MALTA UNIVERSITY CONSULTING

Standard Statistical Modelling Techniques

Using R

February/March 2021 (15 hours)

Dates: **February 2021: Thurs 25th,**
March 2021: Tues 2nd, Thurs 4th, Tues 9th, Thurs 11th, Mon 15th
Time: **5.30pm – 8.00pm**
Venue: **Online using Zoom**

Introductory 3-hour optional session: **Monday 22nd February, 2021** **Time:** **5p.m. – 8p.m.**

Registration Fee: €179/€159 UoM student (to attend the 15-hour course)
3 hour optional session (at an extra cost of €40/€35 UM student)

Note: For those who are not familiar with R software, an introductory three-hour session to R software will be provided prior to this course at an additional cost of €40/€35 UM student. This session will be held on 22nd February, 2021 from 5p.m. – 8p.m.

AIM AND CONTENTS OF COURSE

This course is targeted towards individuals who are familiar with basic statistical concepts or individuals who have attended some basic course in Statistics and would like to learn some more advanced techniques.

The aim of this course is to provide an introduction to statistical modelling by looking into some of the most popular modelling techniques in this field. In this course we shall also see how such models can be fitted using R software. Familiarity with the use of R software and with correlation analysis and hypothesis testing is assumed.

Course outline:

In this course, we start by exploring the fundamentals of linear modelling. We present and explain the model used to describe the relationships between variables. The same model can also be used to predict unknown values of the response variable of interest. We also discuss tests which can be used to verify that the data being analysed satisfies the assumptions made by the model. A number of goodness of fit measures for such models are also covered. Finally, we shall see how R software can be used to fit these models. Topics covered are

(1) Regression Analysis
(2) Generalized Linear Models
(3) Time Series Analysis.

Learning outcomes:

After following this course one becomes more knowledgeable about:

- The analytical potential of statistical modelling
- How to choose the most adequate model for your data.
- Interpreting and assessing the adequacy of the models fitted.

Skills learnt:

- Explore a given dataset using R software.
- Determine which statistical model is the most suitable in accordance with the aims of the analysis.
- Check the relevant statistical assumptions underlying the fitting of a particular model.
- Interpret the results obtained once a model is fitted to the data using R software and assess the resulting fit.

Delivery style: Lectures and hands-on use of R software

Course Tutors: Dr Monique Borg Inguanez, Dr Fiona Sammut and Dr David Suda

Dr Monique Borg Inguanez, Dr Fiona Sammut and Dr David Suda are all lecturers with the Department of Statistics & O.R. at the University of Malta, and have a long-standing experience, of more than 15 years, in teaching Statistics to students at different levels. Furthermore, they have also provided their statistical expertise to people in various sectors such as government authorities, medicine, market research, economics and various scientific fields. The three lecturers obtained a BSc (Hons) in Maths & Statistics & O.R. from the University of Malta followed by an MSc in Statistics also from the University of Malta. Further studies were then pursued in renowned universities in the UK. Dr Monique Borg Inguanez obtained a PhD in Statistics from the University of Leeds, where she conducted research on partial least squares and related methods. Dr Fiona Sammut obtained a PhD in Statistics from the University of Warwick, where she conducted research on compositional data analysis. Dr David Suda obtained a PhD in Statistics from the University of Lancaster, where he conducted research on statistical inference of diffusion processes.

Certification:

Participants who attend at least 80% of the sessions will be awarded a Certificate of Attendance issued by Malta University Consulting Ltd.

Course Registration and contact information:

For further information kindly contact: Malta University Consulting Ltd, Robert Mifsud Bonnici Street, Lija.
Tel: 21240746/9982 9244 e-mail: maria.bugeja@muhc.com.mt; website: www.muhc.com.mt

For online registration click here.

Cheques are to be made payable to Malta University Consulting Ltd

Registration can also be done by emailing the Registration Form to: **maria.bugeja@muhc.com.mt**

Course Programme

Each session is of $2^1/_2$ hours duration

Session 1-2

- Introduction to Regression Analysis
- Multiple Linear Regression Model
- ANOVA and ANCOVA Models
- Multicollinearity
- Testing for model assumptions
- Treating Outliers

Session 3-4

- Introduction to Generalized Linear Models
- Binary and Multinomial Logistic Regression Models
- Log-Linear Models

Sessions 5-6

- Visualisation Tools in Time Series
- Methods for Time Series Decomposition
- Moving Average Methods for Smoothing Time Series
- Tests for Randomness
- Differencing and Seasonal Differencing
- ARIMA and SARIMA models
- Tests for Stationarity