**CIS 3308 Web Application Programming (Upper Level CS Elective)**

**Spring 2021: Instructor Sally Kyvernitis (key-ver-NEE-tees)**

**Course Description**

In this course students will learn how to design and implement web applications – both server side and client side code. We use open source (free) development tools such as the Netbeans Bundle (includes NetBeans context sensitive editor / compiler, Apache Web Server and Glassfish JSP application server – all preconfigured to work together), MySQL (Database Management System) and MySQL Workbench (GUI to help you create SQL to interact with a database). In this course, students write code in the following languages:

- HTML (structure and content of web page) and CSS (styling of web page),
- JavaScript (web page functionality),
- SQL (to create and modify data), and
- Java/JSP (Web APIs, server side code that accesses a database using Java).

In this course, students shall:

- Create a web application User Interface with HTML for page content, CSS for layout, and JavaScript for client side functionality. Publish their web application using sftp (secure file transfer protocol).
- Create their own MySql database and populate it with data.
- Learn about JSON, a web data format that is similar to how JavaScript defines object data.
- Create Web APIs (server side Java/JSP code that access their database) that output JSON data.
- Write client side code (JavaScript/AJAX) to invoke the Web APIs.
- Use server side objects such as out, request, and session (out writes to the page, request contains URL input parameters, we use session for log in). Implement log on and learn about web application security.
- Apply software design patterns such as MVC (Model-View-Controller), SRP (Single Responsibility Principle), DRY (Don’t Repeat Yourself), and Dependency Injection (e.g., if an HTML page invokes a JavaScript function, that function shall not access any aspect of the HTML page – except for whatever was passed to it).
- Learn a little about React, the leading JS library for writing components within Single Page Applications.

Although each student’s web application will employ HTML/CSS to provide some aesthetic appeal, web design is not the major thrust of this course. Instead, this course focuses on designing and implementing client side and server side code to create a reliable, secure, extensible and maintainable web application. We focus on the basics of web development (HTML, CSS, JavaScript, Server Side Programming), but we will also learn a bit about ReAct which is (at this moment) a popular JavaScript Single Page Application Framework. Students must recognize that frameworks come and go but foundational topics endure.

**Course Prerequisites**

- Grade of C- or better in CIS 2107 Computer Systems and Low-Level Programming
- Grade of C- or better in CIS 2168 Data Structures

The only assumption is that students have knowledge and skills obtained in the pre-requisite courses listed just above. All other topics will be introduced as new material, even though some students may already have had some exposure. *Students with more experience can add extra functionality to their weekly assignments (if they wish), as long as they meet all homework requirements and submit on time.*
Textbook and Course Materials/Delivery

- There is no text book. Web references and other materials will be posted online. This is the course web site.
- A Canvas course will contain various assignments (with due dates). You’ll upload your work and receive your grades through Canvas. You’ll also publish your web application code to a Temple Web Server.

Office Hours Via Zoom: https://temple.zoom.us/s/5168459269

- Wednesdays 11:30 am – 1pm
- Fridays 10 am – 11:30 am
- And by appointment (email me at sallyk@temple.edu to set up a time).
- Zoom screen sharing is a very effective way to assist students with programming/technical problems.
- Instructor and Lab Assistant office hours are also listed in a section entitled “Contact” at the top of Canvas when you click on the “Home” link.

Spring 2021 – This course is totally online.

- You’ll need a reasonable internet connection and a web cam on your computer for taking proctored tests.
- To install your development environment (NetBeans Bundle) on your PC/MAC, you probably should have at least 8 gigs of RAM. If buying a a new laptop, I suggest 16 gigs RAM and 256-512 gigs of SSD. SSD makes your laptop faster and consume less battery than if it had a mechanical hard drive.
- Be available during the times that the course is scheduled. You can miss a lecture or two (they are recorded) but the 3 tests are given during lab time and you must be available then.
- If you have a DRS accommodation for extended time to take tests, make sure you have the extra time that you need – either before or after your scheduled lab time.

Course Format

- Lecture/Attendance We’ll have a synchronous zoom meeting during each lecture time. These will be recorded so that students can watch or rewatch them as needed. Attendance is taken using Qwickly. Should you become sick, please email me ASAP so we can work out the details for you to complete course requirements.
- Lab time. We will use Lab time to administer the three tests (see below), but also we should have someone available via Zoom (Instructor or Lab Assistant) to answer any questions that students may have.
- Homeworks. Almost every week, there will be a programming assignment in which you will:
  - Write code (adding to the SINGLE web application you are building this semester), test it locally, publish it (to your remote HW/Project web folder), then test what you published.
  - Upload a zip file of your web application (NetBeans project), plus self assessment, into Canvas. If there is ever a question about a Homework grade, we go by the code that you uploaded into Canvas.
  - If you have not completed your homework by the due date, you can still submit it within the following week (with a -20% penalty). After that, homeworks are not accepted, but you still have to complete the work to avoid further deductions on your project grade. The key to being successful in this class is to start the homeworks as soon as they are assigned, so that you can ask for help if you need it.
Students who allow themselves to fall behind usually find it very difficult to complete this course. Also, you must experiment with the code, not just copy/paste and get help to complete homeworks.

- **Project.** Your project is the culmination of all your labs (all combined into a SINGLE, regression tested, web application). Your project grade is based on functional testing plus a code review of all your source code. So, each week, be sure to keep your code well designed/organized, bug free, and properly indented, with self documenting names and comments.

- **Lab Activities.** Lab Activities are typically designed to give you the skills you need to get started on your homework – often guiding you to complete the first subset of the homework assignment. You’ll have 2-3 days to complete each lab activity, in which you publish your code to your remote Lab Activity web folder and upload a zip file of your code (along with self assessment) into a Canvas assignment.
  - There is no late submission policy for lab activities. If you don’t meet the deadline, you don’t get a grade for the lab activity. (However, you have a long term documented illness, let the instructor know – perhaps an accommodation can be reached.)
  - To account for unexpected problems, your lowest Lab Activity grade will be dropped.

- **Formative Quizzes.** “Formative quizzes” are designed to help you learn and retain new concepts. Formative quizzes are not timed or proctored, you have many days to do them, and you get two attempts to take them.

- **Tests.** The tests in this course are designed to see if you really understand the programming techniques that you have been studying (in sample code) and submitting (for homework). Tests will be given at a specific time and proctored (by Protorio software that uses AI to ensure that you are doing your own work without help from other people, other software, or the internet). There will be **NO final exam** during the final exam period. *The only way to do well on the Tests is to experiment extensively with sample and homework code* (and don’t accept too much help doing your homework).

- **Tutorial Option.** Many students would like an opportunity to write their own code totally from scratch (after learning some things about HTML, CSS, and JavaScript). The Tutorial option allows you to design your own extensive JS code (written in the consumer/provider style and present what you did to the class. Those who select the Tutorial Option are excused from the 2 week Insert Homework. Should you select the tutorial option?
  - In order to get a course grade better than B you must select the Tutorial Option because this assignment demonstrates mastery of the course material.
  - If you are struggling to keep up with homeworks, it may be best not to select the tutorial option because it is a very open ended assignment with no sample code.

To select the Tutorial Option, you must do the following (by their due dates):

1. Post your idea to a discussion board (must be different than students who posted before you).
2. Submit (to canvas and publish) a tutorial proposal and “Proof of Concept” code (prototype).
3. Complete the actual tutorial assignment (as described above).
Tentative (and approximate) Grade Weights

<table>
<thead>
<tr>
<th>Class Participation / Attendance</th>
<th>2%</th>
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<tbody>
<tr>
<td>Lab Activities, must be completed in lab (about 11, drop lowest)</td>
<td>10%</td>
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<tr>
<td>Programming Homeworks (about 10)</td>
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<td>OR if Tutorial selected (about 9 HWs plus Tutorial)</td>
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<tr>
<td>Project (culmination of all Homeworks plus code review)</td>
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<tr>
<td>Formative Quizzes (not timed, not proctored, usually you get two tries)</td>
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<tr>
<td>2 Tests (timed, proctored using Proctorio software)</td>
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<tr>
<td><strong>Total</strong></td>
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EXCEPTIONS:

- If the average of your Test grades is less than C-, your course grade will also be less than C- (and you need at least C- to be able to count this course towards CS major requirements). This is to ensure that you are actually studying sample code and experimenting with it (not just copy/pasting it and getting too much help from others to complete your homework).
- To get a course grade higher than B, you must select the Tutorial Option.

Temple Grade Scale

| 93-100: A | 83- 86: B | 73-76: C | 63-66: D |
| 90- 92: A- | 80-82: B- | 70-72: C- | 60-62: D- |
| 87- 89: B+ | 77-79: C+ | 67-69: D+ | 0-60: F |

Tentative Course Schedule - To see actual dates click on “Syllabus” from your Canvas Course

<table>
<thead>
<tr>
<th>Week</th>
<th>Module</th>
<th>Lab Activity</th>
<th>HW</th>
<th>Formative Quizzes</th>
<th>Tests</th>
<th>HTML, CSS</th>
<th>JS</th>
<th>AJAX, JSON</th>
<th>Database</th>
<th>Web APIs</th>
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<tbody>
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<td>1</td>
<td>Homepage</td>
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<td>Log On &amp; Security</td>
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Miscellaneous

• **Set up your development environment on your PC/MAC ASAP** so you can work from home. The CIS 3308 Web Page has instructions to help you with this (google “SallyK Temple”, click on Teaching – CIS 3308).

• **Communication:** Please contact me as soon as possible if you think you are running into difficulties. Ask me, or your lab instructor, or another student for help AS SOON AS POSSIBLE.

• **Attendance:** All “lectures” will be recorded and available for students to watch at their convenience but students need to be available during scheduled class times so that they can ask questions and participate. As mentioned previously, students must be available during lab time for the administration of the 3 tests.

• **Disability Disclosure:** Any student who has a need for accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Student must provide me with a note from the office of Disability Resources and Services (100 Ritter Annex, 215-204-1280).

• **Academic Honesty and Ethics:** You are expected to observe the highest ethical standards. When working in the lab or on your project, you may consult others, but the work you submit must be your own. Never share your answers with others. Never accept answers from others. All violations of academic honesty will be handled according to university policy.

• **Student Support Services** The following academic support services are available to support you:
  
  o **Student Success Center**
  o **University Libraries**
  o **Undergraduate Research Support**
  o **Career Center**
  o **Tuttleman Counseling Services**
  o **Disability Resources and Services**

If you are experiencing food insecurity or financial struggles, Temple provides resources and support. Notably, the Temple University Cherry Pantry and the Temple University Emergency Student Aid Program are in operation as well as a variety of resources from the Office of Student Affairs.


• Tue Jan 19: Start of Semester.
• Mon Feb 1: Last Day to Drop (you don’t pay for the course and it will not appear on your transcript).
• Mon Mar 8: Mid Term Ratings end.
• Due to COVID, there is no spring break.
• Mon Apr 26: Last Day to Withdraw (you pay for the course, W stays on your transcript, no effect to GPA).
• Mon Apr 26: Last Day of Class.
COVID Specific Information

TEMPLE AND COVID-19 Temple University’s motto is Perseverance Conquers, and we will meet the challenges of the COVID pandemic with flexibility and resilience. The university has made plans for multiple eventualities. Working together as a community to deliver a meaningful learning experience is a responsibility we all share: we’re in this together so we can be together.

This does not really apply to our class since we are totally online, but I was asked to include this information:

- If you feel unwell, you should not come to campus, and you will not be penalized for your absence. Instructors are required to ensure that attendance is recorded for each in-person or synchronous class session. The primary reason for documentation of attendance is to facilitate contact tracing, so that if a student or instructor with whom you have had close contact tests positive for COVID-19, the university can contact you. Recording of attendance will also provide an opportunity for outreach from student services and/or academic support units to support students should they become ill. Faculty and students agree to act in good faith and work with mutual flexibility. The expectation is that students will be honest in representing class attendance.

Other considerations:

- COVID-19 may result in a need for new or additional accommodations for some students. Please communicate with your instructor and/or DRS.
- Synchronous Zoom classes may be recorded. If you do not wish your image to be shown to other students, you do not have to enable your Zoom video. If you do not wish your words to be heard by other students, you can send your course input to the instructor via email.
  - Any recordings permitted in this class can only be used for the student’s personal educational use. Students are not permitted to copy, publish, or redistribute audio or video recordings of any portion of the class session to individuals who are not students in the course or academic program without the express permission of the faculty member and of any students who are recorded. Distribution without permission may be a violation of educational privacy law, known as FERPA as well as certain copyright laws. Any recordings made by the instructor or university of this course are the property of Temple University.
- Zoom, Proctorio or a similar proctoring tool may be used to proctor exams and quizzes in this course. These tools verify your identity and record online actions and surroundings. It is your responsibility to have the necessary government or school issued ID, a laptop or desktop computer with a reliable internet connection, Chrome software with Proctorio extension installed, a webcam or built-in camera and microphone, and system requirements for using Proctorio, Zoom, or a similar proctoring tool.
- Limited resources are available for students who do not have the technology they need for class. Students with educational technology needs, including no computer or camera or insufficient Wifi-access, should submit a request outlining their needs using the Student Emergency Aid Fund form. The University will try to meet needs, such as with a long-term loan of a laptop or Mifi device, a refurbished computer, or subsidized internet access.