

Week Subjects Text pages & Homeworks

8	Phase estimation and Shor's factoring algorithm. Computational complexity of Shor's algorithm. Comparison to best classical algorithm.	221-247
9	Grover's search algorithm. Midterm Exam.	248-255
10	Mixed states and density matrices. Completely positive maps. Partial trace. Von Neumann entropy. Decoherence and effect of environment. Schmidt basis. Effective evolutions. Master equations.	98-118, 353-373, Choose projects, HW #4 due
11	Quantum trajectories. Random error model. Simple error correction. Quantum error correcting codes. Stabilizer codes.	373-398 425-474
12	Operations on encoded q-bits. Concatenated codes. Fault-tolerant quantum computation. Threshold theorem. Brief overview of other topics in quantum information.	474-497 HW #5 due,
13	Implementations. The DiVincenzo criteria. Linear ion trap. NMR. Achievements to date. Prospects of other techniques. Other potential applications.	277-349 Projects due

14-15 Presentation of student projects.

Thanksgiving Holiday Thu-Sun 22-25 Nov 2007

Final exam: Tue 18 Dec 2007, 11 am -- 1 pm

Office hours: Tues 3-5, Wed 2-4

Course Grade:

Problem Sets	15%
Student Project	15% (7.5% written report, 7.5% oral presentation)
Midterm	25%
Final Exam	45%