FALL 2013

City University of New York - Graduate School and University Center

CSc 80040 - Topics in Algorithm Analysis and Scientific and Engineering Computing - Numerical and Algebraic Computation

Code [92312]
3. Credits
Tuesdays, 4.15PM - 6.15PM; also 6.30PM - 8:30PM
Rm. TBA
Professor: Victor Pan

Course Outline:

The course is offered for the students from PhD Programs in both Computer Science and Mathematics. It requires no prerequisites. The listed hours are 4.15 - 6.15, but the Instructor also arranges regular meetings from 6.30 to 8.30 for the students who prefer these later hours. He can also meet with the students before 4 p.m. upon demand. The room number can be found from the Secretaries in Computer Science and Mathematics or by inquiring the Instructor at v_y_pan@yahoo.com

The course covers fundamental and advanced subjects in symbolic and numerical computing. These fields are the basis of modern computations in sciences, engineering, financial mathematics, and signal and image processing. They supply research challenges in both Mathematics and Computer Science.

Specific subjects of the study vary each semester and are adjusted to students’ interests. In the previous semester the study included decompositions of general matrices as well as matrices having structures of Toeplitz, Hankel, Cauchy, and Vandermonde types and linked to fundamental polynomial and rational computations in algebra and geometry. The study is partly based on the instructor’s books, available in the GC library and via the Internet, and also on his survey papers, supplied as handouts. Students can focus on learning or research and are divided into two groups. Novice students are introduced to Numerical Analysis and Computer Algebra. More advanced students are exposed to research topics in these fields. This includes very recent and widely open challenges.

Besides three credits per semester, students can get research support from Instructor’s NSF Grant and are led to publications and PhD defenses. In the last 10 years, 10 Theses have been defended under the guidance of this Instructor in each of the PhD Programs in Computer Science and Mathematics, and dozens of research papers have been published by his students in leading journals and proceedings of competitive conferences.