

Title: *Technology Entrepreneurship: Teaming, Ideation, and Entrepreneurship: ECE 8873*

Abbreviated Title: *Tech Ventures*

Instructor: Gregory B. Mihalik, MBA (gmihalik@gatech.edu)

Description: Different elements including customer discovery, cognitive biases, rapid prototyping, and pivots are covered. In addition, general entrepreneurship and intrapreneurship topics such as teaming, ideation, leadership, negotiation, and capital raises are covered. Principles of entrepreneurship and intrapreneurship will be included.

Pre-requisites: Graduate standing

Credits: 1-2-3-3

1= 1-hour lecture, 2= 2-hour studio session, 3= 3-hours unsupervised lab, 3= total credit hours

Purpose of Course: Provide graduate MSECE students with the necessary vocabulary, knowledge, skills, and experience to understand entrepreneurship and intrapreneurship terminology and principles—21st Century engineering skills. The course will do so in the specific context of teaching a process called evidence-based entrepreneurship.

Topical Outline Overview: The course will have three formats, with the formats organized in parallel. The first format is a *lecture* series that will focus on the elements of entrepreneurship and intrapreneurship ranging from how opportunities are identified, to how ideas are conceived, to what customer discovery means, etc. The second format is a *studio* that will focus on developing the core of a business model for an actual startup idea, or an impactful problem worth pursuing. In this phase, students will conceive a startup idea, perform customer discovery to form a compelling business model, and model seeking customer validation to prove market viability of the startup concept. Connecting these two formats will be *unsupervised lab* hours during which student teams will develop their ideas, validate their ideas through informal conversations, and prepare weekly presentations delivered during the studios.

Grading:

Individual or Group	Description	Percentage
Individual	Quiz 1	15
Individual	Quiz 2	15
Individual	Weekly short quizzes in lecture	5
Group/Individual	In-Class Exercises	10
Group/Individual	Weekly Presentations and Deliverables	30
Individual	Studio Presentation feedback to others	10
Group	Final Presentation	10
Individual	Peer Review	5
	Total	100

Topical Outline:

Lecture Series

This didactic format will focus on a variety of elements of entrepreneurship and intrapreneurship. This will be a weekly lecture. The regular lectures will include the topics outlined below. Please note this is an overview, and the order, and repetition, or topics will be adjusted to maximize learning and accommodate guest lectures.

Ideation: Technology driven ideation of solutions to address market opportunities. How can technology be leveraged to achieve both differentiation and entry barriers? How can the time to market be balanced against completeness of technology?

Evidence-Based Entrepreneurship (EBE): What is evidence-based entrepreneurship? What does evidence mean? How is evidence gathered? What does evidence gathering accomplish?

Lean Startup Methodology: Developing businesses, products, and services through a method to shorten development cycles. How can we employ this approach on a constructed timeframe and adopt these techniques during the course?

Customer Discovery: Do customers validate business hypothesis consisting of the opportunity and potential solution? How should customer discovery be done?

Cognitive Biases: What are cognitive biases? How do they impact customer discovery? How do you control for them when doing customer discovery?

Business Models Canvas: What is the business model canvas? What are the nine elements of the canvas? How do the elements relate to each other? How does evidence-based entrepreneurship use a business model canvas?

Pivoting: How to pivot product and business models based on customer discovery and validation? How to choose pivot direction?

Rapid Prototyping: How to build a rapid prototype of a product? What are the modalities available? How can the rapid prototype help learn about what the product must be? How to use customer discovery in defining the Minimum Viable Product (MVP)?

Intellectual Property: What is the definition of intellectual property? How is it viewed, and valued, at a startup company vs. an established company?

Financing: How much capital does the venture require? How to raise this capital? In what increments should the capital be raised? What are likely liquidity events? What are the tradeoffs?

Teaming: What kind of a team is required for fulfilling the vision of the venture? When should the team members be added? How should the team members be compensated?

Leadership: What is leadership? What are the different models of leadership? Can leadership be systematically cultivated?

Storytelling: How to tell an effective story? What can be learned from effective storytelling mechanisms such as movies?

Intrapreneurship: How can an employee act like an entrepreneur within a larger organization? What are the similarities and differences?

Entrepreneurship Studio:

For this format of the class, students will divide and work in teams. Each team will pursue a concept developed by the team. The concept could be a tangible product that supports the Ga Tech “maker culture” and can be built by the team calling upon their skills in the ECE realm. The concept must allow for customer discovery, with a sufficiently large local market. The instructor must approve the concept.

This course follows an evidence-based entrepreneurship methodology. Each week, students will identify hypotheses about who their customers might be and what problems or needs they have. They will then interview 5-10 potential customers and partners in their market’s ecosystem through informal conversations. In this class students will learn how to secure, conduct, record, and assess these informal conversations. The results of these conversations will be presented in class. The studio instructor team will review the progress and help to redirect the teams as needed. Much of the learning comes from watching and participating in this interaction with other teams. Teams will use this process to set the details on their business model canvas.

The nuts and bolts of how to make good hypotheses, how to identify people to interview, how to get the meetings and what to ask, and finally, how to interpret the results will be covered as part of entrepreneurship basics.

One method to consistently provide a snapshot of the business, is to use a *Business Model Canvas*. The sections of the business model canvas to be covered are: Customer Segments; Value Proposition; Revenue Models and Channels; Metrics; Key Resources and Activities; Cost Structure and Partners.

In the first half-ish of the semester, teams will focus intensely on finding a verifiable problem and value proposition. In the second half of the semester, teams will shift to gathering proof that there is a viable product that can deliver the value proposition.

The studio instructors will offer sufficient time for office hours to allow teams to get individualized help. The goal of this portion of the class is to learn a method for going from a vision to a proven concept with strong potential for value creation.

Textbooks: (Free for students, download non-profit versions)

1. Talking to Humans, Constable & Rimalovski, <https://www.talkingtohumans.com/>
2. Testing with Humans, Constable & Rimalovski, <https://testingwithhumans.com/>

Optional Reading:

3. Technology Ventures, Byers, Dorf, and Nelson
4. The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company, Blank
5. Value Proposition Design: How to Create Products and Services Customers Want (Strategyzer), Alexander Osterwalder, Yves Pigneur, Greg Bernarda and Alan Smith
6. Business Model Generation, Alexander Osterwalder
7. Thinking: Fast and Slow, D. Kahneman
8. The Founder's Dilemma, Noam Wasserman

Instructor Commitment:

All of the instructors commit to dedicating our time and energy to ensure that you have a productive learning environment for this course. In addition, our goal is to maximize evidence-based teaching methods to further enhance the educational experience. Examples include a highly-interactive class environment, self-paced learnings outside of the classroom, as well as reflective in-class exercises.

Student Commitment:

As the student, you agree to commit time and energy to learn the material by completing all assignments in a timely manner, attending all class sessions, and seeking help when required.

Academic Honesty:

All violations of the Georgia Tech Honor Code will be handled by referring the case directly to the Dean of Students for investigation and penalties. As a reminder to students, violations of the Honor Code can be met with minimum drop of one letter grade in their final course grade and potentially academic probation.

Absences:

Class attendance is expected. Institute policy on absences for illness or personal emergencies may be found at: <http://www.catalog.gatech.edu/policies/student-absence-regulations/>

For illnesses, students are responsible for providing the documentation to the Office of Student Life where it will be treated and handled confidentially with necessary information being submitted to the student's instructors for that term.

If you must miss class due to a personal emergency then you should contact the office for the dean of students at (404) 894-6367 or fill out a form requesting assistance at:

<https://studentlife.gatech.edu/content/class-attendance>. The dean of students will then verify the personal emergency with your instructors.

If you have an institute approved activity that will cause you to miss class, then you must provide an institute approval letter by filling out the form at:

<https://registrar.gatech.edu/node/97>.

When properly documented, any of the instances above will constitute an excused absence and you should inform Prof. Mihalik (gmihalik@gatech.edu) without providing any confidential information. If your absence involves missing a quiz or presentation, you must coordinate a means of meet missed requirements with Prof. Mihalik as soon as possible.

Office of Disability Services:

If you are a student registered with the Office of Disability Services (ODS), please make sure the appropriate forms and paperwork are completed by Prof. Mihalik within the first week of classes. The instructors will abide by all accommodations required by ODS. The schedule for quizzes is posted in the syllabus and any potential modifications or changes will be made with at least one week's notice. It is the responsibility of the student to properly arrange test accommodations for each quiz with ODS in sufficient time to guarantee space for quiz administration. ALL quiz accommodations must be handled through ODS. If the student does not register accommodations with ODS for the quiz, then the student will take the quiz at the normally scheduled times, without any additional accommodation unless the instructor is given specific directive from ODS on the students behalf due to a mitigating circumstance.

Diversity Statement:

The School of Electrical and Computer Engineering is committed to creating, supporting, and maintaining an inclusive, equitable, and respectful environment. Our training approach hinges upon bringing together individuals with various backgrounds, as well as academic and industrial experiences, to challenge each other. Critical to enhancing our training approach across multiple dimensions, is the inclusion of diversity in gender, age, race, ethnicity, sexual orientation, and socioeconomic backgrounds. In this course, our approach is hypothesis-driven. Hence, the goal is to critically assess and vet ideas, for the overall benefit of teaching a methodology. Furthermore, the intent is broadening approaches for problem-solving and ultimately value creation. We rely upon the diversity of our community to seed innovation, and share unanticipated perspectives within our course. Therefore, it is essential that we conduct ourselves in a respectful and professional manner as we are exposed to a variety of thinking approaches. Thus, we rely upon our students, instructors, faculty and staff to contribute to the diversity, equity, and inclusiveness of our course environment.