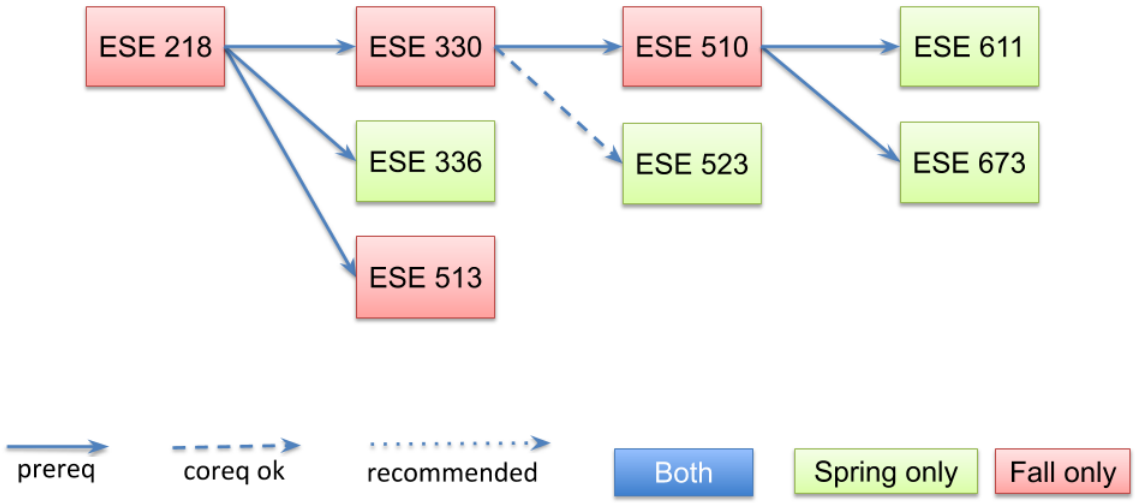
EE Concentration: Photonics & Quantum Technology

Requirements: Complete ESE330 & ESE336
Choose 2 Electives: ESE510, ESE 513, ESE523, ESE611, ESE673

Requirement Flow:



Impact: Optics, photonics and quantum technology have wide-ranging applications including high-speed computing, data security, sensing and imaging, energy, and health. Integrated photonic circuits, much faster and more energy efficient than their electronic counterparts, will soon support terabit-scale data centers in the cloud and chip-scale LIDAR systems for driverless cars. Meanwhile, a revolution in quantum engineering based on solid-state and photonic devices is advancing a future of unhackable communication links, ultra-precise sensors, and quantum computers.

Description: Modern device technologies rely on the control of light and materials at the smallest scales. Examples include LED displays, lasers, optical transceivers, solar cells, photonic integrated circuits, sensors, medical therapies, secure communication systems, and quantum computers. This concentration arms students with a broad understanding of optics and device nanofabrication, with options to further specialize in nanophotonics, integrated photonics, and quantum technology. Students completing these courses will be ideally positioned to pursue advanced degrees or engage with industry to develop cutting-edge photonics technologies and quantum devices.

Sample industries and companies:

- Integrated photonics: Intel, IBM, Luxtera, Cisco
- Nanophotonics: Cree, Philips, Gov't contractors
- Quantum Computing: Google, IBM, Microsoft, Intel
- Quantum Startups: Rigetti, Ion-Q, many more

Sample Job Titles:
Quantum Characterization Engineer, Quantum Research Consultant, Quantum Modeling Scientist, Microfabrication Engineer, Hardware Engineer, Quantum Physicist, Quantum Computing Engineer, Researcher, Professor

Graduate research in: integrated photonics, nanophotonics, applied physics, quantum technology