

ECE 6001 Technology Entrepreneurship: Teaming, Ideation, and Entrepreneurship

Course taught simultaneously at Georgia Tech Lorraine, Atlanta, and China campuses with international interactions and discussions

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Description: The course teaches evidence-based entrepreneurship skills and principles, benefiting students launching a business or pursuing careers with technology and innovation driven companies. The course is designed to be an experiential, project-based, innovative, and cross-curricular program educating and developing future engineers and entrepreneurs through discovery and “real-world” experiences.

Pre-requisites: Graduate standing, all majors ECE, CS, ME, AE are welcome

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 students with the necessary vocabulary, knowledge, skills, and experience to understand entrepreneurship and intrapreneurship terminology and principles—21st Century engineering skills. Different elements include customer discovery, intellectual property, minimum viable product (MVP), pivots, teaming, business canvas, business hypothesis testing, pitches, ideation, leadership, negotiation, finances, grant proposals, ethics, and capital raises.

Topical Outline Overview: The course is structured around 3 platforms: 1)Weekly *lectures* on the elements of entrepreneurship and intrapreneurship ranging from how opportunities are identified, to how ideas are conceived, to what customer discovery means, etc., 2)*Unsupervised lab* for Real-world interactions for students and teams to develop and validate their ideas through customer conversations, and to prepare weekly presentations delivered during studios, and 3)*Studio* sessions where teams conceive a startup idea, perform customer discovery to form a compelling business model, model customer validation to prove market viability of the startup concept, present weekly team updates, and receive coaching on their projects.

Grading: A = 900 – 1000, B = 800 – 899, C = 700 – 799, D = 600 – 699, F < 600

Individual or Group	Description	Percentage	Points
Individual	Test I & II & Written Assignment	30	300
Individual	Quizzes (12)	18	180
Group/Individual	Weekly Presentations & Assignments (13)	32.5	325
Individual	Participation & Attendance	9.5	95
Group	Final Presentation	10	100
	Total	100	1000

Topical Outline:

Lecture Series

The lectures 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?

Student Learning Outcomes:

- 1) Demonstrate an understanding of Evidence based Entrepreneurship through identification and analysis of potential technology-based business opportunities.
- 2) Apply the scientific method in customer discovery interactions through designing, executing, and evaluating business hypotheses.
- 3) Create a Minimal Viable Product (MVP) for one or more prototype business theses.
- 4) Demonstrate an understanding of the importance to continuously learn and improve in the following skills that are an important part of entrepreneurship as well as intrapreneurship: 1) Critical thinking and problem solving, 2) Oral/Written Communication, 3) Teamwork and collaboration, 4) Leadership, 5) Professionalism and ethics, and 6) Career Management.

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 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 in 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.

Textbook: There is no required textbook.

Needed Online Materials: (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:

1. The Lean StartUp_by Eric Ries, 2011.
2. Technology Ventures, Byers, Dorf, and Nelson
3. The Startup Owner’s Manual: The Step-By-Step Guide for Building a Great Company, Blank
4. Value Proposition Design: How to Create Products and Services Customers Want (Strategyzer), Alexander Osterwalder, Yves Pigneur, Greg Bernarda and Alan Smith
5. Business Model Generation, Alexander Osterwalder
6. Testing Business Ideas, Alexander Osterwalder and David Bland
7. Thinking: Fast and Slow, D. Kahneman
8. The Founder’s Dilemma, Noam Wasserman
9. Entrepreneurship, Theory, Process, Practice by Donald F. Kuratko – Cengage publishing
10. Launching New Ventures by Kathleen R. Allen – Cengage publishing

Student-Faculty Expectations Agreement:

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Academic Honesty: Follow the Georgia Tech Honor Code - <http://www.deanofstudents.gatech.edu/>. All conduct in this course will be governed by the Georgia Tech honor code.

Late Assignments:

If you are aware an assignment will be late, please discuss with instructor prior to the due date. Otherwise, late assignments will be accepted, but for each 24-hour period the assignment is late, the assignment will be reduced one letter grade or point equivalent of one letter grade.

Class Attendance:

Missing classes will lower your participation & attendance. If you miss an exam without notice prior to the start of the exam, you will receive a zero for that exam.

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 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 student's behalf due to a mitigating circumstance.

Diversity Statement:

Georgia Tech 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.

Acknowledgements: This syllabus is a modified version from Professor Mihalik