San José State University
Department of Computer Engineering

CMPE 280 Web UI Design and Development

Section 4
Fall 2017

Course and Contact Information

Instructor:	Ron Mak
Office Location:	ENG 250
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Website:	http://www.cs.sjsu.edu/~mak/
Office Hours:	TuTh 3:00 - 4:00 PM
Class Days/Time:	TuTh 12 noon – 1:15 PM
Classroom:	ENG 341
Prerequisites:	Classified graduate standing or instructor consent. Computer Engineering and Software Engineering majors only.

Course Format

This course will be taught primarily face-to-face instruction. Course materials, syllabus, assignments, grading criteria, exams, and other information will be posted on the SJSU Canvas course site at http://sjsu.instructure.com/ You are responsible to check Canvas regularly for class work and exams. You also can find Canvas video tutorials and documentations at http://ges.sjsu.edu/canvas-students

Faculty Web Page and MySJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on my faculty web page at http://www.sjsu.edu/people/firstname.lastname and/or on Canvas Learning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking with the messaging system through MySJSU at http://my.sjsu.edu to learn of any updates.

Piazza will be available for announcements and to serve as an online discussion forum for the class. You are responsible for responding to enrollment invitations.

Course Catalog Description

"Web User-interface (UI) design and development with contemporary web standards. Understand interaction and interface design principles and processes for rich web applications, mobile web, web graphics, web design fundamentals, tools, interaction using client side scripting and server side frameworks."

Course Goals

Learn UI design for web-based applications and the tools and techniques to develop the applications. An outline of the course topics:

- Web programming overview
  - Model-View-Controller (MVC) architecture
  - Client side
    - Web browsers
    - HTML 5, CSS 3, and JavaScript
  - Server side
    - Application server and database server
    - JavaScript: node.js
  - Full-stack frameworks
    - Ruby on Rails
    - MEAN stack (MongoDB, Express, Angular, Node.js)
    - MERN stack (MongoDB, Express, React, Node.js)
  - Single-page websites
  - Responsive websites

- Analysis
  - Functional and nonfunctional requirements
  - Use cases
  - Functional specification

- UI and UX design
  - Storyboards and prototypes
  - UI design principles and patterns
  - Microinteractions
  - Data visualization
  - Design specification

- Server-side programming
  - Framework: node.js + Express
  - Relational database: MySQL
  - NoSQL database: MongoDB
  - RESTful services

- Client-side programming
  - HTML 5 + CSS 3
  - JavaScript
  - JavaScript libraries: jQuery, React
  - AJAX
  - Framework: Angular
  - Internationalization and localization
  - Search engine optimization (SEO)

- Usability testing

In class, there will only be enough time to introduce the various technologies and how they work together, and to see some basic demos. Students will need to do *extensive research and experimentation* on their own to learn enough to develop significant web applications.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

- Execute the complete process of designing, developing, deploying, and maintaining applications using web standards.

- Analyze a problem's requirements and design an application with a compelling user interface (UI) and user experience (UX).

- **Client side:** Use HTML 5, CSS 3, JavaScript, and libraries such as jQuery and React.

- **Server side:** Use technologies such as node.js and MongoDB and packages such as Express to create RESTful web services.

- Implement techniques such as search engine optimization (SEO), internationalization, and localization.

You will develop the *critical job skill* of working in a small project team.

Required Texts/Readings

Title:	**Designed for Use: Create Usable Interfaces for Applications and the Web, 2nd ed.**
Author:	Lukas Mathis
Publisher:	Pragmatic Bookshelf, 2017
ISBN:	978-1680501605

Web standards, tools, and techniques evolve too rapidly for published books to keep up. Rely on the Internet for the most current information.

Course Requirements and Assignments

You will work during the semester in small four-person teams. Assignments will provide practice with web tools and techniques, and opportunities for research. Each student team will develop a significant web application that demonstrates mastery of the material.

This is a challenging course that will demand much of your time and effort throughout the semester.

The university's syllabus policies:

- [University Syllabus Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) at http://www.sjsu.edu/senate/docs/S16-9.pdf.

- Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at http://www.sjsu.edu/gup/syllabusinfo/

The University's Credit Hour Requirement:

"Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus."

Final Examination

Besides a final project from each team, there will be a written in-class final examination for each student. The exam will test understanding (not memorization) of the material taught during the semester and now well each you participated in your project team.

Grading Information

Each assignment will be worth 100 points. For each team assignment, each team member will receive the same score. Late assignments will be penalized 25% and an additional 25% for each subsequent day.

Individual *total scores* will be computed with these weights:

20%	Assignments
30%	Project
15%	Midterm exam #1
15%	Midterm exam #2
20%	Final exam

Class grades will be based on a curve. The median total score will earn a B+. Depending on how all the total scores cluster above and below the median, approximately one quarter of the class will earn higher grades, and another one quarter will earn lower grades.

There can be no make-up midterm or final exams without a valid medical excuse.

Postmortem report

At the end of the semester, each student must also turn in a short (1 page) individual postmortem report that includes:

- A brief description of what you learned in the course.

- An assessment of your accomplishments for your project team on the assignments and the web application project.

- An assessment of each of your other project team members.

Only the instructor will see these reports. How your teammates evaluate you may affect your class grade.

Classroom Protocol

It is very important for each student to attend classes and to participate. Cell phones in silent mode, please.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/.

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This schedule is subject to change with fair notice which will be communicated through emails and announcements via Canvas and Piazza.

Course Schedule

Week	Date	Topics
1	Aug 24	Web programming overview Model-view-controller (MVC) architecture HTTP protocol
2	Aug 29 Aug 31	Functional and nonfunctional requirements Use cases Functional specification "Naked" HTML Lists, tables, links, and images
3	Sept 5 Sept 7	CSS 3 Responsive websites Basic JavaScript on the client side Input validation JSON
4	Sept 12 Sept 14	Advanced JavaScript HTML 5 canvas drawing and animation jQuery jQuery UI AJAX
5	Sept 19 Sept 21	***Midterm exam #1 Tuesday, September 19*** Application server and database server JavaScript on the server side: node.js
6	Sept 26 Sept 28	Single-page websites Storyboards and prototypes UI design principles and patterns
7	Oct 3 Oct 5	Microinteractions Data visualization principles and techniques
8	Oct 10 Oct 12	Full-stack frameworks Ruby on Rails MongoDB + Express + Angular + node.js (MEAN stack) MongoDB+ Express + React + node.js (MERN stack)
9	Oct 17 Oct 19	Server-side programming node.js + Express Session management Data modeling

Week	Date	Topics
10	Oct 24 Oct 26	MongoDB Object-document mapping (ODM) RESTful web services
11	Oct 31 Nov 2	***Midterm exam #2 Tuesday, October 31*** More client-side programming The Angular framework
12	Nov 7 Nov 9	The React library
13	Nov 14 Nov 16	Search engine optimization (SEO) Introduction to WordPress
14	Nov 21	Functional testing Usability testing Internationalization and localization
15	Nov 28 Nov 30	XML data processing
16	Dec 5 Dec 7	Project presentations
Final Exam	Wednesday Dec 13	Time: 9:45 - 12 noon Room: ENG 341