Integrated Approach to Teaching Circuits and Electronics

Brian Hayt

Global Academic Product Marketing Manger

brian.hayt@ni.com

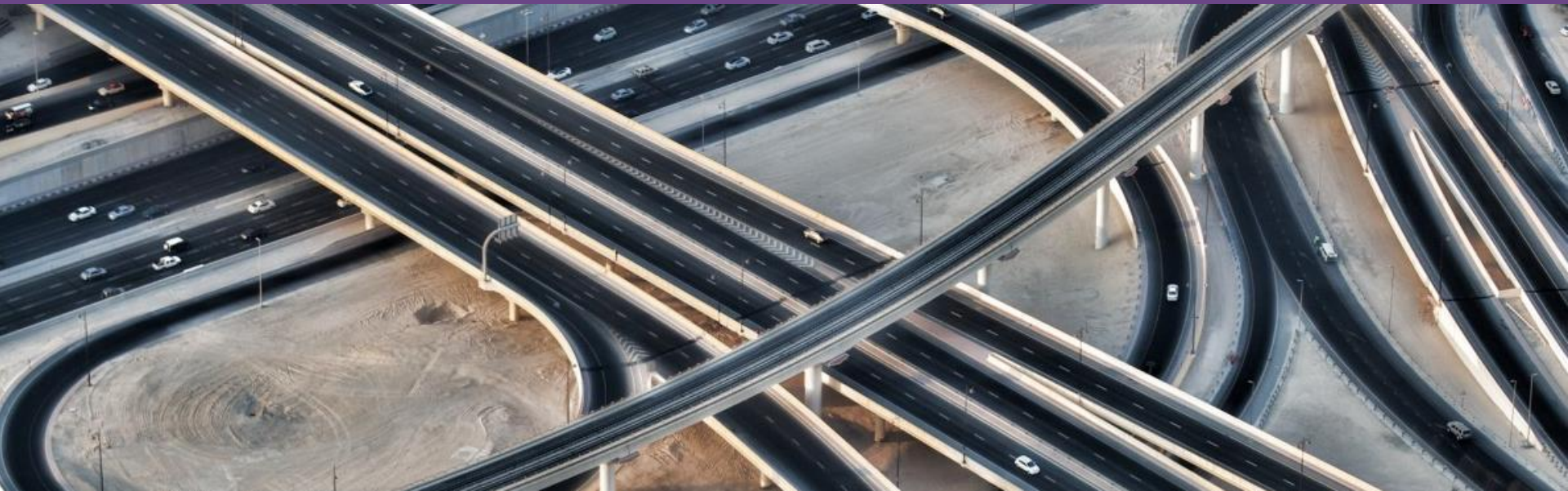
What are the Engineering Challenges ECE Students Will Soon Face?

IEEE Spectrum

2020 will be the year when 5G Goes from Theory to Reality

MIT Technology Review

2021 May Be the Year of the Fully Autonomous Car



National Renewable Energy Laboratory

80% of US Electricity Generation from Renewable Energy Resources by 2050

Challenges in Circuits & Electronics Education

- Developing engineers ready for increasingly complex systems
- Difficulty in building engaging and exciting experiences to retain students
- Limited time in classroom to learn basic topics; barrier to complex projects
- Education research is changing the recommended teaching methods

Research Findings: Engineering Lab of the Future

Educators will need to…

1. Rapidly teach **multi-disciplinary**, complex and advanced new topics
2. Build a **future-ready** laboratory with an increased focus on project-based learning
3. Integrate learning into new trends such as the **flipped and studio classroom**
4. Address need of teaching new application areas (**mechatronics**, **energy**, **power**)
5. Enable students to take measurements on their **personal computing devices** (BYOD)
6. Integrate accreditation, assessment and learning management systems (LMS)
7. Build **industrial relevance** into the education process

NI Partnership Models for Academic Institutions

Enhance Student Retention & Engagement through Curriculum Change

Collaborate to Increase Research Funding

Deliver Student Engagement & Employment

Support Global Societal Impact

Increase Relevancy to Industry with Center of Excellence and Certification

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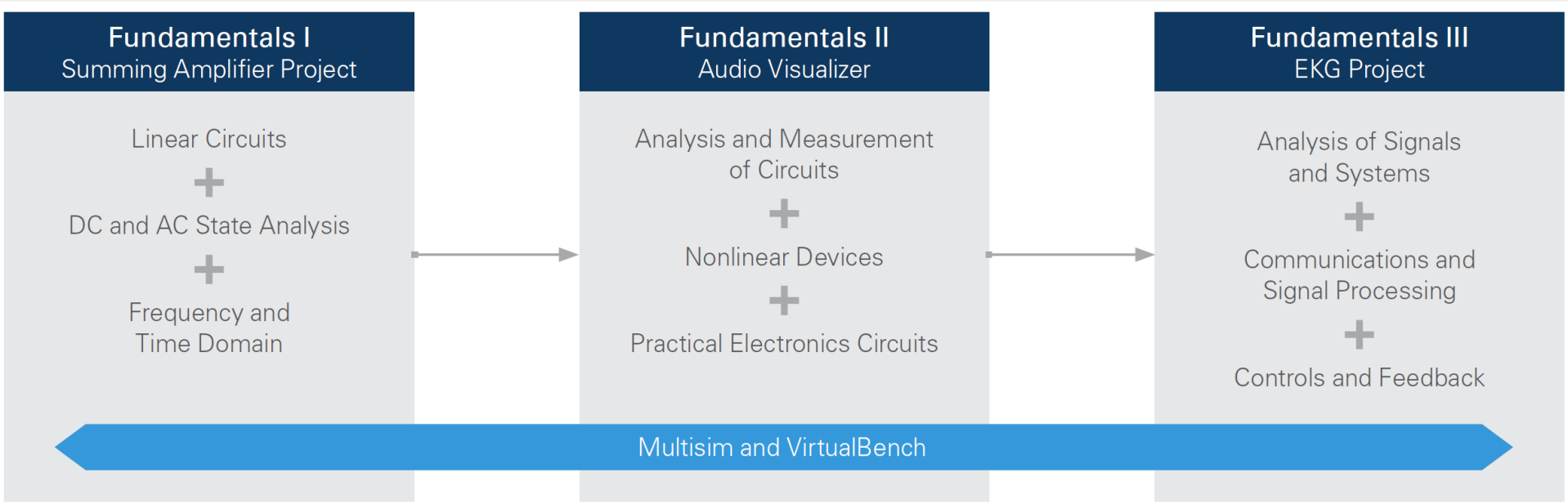
UNIVERSITY of VIRGINIA

First engineering school in the south,1819

#2 public university in the United States

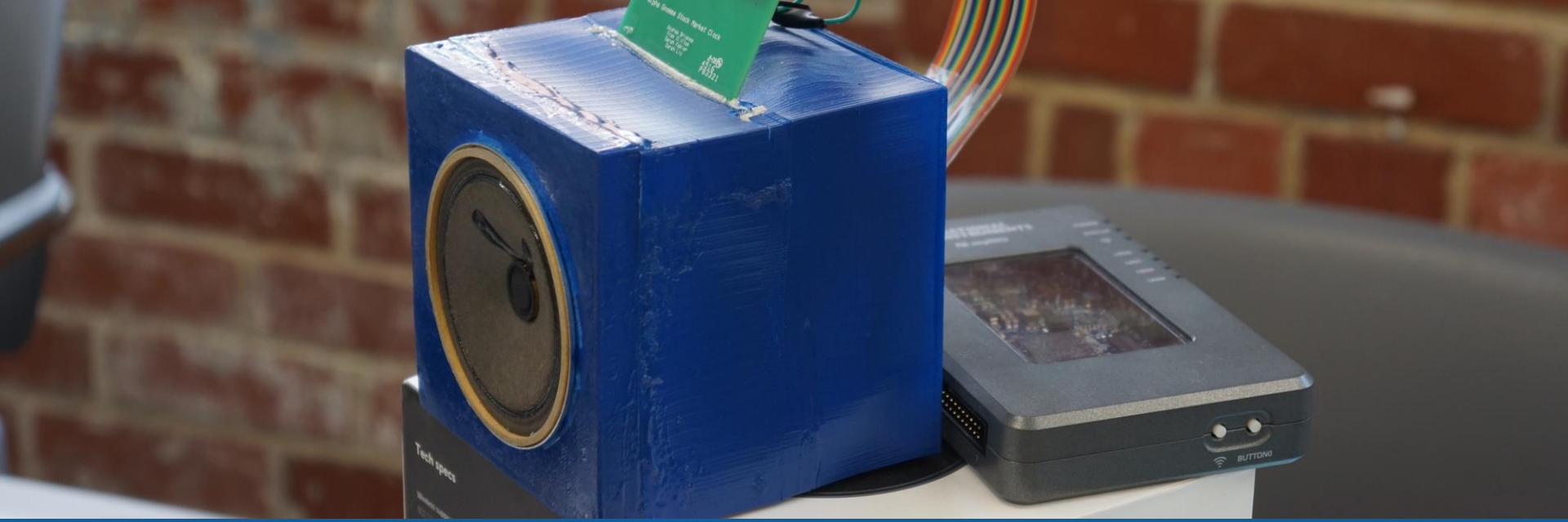
2,700 undergraduate engineering students

NATIONAL INSTRUMENTS



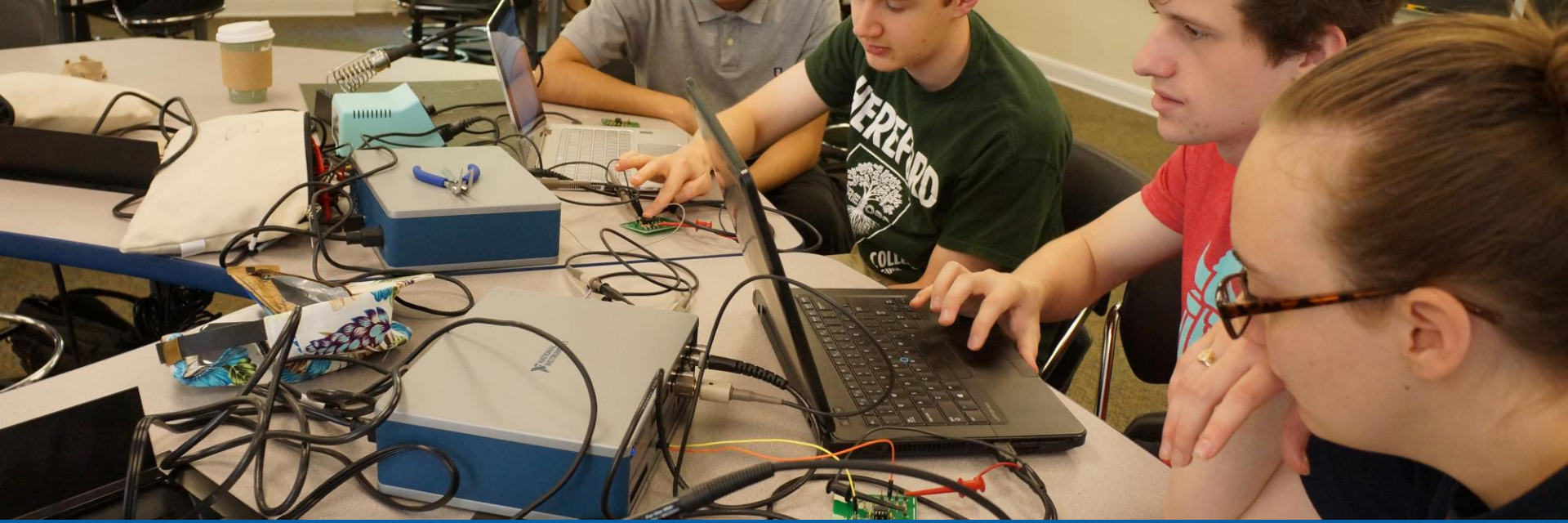
"Students need to get their hands on hardware **from day 1** to truly translate theory to understanding."

-Harry Powell, Associate Director of ECE Department

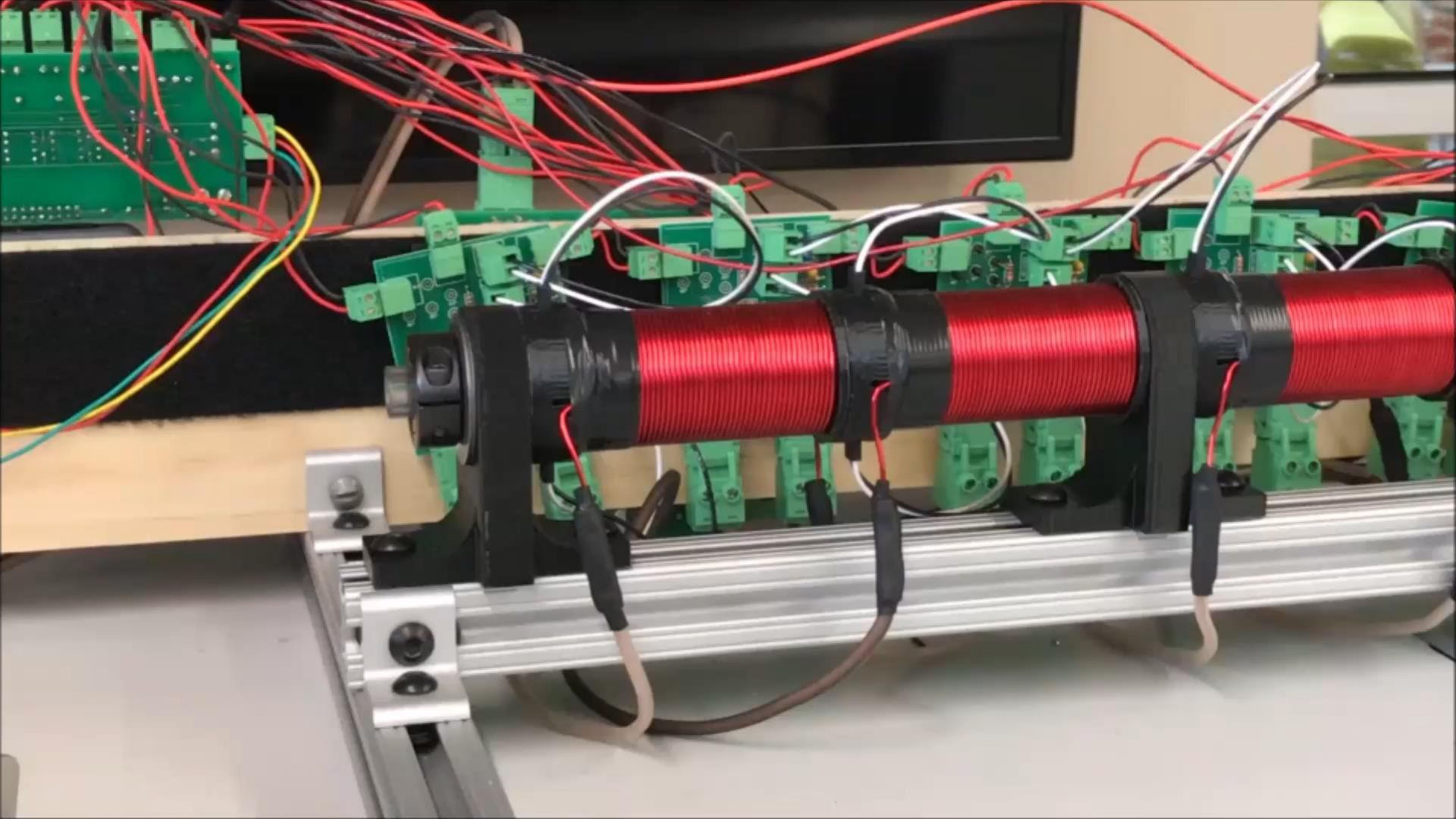


The quality of the senior design projects has seen **remarkable growth**.

Each project integrates everything learned in Fundamentals with Embedded Control.



- Female to male ratio improved by 120%
- 15% more students pass concept inventory test
- 91% of students claim hands-on exercises helped them better understand theory



The Electrical Engineering Department's National Ranking Has

IMPROVED BY 16 POSITIONS

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Power Electronics

Developing Engineers for the Fast Approaching Future

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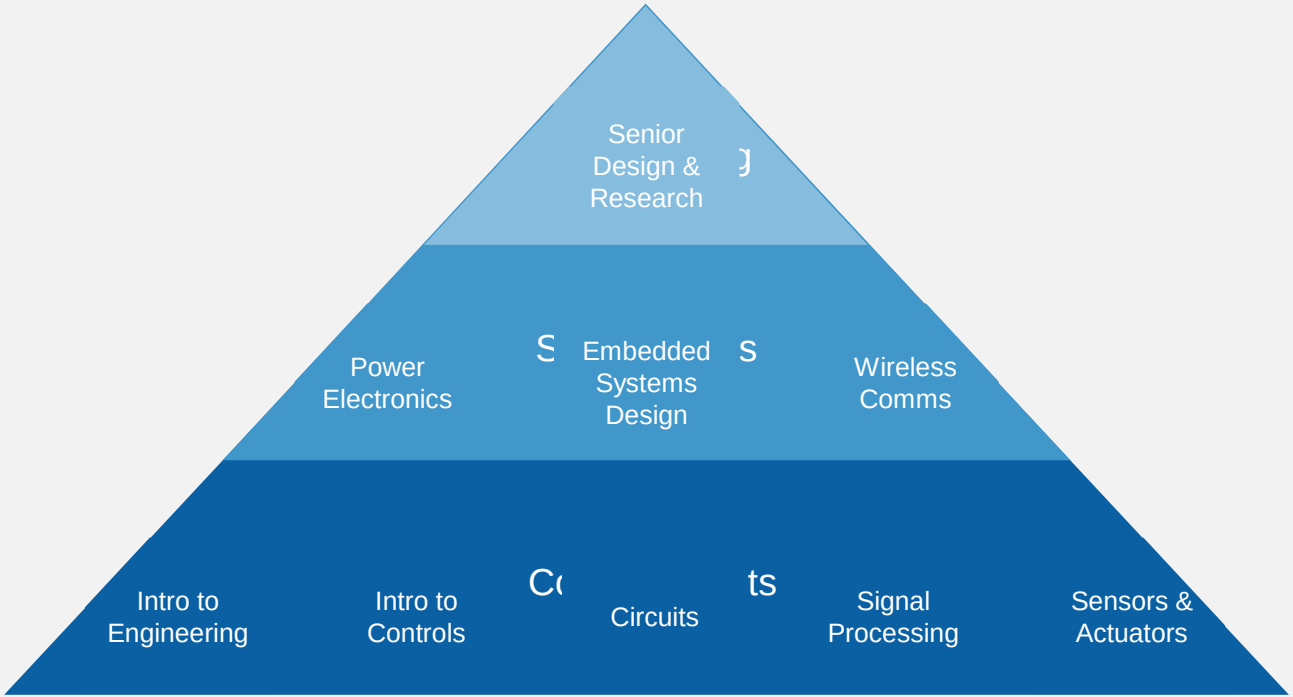
Path to Engineering System Design Success in ECE



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