

# Math 4235: Mathematical Optimization

D Term, 2016 WPI

**Instructor:** Marcel Blais  
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**Office Hours:** To Be Announced

**Class Info:** Lecture: MTRF 3:00pm – 3:50am - SH 202

**Text:** *The Mathematics of Nonlinear Programming*, by A.L. Peressini, F.E. Sullivan, & J.J. Uhl

**Web Page:** Information about the course will be maintained on the course web page on myWPI. Check your email regularly.

**Overview:** This course will focus on continuous nonlinear optimization. We will cover selected chapters from the text dealing with both unconstrained and constrained optimization. Most of the optimization algorithms covered will be basic line search methods, including Newton's Method and the method of steepest descent. We will also cover least squares fits, Lagrange multipliers, convexity, convex optimization, and the Karush-Kuhn-Tucker (KKT) conditions. A project on Markowitz portfolio optimization theory will be assigned. If time permits, we may cover trust-region methods, conjugate gradient methods, or spline fitting.

**Grading:**

Homework	50%
Midterm Exam	25%
Final Exam	25%

**Homework:** There will be several homework assignments, some of which will include programming problems. Students must use MATLAB for programming. Students can discuss homework with one another at the abstract level, but aside from that all assignments must be done independently.

**Matlab Sessions:** There will be MATLAB training sessions scheduled outside of regular class hours.

**Exams:**

Midterm Exam	Thursday April 7,	In Class
Final Exam	Tuesday May 3,	In Class

## Make-up Exam Policy:

Make-up exams will only be allowed in the event of a documented emergency. You are responsible for avoiding conflicts with the exams. Do not plan to leave campus for the term before the final exam.

**Late HW:** Late assignments without prior consent of the professor will not be accepted and will receive a grade of 0. Extensions will be granted only in the event of unforeseen emergencies or extenuating situations that you discuss with the professor well in advance. Documentation supporting your situation is encouraged.

**References:** *Numerical Optimization*, by Nocedal and Wright (available online through Gordon Library)

**Academic Honesty:** WPI has an established academic honor code, described in *The WPI Student Judicial Policies and Procedures*. 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 Prof. Blais.

**Disability Services:** If you need course adaptations or accommodations because of a disability, or if you have medical information to share with me, please make an appointment as soon as possible. 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. The DSO is located in 137 Daniels Hall, its phone number is (508) 831-4908, and its email is [DisabilityServices@wpi.edu](mailto:DisabilityServices@wpi.edu).

This syllabus is subject to change at the professor's discretion.