Math 390 Honors Seminar
Fall 2015
Syllabus

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Class times: Mondays and Thursdays from 3:30 to 4:45 PM.

Office hours: Mondays, Wednesdays and Thursdays from 11-11:50 AM.

Text: Quantum Computing for Computer Scientists by Yanofsky and Mannucci.

This is a fascinating area of study that is based on ideas from linear algebra. What does it mean for a particle to be in a superposition of states? What does it mean for particles to be entangled? What is teleportation? What exactly ‘collapses’ when we make a measurement? How can we use these ideas to compute things? Surprisingly, the answers to all of these questions involve linear algebra.

We will introduce complex numbers – they will form the scalars. We will study certain types of matrices – called Hermitian and Unitary – and look at a new way of combining vectors – the tensor product. Then we will see how this mathematics is used to describe the strange quantum world.

The plan for the seminar is that we will divide the class into small groups of two or three students. Each group will take turns in presenting topics as we gradually work through the book.

Academic Honesty: Quizzes, graded assignments and exams are used to determine formal evaluations; therefore the work you do on these is to be your own. You must not confer with other students, look at other students’ papers, nor use unauthorized lists of information while you are involved in one of these exercises. No electronic devices are allowed.