EECS 227A / EECS127
Convex Optimization
Spring 2018

1. Practical information

Lectures:
Tues/Thurs, 11:00-12:30am, LeConte 4

Discussion section:
Mo 4:00-4:59pm, Dwinelle 219
We 10:00-10:59am, Wheeler 102
Fr 11:00-11:59am, Etcheverry 3109
Fr 2:00-2:59pm, Wheeler 108

2. Course materials

- Homeworks, solutions and recitations along with their solutions will be available on Piazza
- Course slides will be available on BCourses

3. Textbook

No textbook is necessary. We however strongly encourage students to refer to the livetextbook or Laurent's book. Laurent also encourages looking at Boyd's book on Linear Algebra
http://livebooklabs.com/keeppies/c5a5868ce26b8125
https://people.eecs.berkeley.edu/~elghaoui/optmodbook.html
http://web.stanford.edu/~boyd/vmls/

4. Piazza

Please enroll. No discussion on homeworks (except for reporting typos or asking clarifications on notations) will be allowed on Piazza. Instructors will do their best to answer on Piazza. However, due to time constraints, students should not expect to get an immediate response when posting. Please privilege to ask questions in classes discussion or Office Hours.

5. Class Staff

Instructor:
Name: Laurent El Ghaoui
Email: elghaoui AT SYMBOL berkeley DOT edu
Office: 421 Sutardja Dai Hall

Graduate student instructors:

Name: Romain Lopez
Email: romain UNDERSCORE lopez AT SYMBOL berkeley DOT edu

Name: Skander Jemaa
Email: skander UNDERSCORE jemaa AT SYMBOL berkeley DOT edu

Name: Patricia Hidalgo-Gonzalez
Email: patricia DOT hidalgo DOT g AT SYMBOL berkeley DOT edu

6. Office Hours

Instructor Office Hours:
Thu 2:00-3:00pm, 421 Sutardja Dai Hall
Mo 4:00-5:00pm, 421 Sutardja Dai Hall
GSI Office Hours:
Tu 2:00-3:00pm, 367 Cory Hall
We 4:00-5:00pm, 283H Soda Hall
Fri 1:00-2:00pm 341A Soda Hall

7. Homeworks policy

- Homework will have to be uploaded on Gradescope. LaTeX will be preferred but handwritten homeworks will be tolerated. Not readable handwriting will result in the homework not being graded.
- No late homework will be accepted.
- To make you benefit more of the lecture, we strongly encourage you to work on the homeworks alone. We welcome the students to come to office hours and ask clarifications on the notations on Piazza. We will accept the students to have high level discussions on the problems but require them to write an exhaustive and clear solution on their own. A collaboration note “I acknowledge collaborating with … for this homework” will be expected as part of academic honesty.
- Students can use any materials on the slides or the textbooks as reference for their homework. In the extreme case that a result is central to solving an exercise (i.e the exercise is a theorem), it is however expected that the students write enough to show they understood the materials.

8. Exams

No accommodations will be offered for exams. All of them (quizz, midterms) will be hold in class.

9. Regrading policy

Regrading requests will be accepted the week before midterm and the week before finals. We expect students that want their homework regraded to send a fully documented note. Please note that the whole homework will be regraded when submitting a request.

10. Academic policy

Cheating and other forms of academic dishonesty will NOT be tolerated. Please see the EECS department policy on academic dishonesty at: http://www.eecs.berkeley.edu/Policies/acad.dis.shtml.

Schedule:

Week	Lecture #	Date	Part	Lecture	Hw given	Hw due	Topic	Reading (book)	Reading (livebook)
1	1	1/16/18	*Linear algebra*	Introduction			Vectors, matrices, scalar products	Ch. 1	Sec. 1
1	2	1/18/18		Vectors and functions	Hw1			Ch. 2	Sec. 2.1
2	3	1/23/18		Matrices and linear maps				Ch 3, except sec. 3.3, 3.4.9, 3.7	Sec. 2.2, except 2.5
2	4	1/25/18		Review					
3	5	1/30/18		Symmetric matrices and their eigenvalues	Hw2	Hw1	SVD, PCA, covariance matrices	Ch. 4	Sec. 2.5
3	6	2/1/18		Singular value decomposition				Ch. 5	Sec. 2.6
4	7	2/6/18		Linear equations				Ch. 6, except 6.5	Sec. 2.3
4	8	2/8/18		Least-squares and variants					Sec. 2.4
5	9	2/13/18		Review	Hw3	Hw2	Convexity		
5		2/15/18		Quiz					
6	10	2/20/18	*Convex optimization*	Convexity					
6	11	2/22/18		Convex optimization problems					
7	12	2/27/18		Weak duality	Hw4	Hw3	Duality		
7	13	3/1/18		Strong duality					
8	14	3/6/18		Applications of duality					
8		3/8/18		MIDTERM					
9	16	3/13/18	*Conic optimization*	Linear optimization	Hw5	Hw4	LP, QP, SOCP		
9	17	3/15/18		Quadratic optimization					
10	18	3/20/18		Second-order cone optimization					
10	19	3/22/18		Robust optimization					
11	20	3/27/18		*Spring break*					
11	21	3/29/18		*Spring break*					
12		4/3/18		Quiz					
12	22	4/5/18		Robust optimization (II)	Hw6	Hw5	Robust optimization, GP, applications		
13	23	4/10/18		Geometric programming					
13	24	4/12/18	*Applications*	Machine learning applications					
14	25	4/17/18		Control applications					
14	26	4/19/18		Finance applications		Hw6			
15	27	4/24/18		Engineering design applications					
15	28	4/26/18		Review					
		5/10/18		FINAL (8-11am)					