

MATH2340: Linearity and Continuity 1

Callaghan

Semester 1 - 2024



OVERVIEW

Course Description A deeper understanding and experience in the formulation of well-reasoned mathematics is developed in this course. Topics in linear algebra and introductory analysis provide specific knowledge and skills for later studies in mathematics. The focus of the course is on the concepts of linearity and continuity which are fundamental for higher mathematics and its applications.

Academic Progress Requirements Nil

Requisites Students must have successfully completed MATH1120 or MATH1220 before they can enrol in this course.

Contact Hours

Callaghan Lecture
Face to Face On Campus
3 hour(s) per week(s) for 13 week(s) starting Week 1

Workshop
Face to Face On Campus
1 hour(s) per week(s) for 13 week(s) starting Week 1

Unit Weighting Workload 10
Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

CONTACTS

Course Coordinator **Callaghan**
Dr Bishnu Lamichhane
Bishnu.Lamichhane@newcastle.edu.au
(61-2) 49215529
Consultation: By appointment

Teaching Staff Other teaching staff will be advised on the course Canvas site.

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9am-5pm (Mon-Fri)

SYLLABUS

Course Content • Formal mathematics and proof, including quantifiers, deductive reasoning, proof by induction, proof by contradiction.
• Linear Algebra of vectors and matrices, including vector spaces, bases, linear transformations, eigenvectors and diagonalisation.
• Introductory analysis, including sequences, series, convergence and continuity and metric spaces.

Course Learning Outcomes **On successful completion of this course, students will be able to:**
1. Solve mathematical problems using linear algebra and introductory analysis
2. Communicate convincing and reasoned mathematical arguments
3. Use formal processes and language in presenting solutions to mathematical problems.

Course Materials

SCHEDULE

ASSESSMENTS

This course has 5 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Assignments	Friday of Weeks 4 and 10	Individual	10%	1, 2, 3
2	Examination	Thursday class in Week 7	Individual	20%	1, 2, 3
3	Formal Examination	Formal examination period	Individual	50%	1, 2, 3
4	Online quiz	Due dates for the online quizzes will be communicated via Canvas.	Individual	10%	1, 3
5	Weekly workshop discussion	At the end of each workshop (oral quizzes).	Individual	10%	1, 2

Late Submissions The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Assignments

Assessment Type	Written Assignment
Purpose	To help students measure their understanding of course material, and to provide feedback on progress.
Description	An articulate and concise document which conveys evidence-based understanding of the concepts and topics.
Weighting	10%
Due Date	Friday of Weeks 4 and 10
Submission Method	In Class
Assessment Criteria	Correctness of solution and clarity of explanation
Return Method	In Class
Feedback Provided	Returned Work - Two weeks after submission.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 - Examination

Assessment Type	In Term Test
Purpose	To test the students' knowledge of the course material and their ability to describe, analyse and hypothesise from this material.
Description	An invigilated test held in class with multiple part questions requiring written answers.
Weighting	20%
Length	100 minutes
Due Date	Thursday class in Week 7
Submission Method	In Class
Assessment Criteria	Correctness of solution and clarity of explanation
Return Method	In Class
Feedback Provided	Returned Work - Two weeks after submission.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - Formal Examination

Assessment Type	Formal Examination
Purpose	To test the individual student's knowledge of the course and their ability to describe, analyse and hypothesise from this material.
Description	The final exam duration is two hours. It will consist of questions with multiple parts requiring short answers, calculations and explanations.
Weighting	50%
Length	120 minutes + 10 minutes reading time
Due Date	Formal examination period

Submission Method	Formal Exam
Assessment Criteria	Correctness and completeness of solution and clarity of explanation
Return Method	Not Returned
Feedback Provided	No Feedback - .
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 4 - Online quiz

Assessment Type	Online Learning Activity
Purpose	Mostly formative. To encourage engagement in the workshop and provide weekly feedback on students' progress.
Description	Online quizzes (10%) will be conducted through Canvas. The availability and due dates of online quizzes will be communicated via Canvas. They are multiple choice questions. There will be 11 online quizzes and the best 10 out of 11 will be counted in determining your overall final mark.
Weighting	10%
Due Date	Due dates for the online quizzes will be communicated via Canvas.
Submission Method	Online
Assessment Criteria	Correct answers to multiple choice questions
Return Method	Online
Feedback Provided	Online - .
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 5 - Weekly workshop discussion

Assessment Type	Tutorial / Laboratory Exercises
Purpose	Mostly formative. To encourage engagement in the workshop and provide weekly feedback on students' progress.
Description	Brief oral quizzes (10%) will be conducted during each workshop. There will be 11 oral quizzes and the best 10 out of 11 will be counted in determining your overall final mark.
Weighting	10%
Due Date	At the end of each workshop (oral quizzes).
Submission Method	In Class
Assessment Criteria	Demonstrated engagement and coherent verbal explanations for oral quizzes.
Return Method	In Class
Feedback Provided	In Class - Immediately.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory

		development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Communication Methods

Communication methods used in this course include:

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:

<https://policies.newcastle.edu.au/document/view-current.php?id=236>

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at <https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures> that support a safe and respectful environment at the University.

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

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