

EENG 5940 - 001 Advanced Topics in Electrical Engineering

- Quantum Computation and Quantum Information

Spring 2024

Course Description:

This course introduces the fundamentals of quantum computation and quantum information. Topics include introduction to quantum bits, computation, algorithms and information; fundamental postulates of quantum mechanics and applications to quantum computation and information, specifically quantum teleportation and superdense coding. The focus is on analytical and mathematical techniques and the target audience is research students.

Learning Objectives:

The goals of this course are to expose the students to mathematics of quantum mechanics and its applications to quantum computation and information, to prepare the students for research in quantum related topics.

Lectures:

Tu Th, 13:00 - 14:20, NTDP B142.

Instructor:

Hua Sun. Office: NTDP B225. Email: Hua.Sun@unt.edu.

Office Hour: Tu, 14:30 - 15:30, NTDP B225.

Textbook:

Michael A. Nielsen and Isaac L. Chuang, *Quantum Computation and Quantum Information: 10th Anniversary Edition*, ISBN: 9781107002173, Cambridge University Press, 2011

Grading Policy:

Homework: 20%

Project: 20%

Midterm Exam: 30%

Final Exam: 30%

General Policies:

- **Academic Integrity Standards and Consequences.** According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

- **ADA Accommodation Statement.** UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific

course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at disability.unt.edu.

- **Emergency Notification & Procedures.** UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials. If Canvas is not accessible during the emergency, contact me via email (hua.sun@unt.edu) for more information.

- **Attendance.** Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals. Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community.