

QST 202

Quantum Information

Contact information

Professor: TBA

Lecture: TBA

Contact: TBA

Schedule

Attendance in lecture is required. Weekly homework will be assigned and due the following week before class.

Grading: 40% homework
10% participation
20% midterm exam
30% final exam

Introduction: 201 is a pre-requisite. The class will cover topics related to quantum information. These include density matrix evolution, decoherence, characterization of quantum states, distance measures between quantum states, fidelity, quantum error correction, entropy and information, and quantum information theory.

Required Text:

Quantum Computation and Quantum Information by Nielsen & Chuang

Weekly Calendar

Week 1	Quantum operations and noise
Week 2	Lindblad equation and applications
Week 3	Quantum process tomography
Week 4	Distance measures for quantum information and Fidelity
Week 5	Quantum Error Correction 1: 3-qubit, Shor codes, and theory of QEC
Week 6	Quantum Error Correction 2: Calderbank-Shor-Steane codes & stabilizer code
Week 7	Quantum Error Correction 3: surface code and fault-tolerance
Week 8	Entropy and Information 1: Basic properties, Shannon and Von Neumann entropy
Week 9	Quantum Information Theory 1: Quantum communication over noisy channels
Week 10	Quantum Information Theory 2: Entanglement as a resource & Quantum cryptography