

Innovation in Information Systems (67-475) Course Description and Syllabus

COURSE INFORMATION

Term: Fall 2018 (12 units)
Meetings: Wednesdays, 3:00 - 4:20 PM
Locations: WEH 5421, BH 237B, and SH 208 (as announced in class)

INSTRUCTORS

Innovation in Information Systems is co-taught by three faculty members: Sara Moussawi, Jeria Quesenberry, and Raja Sooriamurthi. Consultants from Deloitte will also serve as industry mentors to provide guidance and feedback throughout the semester.

Sara Moussawi, PhD
Hamburg Hall 3034
smoussaw@andrew.cmu.edu
Office Hours:
Tue and Thur 3:00 PM - 4:30 PM

Jeria Quesenberry, PhD
Hamburg Hall 3030
jeriaq@andrew.cmu.edu
Office Hours:
Wed 1:30 PM - 3:00 PM

Raja Sooriamurthi, PhD
Hamburg Hall 3017
raja@cmu.edu
Office Hours:
Tue and Thur 12:15 PM - 1:15 PM

COURSE DESCRIPTION

What is innovation? Is it a flash of genius? Is it an idea adapted from an unconventional place? Is it about improving a process – or improving a technology? Is it about strategy – or about stepping away from overcrowded industries? Innovation requires knowledge, ingenuity, and focus. While innovation almost always needs a spark of inspiration, it is greatly assisted by a systematic and purposeful process.

This course is a senior level team-based capstone experience that aims to capture the challenge and excitement of *creating a solution that adds value* – whether a process, product or service – and to provide students with an opportunity to experience the innovation process. In this course, we will focus on exploring various types of innovation (e.g. design thinking, blue ocean, business innovation, etc.). This course will also help you develop a new set of tools aimed at framing challenges, addressing the right problems, and thinking outside of the box to solve present and future business challenges. The purpose of this course is not merely to create a new app but to *identify a real problem or business need, and to apply structured tools in order to solve the problem*. To substantiate their thinking, teams will talk to stakeholders and users; observe people in their native environments; consider real physical, technical, and social constraints; and understand how to identify and resolve users' needs and pain points.

The semester is structured into two cycles. Cycle 1 is an immersive short cycle (5 weeks) intended to introduce students to the various innovation types and tools, and provide practice in the tools of innovation through individual and group assignments.

In Cycle 2, students are regrouped and tasked with selecting a real world challenge to apply the tools learned in Cycle 1 over a period of 10 weeks. The selection of the team projects will require students to define the

problem, the stakeholders, their actual needs, and to clearly state the opportunity for improvement. Project teams will focus on developing a minimum viable product (MVP) that implements their ideas. These can include but are not limited to: systems, frameworks, apps, or iterated prototypes for highly complex solutions. The end result will either be a working implementation that embodies this improvement, or for more complex challenges, a functioning prototype that demonstrates that the improvement is possible.

LEARNING OBJECTIVES

Upon successful completion of the course, each student should be able to show tangible evidence of growth and maturity in the following areas:

1. Describe the building blocks of innovation including the drivers, sources, methods, types, and benefits.
2. Create innovative solutions (products or systems) to address real world situations that meet user needs.
 - a. Apply disciplined techniques from the innovator's 'toolbox' or methods for bringing an original idea from fuzzy concept, to prototype design, to feasibility testing, to the reality of potential launch.
 - b. Demonstrate mastery of, initiative, or ability to learn, new or unfamiliar technologies, development environments and tools, as needed.
 - c. Explore user centered design principles to ensure a rich and satisfactory user experience.
 - d. Communicate the project, the process and/or the product through documentation, discussions and presentations.
 - e. Demonstrate and quantify how solutions positively impacts user objectives.
3. Apply best practices in agile project management to make plans, organize projects, align resources, monitor obstacles to success and design strategies to overcome them, and achieve desired outcomes.
4. Identify and involve users, stakeholders, industry mentors and faculty advisors in the innovation process and make informed decisions on suggestions and feedback.
5. Demonstrate the ability to work effectively as a productive team member.

COURSE LOGISTICS

In this course, you will work on two small teams to identify, design and build innovative information systems or applications following a disciplined approach. These solutions should address a 'real world' problem or opportunity in some innovative way and meet stakeholder requirements, capabilities and constraints.

To help you achieve the course objectives, you will work with different teams on two project cycles. Each cycle will be comprised of new team members and new sets of deliverables. Due to the short timeframe involved, teams are encouraged to iterate early and frequently on their projects. Teams are also expected to respond to feedback, complete weekly sprint reports and present progress at various studio sessions held during course meeting hours.

The best learning experiences occur when students participate actively. Teams will attend various lecture sessions and 80-minute 'studio' sessions throughout the semester. Lecture sessions will provide students with the background and tools they need to substantiate their projects. Studio sessions will feature student projects, provide valuable feedback and allow students to work out difficult business, design and technical issues together with their peers and instructors.

On-going advice and assistance will be available from the faculty and industry mentors. Throughout the term, teams are encouraged and expected to seek advice and feedback from a variety of third-party sources. As team ideas mature, student teams may be connected with local entrepreneurs, investors, business professionals and others within the CMU and Pittsburgh innovation and entrepreneurship eco-systems.

At the end of the semester, student teams will present their Cycle 2 final projects to a panel of referees for evaluation. Depending on the team's innovation, a final project may consist of some combination of a business plan, product prototype, working system, or other tangible deliverables. Evaluation will heavily depend on how well the team has followed the innovator's paradigm: Did they concentrate on the basics? Did they develop sensible concepts and test them? Did they pay attention to stakeholder needs and feedback? Did they add value? Did they roll out an MVP quickly? Is the project, product or solution ultimately useful?, etc.

Course Meetings

A combination of lectures, student presentations, team-to-team presentations and traditional advising will be implemented throughout the semester. Details, instructions for preparation and schedule will be announced in advance.

Students are expected to attend every weekly meeting, arriving on time and staying until the end. Students are expected to act professionally when others are presenting or speaking by respectfully listening and participating in discussions. All students will be expected to avoid side conversations, leaving the room, using phones, tablets, computers, or working on homework, etc. during class time. Unless needed for your presentation or demonstration or explicitly stated otherwise all such devices should be closed, off, in airplane mode, silenced or out of sight when in class.

Course Participation

We expect all class members to be prepared to actively participate in weekly course meetings. Everyone will be expected to participate in discussions and to work constructively with classmates during the studio times.

Class participation will contribute to each student's final grade. These are elements we will consider in evaluating your class participation:

1. Are you attentive and a good listener?
2. Do you actively participate and ask constructive questions of other students that help to clarify a team's thinking or increase understanding?
3. Are you a helpful peer in providing advice, feedback and constructive criticism?
4. Do you promote an environment where everyone feels free to express their ideas?
5. Do you contribute to the learning environment by sharing your thoughts and experiences in a non-judgmental and non-confrontational way?
6. Are you willing to share ideas and information in a collegial fashion?

SCHEDULE

The weekly schedule will give you a general framework for how the work for this course will be distributed throughout the semester. The schedule also identifies topics covered for each, expectations of team progress and deliverable due dates.

While we make every effort to avoid changing the class outline and schedule, changes are sometimes required. The most current version of the schedule is available online: <https://goo.gl/wBMCFS>

(Your team may propose an alternative schedule or alternate deliverables if your project does not fit the standard schedule. This should be made clear in your required documentation for the cycle and must be approved by faculty instructors.)

COURSE ASSESSMENT

The course will include individual and team assignments. For team assignments, each team will earn a single grade for its project based on demonstration of progress (including required documentation, in-class presentations, sprint reports), required deliverables (project proposals, assignments and project implementations) and performance during the final cycle review presentations. Final project grades will be adjusted for each individual, as needed, by peer evaluations, attendance, time commitment, assessment of individual contributions and other factors. Weights for course assessment activities are described below:

Cycle 1 (25%):

- Team Project Assignments #1-4 (16%)
- Team Lightning Presentation (6%)
- Individual Homework Assignments (2%)
- Individual Reflection (1%)

Cycle 2 (75%):

- Team Project Assignments #1-9 (27%)
- Sprint Reports (7%)
- Project Proposal (5%)
- Final Deliverables and Project Review (30%)
- Individual Homework Assignments (5%)
- Individual Reflection (1%)

Individual Homework and Team Project Assignments: Throughout the semester various classes will be reserved for workshops on the discipline of innovation methodology. Successful innovation requires applying tools designed to identify unmet market needs, defining solution scope, quantifying differentiation to competitive solutions, and constructing value propositions and business models. Examples of tools include ethnography, affinitization diagrams, blue ocean strategy, business value canvases, value proposition summaries and others. Teams will incorporate these methods throughout their projects and will submit output from the various tools for review by faculty, project mentors and peer teams, and include revised output from the tools in their final Cycle 1 and Cycle 2 deliverables.

Sprint Reports: Weekly sprint reports (one per team) are due weekly every Wednesday at 3:00 PM beginning **Wednesday, October 3**. Sprint reports are to be submitted to the Canvas assignment box. Weekly sprint reports will be graded and weighted as noted, and will be used for feedback to the team, and will count toward the team's final grade, as noted. A template for sprint reports is provided on Canvas.

Final Deliverables and Project Reviews: Cycles 1 and 2 will conclude with the delivery of various project materials and a final presentation. Projects will be graded relative to the learning objectives for the course: novelty or innovation in the project idea; attentiveness to process requirements, feedback and input; effective use of tools, techniques and methodologies to reach rapid development of an MVP; bringing project to a state of completion where it's intent is clear to reviewers unfamiliar with the team or the project.

- Final deliverables for Cycle 1 include a copy of your presentation and any supporting documentation or evidence that the team includes to substantiate process, decision making, or conclusions. All final deliverables are due **Wednesday, September 26, 2018** at 3:00 PM to Canvas and presentations for a grade will be given during class time.
- Final deliverables for Cycle 2 include a copy of your presentation and any supporting documentation or evidence that the team includes to substantiate process, decision making, or conclusions, plus, four (or more) screenshots that capture the essence of the project (avoid nonessentials like logon, logoff, and nonessential behind-the-scenes administrative functions), a brief report on user testing and acceptance, pointer or URL link to code repository, and a pointer to deployment of the 'finished' project (in whatever state it may be - tested, untested, polished, unpolished, complete, incomplete, working, non-working, deployed, etc.). All final deliverables are due during finals week on **Friday, December 14, 2018** (time to be announced) to Canvas. Your team will also present your Cycle 2 project to a panel of faculty reviewers and industry mentors for grading. Final project assessment will be determined by **both** the faculty reviewers and the Deloitte industry mentors.

Individual Reflections: Each student will submit a statement of individual reflection on the team and project experience for Cycles 1 and 2. The header of the reflection should have your name, your team members' names and the project title. The individual reflection should first briefly describe the core proposition of the project and list at least three of the project's key features. Typical reflections could include summary of your contributions, discussion of areas that worked well, areas that could be improved, lessons learned that might have improved teamwork or the project, lessons learned that might be applied to future teams or projects. Please indicate the most valuable source(s) of feedback and advice for your project (for example in-class presentations, peer team reviews, speed-dating sessions, advice from instructors or classmates, user testing, interaction with external stakeholders, or other sources).

ADDITIONAL ASSESSMENT CONSIDERATIONS

Final course grades are determined by the course instructors, as a committee. Each team's final grade is the base grade for each student. Individual grades may be adjusted for each individual, by peer evaluations, attendance and participation, time commitment, assessment of individual contributions and initiative relative to other students. The faculty will lower the final course grade for any individual demonstrating a pattern of underperformance, non - performance, absenteeism, unreliability, or low quality work during the term, regardless of ultimate team grade or peer evaluations.

Attendance: Regular attendance at all weekly team meetings and class sessions is required. Your final course grade will be lowered by 1/3 of a letter grade for each unexcused or undocumented absence. Arriving significantly late (more than 5 minutes) or after your team's presentation has begun will count as an absence. Be advised that a poor attendance record will not go unnoticed by your fellow team members, and will likely be reflected in your peer evaluations. Documentation of a personal emergency or other unavoidable contingency will be required to avoid attendance penalties. If you have a legitimate excuse such as an interview trip, alert the faculty a day or more in advance. If you are feeling ill, then contact the faculty well

before the class meeting time. After-the-fact excuses are not good professional communication and indicate a lack of commitment and unreliability.

Deadlines: In both the professional and academic world, you must meet deadlines. All assignments must be submitted, on time, to Canvas to receive credit. If announced, some assignments may be handed in after the deadline with a penalty of 15% for each 24 hour incremental delay in submission.

Teamwork: We expect every team member to act respectfully and professionally to team members, class members, project stakeholders and the faculty throughout the semester. Students who are consistently disrespectful, uncooperative, absent or non-participating may be dismissed from their teams upon recommendation of the team and agreement by the faculty. Under such circumstances (which we expect to occur only rarely) a dismissed student must make up the units or complete an assigned project on his or her own.

Team Roles: Each team must have a project manager who will accept responsibility to coordinate, plan, and track the team's work. The Project Manager acts to keep the team focused and makes sure that the work gets done. Other roles may be designed and assigned by the team. We suggest naming a backup for each of the defined roles.

Team Structure: Working in a team brings with it a high level of responsibility. Each of you needs to depend on the skills, talents, and contributions of the other team members. All members of the team are expected to contribute in meaningful and significant ways to the project's technical work throughout the semester. No one or two individuals should, or should be expected to shoulder the bulk of the technical responsibilities for the project. (This is a serious risk factor, and simply unfair to those individuals.) Individuals should expect that their course grade will be lowered for underperformance relative to their fair share of the team's technical work.

Peer Evaluations: Peer evaluations of your team members are done periodically during the term and the end of the final project cycle. The faculty will use these peer evaluations to assess each individual's relative contributions to their projects and their classmates. Your individual grade may be adjusted upward or downward as a result of the peer evaluations. **Be aware that peer evaluations can increase your final individual grade by up to one letter grade - or reduce it without limit.**

Summaries of peer evaluations will be reported to students during the semester; written comments will be held confidential. The final round of peer evaluations at term's end will be confidential and only available to the faculty. Grade penalties will apply for those individuals who do not complete peer evaluations in a timely way when they are due.

Deloitte Industry Mentors: Beginning with Cycle 2, each project team will be assigned a Deloitte mentor who will provide advice and feedback on the team's progress and deliverables. The team is expected to meet weekly on Fridays for approximately 30 minutes with their mentor. The team should provide a written agenda in advance of the meeting and summarize the discussion in their next Sprint report. Attendance is mandatory. Excused absences (e.g., medical emergencies, conflicting job interviews) must be approved by the faculty and mentor in advance of the meeting. Team and mentor interactions will occur in Slack unless otherwise negotiated. Mentors will provide weekly assessment to the faculty which will be used in final grade adjustments as needed.

Faculty Adjustment: Every individual is responsible for doing his or her fair share of the team's work and consistently demonstrating such throughout the semester. Those who have been contributors to all aspects of the project will be recognized, as will those who have not contributed their fair share. If you cannot demonstrate or present your contributions, there will be little basis for justifying a high grade. Faculty may require proof of performance or demonstration of work products from any student during the semester.

Time Commitment: Innovation in Information Systems is a 12 unit course. **This means that, on average, students are expected to commit 12 hours of their time to this course each week.** Students who, for whatever reasons, are unable or unwilling to make this commitment or who consistently fall below the average, either weekly or in cumulative hours throughout the term, should expect reduced grades in the course. **Claiming to be too busy with other coursework, job interviews, travel, extra-curricular activity or other causes will not be considered as valid justification for failing to commit the time.** Your anticipated absence does not excuse you from completing your commitment to the class, your team or your project. Your deliverables will be due whether you are present or absent on any particular day or days.

Very simply, there is no substitute for time devoted to the projects during the term. We know, from experience, that time lost is seldom made up in subsequent weeks. Insisting that the project must be scaled down during the final weeks of the cycle because the team or individuals have not committed the expected time is poor practice and will affect project evaluation.

ADDITIONAL PROJECT CONSIDERATIONS

History has shown that teams occasionally select project concepts that receive low marks for innovation or creativity at the final project presentations. Therefore, the faculty requires that project concepts that fall into the falling areas (or related areas) be avoided: systems requiring CMU SIO/S3 access, campus calendars, localized online marketplaces, projects that violate corporate privacy or data policies (e.g., unethically scraping user data, etc.), sharing information with friends (e.g. where to go for dinner, bill splitting, etc.). When vetting project concepts we ask students “is this something you would be excited to describe to corporate recruiter”? The project concept should be innovative and inspire excitement and creativity!

SUGGESTED READINGS

Student may wish supplement their required reading lists (which are introduced as a part of individual homework and team assignments). The following is a list of suggested sources:

Business Model Generation by Osterwalder and Pigneur

<https://strategyzer.com/books/business-model-generation>

The Lean Startup by Eric Ries

<http://theleanstartup.com/principles>

Rework! by the 37 Signals team

<https://basecamp.com/books/rework>

The Startup Owner's Manual by Steve Blank

<https://steveblank.com/startup-owners-manual-1in/>

Value Proposition Design by Osterwalder and Pigneur

<https://strategyzer.com/books/value-proposition-design>

UNIVERSITY AND COURSE POLICIES

Academic Integrity: It is the ethical responsibility of students to identify the conceptual sources of work submitted. Failure to do so is dishonest and is the basis for a charge of cheating or plagiarism, which is subject to disciplinary action. More information at: www.cmu.edu/policies/documents/Cheating.html.

An Invitation to Students with Learning Disabilities: CMU is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations in this course must contact the professor at the beginning of the semester to discuss needed accommodations. Students who need accommodations must be registered with Disability Resources at 102 Whitfield Hall 412.268.2013, or with Larry Powell, Equal Opportunity Services Manager, at: lpowell@andrew.cmu.edu.

Take Care of Yourself: Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit their website at <http://www.cmu.edu/counseling/>. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help.

If you or someone you know is feeling suicidal or in danger of self-harm, call someone immediately, day or night: CaPS: 412-268-2922 or Re:solve Crisis Network: 888-796-8226. If the situation is life threatening, call the Police - on campus CMU Police: 412-268-2323 or off campus: 911.

ACTIVE LEARNING RESEARCH

For this class, the faculty – Professors Moussawi, Quesenberry, and Sooriamurthi – are conducting research on team based active learning, and in particular, methods for organizing the course. This research will involve classroom observations and review of a mixture of various pedagogical methods on project outcomes and team engagement. You will not be asked to do anything above and beyond the normal learning activities and assignments that are part of this course. You are free not to participate in this research, and your participation will have no influence on your grade for this course or your academic career at CMU. Participants will not receive any compensation. The data collected as part of this research will not include student grades. All analyses of data from participants' coursework will be conducted after the course is over and final grades are submitted. The Eberly Center may provide support on this research project regarding data analysis and interpretation. To minimize the risk of breach of confidentiality, the Eberly Center will never have access to data from this course containing your personal identifiers. All data will be analyzed in de-identified form and presented in the aggregate, without any personal identifiers. Please contact Professor Quesenberry at jquesenberry@cmu.edu, or in person, if you have questions or concerns about your participation.