

# SWE 642

## Software Engineering for the World Wide Web

Spring Semester, 2021

Location: **Online/Blackboard Collaborate Ultra**

Time: Tuesday 7:20-10:00pm

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Professor:	<b>Dr. Vinod Dubey</b>
Email:	<a href="mailto:vdubey@gmu.edu">vdubey@gmu.edu</a>
Class Hours:	Tuesday 7:20-10:00
Prerequisite:	SWE 619 and SWE Foundation material or (CS 540 and 571)
Office Hours:	Anytime electronically, or by an appointment
GTA:	<b>Naveen Porla</b> , Email: <a href="mailto:nporla@masonlive.gmu.edu">nporla@masonlive.gmu.edu</a>
GTA Office	TBD – Please check GTA office hours site
Hours/Location:	<a href="https://cs.gmu.edu/academics/gta-office-hours/">https://cs.gmu.edu/academics/gta-office-hours/</a>

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## Overview

### OBJECTIVE:

After completing the course, students will understand the concepts and have the knowledge of how web applications are designed and constructed. Students will be able to engineer high quality building blocks for Web applications.

### CONTENT:

Detailed study of the engineering methods and technologies for building highly interactive web sites for e-commerce and other web-based applications. Engineering principles for building web sites that exhibit high reliability, usability, availability, scalability and maintainability are presented. Methods such as client-server programming, component-based software development, middleware, and reusable components are covered. After the course, students should be prepared to create software for large-scale web sites.

SWE 642 teaches some of the topics related to the exciting software development models that are used to support web and e-commerce applications. We will be studying the software design and development side of web applications, rather than the policy, business, or networking sides. An introductory level knowledge of HTML and Java is required. SWE 619 is a required prerequisite and SWE 632 is a good background course. The class will be very practical (how to build things) and require several programming assignments.

The course content will focus on client-side and server-side software design and development. We will learn technologies such as **XHTML/HTML5, CSS3, JavaScript, Ajax, jQuery, Angular-Web Development Framework, TypeScript, Web components of JEE platform: Servlets and JSPs, Integration of Servlets and JSPs: An implementation of Model View Controller (MVC) Architecture, JDBC, Java Persistence API (JPA 2.0), Enterprise JavaBeans (EJB3), Messaging, Message Driven Beans, RESTful Web services, and the Docker container technology to containerize Web Applications.**

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## Textbook and Readings

- *Internet & World Wide Web How to Program (5th Edition)* , P.J. Deitel and H.M. Deitel, Pearson Prentice Hall (**Recommended**)
- *Java: How to Program*, 11th edition, Deitel and Deitel , Prentice Hall. (**Recommended**)
- *Core Servlets and JavaServer Pages*, Second Edition, Volume 1: Core Technologies by Marty Hall and Larry Brown (**Recommended**)
- *Enterprise JavaBeans 3.1, 6th Edition* , By Andrew Lee Rubinger, Bill Burke, O'Reilly, ISBN 0596158025 (**Recommended**)

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## Grading

### EXAMS:

There will be a midterm and a final exam, both in class. The final exam will focus on material covered after the midterm.

**Phone Use Policy:** Phones should be switched off during the mid-term and final exams. Phones, especially smart phones with Internet access and camera, are not allowed to be on person during exams.

## **HOMEWORK/PROGRAMMING ASSIGNMENTS:**

Several homework assignments will be given. I will post the assignments on the class web site or on Blackboard and discuss them in class. You will submit your solutions by placing links to the executables on your class web sites and submitting the source files through [blackboard](#). Be sure that you are on the class mailing list, as refinements and hints for the assignments will be sent through email as well as posted on blackboard. Assignments will be checked immediately after the due date; if you finish an assignment late, you must inform us by email when it is ready for us to grade it. Changing an assignment after the due date without prior permission will be treated as a late submission. Programs will be graded on style and formatting as well as correctness.

## **MAKEUPS:**

Unless arrangements are worked out in advance, missed tests **cannot** be made up, and 10 percent per class meeting will be deducted for late homework submissions. Under no circumstances will any assignment be accepted after the official end of classes (the start of finals week).

## **GRADING:**

Grades will be (approximately): 33% the midterm, 34% the final, 25% the programming assignments, and 8% group project/class participation.

Final averages are assigned a letter grade according to the following ranges:

<b>Percentage</b>	<b>Grade</b>
[99, 100]	A+
[92, 98]	A
[90, 91]	A-
[88, 89]	B+
[82, 87]	B
[80, 81]	B-
[78, 79]	C+
[72, 77]	C
[70, 71]	C-
[60, 69]	D
[0, 59]	F

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## Schedule (subject to change; check regularly)

Week	Date	Lecture topic	Readings	Announcements
1	1/26	<b>Course Overview</b> Introduction to the Internet and World Wide Web	<ul style="list-style-type: none"> <li>DD1, <a href="#">paper</a></li> </ul>	
2	2/02	<b>Intro to Web Software</b> XHTML/HTML5	<ul style="list-style-type: none"> <li>DD 2 and 3</li> <li><a href="https://www.w3schools.com">https://www.w3schools.com</a></li> </ul>	HW1
3	2/09	<b>Presentation &amp; Styles</b> Cascading Style Sheets (CSS3), JavaScript	<ul style="list-style-type: none"> <li>DD 4, 5</li> <li><a href="https://www.w3schools.com">https://www.w3schools.com</a></li> </ul>	
4	2/16	<b>Client-side Software</b> JavaScript, JavaScript Functions, DOM, Event Handling	<ul style="list-style-type: none"> <li>DD 6-13, 16</li> <li><a href="https://www.w3schools.com">https://www.w3schools.com</a></li> </ul>	HW2
5	2/23	<b>Client-side Software</b> More on JavaScript; Cookies, Ajax	<ul style="list-style-type: none"> <li>Class Notes; <a href="http://jquery.com/">http://jquery.com/</a></li> </ul>	
6	3/2	<b>Rich Internet Applications</b> jQuery Essential, jQuery User Interface (jQuery UI) <b>Bootstrap 4</b>	<ul style="list-style-type: none"> <li>Class notes, <a href="http://jquery.com/">http://jquery.com/</a></li> <li><a href="http://jqueryui.com/">http://jqueryui.com/</a></li> <li><a href="https://getbootstrap.com/">https://getbootstrap.com/</a></li> </ul>	
7	3/09	<b>Server-side Software</b> Java Servlets, Java Server Pages (JSP), State Handling in Web Applications <b>Integration of Servlets and JSPs</b> Implementing Model View Controller (MVC) Architecture	Class notes, & Ch 6, 7, 8	HW3

		Midterm Exam Review		
8	3/16	<b>Midterm Exam</b> (7:20 pm - 10:00 pm)	In the classroom/Online	
9	3/23	<b>Data Persistence</b> Java JDBC Java Persistence API (JPA 2.0)	<ul style="list-style-type: none"> <li>• Appendix C, JHTP 28</li> </ul>	
10	3/30	<b>Service Tier</b> Web Services--RESTful	<ul style="list-style-type: none"> <li>• Class notes, <a href="http://www.w3schools.com">http://www.w3schools.com</a></li> <li>• JHTP Chapter 31</li> </ul>	
11	4/6	<b>Single-Page Application (SPA)</b> Angular JavaScript Framework, TypeScript	<ul style="list-style-type: none"> <li>• Class notes, <a href="https://angular.io/docs">https://angular.io/docs</a></li> </ul>	HW4/Project
12	4/13	<b>Business Tier</b> Enterprise JavaBeans (EJB3) Session Beans (Stateless, Stateful, Singleton);	<ul style="list-style-type: none"> <li>• Chapters 5, 6, 7, 8 of EJB3 book</li> </ul>	
13	4/20	<b>Business Tier</b> Messaging and Message Driven Beans	<ul style="list-style-type: none"> <li>• Chapters 5, 6, 7, 8 of EJB3 book</li> </ul>	
15	4/27	<b>Containerizing Web Applications</b> Docker Containers  <b>Project Presentation/Demo</b>  Final Exam Review	<a href="https://www.docker.com/">https://www.docker.com/</a>	
17	5/04	<b>Final exam</b> (7:20 pm - 10:00 pm)	In the classroom/Online	

Note: DD refers to chapters in Deitel & Deitel's Internet and WWW book, and JHTP refers to chapters in Java How to Program book

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## Academic Integrity

George Mason's [policy](#) concerning student conduct applies. Although students are encouraged to discuss the topics covered in class, all homework assignments, exams, and projects are to be completed individually, unless joint work is explicitly authorized by the instructor. If joint work is authorized, all contributing students must be listed on the submission. Any deviation from this is considered an Honor Code violation, and, as a minimum, will result in failure of the submission and, as a maximum, failure of the class.

Please note that there are two honor code policies: an abstract GMU policy and a more specific departmental policy with regard to code plagiarism, test-taking, etc. The students can find them here: [Honor Code Policies](#)

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## Disabilities

If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Resource Center (DRC) at 993-2474. All academic accommodations must be arranged through the DRC.