MATH 3012 COMBINATORICS

Credit Points 10

Legacy Code 301378

Coordinator Leanne Rylands (https://directory.westernsydney.edu.au/search/name/Leanne Rylands/)

Description This subject builds upon the knowledge acquired in the prerequisite subject Discrete Mathematics and helps students to develop understanding and mathematical maturity. The subject covers more sophisticated counting techniques, additional concepts in graph theory, and it introduces coding theory. Many applications of these concepts are included, and some combinatorial algorithms are studied. The applications and techniques presented in the subject are used to model systems such as transport networks and social networks, and they have relevance for communication, computing, probability, statistics, and science, and for many everyday problems such as scheduling.

School Computer, Data & Math Sciences

Discipline Mathematics

Student Contribution Band HECS Band 1 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 3 subject

Pre-requisite(s) MATH 1006 AND
MATH 1015

Assumed Knowledge

Logic, proof techniques, counting techniques, graph theory, matrices.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Apply a variety of techniques to solve counting problems, including the calculation of various probabilities.
2. Apply concepts and algorithms from graph theory to solve problems.
3. Evaluate the use of coding theory for error detection and error correction.
4. Formulate proofs involving counting, graph theory and coding theory.
5. Communicate mathematical arguments effectively in written format.

Subject Content

- Revision of mathematical proof
- Counting techniques, including generating functions
- Applications of counting, including probability
- Graph theory and graph algorithms
- Applications of graph theory
- Introduction to coding theory and applications

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task
Numerical Problem Solving	40 minutes	15	N	Individual
Numerical Problem Solving	45 minutes	20	N	Individual
Numerical Problem Solving	45 minutes	20	N	Individual
Final Exam	2 hours	45	N	Individual

Teaching Periods

Autumn (2024)

Campbelltown

On-site

Subject Contact Leanne Rylands (https://directory.westernsydney.edu.au/search/name/Leanne Rylands/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MATH3012_24-AUT_CA_1#subjects)

Penrith (Kingswood)

On-site

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MATH3012_24-AUT_KW_1#subjects)

Parramatta - Victoria Rd

On-site

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MATH3012_24-AUT_PS_1#subjects)