



UNSW Course Outline

MATH2859 Probability, Statistics and Information - 2024

Published on the 20 May 2024

General Course Information

Course Code : MATH2859

Year : 2024

Term : Term 2

Teaching Period : T2

Is a multi-term course? : No

Faculty : Faculty of Science

Academic Unit : School of Mathematics & Statistics

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 3

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

This course provide tools to apply and interpret statistical methods in an Engineering context and to build foundations for future courses. Topics include descriptive statistics, random variables and special probability distributions such as Binomial, Poisson, Exponential and

Normal, sampling distribution and the Central Limit Theorem, statistical inference for proportions and means including confidence intervals and hypothesis testing, statistical analysis in the simple linear regression model and analysis of variance.

MATLAB will be used as a tool for statistical computations and graphical and numerical illustration of theoretical concepts introduced during the lecture series, and applied during computing labs.

Course Aims

The primary objective of this course is to enable students to apply and interpret statistical methods in an Engineering context, and to build foundations for future courses in their undergraduate degree programs.

Relationship to Other Courses

Prerequisite: MATH1231 or MATH1241 or MATH1251 or DPST1014

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Apply various graphical and numerical tools used in exploratory data analysis for summarising and understanding data.
CLO2 : Apply various statistical models and methods for drawing conclusions and making decisions under uncertainty in engineering contexts.
CLO3 : Use MATLAB for statistical analysis.
CLO4 : Study real or simulated data by applying descriptive data analysis tools, make inferences about means and proportions, perform regression analysis and analysis of variance.

Course Learning Outcomes	Assessment Item
CLO1 : Apply various graphical and numerical tools used in exploratory data analysis for summarising and understanding data.	<ul style="list-style-type: none">• Online quizzes• Mid-term Test• Final exam
CLO2 : Apply various statistical models and methods for drawing conclusions and making decisions under uncertainty in engineering contexts.	<ul style="list-style-type: none">• Online quizzes• Mid-term Test• Final exam
CLO3 : Use MATLAB for statistical analysis.	<ul style="list-style-type: none">• Online quizzes• Mid-term Test• Final exam
CLO4 : Study real or simulated data by applying descriptive data analysis tools, make inferences about means and proportions, perform regression analysis and analysis of variance.	<ul style="list-style-type: none">• Online quizzes• Mid-term Test• Final exam

Learning and Teaching Technologies

Moodle - Learning Management System

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Online quizzes Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Weekly (see Moodle announcements for specific due dates and times)
Mid-term Test Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Week 7 EXM (see your myUNSW timetable)
Final exam Assessment Format: Individual	60%	Start Date: Not Applicable Due Date: During the exam period

Assessment Details

Online quizzes

Assessment Overview

The online quizzes contribute 20% to the total mark for the course. This task consists of completing ten weekly online lectures and quizzes, each worth 2% of the final mark.

You will be expected to watch pre-recorded online lectures each week and complete exercises related to the material presented. Each lecture is accompanied by a quiz.

You will receive your mark and feedback immediately after submitting each quiz.

Course Learning Outcomes

- CL01 : Apply various graphical and numerical tools used in exploratory data analysis for summarising and understanding data.
- CL02 : Apply various statistical models and methods for drawing conclusions and making decisions under uncertainty in engineering contexts.
- CL03 : Use MATLAB for statistical analysis.
- CL04 : Study real or simulated data by applying descriptive data analysis tools, make inferences about means and proportions, perform regression analysis and analysis of variance.

Mid-term Test

Assessment Overview

The midterm test is scheduled in week 7 and covers all topics presented in the first 5 weeks of the course.

Students are allowed only one attempt at the test.

The test duration is 40 minutes. It will take place in the computing labs. You will have to either select the correct answer or enter a numerical value/a text response. You will be asked to copy and paste data and use MATLAB to answer some questions.

You will receive your marked test and feedback within two weeks after submission.

Course Learning Outcomes

- CL01 : Apply various graphical and numerical tools used in exploratory data analysis for summarising and understanding data.
- CL02 : Apply various statistical models and methods for drawing conclusions and making decisions under uncertainty in engineering contexts.
- CL03 : Use MATLAB for statistical analysis.
- CL04 : Study real or simulated data by applying descriptive data analysis tools, make inferences about means and proportions, perform regression analysis and analysis of variance.

Assessment Length

40 min

Final exam

Assessment Overview

The final exam will be held during the official university examinations period. It will have a 1-hour time limit.

The exam is designed to summarise your learning and problem-solving skills on all topics delivered across all weeks of the term, including material from lectures, tutorials and labs. You will have to either select the correct answer or enter a calculated value, as well as a text response. You will be asked to copy and paste data and use MATLAB to answer some questions.

Feedback is available through inquiry with the course convenor.

Course Learning Outcomes

- CL01 : Apply various graphical and numerical tools used in exploratory data analysis for summarising and understanding data.

- CLO2 : Apply various statistical models and methods for drawing conclusions and making decisions under uncertainty in engineering contexts.
- CLO3 : Use MATLAB for statistical analysis.
- CLO4 : Study real or simulated data by applying descriptive data analysis tools, make inferences about means and proportions, perform regression analysis and analysis of variance.

Assessment Length

1 hour

General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Descriptive statistics; Probability (revision)
Week 2 : 3 June - 9 June	Lecture	Random variables
Week 3 : 10 June - 16 June	Lecture	Special random variables
Week 4 : 17 June - 23 June	Lecture	Sampling distributions and the Central Limit Theorem
Week 5 : 24 June - 30 June	Lecture	Confidence intervals for means and proportions
Week 7 : 8 July - 14 July	Lecture	Hypothesis testing
Week 8 : 15 July - 21 July	Lecture	Inference concerning differences in means
Week 9 : 22 July - 28 July	Lecture	Regression analysis
Week 10 : 29 July - 4 August	Lecture	Analysis of variance

Attendance Requirements

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

Course Resources

Recommended Resources

Recommended Textbook:

J. Devore and N. Farnum, Applied Statistics for Engineers and Scientists, 3rd Edition, 2013, Duxbury Press, Thomson Publishers (or 2nd edition of this book).

Additional Reading:

D. Montgomery and G. Runger, Applied Statistics and Probability for Engineers, 7th edition, 2019, Wiley (or a previous edition of this book).

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
	Eka Shinjikashvili					Yes	Yes

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the [UNSW Student Code of Conduct Website](#).

Academic Honesty and Plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity, plagiarism and the use of AI in assessments can

be located at:

- The [Current Students site](#),
- The [ELISE training site](#), and
- The [Use of AI for assessments](#) site.

The Student Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>

Submission of Assessment Tasks

Penalty for Late Submissions

UNSW has a standard late submission penalty of:

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

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

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

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: <https://student.unsw.edu.au/special-consideration>

Important note: UNSW has a “fit to sit/submit” rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination

or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- [The Current Students Gateway](#)
- [Student Support](#)
- [Academic Skills and Support](#)
- [Student Wellbeing, Health and Safety](#)
- [Equitable Learning Services](#)
- [UNSW IT Service Centre](#)
- Science EDI Student [Initiatives](#), [Offerings](#) and [Guidelines](#)

School-specific Information

School of Mathematics and Statistics and UNSW Policies

The School of Mathematics and Statistics has adopted a number of policies relating to enrolment, attendance, assessment, plagiarism, cheating, special consideration etc. These are in addition to the Policies of The University of New South Wales. Individual courses may also adopt other policies in addition to or replacing some of the School ones. These will be clearly notified in the Course Initial Handout and on the Course Home Pages on the Maths Stats web site. Students in courses run by the School of Mathematics and Statistics should be aware of the School and Course policies by reading the appropriate pages on the web site starting at: [The School of Mathematics and Statistics assessment policies](#)

The School of Mathematics and Statistics will assume that all its students have read and understood the School policies on the above pages and any individual course policies on the Course Initial Handout and Course Home Page. Lack of knowledge about a policy will not be an excuse for failing to follow the procedure in it.

Special Consideration - Short Extension Policy

The School of Mathematics and Statistics has carefully reviewed its range of assignments and projects to determine their suitability for automatic short extensions as set out by the UNSW Short Extension Policy. Upon comprehensive examination of our course offerings that incorporate these types of assessments, we have concluded that our current deadline structures

already accommodate the possibility of unexpected circumstances that may lead students to require additional days for submission. Consequently, the School of Mathematics and Statistics has decided to universally opt out of the Short Extension provision for all its courses, having pre-emptively integrated flexibility into our assessment deadlines. The decision is subject to revision in response to the introduction of new course offerings. Students may still apply for Special Consideration via the usual procedures.

Computing Lab

The main computing laboratory is room G012 of the Anita B. Lawrence Centre (formerly Red Centre). You can get to this lab by entering the building through the main entrance to the School of Mathematics (on the Mezzanine Level) and then going down the stairs to the Ground Level. A second smaller lab is Room M020, located on the mezzanine level through the glass door (and along the corridor) opposite the School's entrance.

For more information, including opening hours, see the [computing facilities webpage](#). Remember that there will always be unscheduled periods when the computers are not working because of equipment problems and that this is not a valid excuse for not completing assessments on time.

School Contact Information

Please visit the [School of Mathematics and Statistics website](#) for a range of information.

For information on Courses, please go to "Student life & resources" and either Undergraduate and/or Postgraduate and respective "Undergraduate courses" and "Postgraduate courses" for information on all course offerings.

All school policies, forms and help for students can be located by going to the "Student Services" within "Student life & resources" page. We also post notices in "Student noticeboard" for your information. Please familiarise yourself with the information found in these locations. If you cannot find the answer to your queries on the web you are welcome to contact the Student Services Office directly.

Undergraduate

E: ug.mathsstats@unsw.edu.au

P: 9385 7011 or 9385 7053

Postgraduate

E: pg.mathsstats@unsw.edu.au

P: 9385 7053

Should we need to contact you, we will use your official UNSW email address of in the first instance. **It is your responsibility to regularly check your university email account. Please use your UNSW student email and state your student number in all emails to us.**