Syllabus for CS154aj: The JBS Incubator

Learning Objectives
At the end of the course the students should be able to

- understand the principles of agile methodology, concepts and reasoning behind them
  - stories
  - backlog
  - iteration/sprint
  - velocity
  - pair programming
  - continual integration
  - constant refactoring/automated testing
- understand how to think about marketability, business model, money when it comes to creating a product
- understand the difference between developing a toy program and a real application
- connect the principles of mobile app and game development from the other two course to a real world product effort

Skills to be developed:
- learn to be a great programmer - coding, testing, class design, algorithms, debugging
- how to use agile principles for software engineering
- develop a complete mobile product that has a networked component
- user and usability testing/feedback
- Use Git, Pivotal Tracker, Android Development Kit, ...
- having a working instance of a product at all times starting at the earliest possible moment in a project.
- give clear and engaging oral presentations on the product
- work in a professional software team: making and meeting commitments, asking and giving help to assure the success of the team, communicating well to each other and to 'management', and delivering on objectives
- be highly resourceful in solving problems by taking advantage of all the resources of the web
- describe and show what it took to select, design, develop, test and deploy a mobile product
- build, test and launch an original product using everything you've learned in the course

Topics to Cover

Software Engineering
- Testing (TDD, Unit Tests, Integration Tests, Automated Testing)
- GIT integration, branching and merging
- Documentation and Coding Guidelines
- Performance Testing and Analysis
- Clean code and refactoring
Lean Startup Methodology
- minimal viable products
- lean business models
- early and frequent interaction with customers

Agile Software Development (Scrum)
- Stories, Sprints, Velocity, Epics
- Sprint review, retrospective, planning
- Scrum Roles

Marketing
- Hypothesis testing
- Customer Development

Schedule
In the first session the students will have formed into 3-person teams and coalesced around particular projects. Each week of the JBS Incubator course will begin with students giving a presentation of the current state of their project and working on setting team and individual goals for the rest of the week. The JBS Incubator will culminate with a JBS Product Showcase, open to the public, in which the students will pitch their products and answer questions from the audience and an expert panel.

Week 1 - Building the Minimal Viable Product
In this first week, students will work in 3-person teams to develop their minimal viable product that exercises all critical technological features of their product. They will also learn about the scrum version of Agile Methodology and will complete their first sprint with support from the teaching staff and they will learn about best practices in using collaborative source code management tools (like Git).

Week 2 - User Studies and UI development
In the second week, each group will perform user studies to fine tune their user interface. They will let users interact with their application and analyze the effectiveness of their product in meeting its goals. They will also analyze their market and develop a business plan.

Week 3 - Pivoting and Business Models
In the third week, students will complete the implementation of their launchable product and will develop a business model that will provide an income stream to cover the costs of continued maintenance and development of the product. They will learn about financing model for startups
including angel investors, rounds of venture capital financing, runways, etc.

**Week 4 - Launch!**
In the fourth week, the teams will launch their products (perhaps to a limited audience) and will study the data they receive from the launch to rapidly respond to problems. They will learn how to deploy updates and will discuss case studies of successful (and unsuccessful) product launches.

**Week 5 - JBS Product Showcase**
In the final week students will prepare for the JBS Product Showcase. They will work on their presentations, practice their oral presentation skills. The JBS program will end with a JBS Product Showcase in which 50-100 people will gather in the auditorium to hear each group pitch their product for 20-30 minutes. A panel of experts will provide feedback and the teams will answer questions from the audience. Student will submit individual reflection papers critiquing their performance and the performance of their team members in the JBS Incubator as well as analyzing the successes and failings of their product and the lessons they have learned.

**Grading**
The course will be graded on the following components
- weekly participation
  - effectiveness as a team member
  - quality of product presentation (every Monday)
- final product showcase
  - effectiveness of presentation
  - quality of the product
  - quality of the code
- final reflection paper
  - depth and insight of the reflection paper
  - quality of the presentation (clarity, technical accuracy, etc.)