

# MA3233 Syllabus

**Instructor:** William J. Martin  
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**Office hours:** 10-11 MTRF  
or by appointment, or just stop by ...

MA 3233 – B01, B Term 2014  
Discrete Optimization  
**Optional Text:** “Combinatorial Optimization:  
Algorithms and Complexity”  
by C.H. Papadimitriou & K. Steiglitz  
**Meetings:** 9-9:50 MTRF, SH304

The goal of this course is to introduce the student to the main algorithms and applications of discrete optimization. The algorithms and questions addressed in this course are important both for their intrinsic mathematical beauty and for their widespread deployment in today's economy. We will not spend much time on NP-hard problems, preferring algorithms that run in polynomial time. Our focus is on mathematical issues rather than computer programming or data structures.

Topics addressed will include an informal introduction to computational complexity theory, as well as algorithms for network-based problems among the following: minimum cost spanning tree; shortest path; minimum cost matching; maximum flow through a network; min-cost max-flow; transshipment problems; the Chinese postman problem; special cases of the Travelling Salesman problem. While a knowledge of linear programming is not essential, we will give a brief overview of this important subject. We will often use this as a reference point since it is a generic technique which solves a wide class of problems (or linear relaxations of problems) efficiently.

## GRADES

**A:** 100 % – 88 %;     **B:** 87.99 % – 74 %;     **C:** 73.99 % – 60 %

## GRADING SCHEME

Homework (best 5 out of 7 assignments): 25 %  
3 Tests (Nov. 14, Dec. 4, Dec. 18): 75 %

Due dates for assignments will be determined when the assignments are distributed. In most cases, late assignments will not be accepted for credit.

There will be **no** make-up tests. All students are expected to attend all tests.

## ACADEMIC HONESTY

Each student is expected to familiarize him/herself with WPI's Academic Honesty policies which can be found at

<http://www.wpi.edu/offices/policies/honesty>

All acts of fabrication, plagiarism, cheating, and facilitation will be prosecuted according to the university's policy. If you are ever unsure as to whether your intended actions are considered academically honest or not, please see Professor Martin.

## **STUDENTS WITH DISABILITIES**

If you need course adaptations or accommodations because of a disability, or if you have information to share with me about anything that will impact your performance or participation, please make an appointment with me as soon as possible to discuss how these specifically apply to any aspect of this course. If you have not already done so, students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Office of Disability Services (ODS) as soon as possible to ensure that such accommodations are implemented in a timely fashion. This office is located in the West St. House (157 West St), (508) 831-4908.

## **INFORMATION ON THE WEB**

The course web page is

<http://www.wpi.edu/~martin/TEACHING/current.html>