Course Syllabus

Course Information
Web Science CSCI 4961/ITWS 4200 Section 01
RPI Spring 2013 4 cr
Lecture MR 4:00PM-5:50PM 102 Lally
Course Website: http://tw.rpi.edu/web/Courses/WebScience/2013

Instructor
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Teaching Assistant(s)
<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Office Hours</th>
<th>Email Address</th>
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<tbody>
<tr>
<td>Katie Chastain</td>
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Course Description
Since its inception the World Wide Web has changed the ways people work, play, communicate, collaborate, and educate. There is, however, a growing realization among researchers across a number of disciplines that without fundamental understanding of the current, evolving and potential Web, we may be missing or delaying opportunities for new and revolutionary capabilities. This course attempts to provide the foundations of that understanding, exploring the fundamentals of the World Wide Web's function including the HTTP protocol, key algorithms that make the Web function, future trends, and social issues with respect to Web use and effect.

Course Text(s)
No assigned text - but there will be required readings and videos for Homeworks

Course Goals / Objectives
Intro: What is Web Science
The "original Web"
  Web history - where did it come from?
  Python
  Review of Web Architecture
  URIs, HTTP, Error Codes, etc.
  REST
Search - the killer app?
  Spiders, Crawlers and other Web denizens
Search algorithms and page rank

**Project: Would Google Lie?**

Web 2.0 - the Social Web
- From Powerlaws to People
- Social Machines
- Web 2.0 Infrastructure
- Social Networks - the math, the hacks
- New Media

**Project: What Meme worry?**

Web 3.0 - the third decade
- Linked Data
- RDFa and the Open Graph Protocol
- schema.org and search enhancement
- Semantic Web
- RDF, RDFS, a little OWL
- "Policy aware" Web technologies

**Project: Open the Web** (in memory of Aaron Swartz).

**Student Learning Outcomes**

1. Students will demonstrate knowledge and be able to explain the three different "named" generations of the web (a/k/a Web 1.0, Web 2.0, and Web 3.0) from mathematical, engineering, and social perspectives.
2. Students will demonstrate the ability to participate materially in projects that develop programs relating to Web applications and the analysis of Web data.
3. Students will be able to understand and analyze key Web applications including search engines and social networking sites.
4. Students will be able to understand and explain the key aspects of Web architecture and why these are important to the continued functioning of the World Wide Web.
5. Students will be able to analyze and explain how technical changes affect the social aspects of Web-based computing.
6. Students will be able to develop "linked data" applications using Semantic Web technologies.
7. Students will learn that modern Web application development (cf Google) includes cooperation on coding, contributing to the collective achievement of the organization, and exploring not just technology but the ethical aspects of technological innovation.

**Course Assessment Measures**

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<tr>
<th>Assessment</th>
<th>Due Date</th>
<th>Learning Outcome #s</th>
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<tbody>
<tr>
<td>Project 1</td>
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<td>1, 2, 3, 4, 7</td>
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<td>Project 2</td>
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<td>1, 2, 3, 4, 5, 7</td>
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<tr>
<td>Project 3</td>
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<td>1, 2, 3, 4, 5, 6, 7</td>
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<tr>
<td>Exam (Midterm)</td>
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<td>1, 2, 3, 4</td>
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<tr>
<td>Homework</td>
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<td>1, 2, 3, 4, 5, 6, 7</td>
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**Grading Criteria**

Homeworks and lab sheets: 10%
Projects 1-3: 25, 25, 25%
Midterm: 10%
Attendance/Other: 5% (you get this unless you blow it)
Other: 5% of “extra credit” (includes participation, code sharing, and other - details to be made available)

**Attendance Policy**

Class participation is important (and part of your grade). This includes project presentations, classroom questions, lab participations, etc. Formal attendance will not be taken, but students with poor attendance records will be noted and this will effect your final grade.

Lab assignments and Homeworks will be given out in class. If you miss a class you are responsible for getting this information and for turning in the assignment on time.

**Other Course Policies**

**Code sharing encouraged and rewarded**

On the Web very little code is developed from scratch. To build a Web application without using REST APIs, code libraries, github, Google or other open source development platforms, etc. would be foolish and wasteful. Efficient and scalable algorithms are important and extremely highly-valued, but rarely are they developed in the clean-room coding styles that make up traditional software-engineering - a Web development environment trying to use the "waterfall" model would be doomed to failure before it even started. Further, as code is developed and shared, it is rarely done in a solo manner - paired development, eXtreme programming, and code reviews are common in most companies and required in many.

In this class, we will emulate this modern code development environment by encouraging the reuse and sharing of code, and in requiring that no piece of code is turned in by a single student without some kind of review by a teammate or other class member. To encourage these practices we will have a wiki page for each project where students will be able to share with the rest of the class useful things that they discover. This will count towards participation in the class.

Further, if a student develops a useful piece of code, and makes it available to the rest of the class, she/he will gain extra points based on how other teams make use of it and teams will gain points for using useful code shared by their teammates. All code handed in will be signed by at least two students who will be expected to answer questions about its function and design, all team members are responsible for knowing how projects work.

Projects will be presented to the class at several points between the assignment and turning in, with teams able to take advantage of feedback received by other students and the faculty/staff of the class.

Details of the above will be made available when the projects are assigned, and policies may be updated during the term as we work out the details of this new approach.
On-Time Project/Homework (and lab) submission

Given how class projects work, team basis, etc. projects cannot be handed in after the due date without pre-approval by the Professor (no other staff member can give such permission). This isn’t as bad as it sounds as there will be long times for the assignments and you will be working in teams, so last minute doesn’t work that well.

Homeworks and labs are to be handed at the beginning of class the day they are due. They will not be accepted late unless you have cleared this in advance or have a really good excuse (and even then you are taking a gamble).

Academic Integrity

Student-teacher relationships are built on trust. For example, students must trust that teachers have made appropriate decisions about the structure and content of the courses they teach, and teachers must trust that the (individual) assignments that students turn in are their own (and team projects are from the team). Acts that violate this trust undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities defines various forms of Academic Dishonesty and you should make yourself familiar with these.

In this class there will be significant group work, there will be encouragement to find and use existing code and systems. It will be cheating to change another student's submission, to directly copy on homework (although discussion is encouraged).

If you have any question concerning this policy before submitting an assignment, please ask for clarification.