

STAT0029 STATISTICAL DESIGN OF INVESTIGATIONS

IN-COURSE ASSESSMENT 1 (2020/21 SESSION)

- Your investigation is to be submitted on Moodle **by 4pm on TUESDAY 23rd FEBRUARY 2021**.
- This assignment involves you working in teams of three students. You can choose your own team members. The submission consists of one document per team.
- Details for the submission procedure will be uploaded on the Moodle page for this ICA in the first week of February.
- Late submission will incur a penalty unless there are extenuating circumstances (e.g. medical) supported by appropriate documentation. Penalties are set out in the latest editions of the Statistical Science Department student handbooks, available from the departmental web pages.
- Failure to submit this in-course assessment will mean that your overall examination mark is recorded as “non-complete”, i.e. you will not obtain a pass for the course.
- A maximum word count is specified for this assessment (see below) and submitted work that exceeds this word count will be penalised. Penalties are set out in the latest editions of the Statistical Science Department student handbooks, available from the departmental web pages.
- Any plagiarism will normally result in zero marks for all students involved, and may also mean that your overall examination mark is recorded as non-complete. Guidelines as to what constitutes plagiarism may be found in the Departmental Student Handbooks. A summary of the guidelines is also available on the Moodle page for this ICA. The Turn-It-In® plagiarism detection system may be used to scan your submission for evidence of plagiarism and collusion.
- When submitting the document, all team members will have to affirm that they have read the guidelines on what constitutes plagiarism and collusion and that the work being submitted is entirely their group's own.
- Feedback on your work will be sent to you by email and you will receive a *provisional grade – grades are provisional until confirmed by the Statistics Examiners' Meeting in June 2021*.
- After receiving the provisional grade, office hours will be available for additional feedback.

Experiment

The exercise is to conceive, design, conduct, analyse, and write up an experiment. This assignment involves you working in teams of three students. You can choose your own team members.

You must pick your own research question and design your own experiment! You may wish to look at the list of experiments in the article by GW Hunter, University of Wisconsin (available on the STAT0029 Moodle page) for inspiration, but do not just conduct exactly the same experiment as those listed.

Here is one way of thinking about the project that has worked well for students in the past, and mimics a common situation: consider the different perspectives of clients, statisticians, and outsiders. A client typically poses the research question, conducts the experiment, and collects the data. The statistician proposes how to tackle the question, designs the experiment, and analyses the data. Client and statistician do the write-up jointly. Outsiders may want to read about the experiment and would appreciate a report which is clear and accessible even though they may not have detailed knowledge about statistical design. Thinking about these perspectives and tasks will help you plan and execute the project.

This assignment counts for 50% towards the final course mark. Note that you are required to conduct an experiment and **not** an observational study. If you carry out and report the results of an observational study, you will obtain zero marks for the assignment.

The write-up of the experiment should be in the format of an article. Requirements and guidelines on the preparation of this text are set out in **Annex A** below.

The mark you obtain for the assignment will be assigned equally to the students involved on the assumption of an equal workload. So you need to divide up the work fairly. If there are any problems with respect to the workload, please contact the course lecturer. See **Annex B** for the marking criteria.

Do not leave this assignment till the last minute. Try to plan and perform your experiment and analyse the data by the beginning of February. This will give you about three weeks to write your article.

In addition to the course office hours throughout Term 1, there will be office hours during Term 2 for consultation regarding this assignment. All students are encouraged to discuss their ideas with the course lecturer at an early stage, and as the work develops.

Take note: if the planned experiment involves exposing people to treatment, then it is compulsory to get approval from the course lecturer. As an example, no approval will be given to an experiment that involves investigating the effect of levels of alcohol consumption on cognitive function.

Annex A: Requirements and guidelines on the format of the article

1. The article should be written clearly and simply so that it is accessible to readers in other scientific disciplines and to readers for whom English is not their first language.
2. Use font size 11 or larger.
3. Articles should be organised in the sequence: title, student numbers, summary, main text, references, word count. Place figures and tables in appropriate places in the main text.
4. The article (excluding the references, but including the text for the tables and figures) should be about 1,500 words long, and no longer than 2000 words. Add the word count at the end of the article.
5. For the title, do not exceed two lines in print. Titles do not normally include numbers, acronyms, abbreviations or punctuation.
6. To allow anonymous marking, **only provide the student ID numbers below the title.**
7. The summary should be about 200 words, but certainly no more than 300 words.
8. It is up to you how you divide the main text in sections. Here is one possibility: *Introduction, Design and data, Analysis, Discussion*. Any discussion at the end of the text should be as succinct as possible, to briefly convey the general relevance of the work.
9. As a guideline to the number of figures or tables: use 3 or 4 display items for figures or tables. Number these displays and refer to them in the main text
10. If there are any references, the style of referencing is up to you, but be consistent and provide full information. Feel free to refer to the lecture notes if needed. Have a look at how other people refer in books or articles. Please note: references to websites should give authors if known, title of cited page, url in full, and year of posting in parentheses.

Annex B: marking criteria

In the marking of this assignment, equal weight will be given to the experiment itself and to the write-up. The following considerations will be taken into account:

The experiment

The experiment will be judged on how well it is designed to answer the research question of interest and on the quality of the statistical analysis of the data generated. The following criteria will be considered:

- Is the aim stated clearly and precisely?
- Is the response variable appropriately chosen?
- Is the choice of treatments (i.e. what variables to set, and the levels chosen) appropriate to the aim of the experiment?
- Have other potential influences been considered, and if so how have they been handled in the experimental design?
- Has randomisation been used appropriately to determine the allocation of treatments to experimental units?
- Was the experimental design influenced by the desired precision with which comparisons of interest could be estimated?
- How much care has been taken in the conduct of the experiment itself? Were some trial runs carried out to highlight possible problems?
- Is the analysis appropriate to the design?

The article

The article will be marked according to the quality of its organisation (does it flow in a logical order and does it contain appropriate sections and details?), the clarity and the quality of the English, and the presentation of any mathematical content. Graphs and tables need to be relevant, clear and well presented. For graphs, pay attention to the caption, appropriate choices of symbols, line types, axis labels, units of measurement and so forth. For tables, pay attention to the caption, row and column headings, units of measurement and so forth.