



## UNSW Course Outline

# ZPEM2312 Fundamentals of Data Analysis - 2024

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## General Course Information

**Course Code :** ZPEM2312

**Year :** 2024

**Term :** Semester 1

**Teaching Period :** Z1

**Is a multi-term course? :** No

**Faculty :** UNSW Canberra

**Academic Unit :** UC Science

**Delivery Mode :** In Person

**Delivery Format :** Standard

**Delivery Location :** UNSW Canberra at ADFA

**Campus :** UNSW Canberra

**Study Level :** Undergraduate

**Units of Credit :** 6

### Useful Links

[Handbook Class Timetable](#)

## Course Details & Outcomes

### Course Description

This course provides a foundation for quantitative methods applicable to students in their future careers. It teaches the fundamentals of data analysis with emphasis on the analysis of data arising from real-life situations across the disciplines. It focuses on the understanding of the

concepts of statistics without overemphasizing the mathematical detail.

The course teaches the principles of good experimental design, as well as the interpretation and critical evaluation of statistical information presented in the media and in reports published by organisations. It introduces a computer software package, Excel, which is used for data exploration, presentation and analysis.

Main topics covered include: gathering, organising and summarising data; using graphical techniques to present statistical information; measures of location and spread; probability distributions such as the normal distribution; confidence intervals and hypothesis tests for a single sample; correlation and simple linear regression.

## Course Aims

The aim of the course is to enable students to use data to answer questions and make informed, objective decisions. It aims to teach students to evaluate information, to reason logically, to critically evaluate the reasoning of others, to understand the methods of data analysis and to be able to apply appropriate techniques to analyse data arising from real-life situations.

## Relationship to Other Courses

Students who have completed the following courses are generally excluded from studying this course: ZPEM1302, ZPEM1304, ZPEM2302, and ZPEM2310.

## Course Learning Outcomes

Course Learning Outcomes
CLO1 : At the successful completion of this course, students should be able to summarize and present data clearly in numerical and graphical forms.
CLO2 : At the successful completion of this course, students should be able to solve life-related problems using probability distributions.
CLO3 : At the successful completion of this course, students should be able to estimate the true value of parameters with confidence.
CLO4 : At the successful completion of this course, students should be able to use sample data to assess claims about unknown population parameters.
CLO5 : At the successful completion of this course, students should be able to model relationships between variables by using linear regression techniques.
CLO6 : At the successful completion of this course, students should be able to interpret results of statistical analyses and present conclusions in clear non-technical language.

Course Learning Outcomes	Assessment Item
CLO1 : At the successful completion of this course, students should be able to summarize and present data clearly in numerical and graphical forms.	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Final Examination</li> <li>• Lab Work</li> </ul>
CLO2 : At the successful completion of this course, students should be able to solve life-related problems using probability distributions.	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Final Examination</li> <li>• Lab Work</li> </ul>
CLO3 : At the successful completion of this course, students should be able to estimate the true value of parameters with confidence.	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Final Examination</li> <li>• Lab Work</li> </ul>
CLO4 : At the successful completion of this course, students should be able to use sample data to assess claims about unknown population parameters.	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Final Examination</li> <li>• Lab Work</li> </ul>
CLO5 : At the successful completion of this course, students should be able to model relationships between variables by using linear regression techniques.	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Final Examination</li> <li>• Lab Work</li> </ul>
CLO6 : At the successful completion of this course, students should be able to interpret results of statistical analyses and present conclusions in clear non-technical language.	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Final Examination</li> <li>• Lab Work</li> </ul>

## Learning and Teaching Technologies

Moodle - Learning Management System

### Learning and Teaching in this course

The course makes extensive use of the Moodle on-line learning environment, with weekly PowerPoint slides, lecture recordings, lab work, lab solutions, and supplementary teaching materials all provided online. Students should ensure they check Moodle regularly.

### Additional Course Information

Enrolment in this course or participation in any activity that is recorded constitutes consent to be recorded during tutorial and other teaching sessions. Recordings will only be used for the purposes of teaching this course. If you do not consent to be recorded, you must notify your course convenor immediately so other arrangements can be made.

# Assessments

## Assessment Structure

Assessment Item	Weight	Relevant Dates
Quizzes Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: Not Applicable
Final Examination Assessment Format: Individual	50%	Start Date: Not Applicable Due Date: Not Applicable
Lab Work Assessment Format: Individual	10%	Start Date: Not Applicable Due Date: Not Applicable

## Assessment Details

### Quizzes

#### Assessment Overview

The Quizzes will provide students with feedback on their progress in the course so far. There will be four equally-weighted quizzes throughout the Semester.

#### Course Learning Outcomes

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- CLO2 : At the successful completion of this course, students should be able to solve life-related problems using probability distributions.
- CLO3 : At the successful completion of this course, students should be able to estimate the true value of parameters with confidence.
- CLO4 : At the successful completion of this course, students should be able to use sample data to assess claims about unknown population parameters.
- CLO5 : At the successful completion of this course, students should be able to model relationships between variables by using linear regression techniques.
- CLO6 : At the successful completion of this course, students should be able to interpret results of statistical analyses and present conclusions in clear non-technical language.

#### Detailed Assessment Description

Each quiz will have a weighting of 10% and consist of multiple choice questions. Quiz 1 will be based on Topics 1 and 2, Quiz 2 on Topics 3 and 4, Quiz 3 on Topic 5, and Quiz 4 on Topics 6 and 7. The quizzes will be held during the lecture time slots (with the exact timing to be advised via Moodle) on the following dates:

Quiz 1: Tuesday 12 March

Quiz 2: Tuesday 26 March

Quiz 3: Tuesday 30 April

## Quiz 4: Tuesday 21 May

### Assessment Length

Not Applicable

### Submission notes

Not Applicable

### Assignment submission Turnitin type

Not Applicable

## Final Examination

### Assessment Overview

Final examination of 2 hours duration. This a compulsory assessment task worth 50%.

### Course Learning Outcomes

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- CLO3 : At the successful completion of this course, students should be able to estimate the true value of parameters with confidence.
- CLO4 : At the successful completion of this course, students should be able to use sample data to assess claims about unknown population parameters.
- CLO5 : At the successful completion of this course, students should be able to model relationships between variables by using linear regression techniques.
- CLO6 : At the successful completion of this course, students should be able to interpret results of statistical analyses and present conclusions in clear non-technical language.

### Detailed Assessment Description

The Final Examination for this course will be held during the UNSW Canberra Examination Period. Further information about the format and scope of the Final Examination will be provided during class and on Moodle. Revision Material (including past Examinations and solutions) will also be available on Moodle.

### Assessment Length

Not Applicable

### Submission notes

Not Applicable

### Assignment submission Turnitin type

Not Applicable

## Lab Work

### Assessment Overview

Continuous assessment conducted during laboratories/tutorials.

Students will receive immediate feedback at several points throughout each lab/tutorial. Will use "Checkpoint" method of assessment.

### Course Learning Outcomes

- CLO1 : At the successful completion of this course, students should be able to summarize and present data clearly in numerical and graphical forms.
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- CLO4 : At the successful completion of this course, students should be able to use sample data to assess claims about unknown population parameters.
- CLO5 : At the successful completion of this course, students should be able to model relationships between variables by using linear regression techniques.
- CLO6 : At the successful completion of this course, students should be able to interpret results of statistical analyses and present conclusions in clear non-technical language.

### Detailed Assessment Description

The lab work assessment will be completed during the lab sessions which will be held most weeks of the semester. Each lab sheet will be available on Moodle prior to that week's lab session. Students work through the lab sheet during their scheduled lab session. The "Checkpoint" method of assessment (which will be explained in classes in Week 1) will assess student participation in labs, their ability to conduct the required analyses, their answers to the lab questions and their grasp of the concepts covered. The student is responsible for checking that they have been marked off for the appropriate checkpoint during the labs. Students are not required to submit lab reports.

### Assessment Length

Not Applicable

### Submission notes

Not Applicable

## Assignment submission Turnitin type

Not Applicable

# General Assessment Information

## Missed Assessment

Students who have a valid reason for missing a lab (with appropriate certification, eg. a medical certificate) must contact the course convenor within one week of the missed lab. In this case, it is their responsibility to catch up on the lab in their own time and get it marked off at a time arranged with the lecturer.

Students who miss a quiz should contact the lecturer and apply for special consideration so that alternative arrangements can be made.

Missing a lab or quiz without a valid reason will result in a mark of zero for that assessment task.

For information on special consideration refer to <https://www.student.unsw.edu.au/special-consideration>

## Use of Generative Artificial Intelligence (AI) in Course Assessments

It is prohibited to use Generative AI (such as ChatGPT) in the Quizzes or Final Examination for this course. If its use is detected, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

## Grading Basis

Standard

## Requirements to pass course

The assessment for the course has been designed so that an overall mark of 50% or greater indicates that the student has unambiguously demonstrated satisfactory completion of each learning outcome. For this reason, students who receive less than 50% overall for the course will receive a fail grade.

# Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 26 February - 1 March	Lecture	Tuesday 27 February Topic 1 Lecture: Course overview and basic statistical processes Text Questions: 2.5, 2.9, 2.10-2.12, 2.37, 2.39, 2.47, 2.49, 2.50, 2.54, 2.57, 2.68, 2.69, 3.1, 3.4, 3.12.
	Laboratory	Wednesday 28 February or Friday 1 March Topic 1 Labs (Checkpoint Lab Assessment)
Week 2 : 4 March - 8 March	Lecture	Tuesday 5 March Topic 2 Lecture: Summarising data and probability Text Questions: 3.11, 4.1, 4.12, 4.14(a)-(b), 4.15, 4.19, 4.23(a), 6.1, 6.8, 6.12, 6.14, 6.18, 6.22(b)-(c).
	Laboratory	Wednesday 6 or Friday 8 March Topic 2 Labs (Checkpoint Lab Assessment)
Week 3 : 11 March - 15 March	Assessment	Tuesday 12 March Quiz 1 and Topic 3 Lecture: Introduction to Normal distribution Text Questions: 6.48, 6.49, 6.50*, 6.54, 6.56, 6.59(a), 6.59(b)* (* denotes challenge quest)
	Laboratory	Wednesday 13 or Friday 15 March Topic 3 Labs (Checkpoint Lab Assessment)
Week 4 : 18 March - 22 March	Lecture	Tuesday 19 March Topic 4 Lecture: Confidence intervals Text Questions: 10.2, 10.6*, 10.7, 10.8, 10.10, 10.13
	Laboratory	Wednesday 20 or Friday 22 March Topic 4 Labs (Checkpoint Lab Assessment)
Week 5 : 25 March - 29 March	Assessment	Tuesday 26 March Quiz 2
Week 6 : 1 April - 5 April	Lecture	Tuesday 2 April Topic 5 Lecture: Hypothesis tests Text Questions: 11.13(c), 11.33, 11.34, 11.35, 11.36, 11.64(a)*
	Laboratory	Wednesday 3 or Friday 5 April Topic 5 Labs (Checkpoint Lab Assessment)
Week 7 : 22 April - 26 April	Lecture	Tuesday 23 April Topic 5 Review Lecture: Hypothesis tests
	Laboratory	Friday 26 April Revision Labs (No Checkpoints) (Note that there are no Labs on Wednesday 24 April as this is a Military Training Day)
Week 8 : 29 April - 3 May	Assessment	Tuesday 30 April Quiz 3
Week 9 : 6 May - 10 May	Lecture	Tuesday 7 May Topic 6 Lecture: Correlation and introduction to regression Text Questions: 9.2, 9.3(a), 9.4*, 9.5, 9.6*, 9.8, 9.9, 9.11(a)(c)&(d)
	Laboratory	Wednesday 8 May Topic 6 Labs (Checkpoint Lab Assessment) (Note that there are no Labs on Friday 10 May as this is a Military Training Day)
Week 10 : 13 May - 17 May	Lecture	Tuesday 14 May Topic 7 Lecture: More on regression Text Questions: 9.3(b), 9.3(c)*, 9.11(b), 9.12, 9.14*
	Laboratory	Wednesday 15 or Friday 17 May Topic 7 Labs (Checkpoint Lab Assessment)
Week 11 : 20 May - 24 May	Assessment	Tuesday 21 May Quiz 4
Week 12 : 27 May - 31 May	Laboratory	Wednesday 29 and Friday 31 May Revision Labs (No Checkpoints)
Week 13 : 3 June - 7 June	Lecture	Tuesday 4 June Revision Lecture
	Laboratory	Wednesday 5 and Friday 7 June Revision Labs (No Checkpoints)

# Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

## General Schedule Information

The above Course Schedule is a guide to topics studied each week. For more detailed and up-to-date information regarding the teaching material covered in each class, students should refer to the Course Schedule on the Moodle site for this course. Students need to attend the 2-hour lecture (from 1000-1200h on Tuesdays) and one 2-hour lab per week (students should check their timetable to find out which lab session they are expected to attend). Students should bring their laptop (with Microsoft Excel), pen and paper to every lab. Two optional support classes will also be held each week. The timing of these classes will be negotiated with interested students.

# Course Resources

## Prescribed Resources

Students will need to obtain the following **compulsory** e-Text (see 10% discount voucher on Moodle):

- MacGillivray, H., Utts, J.M., Heckard, R.F., 2014, *Mind on statistics: Australian and New Zealand*, 2<sup>nd</sup> edition, Cengage, ISBN 9780170237901

## Recommended Resources

It may be useful for students to purchase a Casio FX82 (or similar) scientific calculator. However, Microsoft Excel or the laptop calculator function can be used for calculations if preferred.

## Additional Costs

Not Applicable

# Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Leesa Sidihi		Room 133, Building 26, UNSW Canberra ADFA campus	+61 2 5114 5051	The lecturer is available for email consultations at any time, and for in-person (or Teams/Zoom) consultations during normal working hours. Please email to make an appointment.	No	Yes

# Other Useful Information

## Academic Information

### Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of each course.

Students can also provide feedback during the semester via: direct contact with the lecturer, the “On-going Student Feedback” link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups (where applicable). Student opinions really do make a difference. Refer to the Moodle site for your course to see how the feedback from previous students has contributed to the course development.

Important note: Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct.

<https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf>

### Equitable Learning Services (ELS)

Students living with neurodivergent, physical and/or mental health conditions or caring for someone with these conditions may be eligible for support through the Equitable Learning Services team. Equitable Learning Services is a free and confidential service that provides practical support to ensure your mental or physical health conditions do not adversely affect your studies.

Our team of dedicated **Equitable Learning Facilitators (ELFs)** are here to assist you through this process. We offer a number of services to make your education at UNSW easier and more equitable.

Further information about ELS for currently enrolled students can be found at: <https://www.student.unsw.edu.au/equitable-learning>

## Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW staff and students have a responsibility to adhere to this principle of academic integrity. All students are expected to adhere to UNSW's Student Code of Conduct.

Find relevant information at: [Student Code of Conduct \(unsw.edu.au\)](https://student.unsw.edu.au/student-code-of-conduct)

Plagiarism undermines academic integrity and is not tolerated at UNSW. It is defined as using the words or ideas of others and passing them off as your own, and can take many forms, from deliberate cheating to accidental copying from a source without acknowledgement.

For more information, please refer to the following:

<https://student.unsw.edu.au/plagiarism>

## Submission of Assessment Tasks

### Special Consideration

Special Consideration is the process for assessing and addressing the impact on students of short-term events, that are beyond the control of the student, and that affect performance in a specific assessment task or tasks.

Applications for Special Consideration will be accepted in the following circumstances only:

- Where academic work has been hampered to a substantial degree by illness or other cause;
- The circumstances are unexpected and beyond the student's control;
- The circumstances could not have reasonably been anticipated, avoided or guarded against by the student; and either:
  - (i) they occurred during a critical study period and was 3 consecutive days or more duration, or a total of 5 days within the critical study period; or
  - (ii) they prevented the ability to complete, attend or submit an assessment task for a specific date (e.g. final exam, in class test/quiz, in class presentation)

Applications for Special Consideration must be made as soon as practicable after the problem occurs and at the latest within three working days of the assessment or the period covered by the supporting documentation.

By sitting or submitting the assessment task the student is declaring that they are fit to do so and cannot later apply for Special Consideration (UNSW 'fit to sit or submit' requirement).

Sitting, accessing or submitting an assessment task on the scheduled assessment date, after applying for special consideration, renders the special consideration application void.

Find more information about special consideration at: <https://www.student.unsw.edu.au/special/consideration/guide>

Or apply for special consideration through your [MyUNSW portal](#).

### **Late Submission of assessment tasks (other than examinations)**

UNSW has a standard late submission penalty of:

- 5% per day,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

### **Electronic submission of assessment**

Except where the nature of an assessment task precludes its electronic submission, all assessments must be submitted to an electronic repository, approved by UNSW or the Faculty, for archiving and subsequent marking and analysis.

### **Release of final mark**

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is the only official mark.