Innovation, Entrepreneurship, and Leadership in the AEC Industry

Course Description:

This course explores the intersection of entrepreneurship, innovation, leadership, and career development within the Architecture, Engineering, and Construction (AEC) industry. Designed for future leaders in AEC, the course provides a practical and strategic framework for developing innovation-driven solutions, advancing technological change, and excelling in entrepreneurial, intrapreneurial, academic, or industry leadership roles.

Students will examine the dynamics of innovation in complex AEC environments, from identifying market opportunities to navigating technology adoption barriers. The course emphasizes real-world application, including business model development, commercialization pathways, and leadership strategies for driving change. It also integrates career development themes such as professional branding, cross-disciplinary collaboration, and managing innovation teams.

Through interactive lectures, case studies, and guest speakers, students will gain insights into the AEC innovation ecosystem. The course culminates in a capstone project where students pitch original solutions to real-world industry challenges, showcasing their ability to lead transformative initiatives in the built environment.

Learning Outcomes

By the end of this course, students will be able to:

- Identify and evaluate entrepreneurial opportunities within the AEC industry
- Understand the drivers behind innovation and differentiate between market pull and market push
- Apply principles of business model development, technology assessment, and product lifecycle management to address AEC challenges
- Understand the process of translating research innovations into viable commercial products, including technology readiness, market validation, and scaling strategies
- Utilize frameworks to develop, evaluate, and implement innovation-driven solutions that address complex challenges in industries such as AEC
- Analyze the potential of emerging technologies such as automation, digitalization, and AI in driving innovation in the built environment
- Explore diverse AEC career pathways and develop essential skills in leadership, teamwork, networking, emotional intelligence, and strategic career planning

Course Modules

1. Innovation, Entrepreneurship, Intrapreneurship

- Introduction to innovation, entrepreneurship, intrapreneurship, and business management
- The critical role of innovation in AEC
- *Assignment 1: AEC startup case study*

2. Innovation Drivers, Lifecycle, and Adoption

- Key drivers of innovation, innovation lifecycle frameworks, change management strategies, overcoming adoption barriers
- Design thinking and agile methodology
- *Assignment 2: Emerging technology analysis*

3. Business Development

- Building model development fundamentals
- Defining value propositions, identifying revenue streams, customer discovery
- *Assignment 3: Business model development*

4. Startup Stages, Prototyping, Innovation Financing

- Understanding the startup journey and innovation stages
- Prototypes, MVPs, product development strategies
- Sources and types of funding for innovation

5. Marketing, Strategy, Commercialization

- Sales and marketing for innovation-driven ventures
- Business strategy, operating models, performance measurement, OKRs
- Commercialization pathways, intellectual property, technology transfer

6. Leadership, Personal Branding, Career Development

- Leadership, vision, purpose, and team dynamics in innovation settings
- Personal branding, self-awareness, soft skills, building networks, professional growth
- Career paths and adapting to emerging trends and transformations in AEC

7. Final Project Presentations

- Project presentations: Students present an entrepreneurial idea addressing a real-world AEC challenge

Assessments

- ***In-Class Participation and Activities: 10%***
  - Active participation in class. This includes contributing to discussions, engaging with guest speakers, and participating in activities.

- ***Assignment 1 (AEC Startup Case Study): 15%***
  - In small groups, students will research and present a startup that is innovating in the AEC industry.
  - Groups will explore what problem the startup solves, how they innovate, and the impact they are making, or aim to make, in the industry.
  - Groups submit their presentation file and present in class (5 min)
  - *Class presentation: Sep 23 (presentation submission due: Sep 22, 11:55 pm)*

- ***Assignment 2 (Emerging Technology Analysis): 15%***
  - In small groups, students will select an emerging technology relevant to the AEC industry.
  - Groups evaluate users and use cases, the problem the technology solves, innovation stage, TRL, market pull vs push, adoption drivers and barriers, market context, whether to adopt, test, or abandon, and recommended steps to support adoption.
  - Groups submit their presentation file and present in class (8 min)
  - *Class presentation: Oct 7 (presentation submission due: Oct 6, 11:55 pm)*

- ***Assignment 3 (Business Model Development): 20%***
  - In small groups, students will develop a business model for an innovative solution.
  - Groups submit the business model report (max 5 pages) and present their work in class (10 min)
  - *Class presentation: Oct 28 (report submission due: Oct 27, 11:55 pm)*

- ***Final Project Presentation and Report: 40%***
  - Working in teams, students will develop and pitch an original entrepreneurial solution to a real-world AEC challenge.
  - Deliverables:
    - Live presentation (8 minutes + Q&A) to a panel of industry professionals and leaders.
    - Final written report including problem framing and innovation concept, business model, technology assessment, implementation, and scaling strategy.
  - Evaluation will be based on innovation quality and originality; feasibility and market relevance; team collaboration and professionalism; communication clarity and impact.
  - *Class presentation: Dec 2 (presentation submission due: Dec 1, 11:55 pm)*