



Pure Mathematics 471

Combinatorics and Graph Theory

(see Course Descriptions under the year applicable: <http://www.ucalgary.ca/pubs/calendar/>)

Syllabus

Topics

**Number of
hours**

Graphs (eulerian graphs, trees, hamiltonian graphs, planarity,
colouring, digraphs)

12

Counting (recurrence relations, generating functions, partitions)

12

Posets (linear extensions, dimension, Dilworth's theorem)

12

TOTAL HOURS

36

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2011:07:01
Previously known as PMAT 371
WEC

PMAT 471 – Combinatorics and Graph Theory

Course Outcomes

General Outcomes

This course introduces topics in three key areas of discrete mathematics: graph theory, combinatorics, and extremal set theory. Students will have to reason abstractly, provide proofs of mathematical statements, and work with precise definitions.

Specifically, by the end of this course, students will be able to

1. State all of the technical definitions covered in the course (such as a graph, tree, planar graph, colouring, digraph, generating function, linear extension, and other terms).
2. State all of the relevant theorems covered in the course.
3. Use these definitions and theorems from memory to construct solutions to problems and/or proofs.
4. Formulate graph theoretic models to solve real world problems (e.g., scheduling problems).
5. Analyze combinatorial objects satisfying certain properties and answer questions related to existence (proving the existence or non-existence of such objects), construction (describing how to create such objects in the case they exist), enumeration (computing the number of such objects), and optimization (determining which objects satisfy a certain extremal property).

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2017/11/10
RJS
Course outcomes added