

COMPSCI 420 Software Entrepreneurship (3 credits)

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Classes: MoWe 4:00PM - 5:15PM;

Discussion: Fr 9:05AM - 9:55AM;

Office Hours: By Appointment

What you'll learn

Course Description:

COMPSCI 420 Software Entrepreneurship is geared towards students interested in developing software that moves from early stage proof-of-concept ideas towards marketable products with societal benefit. The course leverages the expertise of the Entrepreneurs in Residence (EIR) of the Ventures @ CICS initiative at CICS. The course is grounded in Challenge Based Learning (CBL), an active, student-directed instructional framework that was developed by Apple Inc. and educators.

Prerequisite: COMPSCI 326 Web Programming or 320 Software Engineering - open to COMPSCI and Informatics majors. 3 credits.

Note: This course qualifies as a "Capstone course" for the all-campus Undergraduate Certificate in Public Interest Technology, assuming the student work produced in the class is deemed suitable by the instructor. Make sure you discuss that you want to use this course for this purpose with the instructor at the beginning of the course. For more information on that Certificate, see <https://groups.cs.umass.edu/pit/undergraduate-pit-certificate/>. If you have questions about the PIT Certificate, email Professor Charlie Schweik, the PIT Certificate Program Director: cschweik@umass.edu.

Course Objectives:

The goal of COMPSCI 420 Software Entrepreneurship is to provide real world experiences for you by simulating a startup development process. Using the CBL framework, you participate in Scrum cycles that focus on activities: Engage-Investigate-Act-Reflect. Professional skills are gained through working on real-world problems and thinking critically of Public Interest Technology (PIT) for the development and realization of socially responsible computing solutions for the common good.

The main course objectives are to:

- introduce a Challenge Based Learning (CBL) framework that combines Lean Startup and Customer Development concepts in a project-based course.
- integrate PIT and content for the development, funding, and implementation of solutions to social, cultural, or environmental issues.
- promote ethical and socially responsible use of PIT.

- promote critical thinking through discussions on personal, ethical, and professional social responsibility.

Learning Outcomes:

At the end of the course, working in groups, you should be able to:

- define a challenge or broad concept to explore after customer and market analysis.
- investigate resources to develop a solution and write a business plan (including business costs, funding, and revenue projections).
- implement and verify a minimum viable product (MVP) that addresses the challenge.
- demonstrate evidence of critical thinking on personal, ethical, and professional social responsibility.
- demonstrate collaboration, communication, reflection, and learning-aware learning skills.

Course Topics (the instructor reserves the right to modify the list):

Customer and market analysis:

1. Identification of a Big Idea: A broad concept that can be explored in multiple ways, is engaging, and has importance to students and the larger community.
2. Defining Essential Question: Process of personalizing and pinpointing the important concepts within the big idea.

Implement and verify an MVP

1. Solution: A concrete, actionable and clearly articulated idea to solve the challenge.
2. Implementation: Solutions are put into action with an authentic audience.
3. Evaluation: Learners evaluate the ethical use of PIT through the results of the implementation and refine their solution.

Writing a business plan:

1. Creating Challenge: A call to action designed by professors and students to create a business plan that can result in concrete action.
2. Guiding Questions: A series of questions developed by the learning community, identifying and representing the knowledge and skills needed in order to develop a successful solution.
3. Guiding Activities and Resources: The activities and resources that learners identify, participate in and utilize to answer the guiding questions.
4. Analysis: A process for exploring the answers to the guiding questions and identifying overarching themes and concepts.

Course Structure:

The course is flipped with students completing assignments and online discussions ahead of each class. Class time is used for sprint activities. Sprint lengths are set to 3-4 weeks to enable project teams to work on the deliverables. CICS Entrepreneurs in Residence (<https://www.cics.umass.edu/ventures>) are invited to participate in class activities.

This is a project-based course with group work in teams. There are no quizzes or exams, instead there is a semester-long group project with milestone deliverables. A textbook is not required. Lectures (with group activities) and discussion classes (group work with feedback

from TA) are held during class times. Additionally, there are guest talks by entrepreneurs with live Q&A. It is not possible to attend another course with overlapping class times.

We will use Microsoft Teams and Canvas for communication and access to course resources. You may expect a quick response time during the week. Lecture slides (pdf) will be made available on Canvas. There are no required textbooks and all relevant resources are posted on Canvas. Office hours will be provided by appointment. You are strongly recommended to download the Microsoft Teams app on your mobile phone and laptop.

Weekly Schedule

You should schedule approximately 5-6 hours per week outside class for group project work. Please check Canvas for the detailed weekly schedule, the specific assignment details and rubrics

Week 1-2 - Sprint 0	Orientation and Group formation
Week 3 to 5 - Sprint 1	Customer and market analysis
Week 6 to 8 - Sprint 2	Minimum Viable Product
Week 9 to 11 - Sprint 3	Minimum Viable Business Plan
Week 12 to 14 - Sprint 4	Pitching to investors

How you'll know that you are learning

Course Deliverables:

Students work in teams on a number of deliverables and a final project presentation.

1. **Market Analysis:** Presentation; Lean canvas.
2. **Application:** Minimum Viable Product (MVP) with scrum artifacts, test data, and pivot plans; Presentation.
3. **Business Plan:** Minimum Viable Business Plan (MVBP) including business costs, funding, and revenue projections; Presentation.
4. **Pitch deck:** Final project presentation.

Course Grading:

Grades will be assigned for:

- attendance and participation in class discussions and submission of group reports and worksheets based on discussion activities: 10%
- completing and submitting reflections on guest talks: 10%
- creating a minimum viable product and business plan, making presentations, and completing peer evaluations and sprint retrospectives as part of a group project (see the project description document on Canvas for the grade breakdown): 80%

The final numerical cutoff for final course letter grade assignment will be made after all grading is completed. Here is the approximate grade thresholds that usually apply: A (93-100), A-

(90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (60-66), F (0-59).

How learning is accessible to you

Accommodation Statement

Any student who requires an accommodation due to a disability is directed to contact the UMASS Disability Services: <http://www.umass.edu/disability/> to obtain the appropriate accommodation forms. If you have a documented disability that requires an accommodation, please notify me within the first week of the semester. My goal is to provide every student with a high-quality learning experience. Please contact me if you have any questions or concerns about disabilities or any issue that may impact the quality of your learning.

Getting Excused for Attendance

This is a discussion and activity-based class with four group presentations. While participation, in addition to attendance, is an expectation of students enrolled in the course, I do understand that you may not be able to attend a particular class. Medical conditions, religious or funerary events, university-related events (conference visit, athletic event, field trip, or performance), or extenuating non-academic reasons (military obligation, family illness, jury duty, automobile collision) will be accommodated with written documentation. You can ask for an extension for any assignment that was due during your absence. You can miss attending one class with no questions asked.

Getting Extensions for Assignments

It is possible that you may need an extension for a submission. Please fill in the form on Canvas before the assignment is due. Medical conditions, religious or funerary events, university-related events (conference visit, athletic event, field trip, or performance), or extenuating non-academic reasons (military obligation, family illness, jury duty, automobile collision) that need assignment due date extension will be accommodated with written documentation.

Notes:

- **Group Presentations:** The 4 presentations are equivalent to exams. Attendance is mandatory, unless you have been excused (see paragraph above).
- **Scheduling other exams:** If an exam in another course is scheduled at the same time as the regular class, or, if the final group presentation (in exam week) clashes with another exam, then you must request a makeup exam from the other instructor.
- **Grading for group presentations:** If a group member is absent for a presentation, the group submits a report documenting the work done by each group member. This report must be jointly submitted in the Teams channel.

Course Incompletes

If you are unable to complete the course requirements within the allotted time because of severe medical or personal problems, you may request a grade of Incomplete. Note that incomplete grades are warranted only if you are passing the course at the time of the request and if the course requirements can be completed by the end of the following semester.

Academic Honesty: Why it matters what you do

In general, collaborative work is encouraged. For individual assignments, please refer to UMASS Academic Honesty Policy and Procedures for guidelines on what constitutes academic dishonesty and the sanctions that may be imposed on any student who has committed an act of academic dishonesty: <http://www.umass.edu/honesty/>

Note that CICS explicitly forbids any redistribution (including publicly available posting on an internet site) of any course materials (including student solutions to course assignments, projects, exams, etc.) without the express written consent of the instructor of the course from which the materials come. Violations of this policy will be deemed instances of “facilitating dishonesty” (since a student making use of such materials would be guilty of plagiarism) and therefore may result in charges under the Academic Honesty Policy.

The use of an AI tool such as ChatGPT is explicitly forbidden for creating your team business plan.

Inclusive Learning: Why you are welcome

Your success in this class is important to me. We all learn differently and bring different strengths and needs to the class. If there are aspects of the course that prevent you from learning or make you feel excluded, please let me know as soon as possible. Together we’ll develop strategies to meet both your needs and the requirements of the course. There are also a range of resources on campus, including:

- Writing Center - <http://www.umass.edu/writingcenter>
- Learning Resource Center - <http://www.umass.edu/lrc>
- Center for Counseling and Psychological Health (CCPH)
-<http://www.umass.edu/counseling>
- English as a Second Language (ESL) Program - <http://www.umass.edu/esl>

Title IX

If you have been the victim of sexual violence, gender discrimination, or sexual harassment, the university can provide you with a variety of support resources and accommodations. UMass is committed to providing these resources with minimal impact and costs to survivors on a case-by-case basis. Resources are available to survivors with or without them filing a complaint. No upfront costs are charged to any currently enrolled students for University Health Services or the Center for Counseling and Psychological Health, and no fees exist for services in the Dean of

Students Office, the Center for Women and Community, Student Legal Services, or by live-in residential staff.

Classroom conduct: Why you matter

In this course, each voice in the classroom is valued. We honor UMass's commitment to embrace diverse people, ideas, and perspectives to create a vibrant learning and working environment. You are welcome regardless of age, background, citizenship, disability, sex, education, ethnicity, family status, gender, gender identity, geographical origin, language, military experience, political views, race, religion, sexual orientation, socioeconomic status, and work experience. Please let us know what name and pronouns we should use for you if they are not on the roster. Remember: A student's chosen name and pronouns are to be respected at all times in the classroom.

This course requires students to work in groups and to present material in class. As such, it is expected that all students will observe a "workplace" level of social decorum at all times when interacting with peers. You are expected to treat your work in this class in a professional manner and to treat all individuals with dignity and respect. When asked to provide constructive feedback, do so in ways that are specific to the task at hand and focused on the work itself. To support an inclusive environment, respect each other's viewpoints and maintain civility in the classroom. Please consult the UMass Guidelines for Classroom Civility and Respect: http://www.umass.edu/dean_students/codeofconduct/classroomcivility.