MATH 1006 DISCRETE MATHEMATICS

Credit Points 10

Legacy Code 200025

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

Description Discrete Mathematics introduces set theory, symbolic logic, graph theory and some counting techniques. The unit develops mathematical thinking and builds problem solving skills. It provides a solid foundation for further study in mathematics or computing.

School Computer, Data & Math Sciences

Discipline Mathematical Sciences, Not Elsewhere Classified.

Student Contribution Band HECS Band 1 10cp

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

Level Undergraduate Level 1 subject

Equivalent Subjects LGYB 0448 - Discrete Mathematics (UWSC)

Incompatible Subjects MATH 2004 - Discrete Structures and Complexity

Assumed Knowledge

HSC Mathematics or equivalent.

Learning Outcomes

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

1. Decide the truth of logical statements involving connectives, and simplify logical expressions using the laws of logic and truth tables
2. Give simple proofs by induction and contradiction;
3. Define and recognise primes, factorise small integers, use the Euclidean algorithm, and do calculations with modular arithmetic;
4. Perform simple operations on sets, find Cartesian products of sets, and use Venn diagrams to illustrate relationships between sets;
5. Solve basic problems in counting and probability;
6. Recognize a function, decide whether a given function is one-to-one or onto, and perform elementary manipulations with functions;
7. Describe simple and directed graphs, use concepts such as "path", and find minimal spanning trees

Subject Content

1. Sets: definitions, subsets, equality, operations, properties, empty set.

2. Counting and probability: Introduction, permutations and combinations, counting rules.

3. Functions: one-to-one, onto, inverse functions, composition.

4. Logic: logical connectives, equivalence, conditional statements, contrapositive, converse, valid arguments, predicates, quantifiers.

5. Number theory and mathematical proof: division, direct proof, counter-examples, division into cases, proof by contradiction and contraposition.

6. Induction and recursion: examples, sequences, sigma and product notation.

7. Graphs and trees: paths, circuits, isomorphisms of graphs, definitions, spanning trees, Kruskal's algorithm.

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.

Item	Length	Percent	Threshold	Individual/ Group Task
Numerical Problem Solving	5 minutes each	10	N	Individual
Numerical Problem Solving	45 minutes	20	N	Individual
Numerical Problem Solving	45 minutes	20	N	Individual
Final Exam	2 hours	50	Y	Individual

Prescribed Texts

- Koo-Guan Choo and Donald E. Taylor (1994), Introduction to Discrete Mathematics, Addison Wesley Longman

Teaching Periods

Autumn

Campbelltown

Day

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

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MATH1006_22-AUT_CA_D#subjects)

Penrith (Kingswood)

Day

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MATH1006_22-AUT_KW_D#subjects)

Parramatta City - Macquarie St

Day

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=MATH1006_22-AUT_PC_D#subjects)

Parramatta - Victoria Rd

Day

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