Study Period 1 2026 Statistics Short Courses-Fully online (no on-campus classes)

Course: STAA0001 - Basic Statistics

Duration-12 weeks: from 2nd March 2026 to 31st May 2026

Canvas Site: STAA0001

Assumed Knowledge: None

Software used: IBM SPSS Statistics Version 31

Course Description:

This course introduces basic statistical concepts and skills for students with little or no prior experience in statistics. It begins with an overview of different types of data and best practices in data entry, management, and organisation. Students will learn to describe and summarise data using tables, graphs, and simple numerical measures. The course also develops students' understanding of a range of statistical methods, including the assumptions underlying these methods and the limitations of their application. Students will build the capacity to conduct independent statistical analyses using standard statistical software (IBM SPSS) and will develop skills in effectively communicating the results of statistical investigations.
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Students who successfully complete this unit will be able to:

1. Identify different types of data and apply best practices in data entry, management, and organisation.
2. Effectively display information in datasets graphically.
3. Select an appropriate descriptive or inferential statistical technique based on the researcher's hypothesis, the level of measurement of the variables and testing of the appropriate assumptions to analyse the data.
4. Select appropriate IBM SPSS Statistics procedures, Java applets on the web and mathematical calculations, to obtain basic statistical test results, including confidence intervals and effect size statistics.
5. Explain the foundations of statistical inference, in particular the role of sampling distributions and the use of the normal distribution as a density curve.
6. Recognize when more advanced techniques are needed.
7. Write interpretive summary reports for both descriptive and inferential statistical analysis.

Online quizzes will be available for self-assessment.

Course: STAA0002 - Simple Linear Regression and ANOVA

Duration-12 weeks: from 2nd March 2026 to 31st May 2026

Canvas Site: STAA0002

Assumed Knowledge: Basic Statistics (e.g. STAA0001)

Software used: IBM SPSS Statistics Version 31

Course Description:

This course of study aims to extend the ideas developed in Basic Statistics to include more advanced analyses, broaden the range of applications students are familiar with so that they will be able to carry out independent statistical investigations, and develop an awareness of the assumptions and limitations involved in the generalisation of results of such investigations.

Students who successfully complete this unit will be able to:

1. Choose the appropriate statistical analysis based on the researcher's hypothesis, the level of measurement of the variables and the testing of the appropriate assumptions.
2. Select appropriate statistical procedures, for example, using SPSS, Java applets on the web and mathematical calculations, to analyse data in a variety of contexts.
3. Relate the concepts of effect size, sample size, one or two tailed tests, level of significance and power of a statistical test.
4. Write interpretive summary reports for the inferential statistical techniques covered including linear regression and analysis of variance (ANOVA).
5. Judge when more advanced techniques are needed by comparing different statistical techniques for the variety of research questions.

Online quizzes will be available for self-assessment.

Course: STAA0003A - Introduction to R

Duration-6 weeks: from 3nd March 2026 to 19th April 2026

Canvas Site: STAA0003A

Assumed Knowledge: None

Software used: R and RStudio

Course Description:

In this course, participants will learn how to install and configure R software. They will also learn how to read data into R, access R packages, and organise and comment on R code. Furthermore, they will learn how to use R for effective data analysis and visualisation. Some of the most commonly used probability distributions will be introduced. Statistical data analysis will be conducted using working examples.
After successfully completing this unit, students will be able to:

1. Arrange and consolidate large datasets.
2. Develop the ability to perform basic programming in R.
3. Visualise data using R packages.
4. Relate the basics of fundamental probability distributions to different types of data.
5. Formulate practical and user-friendly solutions to real life problems in the form of a statistical model in an RStudio software environment.

Online quizzes will be available for self-assessment.

Course: STA0003B-Using R for Statistical Analysis

Canvas Site: STAA0003B

Duration-6 weeks: from 20th April 2026 to 31st May 2026

Assumed Knowledge: Introduction to R (e.g. STAA0003A)

Software used: R and RStudio

Course Description:

This course of study aims to extend the ideas developed in Introduction to R. In this course, you will learn key programming principles of R and how to develop and perform different types of statistical analyses and data visualisation. Participants are expected to develop competence in programming in R - an essential skill for a statistician or data scientist.

After successfully completing this unit, students will be able to:

1. Write R programs to conduct hypothesis testing and compare means.
2. Perform simple linear regression in R.
3. Analyse categorical data using R.

Online quizzes will be available for self-assessments

Course: STAA0004A - Survey Design

Canvas Site: STAA0004

Duration-6 weeks: from 2nd March 2026 to 19th April 2026

Assumed Knowledge: Basic Statistics (e.g. STAA0001)

Software used: None

Course Description:

Participants will acquire skills and knowledge in the collection of a survey, observational, experimental, and secondary data, developing a questionnaire, and writing 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

Canvas Site: STAA0004

Duration-6 weeks: from 20th April 2026 to 31st May 2026

Assumed Knowledge: Basic Statistics (e.g. STAA0001) **Software used:** Excel and IBM SPSS

Statistics Version 31

Course Description:

Participants will acquire skills and knowledge in observational and experimental studies, designing an experiment, incidence, and prevalence statistics, and 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, General Linear Models and Multivariate Analysis of Variance

Canvas Site: STAA0005

Duration: 5 weeks: from 2nd March 2026 to 12th April 2026

Assumed Knowledge: Simple Linear Regression and ANOVA (e.g. STAA0002)

Software used: IBM SPSS Statistics Version 31 (R optional)

Course Description:

In the Multiple Regression component, we will examine multiple regression using three approaches: standard regression, stepwise regression, and hierarchical regression. Particular emphasis is placed on assumption checking, outlier detection, report writing, and tests of mediation and moderation using the PROCESS macro. Extensions of multiple linear regression, including general linear models (GLM), are also covered. The course also includes Multivariate Analysis of Variance (MANOVA), examining between-subjects, within-subjects, and mixed-design MANOVA. Emphasis is placed on assumption checking, testing specific contrasts, and effective report writing. Please ensure that you have access to SPSS and revise the relevant material from the Simple Linear Regression and ANOVA short courses prior to attending. .

Online quizzes will be available for self-assessment.

Course: STAA0005B - Factor Analysis (EFA and CFA) and Introduction to Structural Equation Modelling

Canvas Site: STAA0005

Duration: 6 weeks: from 13th April 2026 to 24th May 2026

Assumed Knowledge: Simple Linear Regression and ANOVA (e.g., STAA0002)

Software used: IBM SPSS Statistics Version 31 (R optional) and AMOS

Course Description:

Factor Analysis covers both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). In the 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 scores.

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, with 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 factor analysis can then be used to inform future hypotheses. These hypotheses are subsequently tested using confirmatory factor analysis (CFA), which is conducted within the structural equation modelling framework. Introductory structural equation modelling (SEM) techniques will also be covered during the last two weeks of this course. SEM helps us to investigate patterns of effect within a system of variables which can examine the impact of a set of predictor variables on multiple dependent variables.

Online quizzes will be available for self-assessment.