

MAE 500: Entrepreneurship for Engineers

T/Th 2:00-3:20 (Link 331)

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Office Hours: Wednesday 1:00pm to 3:00pm and
by appointment

Course Description:

The course provides a hands-on experience for learning the key tactics of entrepreneurial activity and the entrepreneurial mindset from an engineering perspective. This course provides an introduction to, and an overview of, the fundamentals of entrepreneurship, including: development of a viable technical business concept, customer discovery, prototyping, the evaluation and planning of start-up businesses, go-to-market strategy, intellectual property, and financing. The course utilizes lectures, directed readings, and guest speakers. Throughout the semester, students work in teams to write and develop a business plan for a venture of their own choosing. The business plan includes description of the business, target market, competition, financial projections and business strategy. Students will also analyze case studies of leading technical/engineering companies such as Tesla.

Credits: 3

Prerequisite / Co-requisite:

The course is open to senior undergraduate and graduate engineering and computer science students or with permission from the instructor.

Teaching Assistants and Office Hours

TBD

Learning Objectives:

1. Acquire a foundational understanding of entrepreneurship from an engineering perspective to understand its nature and scope
2. To provide the opportunity to construct a business plan for a high-growth, high tech business
3. Understand the various sources of funding for engineering start-ups (SBIR/STTR, NSF I-Corps, etc.)
4. Employ entrepreneurial discovery strategies to generate feasible ideas for technical business ventures
5. Demonstrate ability to use self-awareness and specific knowledge of principles of leadership and working in teams to achieve business objectives
6. Improve oral and written communication skills (by learning to create an effective concept statement, develop an in-depth industry analysis, and deliver a persuasive business pitch)
7. Demonstrate understanding of and adherence to rigorous ethical principles in planning and execution of a new business venture and in presentation of the results
8. Understand how to turn a technical/engineering business concept into a sustainable business venture

Speaker Dining Series:

Over the course of the semester, a number of industry experts/successful entrepreneurs will serve as guest speakers. On the evening of each talk, 4-5 students will have the opportunity to dine with the speaker in a professional setting. Speaker bios will be provided at the start of the semester, and students will be asked to rank their top choices. The Speaker Dining Series with student attendees will be posted no later than Week 2 of the semester. These dinners provide students with the opportunity to interact with a high-level professional and practice their communication skills. Dress code is business professional. A one-page written reflection is required and must be submitted within 48 hours of the dinner.

Required Texts/Supplies:

- The Business Planning Guide, Ninth Edition, David H. Bangs, Jr. Upstart Publishing Company, Inc. **ISBN:** 9780793154098
- Three Harvard Business School/Ivey Business School cases
- Additional readings provided by instructor

Classroom Expectations:

- No gum or food. Any food brought in must be left outside the class door. Coffee/water
- No phone use during lecture.
- Be on time to class (you are considered tardy if you are not in your seat when the class starts).
- Be attentive in class. You need to ask questions from speakers.
- If you miss class, it is your responsibility to make up work on your own time.
- This class relies heavily on participation both individually and in groups. You are expected to be actively involved in the learning process!

Assignments, Quizzes, Exams, and Projects:

There are no quizzes or exams in this course. The following are the key components that students will be graded on:

Business Plan (50% of final grade):

1. White Paper – Define the business plan idea
2. Mid-Term Business Plan Report
3. Final Business Plan Report
4. Final Business Plan Presentation
5. Peer Evaluation

Case Write-Ups (10% each = 30% of final grade)**Participation (10% of final grade)****Speaker Dining Series (10% of final grade)****Business Plan (50%)**

Students will form teams of 3-4 members during the first week of the semester. Anyone who does not have a team will be assigned to a team by the instructor. The business plan project consists of a white paper, a mid-term report, a final business plan report, a final business plan presentation and a peer evaluation. The whitepaper will serve as a proposal for the team's business idea. The idea must be technical in nature, as this course is designed for engineers. The business plan itself will consist of four main sections:

Section One: The Business

Section Two: Financial Data

Section Three: The Financing Proposal

Section Four: Supporting Documents

Students will follow the guidelines for each of these sections using the required text, ***The Business Planning Guide***, Ninth Edition, by David H. Bangs. The midterm business plan report will essentially be a draft of the final business plan report and must include a draft of all four sections noted above. More details regarding the business plan project will be provided in class.

Case Write-ups (30%)

Students will be responsible for submitting a one-two page write-up for each of the three cases we will be discussing in class. The write-up is an individual assignment and should include a summary of the case, identify the key issues in the case and provide a recommendation(s). Students must also come prepared to discuss the case questions that will be posed by the professor. Throughout the class session, the instructor will cold-call on students to ensure that everyone comes prepared for a lively and engaging discussion of the case questions. To kick-off this discussion, the instructor will cold-call on one student to provide a brief summary of the case to the class.

Participation (10%)

Students are expected to arrive on time and stay for the duration of each class meeting. We have several guest speakers coming in, and therefore attendance is required at all sessions. Participation includes attendance, contributions to class/case discussions and posing questions to the guest speakers.

Speaker Dining Series (10%)

To give students an opportunity to meet with one or more of the speakers in a small group setting over a formal dinner, this course includes a *Speaker Dining Series*. At the beginning of the semester, students will sign up for the speaker(s) they wish to have dinner with. The dress code for the dinner is business professional, and students are expected to come prepared with 2-3 questions for the speaker. Students will be required to submit a one-page reflection on the experience of meeting and engaging with the speaker over dinner. These reflections will be due within 48 hours of the speaker's visit.

University Attendance Policy

Attendance in classes (in-person or online) is expected in all courses at Syracuse University. Students are expected to attend the first meeting of all classes for which they are registered. Students who do not attend classes starting with the first scheduled meeting may be academically withdrawn as not making progress toward degree by failure to attend. Instructors set course-specific policies for absences from scheduled class meetings in their syllabi.

It is a federal requirement that students who do not attend or cease to attend a class to be reported at the time of determination by the faculty. Faculty should use "ESPR" and "MSPR" in Orange Success to alert the Office of the Registrar and the Office of Financial Aid. A grade of NA is posted to any student for whom the Never Attended flag is raised in Orange SUccess. More information regarding Orange SUccess can be found [here](http://orangesuccess.syr.edu/getting-started-2/), at <http://orangesuccess.syr.edu/getting-started-2/>.

Students should also review the University's religious observance policy and make the required arrangements at the beginning of each semester.

Course Website

<http://blackboard.syr.edu>. Materials posted to the course website will include general announcements, the course syllabus, lecture presentations, etc.

Grading Table

Grade	Grade Points / Credit	Percentage Range
A	4.000	90 – 100
A-	3.667	88 – 89.99
B+	3.333	83 – 87.99
B	3.000	78 – 82.99
B-	2.667	73 – 77.99
C+	2.333	68 – 72.99
C	2.000	63 – 67.99
C-	1.667	58 – 62.99
D	1.000	46.5 – 57.99
F	0	Below 46.50

Other Important Information

- The University policy on classroom attendance states that “Attendance is expected in all courses at Syracuse University.” It is essential that you attend all lectures and recitations.
- New material will be presented during lecture and will be followed by example problems.
- A few lectures and a few recitation sections will be used to review for exams.

Syracuse University Policies: Syracuse University has a variety of other policies designed to guarantee that students live and study in a community respectful of their needs *and those of fellow students*. Some of the most important of these concern:

Diversity and Disability (ensuring that students are aware of their rights *and responsibilities* in a diverse, inclusive, accessible, bias-free campus community) can be found [here](https://www.syracuse.edu/life/accessibilitydiversity/), at: <https://www.syracuse.edu/life/accessibilitydiversity/>.

Religious Observances Notification and Policy (steps to follow to request accommodations *for the observance* of religious holidays) can be found [here](http://supolicies.syr.edu/studs/religious_observance.htm), at: http://supolicies.syr.edu/studs/religious_observance.htm

Orange SUccess (tools to access a variety of SU resources, including ways to communicate with advisors and faculty members) can be found [here](http://orangesuccess.syr.edu/getting-started-2/), at: <http://orangesuccess.syr.edu/getting-started-2/>

COVID-19:

During the COVID-19 pandemic, norms for the conduct of classes and for student classroom behavior are necessarily different than in the past.

All students are expected to affirm their commitment to keeping themselves and the campus community safe by signing the Stay Safe Pledge:

Syracuse University's Stay Safe Pledge reflects the high value that we, as a university community, place on the well-being of our community members. This pledge defines norms for behavior that will promote community health and wellbeing. Classroom expectations include the following: wearing a mask that covers the nose and mouth at all times, maintaining a distance of six feet from others, and staying away from class if you feel unwell. Students who do not follow these norms will not be allowed to continue in face-to-face classes; repeated violations will be treated as violations of the Code of Student Conduct and may result in disciplinary action.

Disability-Related Accommodations:

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to meet with me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Office of Disability Services (ODS) in this process.

If you would like to discuss disability-accommodations or register with ODS, please visit their [website](http://disabilityservices.syr.edu) at: <http://disabilityservices.syr.edu>. Please call (315) 443-4498 or email disabilityservices@syr.edu for more detailed information.

ODS is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible to begin this process.

Academic Integrity Policy:

Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in

violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice.

Diversity Policy:

It is my intension that students from all backgrounds and perspectives will be well served by this course, and that the diversity that students bring to this class will be viewed as an asset. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, socioeconomic background, family education level, ability – and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. Your suggestions are encouraged and appreciated.

Semester Schedule

**All policies, dates etc. given are subject to change by class announcements.

COURSE SYLLABUS

	Tuesday Subject Matter/Events	Thursday Subject Matter/Events	Assignments
Week 1	Session 1 (1/17): Introduction: What is entrepreneurship? Prof. Deyhim	Session 2 (1/19): Building and Leading Effective Teams Prof. Deyhim/Karel Hilversum Speaker Dining Series Sign-Up DUE	Form teams by 1/24 Buy <i>The Business Planning Guide (BPG)</i> Read BPG pp. 1-12 by 1/24
Week 2	Session 3 (1/24): Writing Your Business Plan Prof. Deyhim Teams Contract DUE	Session 4 (1/26): Accounting 101 Chris Hart	Read BPG pp. 13-40 White paper DUE Tuesday 1/31
Week 3	Session 5 (1/31): Financing for Startups: Sources of capital & exit strategies Nasir Ali Dinner 5pm White paper due	Session 6 (2/2): Dr. Greg Galvin Rheonix Dinner 5pm	Read BPG pp. 41-68 Read Case Study 1 (Tesla) Case Study 1 Write-Up DUE Thursday 2/9
Week 4	Session 7 (2/7): Mike Boldt Entrepreneurship within organizations/Moog Dinner 5pm	Session 8 (2/9): Case Study 1: Tesla Prof. Deyhim Case 1 Write-Up DUE	Read BPG pp. 69-85
Week 5	Session 9 (2/14): The Art and Science of Negotiation Duncan Duke	Session 10 (2/16): Customer Discovery Brad Treat	Read BPG pp. 86-107 Read Case Study 2 (Zarr Tech) Case Study 2 Write-Up DUE Thursday 2/23
Week 6	Session 11 (2/21): Ross Berntson Indium Dinner 5pm	Session 12 (2/23): Case Study 2: Zarr Tech Prof. Deyhim Case 2 Write-Up DUE	Read BPG pp. 108-116
Week 7	Session 13 (2/28): TEAM MEETINGS – work on Midterm Report (due Tuesday, March 7th)	Session 14 (3/2): Navigating Legal and IP Issues: Patents, trademarks, or copyrights Michael Tierney	Read BPG pp. 117-124 Midterm report DUE Tuesday, 3/7
Week 8	Session 15 (3/7): Communication/TBD Prof. Deyhim/Karel Hilversum Midterm report due	Session 16 (3/9): Market Entry Strategies: Licensing vs Direct Sales, Joint Venture Brad Treat	
SPRING BREAK (3/11 TO 3/18)			
Week 9	Session 17 (3/21): Developing Networks and Leading Effective Teams Dr. Kwame Amponsah Dinner 5pm	Session 18 (3/23): SBIR Grants Prof. Deyhim	Read Case Study 3 (Primateria) Case Study 3 Write-Up DUE Thursday 3/30
Week 10	Session 19 (3/28): Prototyping John Meier Dinner 5pm	Session 20 (3/30): Case Study 3: Primateria Prof. Deyhim Case 2 Write-Up DUE	
Week 11	Session 21 (4/4): Business Plan Q&A Prof. Deyhim	Session 22 (4/6): Forming a Company/Types of Corporations Prof. Deyhim	
Week 12	Session 23 (4/11): Failure & Entrepreneurship Bob Bellandi	Session 24 (4/13): Entrepreneurial Sales & Marketing/Smart Pricing Strategies Ed Catto	
Week 13	Session 25 (4/18): Tiffany Norwood Tribetan Dinner 5pm	Session 26 (4/20): Practice Final Presentations	Business Plan Report DUE Thursday, 4/27
Week 14	Session 27 (4/25): Blackstone Launchpad Linda Hartsock	Session 28 (4/27): Business Plan Report DUE	
Final Business Plan Presentations: Tuesday, May 09, 10:15am-12:15pm			