

# Statistical Computing I: Optimization

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## General Information:

Meeting days and times: MWF

Class location: FLO-0230

Instructor:

Professor Leo Duan  
Office Building/Number: Griffin-Floyd 220  
Phone: 352-294-1827  
Email: li.duan@ufl.edu  
Office Hours: Monday 12:40pm-1:40pm

Teaching Assistant:

Name: TBA  
Office Building/Number:  
Phone:  
Email:  
Office Hours:

## Lecture Format:

The course will be delivered in person in the classroom.

## Primary Textbooks:

1. Convex Optimization, by Boyd and Vandenberghe
2. Convex Optimization Theory, by Bertsekas

## Course Description and Objectives:

This course is designed to provide students with a foundational understanding about optimization. The lectures are structured around two primary areas of focus: the introduction and implementation of optimization algorithms, and a rigorous mathematical analysis of the underlying properties. Special emphasis is placed on the formulation and analysis of convex optimization problems, particularly those motivated by statistical and machine learning applications. Topics covered in the lectures include convexity, convergence, gradient descent, Newton's method, acceleration techniques, sub-gradient and proximal methods, duality, linear and quadratic programming, interior point methods, and some advanced topics such as convex relaxation and integer programming (if schedule permits). Python will be the primary coding language for implementing algorithms and solving numerical problems.

## Grading and exams:

The total score grade consists of:

Percentage	Source	Date
25%	Homework	Biweekly
25%	First Exam (in class)	September 25
25%	Second Exam (in class)	October 23
25%	Third Exam (in class)	December 4

The letter grade is tentatively planned as the 5-point scale (90% for A, 85% for A-, 80% for B+, 75% for B, 70% for B-, 65 for C+, 60% for C, <60% for F).

See the UF Catalog's "Grades and Grading Policies" for information on how UF assigns grade points.

**No late homework will be accepted**, except for ones justified with appropriate documentation.

## University Policies and Resources

### Attendance policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

### Students requiring accommodation

Students who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### UF course evaluation process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <http://gatorevals.aa.ufl.edu/students>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <http://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <http://gatorevals.aa.ufl.edu/public-results/>.

### University Honesty Policy

University of Florida students are bound by the Honor Pledge. On all work submitted for credit by a student, the following pledge is required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Student Honor Code and Conduct Code (Regulation 4.040) specifies a number of behaviors that are in violation of this code, as well as the process for reported allegations and

sanctions that may be implemented. All potential violations of the code will be reported to Student Conduct and Conflict Resolution. If a student is found responsible for an Honor Code violation in this course, the instructor will enter a Grade Adjustment sanction which may be up to or including failure of the course. For additional information, see <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>.

### **In-class recording**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party-note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### **Procedure for conflict resolution**

Any classroom issues, disagreements or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, please contact Christine Miron ([brown.christine@ufl.edu](mailto:brown.christine@ufl.edu), 352-392-1941). Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (<http://www.ombuds.ufl.edu>; 352-392-1308) or the Dean of Students Office (<http://www.dso.ufl.edu>; 352-392-1261).

### **Resources available to students**

#### Health and Wellness

- U Matter, We Care: [umatter@ufl.edu](mailto:umatter@ufl.edu); 352-392-1575.
- Counseling and Wellness Center: <http://www.counseling.ufl.edu>; 352-392-1575.
- Sexual Assault Recovery Services (SARS): Student Health Care Center; 352-392-1161.
- University Police Department: <http://www.police.ufl.edu/>; 352-392-1111 (911 for emergencies).

#### Academic Resources

- E-learning technical support: [learning-support@ufl.edu](mailto:learning-support@ufl.edu); <https://elearning.ufl.edu>; 352-392-4357.
- Career Connections Center: Reitz Union; <http://www.career.ufl.edu/>; 352-392-1601.
- Library Support: <http://cms.uflib.ufl.edu/ask>.
- Academic Resources: 1317 Turlington Hall; 352-392-2010; <https://academicresources.clas.ufl.edu>.
- Writing Studio: 2215 Turlington Hall; <http://writing.ufl.edu/writing-studio/>.