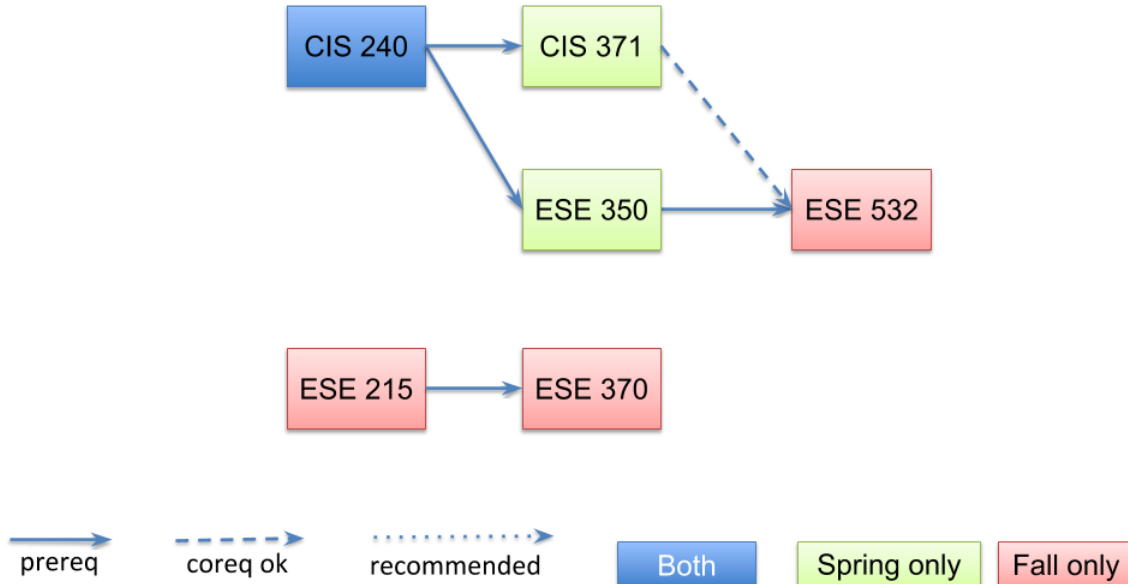


EE Concentration: System-on-a-Chip (SoC)

Requirements: Complete ESE350, ESE370, CIS371, ESE532

Requirement Flow:



Impact: The chip at the heart of your smartphone, tablet, or mp3 player (including the Apple A11, A12) is an SoC. The chips that run almost all of your gadgets today are SoCs. These are the current culmination of miniaturization and part count reduction that allows such systems to be built inexpensively and from small part counts. These chips democratize innovation, by providing a platform for the deployment of novel ideas without requiring hundreds of millions of dollars to build new custom ICs.

Description: Modern computational and control chips contain billions of transistors and run software that has millions of lines of code. They integrate complete systems including multiple, potentially heterogeneous, processing elements, sophisticated memory hierarchies, communications, and rich interfaces for inputs and outputs including sensing and actuations. To design these systems, engineers must understand IC technology, digital circuits, processor and accelerator architectures, networking, and composition and interfacing and be able to manage hardware/software trade-offs. This concentration prepares students both to participate in the design of these SoC architectures and to use SoC architectures as implementation vehicles for novel embedded computing tasks.

Sample industries and companies:

- Integrated Circuit Design: ARM, IBM, Intel, Nvidia, Samsung, Qualcomm, Xilinx
- Consumer Electronics: Apple, Samsung, NEST, Hewlett Packard
- Systems: Amazon, CISCO, Google, Facebook, Microsoft
- Automotive and Aerospace: Boeing, Ford, Space-X, Tesla, Waymo
- *Your startup*

Sample Job Titles:

- Hardware Engineer, Chip Designer, Chip Architect, Architect, Verification Engineer, Software Engineering, Embedded Software Engineer, Member of Technical Staff, VP Engineering, CTO

Graduate research in: computer systems and architecture