

# CIS 311: Interactive Web Development

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Spring 2017

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## 1. Class Meetings and Office Hours

Class meetings:

### Section 2:

Tuesday, Thursday from 1 pm until 2:50 pm, room 98C 5-006  
Office Hours: Tuesday, Thursday 4 - 5:50 pm, office above

### Section 3:

Tuesday, Thursday from 1 pm until 2:50 pm, Building 6 room 229  
Office Hours: Tuesday, Thursday 4 - 5:50 pm, office above

## 2. Course Description

From our catalog:

*The Design and development of web applications for business. Principles and applications of modern website design. Use of client-side scripting for website dynamics and interactivity. Development of server-side scripts for three-tier web applications. 4 units lectures/problem solving.*

Instruction will focus upon core protocols supporting browser markup and web-based applications: html 5, CSS, javascript, server side scripting, cloud infrastructures and internet-facing data bases. The course entails a hands-on basis for learning, with deliverables in the form of projects and programming exercises. Students should use the course as a means to discover a potential major (application development) while gathering deep understanding about the security and infrastructure demands of employee and public-facing web applications. Additional discussion explores the corporate strategic impact of web development, and organizational/cultural change.

## 3. Learning Objectives

Students successfully completing this course should have acquired the ability to:

- Understand different types of web applications and how they work.
- Analyze and translate user needs and requirements into a software architectural model.
- Create wireframes and prototypes of user-centered and SEO-friendly web sites
- Create structure and content for web sites using standards-compliant HTML and HTML 5.
- Create styles for web sites using Cascading Style Sheets (CSS).
- Interact with users using client-side Javascript.
- Understand how ASP.NET works to enable dynamic contents and web applications.

- Control the flow of scripts, use conditional statements, loops, strings and arrays, write reusable modules in Visual Basic.
- Collect, validate and process information entered by users via web forms.
- Build dynamic web site that connect to a text file and database, insert, present and modify data in sophisticated ways.
- Understand the basics of web analytics and optimization, including the role of content, link building, social media marketing, usability, accessibility, other search engine and conversion optimization tactics.

## 4. Prerequisites

A minimum grade of C (2.0) in CIS 304, 305

## 5. Textbook and Software

Recommended Textbooks:

None. Many online sources will be assigned for reading, each week. Please consult your assignments on github for your weekly, and per-class reading.

Required Web Development Software:

For client-side development: A text editor. Options include: Notepad (plain mode, default on all Windows), TextEdit (plain mode, default on all Mac) notepad ++ (freeware), and Dreamweaver (student discount available at bookstore).

For server-side development: Microsoft Visual Studio 2010 Premium (free and available on CIS dept website -> MSDNAA Download) with built-in MS SQL server Compact. Alternatively you can install Visual Web Developer 2010 Express

## 6. Exams, Projects and Assignments

Exams: There will be one midterm and one final exam. Final exam is comprehensive, with emphasis on the content after the midterm.

Projects: There will be 3 projects. The goal of the projects is to apply comprehensive knowledge and skills you learned in class to create a sophisticated web application that solves a specific business problem. Each project builds upon the last, and builds a web development product, iteratively.

Final Project Presentation

Students will present their final project to the Instructor or to the class.

Make-up policy: There will be no make-up exams except for serious and compelling reasons that are substantiated with formal documents. For example, medical cases have to be substantiated with valid doctor or hospital note stating that the student is too ill to attend the exam.

Late assignments or projects: Late assignments or projects submitted within one week after due date and time will be penalized 50%. Late assignments or projects submitted more than one week late will not be accepted. If the student submits an assignment or project late, the student is responsible to send an email to notify the instructor upon submission; otherwise the assignment or project will not be graded.

Tutoring: For free tutoring on campus, contact the Learning Center in the library.

## 7. Grading

Grade	Percentage
A	93.00-100.00
A-	90.00-92.99
B+	87.00-89.99
B	83.00-86.99
B-	80.00-82.99
C+	77.00-79.99
C	73.00-76.99
C-	70.00-72.99
D+	67.00-69.99
D	63.00-66.99
D-	60.00-62.99
F	0-59.99

For a detailed breakdown of assignments, weight and their details, please see section 11, 'Tentative Course Schedule and Graded Items.'

## 8. Class Communication

**E-mail:** All emails must be sent to the instructor via Cal Poly email account, must be signed with the student's first and last name, and must have "CIS 311" in the subject line, or it may not be read or responded. Please consult the syllabus before sending emails. Messages sent through Blackboard will not be read.

### Assignment submission

Unless otherwise noted, all assignments are to be uploaded to a free web-based hosting account on Amazon Web Services (AWS), then the link is to be sent to the Instructor for review.

**Github:** Course materials including announcements, lecture presentations, assignments, projects documents, classroom exercises and solutions, and grades will be posted on Github. All graded assignments and projects will be visible in Blackboard Gradebook. Our github will be:

- <https://github.com/stefanbund/311>

Refer to the Github page above for all homework, learning materials, lesson plans and other details critical for your success in 311.

Subject to Change: This syllabus and class schedule are subject to change. If the student is absent from class, it is the student's responsibility to check on announcements made and make up the work while absent.

## 9. Course Policies

Classroom environment: The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class.

Using laptops, cellphones and other electronic devices:

- Using laptops during the class for anything other than this class, personal conversations, talking or texting on cell phones or other distracting behavior are prohibited.
- As a courtesy to all, please turn off all cell phones and pagers during class. If the student needs to be reached for family medical or significant work-related issues, the student must present evidence to the instructor before the class starts.
- Absolutely no cellphones or other electronic devices may be used during an exam or quiz.

### **Attendance:**

- Arrive on time. Do not disturb other students by asking for directions or help on exercises when arrived late.
- If the student needs to leave early, the student must let the instructor know before the class starts, and choose a seat that minimizes disruption to the class when leaving.
- If the student has to miss the class, the student must send an email to let instructor know before class and explain the reason.
- If the student is sick and contagious, the student should not come to the class and risk getting others sick.
- If the student miss an exam due to this reason, a make up may be given. However students shall not abuse the trust - if the student appears to be sick very often then the student may be asked to present evidence such as doctor notes to the instructor.

## **Student responsibilities:**

Each student is responsible for the successful completion and submission of all assignments and projects. Corrupted files or incomplete submission will not be credited. Students are also responsible for keeping a backup copy of each submission.

The instructor will not review your assignments or projects before grading for the entire class to ensure fairness. The instructor will, however, help you understand the expectations and clarify the requirements. Spot assessments will help you to outline questions and receive pre-due date feedback.

The instructor will not debug assignments or projects for individual student. The instructor will, however, help you gain knowledge and skills in analysis and design, problem solving, coding, testing and debugging, and answer specific questions about course topics. Make sure you have

spent significant and reasonable amount of time and effort in research and working on your own before asking help.

Turnitin: Students written assignments may be checked through [Turnitin.com](https://turnitin.com) for plagiarism detection.

#### Team Work

In cases where team work is assigned, a log of project delegations will be kept so to track individual contributions. For deficient projects, each student will receive an individual grade, according to contribution.

## 10. University Policies

**Students with Disabilities:** Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities at <http://dsa.csupomona.edu/drc/>.

**Academic Integrity:** Students should understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism, or inappropriate collaboration); neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading; take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

**Cheating and Plagiarism:** Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work. Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university.

**Computing Resources:** At Cal Poly Pomona, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own laptop/computer or have other access to a computer with all the recommended software for this course. Find out more about how to access to the university's information resources from Information Technology Services.

**Copyright Policy:** Copyright laws and fair use policies protect the rights of those who have produced the material. The copy in this course has been provided for private study, scholarship, or research. Other uses may require permission from the copyright holder. The user of this work is responsible for adhering to copyright law of the U.S. (Title 17, U.S. Code). A full description of Cal Poly Pomona's copyright policy is included in the University's Intellectual Property policy. The course web site contains material protected by copyrights held by the instructor, other individuals or institutions. Such material is used for educational purposes in accord with copyright law and/or with permission given by the owners of the original material. Students may

download one copy of the materials on any single computer for non-commercial, personal, or educational purposes only, provided that (1) do not modify it, (2) use it only for the duration of this course, and (3) include both this notice and any copyright notice originally included with the material. Beyond this use, no material from the course web site may be copied, reproduced, republished, uploaded, posted, transmitted, or distributed in any way without the permission of the original copyright holder. The instructor assumes no responsibility for individuals who improperly use copyrighted material placed on the web site.

## 11. Tentative Course Schedule and Graded Items

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### Term Grading

The Term will contain 7 micro-projects, each worth 10%, and due at the close of each unit in the Lesson Plan. A Final term project will take place worth 20%.

Item	Unit MP	Weight (%)	Due
<b>Microproject (MP)</b>	1	10	January 10th
	2	10	January 17th
	3	10	January 24th
	4	10	February 7th
	5	10	February 14th
	6	10	February 21st
	7	10	February 28th
	8	~	March 9th, can be submitted to replace another MP
<b>Final Project</b>		20	March 16th midnight

MP 8 is optional, and can be submitted to replace a grade on a prior MP.

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### Term Final Project

Students may choose from one of the following Tracks for the final project.

1. **Interactive Web Product.** The final project compiles each micro-project into a cohesive interactive web product. Teams may be formed with no more than 5 members (Optionally). Compile a product video on a promotional page of the product's website.

Students should plan the project within the first month of the course, then seek to develop small facets of the project with each mini-project. Since each mini-project awards conceptual development, the final should complete whatever concept was initiated during the term.

**Grading rubric, for AWS projects:**

- A. Product is suitable to compete a Cal Poly entrepreneurship competition. A working prototype should exist with a demonstration account. A video should demonstrate the website in a clear and honest manner, with narration and instruction (not a marketing presentation). Product should possess a goal, be conceived to solve a problem, and lay out the rationale for its design. The product should operate smoothly, and bring the user through a basic business process where the concept can be discussed by an outside observer. The site should be hosted publicly on Amazon web services simple storage service (S3), and employ techniques taught during the term.
- B. Missing one element from an A project
- C. Missing two elements from an A project
- D. Missing three elements from an A project
- E. Missing four or more elements from an A project.

Grading Rubric, for ASP.NET projects:

- A. Project completes the Lynda tutorial completely, submitting a document that details the completed project, via screenshot. Full code is submitted, copy/pasted, not screenshot.
- B. Project is missing 10% of the Lynda tutorial.
- C. Project is missing 20% of the Lynda tutorial.
- D. Project is missing 30% of the Lynda tutorial.
- E. Project is missing 40% of the Lynda tutorial or more.

- 2. **Website Security Analysis.** Implement a Web Application Firewall for a Product team, then test the application for vulnerabilities using common penetration testing tools. Submit a video of proof of your analysis and an accompanying test report.

Students who have not completed upper-level coursework in security, network or systems administration will not be permitted to do Track 2. There are expenses related to this project, via AWS.

**Grading rubric:**

A paper is submitted with screenshots which document your research.

- A. The team employs AWS WAF, implemented on an existing product team, or a demonstration site created by them, which interacts with AWS via database, as instructed in class. A micro-project hosted on S3 with DynamoDB interactions may be used as a test. Penetration testing tools must attempt to capture data in-transit to and from the site before and after OAuth is implemented. Common, open-source tools that are commonly used in penetration testing are to be used to investigate the site. A suite of five tools should be used to demonstrate the security state of the site through several security vectors, defined by the team. Tools with overlapping test capacity are not to be used. A website documenting the test is constructed to show off the results, with a video summarizing your results. The video should be constructed for a security audience, and sufficient for presentation during a security interview.
- B. Missing one element from an A project
- C. Missing two elements from an A project

- D. Missing three elements from an A project
- E. Missing four or more elements from an A project.

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## Micro-Projects

For each unit in the following matrix, a small project is made by the student to practice and implement the technology. Source code will be presented and made available online on our course GitHub. Students will be expected to show competency implementing the code demonstrated for the unit in some working metaphor, or micro-project.

**Deliverable.** Three pages should be made per unit, with some contrasting use of the programming techniques. The coding practices taught in the unit should be present on each page in some functional, explainable way. The student should show that they have learned how to use the skills, then apply them in a very simple demonstration. An outside observer should show them moving data then display it in HTML markup, in a very simple business process.

Each student will use a public blogging service to describe their work, then link to their project. The assignment is a blog post, completed by the due date, which links to their functioning micro-project on the web.

### Best Practices

For your micro-project, understand that A projects are small portfolio pieces, adequate to show employers a wide range of web development skills.

### Due dates

Micro-projects must be submitted by beginning of the next unit. For example, class ends on a Thursday, then the micro-project will be due on the following Tuesday, before the next unit begins. Your micro-project must be online and accessible for full credit.

### Grading Rubric

#### A

Demonstrates the topic instructed completely, with some conceptual development. The skills from the prior unit are incorporated, and stacked into a new version of the site. There is clear progress toward the final project.

#### B

Demonstrates the programming skills instructed but lacks conceptual development (has no theme, idea or functional goal). There is limited integration of prior code. The code has limited integration into the final project.

#### C

B project, but errors exist which are fixable with additional instruction. The student is trying to implement the code.



D

Code is present in a copy/pasted way, with little evidence of the student having tried the code.

E

Code is not present for the unit.

### Lesson Plan, Lecture Topics and Session Objectives

Months	Class sessions	Topics and links	Unit # on github
January	3	<b>Basic Javascript.</b> Basic user interface interactivity, HTML elements	1
	5	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	10	<b>Javascript objects.</b> Manipulating member variables and functions in javascript core language	2
	12	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	17	<b>Handling Data with Javascript Objects.</b> Javascript Object Notation (JSON), java objects, arrays, array traversal, functions, forEach iteration, Document Object Model (DOM) and javascript, text nodes	3
	19	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	24	<b>Cloud Security and Querying NoSql Databases.</b> OAUTH, Amazon Web Services SDK, Identity and Access Management (IAM), DynamoDB and DocumentClient, event-driven javascript, Web Identity Federation, Third Party Authentication Systems and Cloud Computing	4
	26	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	31	<b>Integrating services into client-side javascript.</b> HTML Elements integrated with cloud computing API use	
February	2	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	7	<b>Basic Get, Put, Update, Delete on NoSql cloud environments.</b> Transferring cloud JSON into HTML elements	5
	9	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	14	<b>Persisting client-side data with cookies</b>	6

Months	Class sessions	Topics and links	Unit # on github
	16	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	21	<b>HTML FILE protocols and uploading images to the cloud</b>	7
	23	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	28	<b>Responsive Web Design with CSS.</b> Introduction to Bootstrap.	8
<b>March</b>	2	<i>Micro-project. Dedicated time in-class to answer questions, debug your technology.</i>	
	7	Final project work	
	9	Final project work	
	finals week, 14/16	final exam	