:** Mondays 29/8, 5/9, 12/9, 19/9, 26/9, 3/10 (5:30 pm – 8:30 pm)

**Room** ATC325

**Assumed Knowledge:** Multiple Regression and Factor Analysis

**Software used:** AMOS

Maximum 20 students

**Course Description**

This course is designed as an introductory, applied course in the use of Structural Equation Models (SEM) in research. The aim of this subject is to provide students with a broad understanding of structural equation modelling, its underlying theory and potential uses in research, as well as an awareness of its strengths and limitations. It is designed to give students the skills to competently design, assess, and interpret simple research models across multiple discipline areas using structural equation modelling techniques.

**Topics:**
- Review Exploratory Factor Analysis (SPSS).
- Introduction to AMOS and Confirmatory Factor Analysis (CFA)
- Confirmatory Factor Analysis (CFA)
- Review Multiple Regression (SPSS) and Path Analysis in AMOS
- Full Structural Models
- Using SEM to assess measures (Congeneric Confirmatory Factor Analysis, Scale Reliability and Validity, Higher Order Confirmatory Factor Analysis)

Online quizzes will be available for self-assessment.
Course: STAA0009B - Advanced Structural Equation Modelling (SEM) with MPLUS (15 hrs)

Blackboard Site: STAA0009

Dates: Mondays 10/10, 17/10, 24/10, 31/10, 7/11 (5:30 pm – 8:30 pm)

Room ATC325

Assumed Knowledge: Introduction to SEM using AMOS

Software used: MPLUS

Maximum 20 students

Course Description

This course is designed as an extension to introductory SEM using AMOS. The aim of this subject is to introduce students to the MPLUS software and more advanced SEM models. It is designed to give students the skills to competently design, assess, and interpret more advanced models across multiple discipline areas using structural equation modelling techniques.

Topics:
Introduction to MPLUS and Model Issues:
- Formative vs. Reflective Indicators
- Item parcelling including Munck’s method
- Using ordinal indicators

Multi-sample models and invariance testing using MPLUS
Mean structure models using MPLUS
Longitudinal models using MPLUS
Assumptions, missing data and model issues

Online quizzes will be available for self-assessment.
Course: STAA0011A: -Data Mining with SAS Enterprise Miner (SASEM) (18hrs)

Blackboard Site: STAA0011

Dates: Tuesdays 30/8, 6/9, 13/9, 20/9, 27/9, 4/10 (5:30 pm – 8:30 pm)

Room  ATC325

Assumed Knowledge: Multiple Regression

Software used: SAS Enterprise Miner

Maximum 20 students

Course Description

This short course provides and introduction to data mining using SAS Enterprise Miner. In particular it introduces market basket analysis, sequence analysis, link analysis and text analysis before comparing classification methods such as Classification Trees and Logistic Regression, and comparing prediction methods such as Regression and Regression Trees. In addition it describes the use of neural network methods for classification, prediction and segmentation.

Online quizzes will be available for self-assessment.
Course: STAA0011B - Statistical Marketing Tools (12hrs)

Blackboard Site: STAA0011

Dates: Tues 18/10, 25/10, 8/11, 15/11 (5:30 pm – 8:30 pm)

Room ATC325

Assumed Knowledge: Factor Analysis

Software used: SPSS

Maximum 20 students

Course Description

This short course introduces four statistical methods commonly used for marketing and other purposes. Visualisation is key for these methods. These methods include Multidimensional scaling for displaying patterns of similarity for objects (e.g. similarity of brands in terms of customer perception). Correspondence analysis is used to illustrate the relationships between categorical variables. Conjoint Analysis is used to measure the importance of product attributes underlying product preferences and Cluster Analysis is used to create homogeneous groups of people or objects, that can be used for strategic and other purposes.

Online quizzes will be available for self-assessment.