

# MAD: Mathematics: Discrete Courses

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## Courses

MAD 3107 Discrete Mathematics and Applications

3 sh (may not be repeated for credit)

Prerequisite: MHF 3202\*

Introductory combinatorics, counting, graphs and trees, and their applications; relations and partial orders; some algorithms associated with applications of graphs, trees, and relations.

MAD 4301 Graphs and Their Application

3 sh (may not be repeated for credit)

Prerequisite: MHF 3202

Directed and undirected graphs, basic concepts and terminology, paths and cycles, Euler and Hamiltonian cycles, bipartite Graphs, matchings in bipartite graphs, connectivity, graph colorings, planar graphs, graph models, and applications. Offered concurrently with MAD 5305; graduate students will be assigned additional work.

MAD 4401 Numerical Analysis

3 sh (may not be repeated for credit)

Prerequisite: MAS 3105

Numerical solutions of equations in one variable, interpolation and polynomial approximation, numerical differentiation and integration, numerical solutions of initial value and boundary value problems for O.D.E., direct methods for solving linear systems, iterative techniques in matrix algebra. Some problems solved with aid of computer. A computer language is required prior to this course. Meets Gordon Rule Theoretical Mathematics Requirement.

MAD 4905 Directed Study

1-12 sh (may be repeated indefinitely for credit)

MAD 5305 Graphs and Their Applications

3 sh (may not be repeated for credit)

Directed and undirected graphs, basic concepts and terminology, paths and cycles, Euler and Hamiltonian cycles, bipartite graphs, matchings in bipartite graphs, connectivity, graph colorings, planar graphs, graph models, and applications. Offered concurrently with MAD 4310; graduate students will be assigned additional work.

MAD 5905 Directed Study

1-12 sh (may be repeated indefinitely for credit)

MAD 6396 Topics in Combinatorial Theory

3 sh (may not be repeated for credit)

This course is devoted to topics chosen from among graph theory, coding theory, matroid theory, design theory, finite geometries, projective geometries, optimization, and searching and sorting algorithms.

MAD 6405 Numerical Analysis I

3 sh (may not be repeated for credit)

Theoretical treatment of numerical methods of linear algebra supplemented with use of computers; polynomial approximations, uniform approximations, least square approximations, error analysis for numerical solutions of linear equations, algebraic eigenvalue problems.

\* This course may be taken prior to or during the same term.