ST344-15 Professional Practice of Data Analysis

26/27

Department
Statistics
Level
Undergraduate Level 3
Module leader
Elke Thonnes
Credit value
15
Module duration
10 weeks
Assessment
Multiple
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This module is only available to students with their home department in Statistics.

The student numbers on this module are strictly limited and pre-registration will be required.

Please see https://go.warwick.ac.uk/ST344 for preregistration information and selection criteria.

Module web page

Module aims

The module will introduce students to statistical problem solving and the statistical investigative cycle from problem formulation to the communication of conclusions. Students will be trained in teamwork, leadership and communication/presentation skills.

Broadly speaking, the intention of this module is to complement the more specialized and/or technical modules that our students take, by emphasising the skills needed to translate technical knowhow into professional practice.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

- The statistical investigative cycle
- Data collection and quality
- Exploratory analysis of data
- Data analysis and visualisations using R
- Oral presentations and academic writing skills
- Writing for a non-specialist audience
- Teamwork, leadership and communication

Learning outcomes

By the end of the module, students should be able to:

- Understand the elements of a statistical investigative cycle
- Perform a statistical investigation for a simple problem
- Produce numerical and graphical output from R to support a statistical investigation
- Communicate the results of a statistical analysis in a written report and online
- Understand approaches to and issues in teamwork, leadership and communication
- Work effectively in a collaborative team

Indicative reading list

Specific reading list for the module

Subject specific skills

- Competence in using exploratory analysis, statistical modelling and inference to investigate and draw well founded conclusions from data.
- Competence in the use of R for data analysis, visualisation and statistical modelling.
- Ability to evaluate, select and apply appropriate statistical modelling techniques and communicate the results.
- Competence in creating structured and coherent arguments communicating them in written form, reasoning critically, carefully, and logically.

Transferable skills

- Problem solving: Use rational and logical reasoning to deduce appropriate and well-reasoned conclusions.
- Communication: Present arguments, knowledge and ideas, in a range of formats. Articulate

complex statistical findings clearly and persuasively to executive audiences and potential clients, tailoring communication for technical experts and non-specialist stakeholders alike.

- Ability to deliver results in a professional executive setting, bridging the gap between detailed statistical analysis and strategic decision-making for diverse audiences.
- Teamwork: Understand approaches to and issues in teamwork and leadership. Work effectively in a collaborative team.
- Professionalism: Being prepared to operate autonomously, awareness of how to be efficient and resilient, managing priorities and time, self-motivated, setting and achieving goals, prioritising tasks.

Study

Study time

Type	Required
Lectures	7 sessions of 1 hour (5%)
Project supervision	4 sessions of 30 minutes (1%)
Supervised practical classes	6 sessions of 2 hours (8%)
Online learning (independent)	16 sessions of 1 hour (11%)
Private study	13 hours (9%)
Assessment	100 hours (67%)
Total	150 hours

Private study description

Weekly recommended and wider reading, data analysis, group meetings and preparation for group activities.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A5

	Weighting	Study time	Eligible for self-certification
Professional Data Analysis Portfolio.	45%	50 hours	No

A portfolio of work carried out over the term that builds evidence of data analysis professional standards. This evidence includes the following elements.

1. Using R to professionally carry out data analysis tasks on data sets that are presented, interpreted, discussed, and evaluated.
2. A formal data set investigation that comprises an executive summary presenting a summary of the findings to an intelligent, but not statistically trained audience; a clear statement of objectives, that is, the research questions posed; a description and critical discussion of the analysis performed to answer the research questions; a presentation and critical discussion of the findings; a bibliography listing literature and other sources; a “technical appendix” in the form of either a single, annotated .Rmd file giving the details of your analysis to allow the analysis to be reproduced, a .zip archive with the .Rmd file and all other relevant files; a self-contained HTML page containing a collection of 3-4 visualisations of the data.
3. Critical reflections that contextualise the learning claimed.

The study time noted refers to the amount of time in hours that a well-prepared student who has attended lectures and practicals and carried out an appropriate amount of independent study on the material could expect to spend on this assignment.

Professional Group Project Portfolio	55%	50 hours	No

A portfolio of work carried out as a team and individual that builds evidence of professional team work to complete a data analysis task. This evidence includes the following.

1. A plan setting out realistic timeline with appropriate work milestones, meeting dates and provisional allocation of tasks to group members.
2. A professional team report presenting the analysis and findings of the group from the data analysis task set. This document should be written for readers who do not necessarily have advanced statistical training but are considered professionals.
3. An approximate 10-minute professional team oral presentation detailing the analysis of main findings. The intended audience is considered statistically trained.
4. An individual piece of reflective writing on teamwork experiences. This personal account describes, critically discusses, and reflects on the individual learning experience.

The study time noted refers to the amount of time in hours that a well-prepared student who has attended lectures and practicals and carried out an appropriate amount of independent study on the material could expect to spend on this assignment.

Assessment group R4

	Weighting	Study time	Eligible for self-certification
Reassessment as an individual project	100%		No

This is an individual project replacing any parts of the module that need to be reassessed.

Feedback on assessment

Submitted work is marked and given feedback online within 20 working days of the submission deadline.

Availability

Courses

This module is Core for:

- Year 3 of USTA-G304 Undergraduate Data Science (MSci)

This module is Optional for:

- USTA-G300 Undergraduate Master of Mathematics,Operational Research,Statistics and Economics
  - Year 3 of G300 Mathematics, Operational Research, Statistics and Economics
  - Year 4 of G300 Mathematics, Operational Research, Statistics and Economics

This module is Option list A for:

- Year 3 of USTA-GG14 Undergraduate Mathematics and Statistics (BSc)
- Year 4 of USTA-GG17 Undergraduate Mathematics and Statistics (with Intercalated Year)
- Year 3 of USTA-Y602 Undergraduate Mathematics,Operational Research,Statistics and Economics
- Year 4 of USTA-Y603 Undergraduate Mathematics,Operational Research,Statistics,Economics (with Intercalated Year)

This module is Option list B for:

- Year 3 of USTA-G302 Undergraduate Data Science
- Year 4 of USTA-G303 Undergraduate Data Science (with Intercalated Year)
- Year 3 of USTA-G301 Undergraduate Master of Mathematics,Operational Research,Statistics and Economics (with Intercalated
- Year 3 of USTA-G1G3 Undergraduate Mathematics and Statistics (BSc MMathStat)
- Year 4 of USTA-G1G4 Undergraduate Mathematics and Statistics (BSc MMathStat) (with Intercalated Year)

This module is Option list G for:

- USTA-G300 Undergraduate Master of Mathematics,Operational Research,Statistics and

Economics

- Year 3 of G300 Mathematics, Operational Research, Statistics and Economics
- Year 4 of G300 Mathematics, Operational Research, Statistics and Economics