

Texas A&M University, Department of Mathematics, Fall 2019
MATH 664 (601) — Topics in Mathematical Data Science *
TR 8:00am-9:15am, Blocker Building, Room 148

Instructor: Simon Foucart, 502D Blocker Building, foucart@tamu.edu

Office hours: TR 10:50am-11:30am, W 1:20pm-2:00pm, and by appointment

Course web page: accessed via eCampus at <http://ecampus.tamu.edu/>

Textbook: none; lecture notes will be distributed.

Course Content: The following topics will (tentatively) be covered:

- Machine Learning: general concepts, VC dimension, binary classification, support vector machines, regression, clustering;
- Optimal Recovery: fundamental results, approximability models, optimal observations, tractability and curse of dimensionality;
- Compressive Sensing: sparse recovery, optimality, low-rank recovery, one-bit sensing;
- Optimization: basics, linear programming, semidefinite programming, duality;
- Neural Networks: general concepts, expressiveness of shallow networks, the advantages of depth, training by back-propagation.

Prerequisite: Some basic knowledge of linear algebra, analysis, and probability; familiarity with a programming language is a plus.

Grading: Based on attendance and class participation.

Electronic Etiquette: Cell phones must absolutely be put on silent mode, left closed, and put away. If you have a family emergency and need to take a call during class, I shall be notified in advance so that a special arrangement can be made.

Academic Honesty: *“An Aggie does not lie, cheat, or steal or tolerate those who do.”*

See <http://aggiehonor.tamu.edu> for more information.

Americans with Disabilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

*this syllabus is a general plan for the course; deviations announced in class may be necessary