

## EPMATH 153: Advanced Mathematics 1

Online

Semester 1 - 2024



THE UNIVERSITY OF  
NEWCASTLE  
AUSTRALIA

*The Pathways and Academic Learning Support Centre recognises and respects the unique history and culture of Aboriginal and Torres Strait Islander peoples and their unbroken relationship with the lands and the waters of Australia over millennia. We are dedicated to reconciliation and to offering opportunities for Aboriginal and Torres Strait Islander peoples to access and succeed in higher education. The Centre is committed to providing a culturally safe and inclusive environment for all.*

## OVERVIEW

**Course Description** This course prepares students for the commencement of undergraduate study in those courses that require a sound knowledge of mathematical principles. The depth and content of the course is similar to HSC 2 unit Mathematics. The course covers number systems, basic algebra, simultaneous and quadratic equations, functions and graphs, sequences and series. The course aims to develop the algebraic and graphical skills necessary for calculus.

Recommended for degrees in Mathematics, Engineering, Computer Science, Surveying and Biotechnology.

**Academic Progress Requirements** Nil

**Requisites** You cannot enrol in this course if you have successfully completed or are enrolled in EPMATH124, EPMATH134, EPMATH135, EPMATH302, EPMATH303 or EPMATH309.

**Contact Hours**

**Self-Directed Learning**  
Self-Directed  
2 hour(s) per week(s) for 12 week(s) starting Week 1  
Self-Directed learning is equivalent to face-to-face contact hours. It involves engagement with course materials that are delivered at a time that suits you via short videos, course notes, podcasts, readings and other activities.

**Tutorial**  
Online  
1 hour(s) per week(s) for 12 week(s) starting Week 1

**Unit Weighting** 10

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

# COURSE OUTLINE

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# CONTACTS

<b>Course Coordinator</b>	<b>Dr Scott Sciffer</b> <a href="mailto:Scott.Sciffer@newcastle.edu.au">Scott.Sciffer@newcastle.edu.au</a> (02) 4921 7874 Consultation: Please email to schedule an appointment.	
<b>Teaching Staff</b>	Other teaching staff will be advised on the course Canvas site.	
<b>School Office</b>	<b>Callaghan</b> Ground Floor, General Purpose Building (GP) Ph: 02 4921 5558 <a href="mailto:enabling@newcastle.edu.au">enabling@newcastle.edu.au</a>	<b>Ourimbah</b> HO 168, Humanities Building Ph: 02 4348 4076 <a href="mailto:enabling@newcastle.edu.au">enabling@newcastle.edu.au</a>

# SYLLABUS

<b>Course Content</b>	The course covers: <ul style="list-style-type: none"><li>• number systems: natural numbers, rationals, intergers, surds and real numbers.</li><li>• basic algebra: expanding, factoring, simplifying, solving equations and inequalities, quadratic equations, simultaneous equations.</li><li>• curve sketching lines, circles, parabolas, hyperbolae, ellipses, polynomials, rational functions.</li><li>• sequences and series: arithmetic and geometric progressions.</li></ul>
<b>Course Learning Outcomes</b>	<b>On successful completion of this course, students will be able to:</b> <ol style="list-style-type: none"><li>1. Explain the different number systems and how they are used within various scientific disciplines</li><li>2. Use algebraic skills to solve real world problems</li><li>3. Use graphical skills to solve real world problems</li><li>4. Communicate mathematics in oral and written forms</li><li>5. Determine the correct use of mathematical notation</li><li>6. Formulate and solve real world problems in the language of mathematics</li></ol>
<b>Course Materials</b>	Students will required to have a non-programmable, non-graphics scientific calculator. All other course materials will be provided on the course Canvas site. Students are not required to purchase a textbook.

# SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	Naturals, integers, rationales	Online tutorial	
2	4 Mar	Pythagoras, surds, indices	Online tutorial	- Quiz 1 - Assignment 1
3	11 Mar	Real and complex numbers	Online tutorial	- Quiz 2 - Assignment 2
4	18 Mar	Basics of algebra	Online tutorial	- Quiz 3 - Assignment 3
5	25 Mar	Polynomials	Online tutorial	- Quiz 4 - Assignment 4
6	1 Apr	Solving equations	Online tutorial	- Quiz 5 - Assignment 5
7	8 Apr	Solving more equations	Online tutorial	- Quiz 6 - Assignment 6
<b>Recess</b>				
<b>Recess</b>				
8	29 Apr	Inequalities	Online tutorial	- Quiz 7 - Assignment 7
9	6 May	Sequences and series	Online tutorial	- Quiz 8 - Assignment 8
10	13 May	Functions and relations	Online tutorial	- Quiz 9 - Assignment 9
11	20 May	Graphs of common functions	Online tutorial	- Quiz 10 - Assignment 10
12	27 May	Advanced graphing	Online tutorial	- Quiz 11 - Assignment 11
13	3 Jun		No classes	- Quiz 12 - Assignment 12 - Minor essay
<b>Examination Period</b>				
<b>Examination Period</b>				

# ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Minor Essay	Sunday 9 <sup>th</sup> June 11:59pm	Individual	10%	4
2	Weekly Assignments	Sundays 11:59pm Weeks 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Individual	20%	1, 2, 3, 5, 6
3	Weekly Quizzes	Sundays 11:59pm Weeks 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Individual	20%	1, 2, 3, 5, 6
4	Final Examination	During the examination period	Individual	50%	1, 2, 3, 5, 6

## 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 5% 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.

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## Assessment 1 - Minor Essay

<b>Assessment Type</b>	Essay
<b>Description</b>	Choose a topic relating to the history or practice of mathematics, briefly research the topic, and write about it in a non-technical way. One A4 page (about 500 words) is sufficient. No referencing is required! This is an exercise in communication rather than mathematical content. It is meant to be light-weight, even light-hearted. I'm looking for clear, concise, well-structured prose. Good spelling and punctuation. Some evidence you researched the topic (but formal referencing is <i>not</i> required). Make it entertaining because I have to read a lot of them!
<b>Weighting</b>	10%
<b>Due Date</b>	Sunday 9 <sup>th</sup> June 11:59pm
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Rubric will be provided
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Feedback will be provided in Canvas

## Assessment 2 - Weekly Assignments

<b>Assessment Type</b>	Written Assignment
<b>Description</b>	A short assignment consisting of questions covered in the relevant week's content. Fully worked solutions are required. Bare answers not acceptable. Online via Canvas. Scan and upload copies of your handwritten work. Do not attempt to type your solutions! Do not submit computer-generated graphs, as that defeats the purpose of the topic!!
<b>Weighting</b>	20%
<b>Due Date</b>	Sundays 11:59pm Weeks 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers and justification of solution by providing any necessary working out
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Feedback will be provided in Canvas

## Assessment 3 - Weekly Quizzes

<b>Assessment Type</b>	Quiz
<b>Description</b>	10 multiple choice or short answer questions, done via computer and automatically marked by the computer. 30 minutes duration.
<b>Weighting</b>	20%
<b>Due Date</b>	Sundays 11:59pm Weeks 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Feedback will be provided in Canvas

## Assessment 4 - Final Examination

<b>Assessment Type</b>	Formal Examination
<b>Description</b>	A paper of 2 hours duration, conducted online via Canvas. Fully worked solutions required. Solutions to be scanned and submitted to Canvas within the specified time limit.
<b>Weighting</b>	50%
<b>Due Date</b>	During the examination period
<b>Submission Method</b>	Formal examination
<b>Assessment Criteria</b>	Correct answers and well-justified solutions to the problems posed. Bare answers, with no supporting working out, can expect to receive no marks.
<b>Return Method</b>	This assessment will not be returned
<b>Feedback Provided</b>	No feedback will be provided for 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.

## Communication Methods

**Email** is the principal form of communication at the university and within this course. Always use your student email (NUmail), rather than a private email address, and check this regularly. As Course Coordinator I will try to respond to your email within three (3) working days. I will not normally respond to emails over the weekends. Please be courteous in your email communication and in the online space.

**Canvas** is used to distribute course material, announcements and other information. It is also used for online quizzes and to allow students to track their individual progressive assessment results throughout the semester via Grades.

**Discussions forums** in Canvas can be used to ask questions about minor issues. Students are strongly encouraged to use these to communicate with each other, discuss issues relating to the course, and solve minor problems.

## Attendance and Engagement

In addition to face-to-face hours in class, out-of-class study and related work will require an additional commitment of up to 10 hours per week of reading, preparation, and study time over the semester. Students are required to spend on average 120-140 hours of effort (contact and non-contact hours including assessment) per semester per 10 unit course.

To maximise your learning opportunities, you should read all relevant material prior to attending class.

It is strongly recommended that you attend your classes every week. Our data shows that you will get better results if you attend class with your peers. If you do have to miss a class, you should catch up on any missed work by accessing lecture recordings if you are enrolled face-to-face. While online tutorials are recorded, on-campus tutorials are not, so you should view other resources available on your Canvas site and contact your course coordinator if you would like advice on how to best catch up on any material that was missed. **If you are unable to attend classes regularly you should reach out to your course coordinator as soon as possible to discuss ways that you can continue to engage with the learning material.**

A plan of regular revision throughout the semester is also strongly recommended to help you manage your time, consolidate information and retain that knowledge for the duration of

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the course and beyond.

Assessment items have been designed to reinforce and revise the course material, and ensure you are up to date with course content. You are required to submit all assessable items by the due dates unless prior arrangements have been made.

#### **Additional Contact Details**

If you have any questions about your course, please speak with your course coordinator, lecturer or tutor first. For general enquiries, please contact the Pathways and Academic Learning Support Centre Office or your Student Liaison Officer. Contact details for both the office and Student Liaison Officers can be found [here](#).

Yapug students can also contact your Indigenous Enabling Learning Advisor [Hannah Pipe](#) or your Program Convenor [Dan Collins](#).

#### **Final Examination**

This course has a formal examination. All formal examinations will be held during the [University's Examination Period](#). Your [exam timetable](#) will be available approximately 4 weeks before the exam period and you must ensure that you are available to undertake your exam at any time during the Examination Period.

If you are unable to attend a scheduled examination due to illness or you have another significant, verifiable reason, contact the Pathways and Academic Learning Support Office and advise your lecturer at the earliest opportunity. Completion of an [online Adverse Circumstances application](#) including appropriate documentation is required.

If you have a permanent or temporary disability or medical condition that means you may need adjustments made during your examination, you must register with [AccessAbility](#) at the start of semester so that these arrangements can be made.

If you have a Reasonable Adjustment Plan (RAP), your examination will be scheduled in accordance with it. If you are unable to attend your scheduled examination due to illness or other circumstance, you will need to submit an online Adverse Circumstances application and supply appropriate documentation to support your application. Your RAP is not able to be used as your documentation.

#### **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 Adverse Circumstances must be lodged via the online Adverse Circumstances system for all individual assessment items worth 30% or greater **by 11:00pm on the day the assessment is due**. For assessment items less than 30%, you will need to contact your Course Coordinator by 11:00pm on the due date of the assessment item.

Before applying you must refer to the [Adverse Circumstances Affecting Assessment Items Procedure](#) and the [Adverse Circumstances Affecting Assessment Items Policy](#).

Please note that students must submit their adverse circumstances application via the online Adverse Circumstances system by 11:00pm on the due date of the assessment item, even if you are using a [Reasonable Adjustment Plan \(RAP\)](#) as your supporting documentation.

#### **Written Assessment Word Limits**

If this course includes written assessments, the word limit listed will include headings, sub-heading, in-text citations, quotes and referencing but does not include the list of references, appendices and footnotes. You will not receive a penalty for exceeding the word limit (there is a tolerance of up to 10%), but any work after the maximum word limit may not be included within the allocation of marks.

#### **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. Please refer to the [Student Academic Integrity Policy](#).

#### **Oral Interviews (Vivas)**

As part of the evaluation process of any assessment item in this course an oral examination

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(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](#).

**Workplace Health and Safety Requirements**

There are no specific WH&S requirements for this course.

**Software**

Free Microsoft Office software is available to enrolled students [here](#) and includes 5 TB of free cloud storage with OneDrive.

**Timetable**

Your timetable for this course is available via the myUni Student Portal and can also be found [here](#).

**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.

**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](#) that support a safe and respectful environment at the University.

*This course outline was approved by the Director, PALS. No alteration of this course outline is permitted without Director 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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