Quantum Science and Engineering Certificate

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Quantum information science and engineering explores how the principles of quantum mechanics can be harnessed to encode, manipulate, process, learn, and distribute information in fundamentally novel ways. This rapidly evolving field unites experts from physics, computer science, engineering, chemistry, and material science to develop revolutionary technologies in computing, simulation, sensing, timing, and networking, promising transformative impacts across society.

REQUIREMENTS

See Links to the attributes indicating courses approved for the certificate requirements.

Students must complete five courses (5 credits), one of which must be PHYS 3450 or CPSC 4470. The remaining four courses may be chosen from courses offered by the Applied Physics, Chemistry, Computer Science, Electrical Engineering, Global Affairs, Mathematics, Physics, or Statistics & Data Science departments. Courses that fulfill the requirements of the certificate carry the *YC Quantum Elective* attribute. The minimum grade for all courses is a C.

No more than two course credits may overlap in the fulfillment of the requirements of the Quantum Science & Engineering Certificate and of a major, a simultaneous degree, or another certificate. In addition to the Yale College course overlap policy, students earning this certificate may not overlap any 1000/2000 level courses; only two 3000+ level courses may overlap. Additionally, no course credit may be applied toward the requirements of more than two curricular programs. For example, the same course credit may not be used to fulfill the requirements of two certificates and a major. Approved graduate and professional school courses may count toward the certificate. Non-Yale courses may not count toward the certificate. Students are also encouraged to participate in the following optional activities:

- Join the Yale Undergraduate Quantum Computing group (YuQC)
- Participate in YdQC and other quantum hacakathons
- Attend colloquia offered by the Yale Quantum Institute
- Tour the Yale Quantum Institute laboratories

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the certificate.

DECLARATION OF CANDIDACY

Students must declare their intent to earn a certificate by the last day of add/drop period in their final term of enrollment. This is done on the *Declare Major, Concentration within the Major, Certificate* page on Yale Hub. Once declared, Degree Audit will track students' progress toward completion of the certificate.

SUMMARY OF REQUIREMENTS

Number of courses 5 course credits

Distribution of courses PHYS 3450 or CPSC 4470 and 4 electives that carry the YC Quantum Elective attribute