MATH1007
Discrete Mathematics I
Session 2, Special circumstances 2021

Department of Mathematics and Statistics

Contents

General Information 2
Learning Outcomes 2
General Assessment Information 3
Assessment Tasks 4
Delivery and Resources 8
Unit Schedule 8
Policies and Procedures 9
Changes from Previous Offering 11
Changes since First Published 11

Disclaimer
Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.
## General Information

<table>
<thead>
<tr>
<th>Unit convenor and teaching staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit convenor</td>
</tr>
<tr>
<td>Richard Garner</td>
</tr>
<tr>
<td><a href="mailto:richard.garner@mq.edu.au">richard.garner@mq.edu.au</a></td>
</tr>
<tr>
<td>Contact via Email</td>
</tr>
<tr>
<td>12WW 718</td>
</tr>
<tr>
<td>See iLearn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit convenor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christopher Gordon</td>
</tr>
<tr>
<td><a href="mailto:chris.gordon@mq.edu.au">chris.gordon@mq.edu.au</a></td>
</tr>
<tr>
<td>Contact via Email</td>
</tr>
<tr>
<td>12WW 618</td>
</tr>
<tr>
<td>See iLearn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prerequisites</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Corequisites</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Co-badged status</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Unit description</th>
</tr>
</thead>
</table>

This unit provides a background in the area of discrete mathematics to provide an adequate foundation for further study in computer science. It is also of great interest to students wishing to pursue further study in mathematics. In this unit, students study propositional and predicate logic; methods of proof; fundamental structures in discrete mathematics such as sets, functions, relations and equivalence relations; Boolean algebra and digital logic; elementary number theory; graphs and trees; and elementary counting techniques.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at [https://students.mq.edu.au/important-dates](https://students.mq.edu.au/important-dates).

## Learning Outcomes

On successful completion of this unit, you will be able to:

**ULO1:** Demonstrate knowledge of the basic concepts of discrete mathematics, including
logic, sets, functions relations, proofs, counting arguments, elementary number theory, 
matrices, and graph theory.

ULO2: Construct logical, clearly presented and justified mathematical arguments in the 
context of discrete mathematics.

ULO3: Apply the principles, concepts, and techniques learned in this unit to solve 
practical and abstract problems.

ULO4: Demonstrate appropriate interpretation of information communicated in 
mathematical form and formulate ideas and language from discrete mathematics.

ULO6: Communicate to a general audience the relevance of mathematics to computer 
science.

ULO7: Demonstrate foundational learning skills including active engagement in your 
learning process.

General Assessment Information

HURDLES: SGTAs are hurdle assessments, which will be evaluated by the successful 
completion of a simple task during your SGTA class (either online or on campus). To meet the 
SGTA hurdle you must complete 10 of the 12 SGTA tasks.

ASSIGNMENT SUBMISSION: Assignment submission will be online through the appropriate 
link on the MATH1007 iLearn page.

A personalised cover sheet is not required with online submissions. Read the submission 
statement carefully before accepting it as there are substantial penalties for making a false 
declaration.

You should upload your work as a single scanned PDF file.

Please make sure that each page in your uploaded assignment corresponds to only one A4 
page (do not upload an A3 page worth of content as an A4 page in landscape). If you are using 
an app like Clear Scanner, please make sure that the photos you are using are clear and 
shadow-free.

It is your responsibility to make sure your assignment submission is legible.

If there are technical obstructions to your submitting online, please email us to let us know.

You may submit as often as required prior to the due date/time. Please note that each 
submission will completely replace any previous submissions. It is in your interests to make 
frequent submissions of your partially completed work as insurance against technical or other 
problems near the submission deadline.

LATE SUBMISSION OF WORK: All assignments or assessments must be submitted by the 
oficial due date and time. The penalty for late submissions will be 20% per day unless an 
extension has been granted following a successful application for Special Consideration. Please 
contact the unit convenor for advice as soon as you become aware that you may have difficulty 
meeting any of the assignment deadlines.
**Assessment Tasks**

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Online Quizzes</td>
<td>10%</td>
<td>No</td>
<td>Weekly</td>
</tr>
<tr>
<td>Participation in SGTA classes</td>
<td>0%</td>
<td>Yes</td>
<td>Weekly from week 2</td>
</tr>
<tr>
<td>Module Examinations</td>
<td>48%</td>
<td>No</td>
<td>Weeks 5, 9 and 13</td>
</tr>
<tr>
<td>Assignment 1</td>
<td>18%</td>
<td>No</td>
<td>Week 7</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>24%</td>
<td>No</td>
<td>Week 11</td>
</tr>
</tbody>
</table>

**Weekly Online Quizzes**

Assessment Type: Quiz/Test  
Indicative Time on Task: 10 hours  
Due: Weekly  
Weighting: 10%

The quizzes are competency tests to ensure that all students who pass this unit possess certain basic skills.

On successful completion you will be able to:

- Demonstrate knowledge of the basic concepts of discrete mathematics, including logic,
sets, functions relations, proofs, counting arguments, elementary number theory, matrices, and graph theory.

- Apply the principles, concepts, and techniques learned in this unit to solve practical and abstract problems.
- Demonstrate appropriate interpretation of information communicated in mathematical form and formulate ideas and language from discrete mathematics.

**Participation in SGTA classess**

Assessment Type ¹: Participatory task
Indicative Time on Task ²: 0 hours
Due: Weekly from week 2
Weighting: 0%
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

Answering questions based on the previous week's lecture material

On successful completion you will be able to:

- Demonstrate knowledge of the basic concepts of discrete mathematics, including logic, sets, functions relations, proofs, counting arguments, elementary number theory, matrices, and graph theory.
- Construct logical, clearly presented and justified mathematical arguments in the context of discrete mathematics.
- Apply the principles, concepts, and techniques learned in this unit to solve practical and abstract problems.
- Demonstrate appropriate interpretation of information communicated in mathematical form and formulate ideas and language from discrete mathematics.
- Demonstrate foundational learning skills including active engagement in your learning process.

**Module Examinations**

Assessment Type ¹: Examination
Indicative Time on Task ²: 20 hours
Due: Weeks 5, 9 and 13
Weighting: 48%
The content of this unit is structured and delivered as modules. At the end of each module students complete a module exam which is offered during their SGTA or Lecture class. They are offered a second opportunity to complete a different version of each module exam during the final exam period. If a student makes two attempts at an exam for a module, the final mark awarded is the maximum of the marks attained in each attempt.

On successful completion you will be able to:

- Demonstrate knowledge of the basic concepts of discrete mathematics, including logic, sets, functions relations, proofs, counting arguments, elementary number theory, matrices, and graph theory.
- Construct logical, clearly presented and justified mathematical arguments in the context of discrete mathematics.
- Apply the principles, concepts, and techniques learned in this unit to solve practical and abstract problems.
- Demonstrate appropriate interpretation of information communicated in mathematical form and formulate ideas and language from discrete mathematics.
- Demonstrate foundational learning skills including active engagement in your learning process.

Assignment 1

Assessment Type: Problem set
Indicative Time on Task: 10 hours
Due: Week 7
Weighting: 18%

Problems are chosen to explore concepts and techniques learned in the unit. Students will solve the problems using logical mathematical arguments and submit clearly written solutions.

On successful completion you will be able to:

- Demonstrate knowledge of the basic concepts of discrete mathematics, including logic, sets, functions relations, proofs, counting arguments, elementary number theory, matrices, and graph theory.
- Construct logical, clearly presented and justified mathematical arguments in the context of discrete mathematics.
- Apply the principles, concepts, and techniques learned in this unit to solve practical and
abstract problems.

- Demonstrate appropriate interpretation of information communicated in mathematical form and formulate ideas and language from discrete mathematics.
- Communicate to a general audience the relevance of mathematics to computer science.
- Demonstrate foundational learning skills including active engagement in your learning process.

Assignment 2

Assessment Type 1: Problem set
Indicative Time on Task 2: 15 hours
Due: Week 11
Weighting: 24%

Problems are chosen to explore concepts and techniques learned in the unit. Students will solve the problems using logical mathematical arguments and submit clearly written solutions

On successful completion you will be able to:

- Demonstrate knowledge of the basic concepts of discrete mathematics, including logic, sets, functions relations, proofs, counting arguments, elementary number theory, matrices, and graph theory.
- Construct logical, clearly presented and justified mathematical arguments in the context of discrete mathematics.
- Apply the principles, concepts, and techniques learned in this unit to solve practical and abstract problems.
- Demonstrate appropriate interpretation of information communicated in mathematical form and formulate ideas and language from discrete mathematics.
- Communicate to a general audience the relevance of mathematics to computer science.
- Demonstrate foundational learning skills including active engagement in your learning process.

1 If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Learning Skills Unit for academic skills support.
Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation.

**Delivery and Resources**

**Classes**

**Lectures:** lectures will be delivered online or, in a few cases, in the form of pre-recorded videos. You should attend all scheduled online lectures and you are strongly advised to watch any pre-recorded videos in the week that they are released to you. If a specific online lecture in any week is to be replaced by a pre-recorded video then you will be notified of that fact on iLearn at the beginning of that week. In total you are expected to spend two (2) hours each week attending online lectures and/or reviewing lecture videos.

**Small Group Teaching Activities (SGTA):** you can attend an SGTA either on campus or, in some cases, online. In either mode you should attend one 1-hour SGTA each week, starting in Week 2.

**Workshops:** the Numeracy Centre runs regular workshops for students in this unit.

**Required and Recommended Texts and/or Materials**

The recommended text for MATH1007 are:

- The open text *Discrete Mathematics, An Open Introduction* by Oscar Levin, which is freely available online.

Other useful resources and materials will be made available via the MATH1007 iLearn site.

**Technology Used and Required**

Students are expected to have access to an internet-enabled computer with a web browser and Adobe Reader software. Most areas of the university provide wireless access for portable devices. There are computers for student use in the Library.

Difficulties with your home computer or internet connection do not constitute a reasonable excuse for lateness of, or failure to submit, assessment tasks.

**Unit Schedule**

<table>
<thead>
<tr>
<th>WEEK</th>
<th>MODULE</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Graphs</td>
<td>Introduction to graph theory: undirected, directed and weighted graphs, degree of a vertex, equivalent graphs, complete and bipartite graphs.</td>
</tr>
<tr>
<td>2</td>
<td>Graphs</td>
<td>Walks, paths and cycles, trees and forests, Euler's formula.</td>
</tr>
<tr>
<td>3</td>
<td>Graphs</td>
<td>Algorithms on graphs: minimal spanning trees and shortest paths.</td>
</tr>
</tbody>
</table>
### Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central ([https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central)). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
Students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

**Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

**Results**

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

**Student Support**

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

**Learning Skills**

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

**Student Enquiry Service**

For all student enquiries, visit Student Connect at ask.mq.edu.au
Equity Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

Module exams throughout semester, with a second chance to take the material in the final exam period.

Hurdle requirement for lectures removed.

Midterm test replaced by weekly quiz activities.

Changes since First Published

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25/07/2021</td>
<td>Corrected error in description of SGTA hurdle requirement: to pass the hurdle one must participate in 10 out of 12 classes.</td>
</tr>
</tbody>
</table>