# CS/MATH 5486: Advanced Optimization. Mon/Wed 2.30 - 3.45 MCB 322

Instructor:	(1)	Dr. Alexey V. Onufriev, 2160C Torgersen Hall
		Email: `alexey@cs.vt.edu`
		Office Hours: 2 - 4 pm Tue
Teaching Assistants:		TBA
Textbooks:		See the web site
Course Notes:		See the web site
Midterm:		NONE
Pre-reqs:		Can be waived. Talk to instructor.
Final exam:		Final project report, due date TBA
Course Website:		`http://courses.cs.vt.edu/5486/S19`

Course purpose and structure   This course gives students hands-on experience with advanced optimization techniques used in modern science/engineering. Students will also gain experience with high performance computing relevant to optimization problems. The focus is on practical aspects of the problem. We will start with the basics, then progress to the hardest and important problem – finding global optimum of a function in multiple dimensions. Various approaches, common pitfalls and workaround will be covered, including the issue of robustness of computed optima.
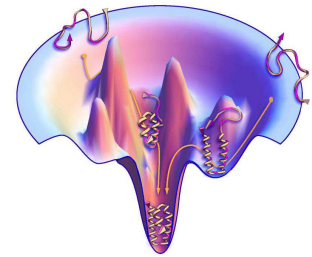
Students will work in groups (depending on the class size) on realistic projects. Students will learn about modern high performance computing and software relevant to the coarse goals. Numerical methods relevant to the projects, as well as useful UNIX tools will also be covered. Access to real computational facilities will be provided.

The course will include instructor's lectures, guest lectures, student presentations, hands-on "labs", and work on the project.

In the past, students from different disciplines and departments (Physics, Bio, CS, GBCB) took a similar course from me, which made it a multi-disciplinary experience. Not everyone is expected to have the same background.

Grades   Final grade: 70-80 % will come from the project and student presentations, 20-30 % from the warm-up homeworks.

Special Accommodations.   If any student needs special accommodations because of a disability, please contact the instructor during the first week of class.