ACE Network Subject Information Guide

Consulting in Statistics and Data Science: STAT904

Semester 2, 2024

Administration and contact details

Host department	School of Mathematics and Applied Statistics
Host institution	University of Wollongong
Name of lecturer	**Marijka Batterham**
Phone number	02 4221 8190
Email address	marijka@uow.edu.au
Homepage	https://scholars.uow.edu.au/display/marijka_batterham
Name of honours coordinator	**Marianito Rodrigo**
Phone number	02 42214304
Email address	marianit@uow.edu.au
Name of masters coordinator	Adam Rennie
Phone number	02 4221 3822
Email address	adam_rennie@uow.edu.au

Subject details

Handbook entry URL	TBA
Subject homepage URL	TBA
Honours student hand-out URL	https://eis.uow.edu.au/smas/current-students/undergraduate/honours/index.html
Start date:	22nd July
End date:	14th November
Contact hours per week:	2 hours
ACE enrolment closure date:	**22nd July**
Census date:	31st August
Lecture day(s) and time(s):	**TBC**
Exam period (start and end date):	**2nd-14th November**
Description of electronic access arrangements for students (for example, WebCT)	**Zoom or Webex, details to be confirmed email: marijka@uow.edu.au**

Subject content

1. **Subject content description**

In this subject we consider the issues associated with the role of statistical consultant and client. Topics include: communication skills, choosing analysis techniques, developing appropriate study designs, questionnaire development, researching the unknown, sample size, initial interviews, follow-up interviews, analysing data, reporting, and time and project management.

2. **Week-by-week topic overview**

   Topics to be confirmed subject to availability of guest lecturers. Guest lecturers include Statisticians consulting in Industry and Academia. Some consulting topics may vary depending on availability of guest lecturers. Topics include: Aspects of statistical consulting, assessing quantitative research, report writing, consulting in an academic environment, Biostatistical consulting, survey design, design of experiments, big data, handling missing data, randomised controlled trials, data governance, consulting in Industry

   The course will be weekly seminars conducted by the subject co-ordinator Professor Marijka Batterham and several guest Speakers (subject to change) including:
   Some of our internal staff
   Dr Brad Wakefield – Statistical Consultant UOW
   Senior Professor David Steel: Statistical design, including survey design, design of experiments.
   Alberto Nettel- Aguirre; Professor of Biostatistics UOW
   Dave Hughes - Centre for Biometrics and Data Science for Sustainable Primary industries, UOW. Consulting for the grains industry.
   And a number of external/industry consultants in statistics and data science to be confirmed closer to the term start date.

   The final week of term will be student presentations
   Lectures and classes will be conducted using Zoom or Webex and may be a mixture of live and recorded material. Make sure that you have emailed Prof Batterham with your details to ensure that you are included in the relevant Zoom/Webex invitation

3. **Assumed prerequisite knowledge and capabilities**

   IMPORTANT: to enrol, you will be required to provide evidence of previous statistics learning!
   Major in undergraduate statistics, including common statistical methods such as ANOVA, linear and logistic regression, t- tests, chi-squared tests. Ability to use a common statistical analysis package such as SPSS, SAS, STATA or R.

4. **Learning outcomes and objectives**

After successful completion of this subject, students should be able to perform the following tasks;
(i) Identify and deal with ethical issues arising through the consulting relationship
(ii) Conduct an initial interview as a statistical consultant, eliciting the problem and directing appropriate follow-up.
(iii) Appraise statistical consulting sessions conducted by others.
(iv) Analyse and report to a client in a timely and effective manner.
(v) Research topics previously unknown to them.
(vi) Identify relevant analysis and design approaches in practical situations.

AQF specific Program Learning Outcomes and Learning Outcome Descriptors (if available):

AQF Program Learning Outcomes addressed in this subject	**Associated AQF Learning Outcome Descriptors for this subject**
Efficiently conduct a consulting session with a client	K1, S5, A1
Find information on statistical methodology using the resources of the Library and the World Wide Web	S5, A2
Explain the important principles behind designing and conducting an experiment, sample survey or statistical study	S5, A2
Determine appropriate statistical procedures to use on a wide variety of data sets	S5, A2
Apply and interpret procedures from a statistical package	S5, A2,K2

Learning Outcome Descriptors at AQF Level 8

Knowledge

K1: coherent and advanced knowledge of the underlying principles and concepts in one or more disciplines
K2: knowledge of research principles and methods

Skills

S1: cognitive skills to review, analyse, consolidate and synthesise knowledge to identify and provide solutions to complex problem with intellectual independence
S2: cognitive and technical skills to demonstrate a broad understanding of a body of knowledge and theoretical concepts with advanced understanding in some areas
S3: cognitive skills to exercise critical thinking and judgement in developing new understanding
S4: technical skills to design and use in a research project
S5: communication skills to present clear and coherent exposition of knowledge and ideas to a variety of audiences

Application of Knowledge and Skills

A1: with initiative and judgement in professional practice and/or scholarship
A2: to adapt knowledge and skills in diverse contexts
A3: with responsibility and accountability for own learning and practice and in collaboration with others within broad parameters
A4: to plan and execute project work and/or a piece of research and scholarship with some independence

- Students are not required to purchase reference books. Rather they will be expected to conduct literature reviews to identify current resources and issues in consulting using the Library catalogue and databases. Various notes and background reading materials will be made available to students on the UOW eLearning Space.
- Software (local access) Access to a standard statistical software package such as SPSS, Stata, SAS, or R will be required to undertake some statistical analysis for assignments.
- Observations of at least two consulting sessions are required at the home institution. Prof Batterham will liaise with the relevant institutions on how this can be achieved.

6. Assessment

The final mark in STAT904 will be determined as follows*:

Task	Weighting	Due Date
3 Assignments (10% each)	**30%**	**09 Aug 2024 30 Aug 2024 20 Sep 2024**
Report and presentation	**25%**	**25th Oct 2024**
Consultant observation report	**15%**	**28th Oct 2024**
Take home exam	**30%**	**4th Nov 2024**
Total	**100%**	

***Attendance at classes and interaction with the speakers will be taken into account**

Consultant Observations: Each student will also be asked to observe some real consultations and provide a report on them. This assessment must be submitted by 5pm Friday in week 13 (25th October) and will count for 15% of the final mark. To be involved in real consulting students will have to make themselves available outside standard class contact times. Any anticipated problem in this regard should be brought to the attention of Prof Batterham.

Report and Presentation: Each student will be allocated a topic to research and provide a written report and give a 10-minute presentation at the lecture in week 13. This will count for 25% of the final mark in total, 15% for the report and 10% for the presentation.

Take Home Exam (summary of important points): There is a written report identifying and commenting on the important points covered in the subject, including those made by the guest lecturers. This must be submitted by 5pm on Monday the 4th November 2024 and will count for 30% of the final mark.

7. Institution honours program details

Weight of subject in total honours assessment at host department	**1/8**
Thesis/subject split at host department	BMath, thesis worth 25% BMath(Advanced) thesis worth 37.5%
Honours grade ranges at host department	
H1	85-100 %
H2a	75-84 %
H2b	65-74 %
H3	50-64 %