Marshall University
College of Science

MTH 440: Graph Theory and Combinatorics

Course catalog description
The course is designed to introduce students in mathematical sciences to the theorems, techniques and applications of graph theory and combinatorics.

Credit hours
3 hours

Prerequisites
A grade of C or higher in MTH 300

List of topics

• Enumerative combinatorics
  • Permutations and combinations. Binomial coefficients. Stirling numbers of the second kind.
  • The Inclusion-exclusion principle
  • Probabilities
  • Generating functions
  • Recurrence relations, solving linear homogeneous recurrences

• Graph theory
  • Common families of graphs
  • Connectedness and paths
  • Planar graphs
  • Eulerian and Hamiltonian graphs
  • Graph colorings and the Four Color Theorem
  • Trees, labeled trees, and spanning trees
  • Tree traversal algorithms
  • Flows, the maximum flow / minimum cut theorem

Suggested textbooks


**Last updated**
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