

SOEN 387 Web-Based Enterprise Application Design

Fall 2022

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Lecture	M-W	11:45AM - 1:00PM	H 531 SGW
Tutorial FA	M	8:45AM - 9:35AM	MB 3.285 SGW
Tutorial FB	Fr	11:45AM - 12:35PM	MB 1.301 SGW
Tutorial FC	M	8:45AM - 9:35AM	MB 2.285 SGW
Tutorial FD	Fr	11:45AM - 12:45PM	MB 2.255 SGW

Note: There is no tutorials during the first week of classes.

Course Description

Hypertext Transfer Protocol (HTTP), web mark-up languages and encodings. Document Object Models (DOM). Client/server and layered architectures for Web-based Enterprise Applications (WEA). Presentation, Domain and Data Source design patterns. Client-side programming. Java servlets and Java Server Pages. Authentication, security and transaction processing.

Lectures: three hours per week.

Tutorial: one hour per week.

Pre-requisites: COMP 353 previously or concurrently; COMP 354 or SOEN 341; SOEN 287.

Method of Delivery

The lectures and tutorials are delivered in person on campus.

Background

The official pre-requisites for this course are COMP 353, COMP 354 or SOEN 341, as well as SOEN 287. Students are expected to know and remember the knowledge that have acquired in SOEN 287 on Web Programming, as well as the fundamentals and component of Web and the HTTP protocol; be familiar with Software Engineering Mythologies, Software Modeling, and Software Processes (via COMP 354 or SOEN 341), and the fundamentals of Databases (through COMP 353).

The important skills needed to do well in this course include good programming skills, including the ability to understand, analyze, design, and implement large scale programs, understanding and applying design patterns, designing and working with databases.

Objectives and Learning Outcomes

This course is about the architecture and technology used to develop Web-Based Enterprise Applications. Whereas a Software Architecture course will give you a broad idea of architectural patterns, some of which you will see again in this course, SOEN 387 will focus on those patterns directly applicable to web application development.

In this course you will learn about the following technologies: Hypertext Transfer Protocol (HTTP), Web markup languages and encodings. Document Object Models (DOM). Client/server and layered architectures for Web-based Enterprise Applications (WEA). Presentation, Domain and Data Source design patterns. Client-side programming. Java servlets and Java Server Pages. Authentication, security and transaction processing.

Textbooks

“Patterns of Enterprise Application Architecture”, Martin Fowler, 2002, ISBN: 978-0321127426. [required]

Other references

“Internet and World Wide Web How to Program”, Deitel, Harvey M., Deitel, Paul J., Deitel, Abbey. (2012). 5/e. ISBN-10: 0-13-215100-6 ,Prentice Hall [recommended]

“Enterprise Integration Patterns: Designing, Building, and Deploying Messaging Solution”, Gregor Hohpe and Bobby Woolf, 2003, ISBN: 978-0321200686. [complementary]

“Applying UML and patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development” (3rd Edition), Craig Larman, 2004, ISBN: 978-0131489066. [recommended]

“Murach's Java Servlets and JSP” (3rd Edition), Joel Murach and Michael Urban, 2014, ISBN: 978-1890774783. [recommended]

Lecture notes and other reading materials will be available throughout the semester via Moodle.

Teaching Method

The course comprises of weekly lectures and practical training; both in the form of tutorials and assignments. It is emphasized that the attendance in lectures as well as tutorials is mandatory for learning and performing well in this course. The course is delivered on campus. Lectures and Tutorials are delivered in-person.

Course Structure

Lectures: The lectures are a key component of the course, and you are advised to attend the lectures regularly and attentively. The course material is extensive and includes several difficult concepts. Accordingly, we will try to utilize the lecture time in doing things that you would not get by simply reading the book (explaining difficult concepts, giving you alternate perspectives, solving problems, etc.) rather than merely repeating facts that you can simply read from the text book. It is strongly advised that you stay current in your reading of the textbook, and attend the lectures regularly. That will enhance your learning experience and prevent you from being lost in the lectures. In fact, we suggest that you casually go through the textbook sections once before the lecture. You are also strongly advised to go and read the material thoroughly after the lecture. Discussing the material with your fellow classmates, solving problems, and asking questions in the lectures are also likely to help you.

Tutorial: The tutorials will reinforce the material seen during the lectures with examples and exercises. The tutorials are also designed in a way that would assist you to get deeper knowledge and experience of problem analysis and problem solving. It is hence strongly recommended that you attend all the tutorials. Tutorials will take place every week. During the tutorial session, your tutor will explain more examples as well as discuss the assignments and answer questions related to the course, and more specifically related to the assignments. We strongly encourage you to attend these tutorials.

Note: Tutorials start as of week two. There is no tutorial during the first week of classes.

Exams: To pass the course, you must pass the overall exams regardless of your grade in the assignments. The midterm and final exams are held in person at the university. The date/time of the MIDTERM exam will be announced by Week 5. The final exam will be scheduled by the exam's office, during the final exam period. Please see the important dates at the end of this document.

Workload and Grading

Assignments: 30%: There will be 3 to 4 assignments in form of mini projects. These assignments are designed to give you more understanding of the course material and to give you practice into various aspects of web enterprise application design. More information on the specific software, IDE, and compiler version, as well as where they can be accessed will be provided during tutorial/lab times.

Please note that all assignments will be posted on Moodle, all of which must be submitted electronically via Moodle. Not email submission is accepted.

IMPORTANT: A demo will be required for each of programming assignments. Markers will communicate with you via Moodle and you must book a demo time with them. You must perform the demo (if working in a group, all members of the team must be present during the demo). The demos will be carried out online via ZOOM. More information will be provided by the markers. All members of the team must be present during the demo. Failing to demo the assignment or failing to attend the demo at the reserved time, will result in a 0 mark regardless of your submission. There will be no replacement for a missed demo time.

Midterm Exam: 30%: The exam date will be announced on Moodle. The midterm will cover all material presented in the lectures, course notes, the textbooks, and in the assignments up to and including the lecture preceding the exam.

Final Exam: 40%: The final exam will be held during final exam period and will be scheduled by the exam's office. The final exam is comprehensive and covers all the materials taught in the course.

Grading: In order to pass the course, you must pass the overall grade of all four tests regardless of your grade in the assignments.

Note: There is NO standard relationship between percentages and letter grades assigned for this course.

Graduate Attributes

As part of both Computer Science and Software Engineering program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, Computer Scientists and IT professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This course aims at teaching and evaluating the following graduate attributes:

Demonstrate Knowledge Knowledge of Hypertext Transfer Protocol (HTTP), web mark-up languages and encodings. eXtensible Markup Language (XML). Client/server and layered architectures for Web-based Enterprise Applications (WEA). Presentation, Domain and Data Source design patterns. Client-side programming. Java servlets and Java Server Pages. Authentication, security and transaction processing.

Problem Analysis Analyze different problems and derive the requirements, design and implementation constraints for the deployment of web-based enterprise applications.

Design Use of eXtensible Markup Language (XML), client/server and layered architectures for Web-based Enterprise Applications (WEA), presentation, domain and data source design patterns. Use of class diagrams and sequence diagrams to express system design.

Use of Engineering Tools Choice and use of appropriate tools for the development of web-based applications, including client- and server-side application development languages and tools.

Contents

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member.

Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the Academic Code of Conduct and/or the Code of Rights and Responsibilities.

Code of Conduct

Students should be aware of the University's Code of Conduct (Section 17.10.3 of the Undergraduate Calendar) concerning cheating, plagiarism, and the possible consequences of violating this code. Sharing codes, design diagrams, algorithms, etc. amongst teams or taken from elsewhere (without proper citation) is not permitted. No need to mention that one learns little from copying others' work.

Submission format

All assignment-related submissions must be adequately archived in a ZIP file using your ID(s) and last name(s) as file name. The submission itself must also contain your name(s) and student ID(s). Use your "official" name only - no abbreviations or nick names; capitalize the usual "last" name. Inappropriate submissions will be heavily penalized. Only electronic submissions via Moodle will be accepted.

Topics

The approximate timetable is shown below. Students will benefit greatly by reading the relevant sections of the textbook and/or the lecture notes before coming to class.

Week	Topics
1	An overview of HTML5, JavaScript, PHP, SQL, Java
2	Chapter 1: Layering
	Chapter 2: Organizing Domain Logic
3	Chapter 3: Mapping to Relational Databases
	Chapter 4: Web presentation
4	Chapter 5 Concurrency
	Chapter 6: Session State
5	Chapter 9: Domain Logic pattern
6	Chapter 10: Data source Architectural pattern
7	Chapter 11: Object-Relational Behavioral Patterns
	Chapter 12: Object-Relational Structural Patterns
8	Chapter 13: Object-Relational Metadata Mapping Patterns
9	Chapter 14: Web presentation Patterns (MCV)
10	Chapter 15: Distribution Pattern (Remote Façade)
11	Chapter 16: Offline Concurrency Pattern
12	Chapter 17: Session State Patterns (client, server and Database)
13	Chapter 18: Base Pattern