Engineering Design, Innovation, and Entrepreneurship, Additional Major

Engineering Design, Innovation, and Entrepreneurship (EDIE) Additional Major

Overview

As humanity grapples with dilemmas of extraordinary complexity throughout the globe, our world needs engineers who are leaders and change makers. Our world needs engineers who seek to push the boundaries in their education, and carry their passion for technological innovation forward.

The Engineering Design, Innovation, and Entrepreneurship (EDIE) additional major will provide students the know-how to innovate products around that technology and deliver product solutions to the people who need them.

EDIE students will have expertise in technology and the ability to design, develop, and deliver economically viable solutions to the real-world challenges of today and tomorrow.

Students who elect Engineering Design, Innovation & Entrepreneurship (EDIE) as a major must also declare a major in one of the traditional engineering disciplines:

- Chemical Engineering (http://coursecatalog.web.cmu.edu/schools-colleges/collegeofengineering/departmentofchemicalengineering/chemical-engineering-bs/)
- Civil Engineering (http://coursecatalog.web.cmu.edu/schools-colleges/collegeofengineering/departmentofcivilandenvironmentalengineering/civil-engineering-bs/)
- Electrical & Computer Engineering (http://coursecatalog.web.cmu.edu/schools-colleges/collegeofengineering/departmentofelectricalandcomputerengineering/electrical-computer-engineering-bs/)
- Environmental Engineering (http://coursecatalog.web.cmu.edu/schools-colleges/collegeofengineering/departmentofcivilandenvironmentalengineering/environmental-engineering-bs/)
- Materials Science & Engineering (http://coursecatalog.web.cmu.edu/schools-colleges/collegeofengineering/materialsscienceandengineering/materials-science-engineering-bs/)
- Mechanical Engineering (http://coursecatalog.web.cmu.edu/schools-colleges/collegeofengineering/departmentofmechanicalengineering/mechanical-engineering-bs/)

The curriculum, demanding but readily feasible to complete in four years, is highly rewarding to motivated students.

Common Requirements for the Additional Major

The EDIE additional major program takes advantage of curricular overlaps between EDIE and traditional engineering majors, such that the additional major can be completed in four years with only a modest increase in course requirements. The courses requirements for EDIE consist of foundational skills, Engineering Design and Innovation, Engineering Entrepreneurship and two capstone experiences. The foundational skill courses focus on the fundamentals of microeconomics and public speaking. With core courses in engineering design, innovation and entrepreneurship are designed for engineers to learn with engineers, building on the fundamentals in their primary degree. Finally, students complete two capstone courses to explore real-world applications.

The additional major in Engineering Design, Innovation & Entrepreneurship should be declared at the same time when declaring a traditional engineering major.

Some courses for the EDIE additional major may also satisfy requirements for traditional engineering courses or for general education courses.

Educational Objectives and Outcomes

The Integrated Innovation Institute breaks down the silos that impede innovation. We believe that by uniting the disciplines of engineering, business, and design, we can create impactful product and service solutions that create real value for real people.

Students emerge from our programs with hard and soft skills that empower them to solve complex real-world problems, regardless of industry, technology, or discipline.

Our graduates will become:

- Technology Entrepreneurs who utilize their specialized skills and ability to collaboratively explore and exploit scientific and technological change to benefit the firm.
- Leaders with relevant skills in technology-driven industries; becoming people who proactively see opportunities and know how to take action to fulfill them by developing products and launching ventures.
- Complex Problem Solvers who can leverage the skills in the core disciplines of innovation, entrepreneurship, and engineering design to create real value for real people while collaborating in a team environment.
- Futurists who are forward-thinking and eager to leave an impact on society

Student Learning Outcomes

1. An ability to formulate, articulate, and execute processes to discover new technology innovations and create entrepreneurial ventures.
2. Understand how the interdependence between technological change and new product development differentiates technological entrepreneurship from other entrepreneurship styles.
3. An ability to apply fundamentals learned in disciplines of innovation, entrepreneurship, and engineering design to produce solutions that meet specific needs that create and capture value for a firm.
4. An ability to communicate project learnings effectively using oral, written, and/or prototyping and other non-verbal communication methods.
5. An ability to collaborate on a multidisciplinary team, such as in EDIE capstone projects, based on a shared vision of future challenges in technology.
6. An ability to grow leadership skills and personal capacity for leadership while working effectively on teams to foster a collaborative and inclusive environment.
7. An ability to apply the program's active learning methodology in a repeatable continuous process of innovation, critical thinking, and active learning.
8. An ability to recognize the attributes of a growth mindset and to apply the principles in a professional context.

How does EDIE make you a better engineer?

Complementing your core engineering training, the practical expertise you acquire from the EDIE program will equip you to be a more effective, well-rounded, and adaptable engineer in the real world. Coupling your technical engineering training with the design, innovation, and entrepreneurship skills you'll acquire in the EDIE program will give you a significant advantage in your career preparation and post-graduation options and marketability.

Curriculum

The EDIE additional major isn't just for students who want to create a startup—it will help to prepare hands-on, get-it-done leaders who are in demand in all sectors of society and industry, for-profit and not-for-profit. Given the applied focus of our curriculum, courses will equip our students with mindsets, skills, and capabilities to identify and shape opportunities and develop economically sustainable solutions.

Students in the EDIE additional major must also satisfy the core requirements of their primary major typically following the standard schedule of courses each semester. EDIE core requirements are fulfilled in addition to the course requirements of their primary major, mainly using various elective units. The side-by-side curriculum charts (https://www.cmu.edu/iii/undergraduate-program/) for each primary major show how the requirements for the stand-alone majors and the primary major plus EDIE additional major compare.

Introductory Course

		Units
49-101	Introduction to Engineering Design, Innovation, and Entrepreneurship	12

Engineering Design and Innovation Courses

49-305	Customer Discovery for Tech Innovation	4.5
49-306	Engineering Design Methods & Tools	4.5
49-405	Leading Engineering Innovation Teams	4.5

Engineering Entrepreneurship Courses

49-205	Tech Venture Marketing for Engineers	4.5
49-206	Tech Business Planning	4.5
49-406	Tech Venture Formation	4.5
		13.5

Foundation Skills Courses

Microeconomics

73-102	Principles of Microeconomics	9

Writing & Expression

Choose one (1) of the following courses:

70-347	Entrepreneurship Communication *	9
70-340	Business Communications	9
70-345	Business Presentations	9
70-350	Acting for Business	9

* recommended option for EDIE students

edie capstone courses

49-420	EDIE Innovation Capstone	9
49-421	EDIE Entrepreneurship Capstone	9

Home Department Engineering Design Capstone (12 units)

Please consult with your home engineering department to confirm the specific Engineering Design Capstone course(s) that apply to your primary engineering degree. 12 units will count towards your EDIE degree requirements.