Startup Programming and Management

ENTR-925, Spring Quarter 2013
Kellogg School of Management
Northwestern University

Course Description

This course provides students with an introduction to web development and software engineering project management.

Learning Goals

Students will learn:

1. The key concepts involved in modern web programming
2. The essentials of the Ruby on Rails web framework
3. Core principles of agile management and agile team methodologies
4. Best practices for hiring and managing developers
5. Hands-on experience with several product management tools and online resources

Course Organization

An interesting aspect of this course is that the course itself has both technical and agile management aspects woven right into the course. Key highlights include:

- The class agenda will be managed visually during class using a project management tool like Basecamp, Pivotal Tracker, or Agile Zen.
- Lecture sessions include lab sessions, so that students will gain hands-on practical skills . Each session is a combination of brief demonstrations, lecture material, and labs.
- Students will participate in group projects that follow standard agile project practices, such as sprint planning, story prioritization, velocity tracking, and retrospectives.
- All labs use the concept of “pair programming” so students gain sense of what it’s like for a real software engineer to be working on a team that adhers to agile practices.

Homework

For the first five weeks, students are required to complete short coding assignments that are submitted electronically. Instructions for homework submission will be provided on the first day of class.

Final Project

Final projects are done individually. Each project should be a prototype of a minimum viable product for their startup or product concept. The project must be accompanied by a 3-5 page reflective essay detailing areas of the course that have been met enlightening, and how they would directly affect the student's future projects or endeavors.

Suggested Reading

Course notes will be provided, but students may wish to augment their learning with any of the following texts:

- *Learn to Program*, 2nd Edition, Chris Pine, Pragmatic Bookshelf 2009.
- *Agile Web Development with Rails*, 5th Edition, Sam Ruby et. al. Pragmatic Bookshelf 2010.
- *Succeeding with Agile: Software Development Using Scrum*, Mike Cohn, Addison-Wesley, 2009

Calendar

Week	Topics	Due
1 **Thursday April 4**	Introduction to Ruby. Data structures and enumeration. Basic HTTP protocol. JSON data format and parsing.	
2 **Thursday April 11**	Introduction to the Rails framework. The MVC architecture pattern. Development tools. Routes, controllers, actions, and views.	*Homework #1 Due*

Week	Topics	Due
3 **Thursday April 18**	Receiving user input. Forms.	*Homework #2 Due*
4 **Thursday April 25**	Relational databases. Models and schema migrations. Business logic. MIME types and custom responders. Rails resources.	*Homework #3 Due*
5 **Thursday May 2**	ActiveRecord query interface. Advanced database migrations. Model associations (part 1).	*Homework #4 Due* **Project Declaration Due**
6 **Thursday May 9**	Model associations (part 2). Advanced queries. Browser security. HTTP cookies and sessions.	*Homework #5 Due*
7 **Thursday May 16**	User authorization and security. RubyGems.	**Project Review Due**
8 **Thursday May 23**	Hiring developers, management approach, outside contracting, project costing	
9 **Thursday May 30**	Product lifecycle analysis, real-world production deployment, risk assessment analysis	
10 **Thursday June 6**	Agile toolset review	
11 **Thursday June 13**	**FINAL PROJECT DUE**	