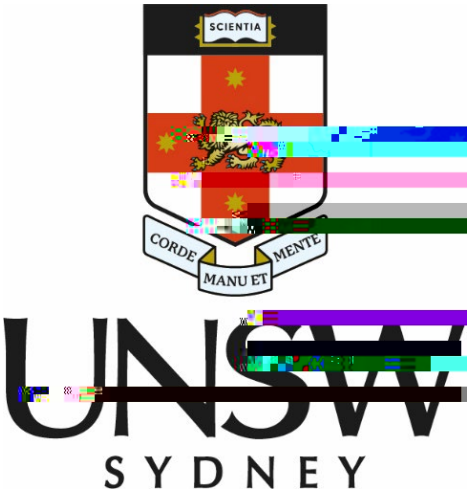
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Staff

Position	Name	Email	Room
Lecturer-in-charge	Assoc. Prof. Vera Roshchina	v.roshchina@unsw.edu.au	RC-2071

Course Aims

- Introduce major mathematical ideas behind modern optimisation techniques used in data science, such as convex and nonconvex (continuous) optimisation problems, first-order methods, splitting and projection techniques, stochastic optimisation.
- Discuss the considerations contributing to complexity analysis of optimisation problems and algorithms in the context of data science, such as the problem's size and structure, accuracy and efficiency requirements, advantages and limitations of different optimisation techniques, and different perspectives on convergence and (iteration) complexity.
- Place optimisation techniques in the context of major data science applications such as the training of artificial neural networks and data classification, addressing the appropriate choice of numerical methods and their limitations.
- Introduce the students to professional communication styles in the area of optimisation for data science, in particular mapping the ideas and terminology used in different fields. Help

- CLO2 Recognise typical optimisation models used in data science and the factors influencing performance of standard optimisation algorithms on these models. Perform mathematical analysis to make an informed choice of an optimisation model and solution technique based on the type of the problem and computational constraints.
- CLO3 Apply standard optimisation techniques to specific problems and estimate their efficiency taking into consideration the problem's parameters and computational constraints. Modify standard methods or design new optimisation techniques to suit specific problems.
- CLO4 Demonstrate competence in mathematical presentation and communication skills, support decisions using mathematical argument and references.
- CLO5 Critically evaluate emerging methods and applications, by comparing the new approaches to well-known techniques, identifying strengths, disadvantages and knowledge gaps.

Course Schedule

The course will include material taken from some of the following topics. This should only serve as a guide as it is not an extensive list of the material to be covered and the timings are approximate. The course content is ultimately defined by the material covered in lectures.

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Weeks

School and UNSW Policies

The School of Mathematics and Statistics has adopted a number of policies relating to enrolment, attendance, assessment, plagiarism, cheating, special consideration etc. These are in addition to the Policies of The University of New South Wales. Individual courses may also adopt other policies in addition to or replacing some of the School ones. These will be clearly notified in the Course Initial Handout and on the Course Home Pages on the Maths Stats web site.

Students in courses run by the School of Mathematics and Statistics should be aware of the School and Course policies by reading the appropriate pages on the Maths Stats web site starting at:

https://www.maths.unsw.edu.au/currentstudents/assessment-policies

The School of Mathematics and Statistics will assume that all its students have read and understood the School policies on the above pages and any individual course policies on the Course Initial Handout and Course Home Page. Lack of knowledge about a policy will not be an excuse for failing to follow the procedure in it.

Academic Integrity and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integ0.007 Tw 11.04 0 0 11.04 4800.005 Tw 02 Tw [0 Tc 0 ulHttSerH

Plagiarism

Plagiarism is presenting another person's work or ideas as your own. Plagiarism is a serious

Equitable Learning Services (ELS) may determine that your condition requires special