

ENGR 4302/5302, EE 4302: Engineering Entrepreneurship
Fall semester 2023

Instructor Information

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Office Hours: TuTh 2:00-3:00pm (Magnusson); by appointment (Devarajan)

Course Information

Section Information: ENGR 4302-001, ENGR 5302-001, ENGR 5302-002, ENGR 5302-003, EE 4302-001, EE5302-001

Time and Place of Class Meetings: This is a face-to-face course with recorded lectures available on Canvas. Classroom is 105 NH.

Description of Course Content:

Topics include special problems of newly formed firms, planning, start-up business considerations, business strategy, management basics, and business plan design. Students will engage in business and entrepreneurship training or discussion, become aware of basic business operations, and learn about inventions, intellectual property, and the patenting process. Other topics include assessment of possible markets, venture feasibility, teambuilding, and leadership. Opportunities in university environments will be discussed including incubation centers and patent licensing. We address legal issues, SBIR proposal design, SBIR funding from NSF, NIH, and others, the review process, reporting, local high-tech business accelerators, startup company valuation, venture plans, and venture capital. Invited experts on selected topics will give special lectures. Opportunity for seed funding of business ideas is available for student teams. For that, an excellent startup business idea is key.

Key topics:

1. Initial considerations
 - a. Planning
 - b. Seed financing
 - c. Start-up business considerations
 - d. Common business models
 - e. Business plan design
 - f. Management basics
 - g. Exit strategy
2. Inventions
 - a. Intellectual property strategy
 - b. Patent licensing
 - c. Patent process
 - d. Construction of claims
3. Market assessment
 - a. Feasibility of product/services
 - b. Customers
 - c. Distribution channels
 - d. Competition

4. Business planning
 - a. Structure of business plan
 - b. Chief ingredients
 - c. Time evolution
5. Business and entrepreneurship training
 - a. Networking
 - b. Need for experienced mentors
6. Business operations
 - a. Hiring the right team is critical
 - b. Strategic partnerships (manufacturing, distribution and sales)
 - c. Marketing and sales strategy
 - d. Building customer relationships
7. University opportunities
 - a. Incubation centers
 - b. Patent licensing
 - c. Collaboration/support/initial facilities and space
 - d. Seed financing
8. Legal issues
 - a. Infringement
 - b. Patent reexamination/validation
 - c. Partner disputes
9. Funding
 - a. Founders, friends and family
 - b. SBIR proposals
 - c. Angel investors and investor groups
 - d. Placing a value on your company
 - e. Venture plans
 - f. Venture capital

Student Learning Outcomes:

Understanding of entrepreneurship and its personal/societal value
 Knowledge of business startup methods and corporate structure
 Knowledge of inventions, patenting, and licensing
 Ability to write proposals and presentations
 Ability to formulate a convincing business plan
 Ability to develop a convincing business pitch

Requirements:

Prerequisites: Junior standing

Regular on-line class attendance and participation are strongly encouraged because of the special needs of this class for creating a convincing business plan, learning to network, etc.

Required Textbooks and Other Course Materials:

We will use Canvas, an online platform, for all course-related materials and Q&A discussions.

Eric Koester, "What Every Engineer Should Know About Starting a High-Tech Business Venture," CRC Press: Boca Raton, FL, 2009.

Tim Berry, "Planning for Success: Hurdle – The Book on Business Planning," Sixth Edition, Palo Alto Software: Eugene, OR, 2006. (Free download at <http://www.bplans.co.uk/hou/HurdleBook.pdf>)

Additional reading material or websites will be suggested and assigned.

Descriptions of major assignments and examinations:

Grading:	Individual projects/short reports/case studies	40%
	Business plan for a new venture	40%
	Final pitch presentation	20%

Project due dates: TBD

Technology Requirements

The course lecture materials and assignments will be uploaded to the Canvas platform.

Grading Information

Grading Policy:

Final grade is determined in accordance with scores on assignments as summarized above. The standard academic scale of A, B, C, D, F will be used.

Expectations for Out-of-Class Study

Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Course Schedule

Tentative Course Schedule

Period/topic or activity

1. Preface, motivation, introductions, syllabus, Q/A.
2. Introduction to Engineering Entrepreneurship; The startup life
3. Your engineering business concept
4. The startup road ahead
5. Guest lecture-by a practicing entrepreneur/investor/patent attorney
6. Forming the founding team
7. Working with attorneys
8. Leaving your job
9. Forming your business—various types
10. Business planning
11. Business planning
12. IP protection and patents
13. IP protection and patents
14. Raising money—Angels and VCs/SBIR
15. Guest lecture-by a practicing entrepreneur/investor/patent attorney
16. Guest lecture-by a practicing entrepreneur/investor/patent attorney
17. Due diligence by potential investors—methods
18. Methods for valuating startup companies
19. Guest lecture-by a practicing entrepreneur/investor/patent attorney
20. Business ethics
21. Guest lecture-by a practicing entrepreneur
22. Magnusson companies and their history—lessons learned
23. Open discussion/invited expert lecture
24. Elementary startup accounting
25. Final project presentations
26. Final project presentations
27. Final project presentations
28. Pitch day---TBD

Maverick Business Pitch ---a great opportunity!

Round One - Students will develop, organize and present a business plan to a panel of judges with the aid of PowerPoint decks and other visual aids. Teams will have 12 minutes to pitch their business idea followed by a question and answer period.

Round Two on Pitch Day– Students will develop, organize and pitch their business idea to a panel of judges with the aid of PowerPoint decks and other visual aids. Individuals and/or team will have 3 minutes to pitch their business idea followed by up to 3 minutes of questioning by the judges. The 2nd round assignment will be part of a competitive pitch event (Maverick Business Pitch) and students will be vying for over \$100,000 in cash awards.

We reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Robert Magnusson/Venkat Devarajan

Institution Information

UTA students are encouraged to review the below institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the [Institutional Information](https://resources.uta.edu/provost/course-related-info/institutional-policies.php) page (<https://resources.uta.edu/provost/course-related-info/institutional-policies.php>) which includes the following policies among others:

- Drop Policy
- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Additional Information

Face Covering Policy

Face coverings are not mandatory. However, students and instructional staff are welcome to wear face coverings while they are on campus or in the classroom.

Attendance

At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructors of this course, we believe attendance is a critical indicator in student success. During the synchronous Canvas on-line lectures, we see who is present and will occasionally make a note of that. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients.

We will take attendance sporadically as needed.

Emergency Exit Procedures

Should we experience an emergency event that requires evacuation of the building, students should exit the room and move toward the nearest exit, which is located immediately to your left as you exit Room 112 in Nedderman Hall. When exiting the building during an emergency, do not take an elevator but use the stairwells instead. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: Academic Success Center. The IDEAS Center (<https://www.uta.edu/ideas/>) (2nd Floor of Central Library) offers FREE tutoring and mentoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817) 272-6593.

The University is committed to Diversity, Equity, Inclusion (DEI) principles and initiatives to ensure success for all students, staff, and faculty, regardless of identity or cultural background. <https://www.uta.edu/about/diversity-equity-inclusion> and highlighted by the following statement in the University's vision statement¹ "The diverse student body shares a wide range of cultural values and the University community fosters unity of purpose and cultivates mutual respect." Following the University, the College of Engineering has developed its own DEI initiatives². As a faculty member and instructor in the College of Engineering, during this course I intend to follow and implement norms in our student faculty interactions that uphold University and College of Engineering DEI principles and initiatives. University values are affirmed by the DEI stance of professional engineering organizations such as, the National Society of Black Engineers, National Society of Hispanic Engineers, Society of Women Engineers, Engineering Accreditation Commission (ABET) ³, and the National Society of Professional Engineers:⁴ "Engineers shall be guided in all their relations by the highest standards of honesty and integrity. Engineers shall treat all persons with dignity, respect, fairness and without discrimination." If you experience a violation of DEI principles in our course, feel free to contact me, or the College of Engineering Student Ombud's-Team⁵, or the Chair of your Department, or the College Associate Dean of Graduate Affairs if you are a graduate student.

1 <https://www.uta.edu/strategicplan/about/mission.php>

2 <https://www.uta.edu/academics/schools-colleges/engineering/about/diversity-equity-inclusion>

3 [https://www.abet.org/about-abet/diversity-equity-and-](https://www.abet.org/about-abet/diversity-equity-and-inclusion)

4inclusion/<https://www.nspe.org/resources/ethics/code-ethics>

5 <https://www.uta.edu/academics/schools-colleges/engineering/students/ombuds-team>

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381