



UNSW Course Outline

ZPEM2310 Engineering Mathematics 2B - 2024

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General Course Information

Course Code : ZPEM2310

Year : 2024

Term : Semester 2

Teaching Period : Z2

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

The course covers two distinct topics. The first, Partial Differential Equations (PDEs), looks at the basics of mathematical modelling with PDEs, with special emphasis on diffusion and wave equations in several different coordinate systems (for example, Cartesian and polar

coordinates). The course will cover separable PDEs and orthogonal functions. The second topic, Statistics, builds on the first-year probability course to consider a selection of topics such as: discrete and continuous probability distributions; populations, samples and randomness; sampling distributions; estimation of population parameters and testing claims about population parameters; and measuring the association between two variables.

Course Aims

This course aims to give students an understanding of PDEs and data analysis techniques at an introductory level, and an ability to use PDEs and statistical methods to solve simple problems.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : At the successful completion of this course, students should be able to demonstrate an understanding of where PDE problems arise and solve these problems.
CLO2 : At the successful completion of this course, students should be able to solve wave, diffusion and Laplace equations in different coordinate systems.
CLO3 : At the successful completion of this course, students should be able to demonstrate correct interpretation of solutions to PDE equations in terms of physical quantities.
CLO4 : At the successful completion of this course, students should be able to demonstrate an understanding of basic statistical methods.
CLO5 : At the successful completion of this course, students should be able to formulate and solve life-related problems involving data using appropriate statistical methods.
CLO6 : At the successful completion of this course, students should be able to interpret output from statistical analysis and make sound decisions based on that interpretation.

Course Learning Outcomes	Assessment Item
CLO1 : At the successful completion of this course, students should be able to demonstrate an understanding of where PDE problems arise and solve these problems.	<ul style="list-style-type: none"> • Quizzes • Class tests • PDE Group project • Final Examination
CLO2 : At the successful completion of this course, students should be able to solve wave, diffusion and Laplace equations in different coordinate systems.	<ul style="list-style-type: none"> • Quizzes • Class tests • PDE Group project • Final Examination
CLO3 : At the successful completion of this course, students should be able to demonstrate correct interpretation of solutions to PDE equations in terms of physical quantities.	<ul style="list-style-type: none"> • Quizzes • Class tests • PDE Group project • Final Examination
CLO4 : At the successful completion of this course, students should be able to demonstrate an understanding of basic statistical methods.	<ul style="list-style-type: none"> • Quizzes • Class tests • Final Examination
CLO5 : At the successful completion of this course, students should be able to formulate and solve life-related problems involving data using appropriate statistical methods.	<ul style="list-style-type: none"> • Quizzes • Class tests • Final Examination
CLO6 : At the successful completion of this course, students should be able to interpret output from statistical analysis and make sound decisions based on that interpretation.	<ul style="list-style-type: none"> • Quizzes • Class tests • Final Examination

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Learning and Teaching in this course

Lectures given live. Lecture recordings available online. Course materials available online.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Quizzes Assessment Format: Individual	22%	Start Date: Not Applicable Due Date: Not Applicable
Class tests Assessment Format: Individual	28%	Start Date: Not Applicable Due Date: Not Applicable
PDE Group project Assessment Format: Group	10%	Start Date: Not Applicable Due Date: Not Applicable
Final Examination Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: Not Applicable

Assessment Details

Quizzes

Assessment Overview

Weekly online quizzes. Multiple attempts allowed.

Course Learning Outcomes

- CL01 : At the successful completion of this course, students should be able to demonstrate an understanding of where PDE problems arise and solve these problems.
- CL02 : At the successful completion of this course, students should be able to solve wave, diffusion and Laplace equations in different coordinate systems.
- CL03 : At the successful completion of this course, students should be able to demonstrate correct interpretation of solutions to PDE equations in terms of physical quantities.
- CL04 : At the successful completion of this course, students should be able to demonstrate an understanding of basic statistical methods.
- CL05 : At the successful completion of this course, students should be able to formulate and solve life-related problems involving data using appropriate statistical methods.
- CL06 : At the successful completion of this course, students should be able to interpret output from statistical analysis and make sound decisions based on that interpretation.

Detailed Assessment Description

Weekly online quizzes. Multiple attempts allowed. Cover both PDEs and stats. Stats weighted

significantly higher (16% vs. 6% contribution to course mark) as there is no stats assignment.

Assignment submission Turnitin type

Not Applicable

Class tests

Assessment Overview

Two short class test

Course Learning Outcomes

- CLO1 : At the successful completion of this course, students should be able to demonstrate an understanding of where PDE problems arise and solve these problems.
- CLO2 : At the successful completion of this course, students should be able to solve wave, diffusion and Laplace equations in different coordinate systems.
- CLO3 : At the successful completion of this course, students should be able to demonstrate correct interpretation of solutions to PDE equations in terms of physical quantities.
- CLO4 : At the successful completion of this course, students should be able to demonstrate an understanding of basic statistical methods.
- CLO5 : At the successful completion of this course, students should be able to formulate and solve life-related problems involving data using appropriate statistical methods.
- CLO6 : At the successful completion of this course, students should be able to interpret output from statistical analysis and make sound decisions based on that interpretation.

Detailed Assessment Description

Will be scheduled during lecture times. Once test each on PDEs and statistics.

Assignment submission Turnitin type

Not Applicable

PDE Group project

Assessment Overview

Two small group projects

Course Learning Outcomes

- CLO1 : At the successful completion of this course, students should be able to demonstrate an understanding of where PDE problems arise and solve these problems.
- CLO2 : At the successful completion of this course, students should be able to solve wave, diffusion and Laplace equations in different coordinate systems.
- CLO3 : At the successful completion of this course, students should be able to demonstrate correct interpretation of solutions to PDE equations in terms of physical quantities.

Detailed Assessment Description

Group project, with a single submission per group.

Assignment submission Turnitin type

Not Applicable

Final Examination

Assessment Overview

Not specified

Course Learning Outcomes

- CLO1 : At the successful completion of this course, students should be able to demonstrate an understanding of where PDE problems arise and solve these problems.
- CLO2 : At the successful completion of this course, students should be able to solve wave, diffusion and Laplace equations in different coordinate systems.
- CLO3 : At the successful completion of this course, students should be able to demonstrate correct interpretation of solutions to PDE equations in terms of physical quantities.
- CLO4 : At the successful completion of this course, students should be able to demonstrate an understanding of basic statistical methods.
- CLO5 : At the successful completion of this course, students should be able to formulate and solve life-related problems involving data using appropriate statistical methods.
- CLO6 : At the successful completion of this course, students should be able to interpret output from statistical analysis and make sound decisions based on that interpretation.

Detailed Assessment Description

Covers the whole course, scheduled during the exam period.

Assessment Length

3 hours

Assignment submission Turnitin type

Not Applicable

General Assessment Information

The two modules (PDEs and statistics) are assessed independently.

For quizzes, tests and the exam, it is prohibited to use any software or service to search for or generate information or answers. 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

For the PDE group assignment it is permissible to use standard editing and referencing software. You can use generative AI software in this assessment (the PDE group assignment) to the extent specified in the assessment instructions. Any output of generative software within your assessment must be attributed with full referencing. If the outputs of generative AI such as ChatGPT form part of your submission and is not appropriately attributed, 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

In order to pass the course an aggregate mark of 50 out of 100 is required, derived from equal weighting of PDE and statistics modules. In addition, a grade of at least 40% is required in each of the two modules. Failure to achieve at least 40% in one module will result in a technical fail, irrespective of the overall aggregate mark.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 15 July - 19 July	Module	PDEs
Week 2 : 22 July - 26 July	Module	PDEs
Week 3 : 29 July - 2 August	Module	PDEs
Week 4 : 5 August - 9 August	Module	PDEs
Week 5 : 12 August - 16 August	Module	PDEs
Week 6 : 19 August - 23 August	Module	PDEs
Week 7 : 9 September - 13 September	Module	Stats
Week 8 : 16 September - 20 September	Module	Stats
Week 9 : 23 September - 27 September	Module	Stats
Week 10 : 30 September - 4 October	Module	Stats
Week 11 : 7 October - 11 October	Module	Stats
Week 12 : 14 October - 18 October	Module	Stats
Week 13 : 21 October - 25 October	Module	Stats

Attendance Requirements

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

General Schedule Information

Students scheduled to attend four lectures and one tutorial per week.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Terry Frank combe		B26 R135		Drop in, or email for appointment.	Yes	Yes