ME 6745 – Engineering Based Intraprenuership
Fall 2026 Course Syllabus

Instructors:

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Background:

In informal surveys of Georgia Tech students enrolled in current entrepreneurship courses, less than 1 in 10 stated they were interested in starting their own company after graduation. However, nearly all these engineering students expressed a high level of interest in intrapreneurship – or start-ups within corporations. And high-performing companies have learned that they need to constantly re-invent themselves and find start-up equipped engineers to create new products and services to compete. In fact, a recent study by McKinsey revealed that the top 25% of global companies generated over a third of their revenue from new products or services. The purpose of this course is to provide engineering students with the tools and leadership skills they need to champion corporate start-up initiatives.

Catalog Description:

This course teaches engineering-based Intraprenuership skills and principles, benefiting students pursuing careers within engineering and innovation driven companies. These companies need start-up-minded engineers equipped with the tools and leadership skills to innovate and create corporate start-ups.

Purpose:

Provide graduate and undergraduate engineering students with the key vocabulary, knowledge, skills, and experience to be successful intrapreneurs. Key elements include customer discovery, innovation and idea generation techniques, new business models, successful business case development, understanding company financials, corporate structures, storytelling/pitching, team building, leadership, and execution.

Objectives:

At the end of the course students should be able to:

1. Demonstrate an understanding of Engineering-based Intrapreneurship though identification and analysis of technology-based opportunities.
2. Understand and apply multiple ideation techniques, emerging technology impacts, and new business models to generate new business opportunities.
3. Understand and analyze key financial reports and metrics for publicly traded companies such as Balance Sheet, Income Statement, and Cash Flow Statement. Apply start-up financial framework to new ideas using company specific financials and metrics to value the idea and force-rank the opportunity against other options (NPV).
4. Model their idea in Excel and demonstrate their ability to use sensitivity analysis. Construct a compelling business case and learn how to gain approval within a corporate setting.
5. Create a Minimal Viable Product (MVP) for one or more prototype business theses.
6. Learn different approaches for staffing and leading a team executing a successful start-up organization.

Required Texts:

Case Study – Tesla's Entry into the U.S. Auto Industry, 2019 by Donald Sull and Cate Reavis, MIT Sloan School of Management (free)

Case Study - Alphabet Eyes New Frontiers", ref 9-717-418, REV: FEBRUARY 26, 2018, Harvard Business Publishing. $4.25/student

Mini-Case Studies – Apple vs Ford – Successful Strategies in shifting towards Subscription Services by Mike Tinskey (distributed & discussed in class, no charge)

– Automakers Entering The Re-fueling Business by Mike Tinskey

– Drone Power – The Case For Leveraging Existing Assets Into A Growth Market by Mike Tinskey

Movie Documentary – General Magic,1hr32 min, $1.99 Amazon Rental, $3.99 Apple Rental

Build: An Unorthodox Guide to Making Things Worth Making, by Tony Fadell, $17 – Required book for all graduate-level students.

Cagan, J., & Vogel, C. M. (2013). Creating Breakthrough Products: Revealing the Secrets that Drive Global Innovation, (Chapters 1 and 9) (free with link)

Wall Street Journal Subscription – Free for students of Georgia Tech.

Optional:

The Invincible Company: How to Constantly Reinvent Your Organization with Inspiration From the World's Best Business Models, by Alexander Osterwalder et al ….($17)

Start Within: How to sell your idea, overcome roadblocks, and love your job, by Karen Holst et al, $15.99

The Innovator's Dilemma, with a New Foreword: When New Technologies Cause Great Firms to Fail Hardcover – April 9, 2024

The above "Optional" textbooks are suggested (**not required!**) references. I have a copy of the optional books in my office if a student is interested in borrowing. The case studies are required. Additionally, ford the Distance Learning section, the course should be recorded for async viewing.

Prerequisites:

Junior, Senior, or Graduate standing in any GT College of Engineering.

Honor Code:

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards and students are expected to abide by the GT Honor Code (www.honor.gatech.edu) at all times. The objective of the honor code is "to prevent any students from gaining an unfair advantage over other students through academic misconduct". Please adhere to this code and take it seriously; both instructors certainly do and have a zero-tolerance policy for code violations.

Examples of honor code violations include:

- Communicating with other students during a quiz, test or exam.
- Claiming other students' work as your own.
- Using notes of any kind during closed-book, in-class quizzes
- Making untrue claims/statements (of any sort) to the instructors regarding use of electronic resources (your personal laptop crashing, etc.)

We will be spending a few minutes discussing ChatGPT/AI in class to show its current strengths and weaknesses. If a student uses ChatGPT on any assignment or exam, please disclose in the assignment/exam and how it was used.

For any questions involving these or any other Academic Honor Code issues, please consult your instructor or visit www.honor.gatech.edu.

Accommodations for Students with Disabilities:

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404) 894-2563 or http://disabilityservices.gatech.edu, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. We fully support and recognize the need to make accommodations that improve teaching and learning for all students. Please also e-mail us as soon as possible to set up a time to discuss your learning needs.

Lectures:

Times and location: 184 Love Building, Monday/Wednesday 3:30 to 4:45 pm

- Lectures will be held twice per week (75 minutes each).
- In general, we will use the class slot for a few different purposes:
  - On Monday's, we will have an in-person lecture on a specific module of the course. This may occasionally include a case study discussion.
  - On Wednesday's we will have an in-person discussion that will include an interactive studio type session, building on Monday's module, where teams will conceive a corporate start-up idea, perform customer discovery to form a

compelling business case, present weekly team updates, and receive coaching/feedback on their projects.
    - Students are expected to spend 3 hours per week in an Unsupervised Lab where they continue to research their project, complete weekly assignments, and validate their ideas through real-world feedback.
    - Note that if you are not in the DL session, you should make every effort to join the class in-person…. That is where the material will be discussed and learned.
- There are a few exceptions to the above general format
    - We will use some of the lecture slots for students to present their progress on projects.
    - Towards the end of term, graduate students will give lectures on a topic. This is an opportunity for all students to become subject matter experts and demonstrate their knowledge of intrapreneurship. The lectures will be graded (more details below).

Keys to Success:

There are several keys to success in this class.

- First and foremost, be excited to learn and be passionate about understanding the underlying concepts of Intraprenuership.
- Seek understanding, rather than just getting the correct answer.
- Conduct course activities in a timely manner; watch lectures (well) before the due date and take notes during the lecture, engage in the class examples, case studies and activities
- Participate with your group work, and in discussion during the class and group meetings.
- Review materials and problem sets (well) prior to quizzes, term tests, and exams. Go over the solutions carefully and understand the concepts behind the solutions, not just the steps and math to solve the problem.
- Ask questions! It is critical that you dialogue with your group and the instructor.

Grading:

This is a mixed graduate/undergraduate class. Students will work together but some aspects of the evaluation will differ between graduate and undergraduate students. Also, we have designed the class so that there are multiple “small stakes” assessments, as follows:

ME4745 Grading (both in-person & distance learners):

Term Tests (see below)	30% total (15% each x 2 tests)
Homework & Project Grades	25% total

Individual Participation, Attendance	10% total
Final Team Project Paper	20%
Final Team Project Presentation	15% (comprehensive)

ME6745 Grading:

Term Tests (see below)	30% total (15% each x 2 tests)
Homework & Project Grades	25% total
Individual Participation, Attendance	10% total
Final Team Project Paper	15%
Final Team Project Presentation	10% (comprehensive)
Individual Project / Presentation	10%

ME6745-Q Distance Learning Grading:

Term Tests (see below)	30% total (15% each x 2 tests)
Homework & Project Grades	25% total
Individual Participation, Attendance	10% total
Final Team Project Paper/Presentation	25% (comprehensive)
Individual Project / Presentation	10%

Final Grading	Final Grade
90-100%	A
80-89.9%	B
70-79.9%	C
60-69.9%	D
Lower than 60%	F

Student Team Project:

A student group project is an important part of this course, designed to achieve an important goal: to teach students how to identify, evaluate, and pitch a new technology-based idea within a corporate setting. This course project is a culmination and demonstration that you have gained these skills throughout the semester. The project will have both a written and presentation component.

Students will form groups consisting of graduate students and undergraduates. The standard format for group projects will be assigned/choose a company (you can have input on this), and use techniques and lessons in the class to build up a business case for an engineering-based Intrapreneurship idea for this company:

- Problem Statements
- Financial Reports
- Business Case
- Approval Approach
- Go To Market/Launch Plan
- Ideation & Technology
- Engineering Analysis
- Excel Model NPV & Sensitivity
- MVP
- Competitive Assessment / Analogs

Grade evaluations will differ between undergraduate and graduate student, as described in detail below.

<u>For graduate students:</u> Graduate students will have a required reading book (Build by Tony Fadell) and one or both exams will have a question related to the book. Graduate students have a choice to do a mini-final project on a second company that is individual and interesting to them (i.e. a target employer) … or the graduate students can deliver a 10-minute lecture on their analysis of a company's intrapreneurship activities (i.e. company growth history, interesting results, etc.). Students must consult with the instructor at least 1 week in advance of the lecture and provide an outline of the material that will be covered in the lecture.

The Course Instructors will ultimately assign the final project grade for graduate students in each team. However, peer-review feedback will be used to help the Course Instructors to assign grades. Students in the course will be asked to complete surveys to answer questions, such as:

- Rate the clarity of the lecture material and your ability to understand and follow the lectures.
    - Adequate visual aids, appropriate lecture time, well organized, clear statements and concepts, and appropriate definitions of terms, symbols, etc.
    - Was there breadth of material covered appropriate? Was the content correct? Did the team tie this material into the framework of the rest of the course? Did the team provide adequate linkages between idea and the customer and company?
- Rate the level of engagement, simulation of interest, and class interaction

- Did the lecture stimulate your interest in the topic? Were the presenters engaging and excited about the material?
- What was the greatest strength of the lecture material? What was the greatest weakness of the lecture material?

We will also ask each student, individually, to provide critical peer reviews of the other group presentations, including strengths and weaknesses of each presentation that align with the overall scoring of the presentation. Your peer reviews will be graded for completeness and thoughtfulness of your comments and scores. Giving all other groups a 100% and saying 'it was a great presentation' is not very thoughtful. If it was really a 'perfect' presentation, then list the strengths that justify your score. Similarly, giving a group a score of 50%, with few critiques to justify your score, is also not a thoughtful review.

For undergraduate students: Grades will be based on the team written report and the team presentation. Grades will be based on how well the project uses the frameworks and tools applied to the target company, as well as the innovation of the idea, and the presentation with feedback from the student peers. Undergraduate students can also earn extra credit by completing the graduate level assignments above with the instructor's permission.

Homework:

Over the course of the term, several reading assignments and team project steps will be assigned and required to be turned in by the due date. All will be graded, and feedback given.

Term Test:

There will be one mid-term exam. It will be taken online at the student's convenience (one week window). It will be timed to 90 minutes. Students who have attended the course lectures and case studies can expect to score extremely well on the term tests.

Final Exam:

The final project paper and presentation will be the measure of the student's comprehension of the course material**. There will not be a final exam.**

Digital Etiquette:

Georgia Tech is a professional environment, and all members of the campus community are expected to act accordingly. This extends to the use of email. Email inquiries to an instructor should be addressed either "Dear Prof __", "Dear Mr __" or "Dear Ms __" (as appropriate), and signed with a student's first and last name to receive a response.

Attendance Policy:

Planned absences: Except for approved Institute activities, permission to miss a scheduled quiz/test/exam will only be given in extremely unusual circumstances. We require that all planned absences be supported

by documentation in advance of the planned absence. Therefore, planned absence from a quiz, term test, presentation and/or exam without prior discussion with the instructors and their approval will automatically result in a mark of zero for that quiz/term test/presentation/exam, with no exceptions.

Unplanned absences: If a student is unavoidably absent from one or more quizzes, terms test, presentation or the final exam, he/she must notify the professor as soon as practically possible. The reason for the absence must be communicated and documentary evidence provided, e.g. a doctor's note in case of illness. Failure to provide suitable documentary evidence and/or timely notification will automatically result in a mark of zero for that quiz/term test/presentation/exam, with no exceptions.