

CSE494/CSE598

## Service-Oriented Computing and Information Management

### Syllabus and Course Information

<http://www.public.asu.edu/~ychen10/teaching/cse494socim/CSE494598SOCIM.pdf>

First offer: Summer 2010, planned to be offered every summer 8 weeks session

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### Course Description

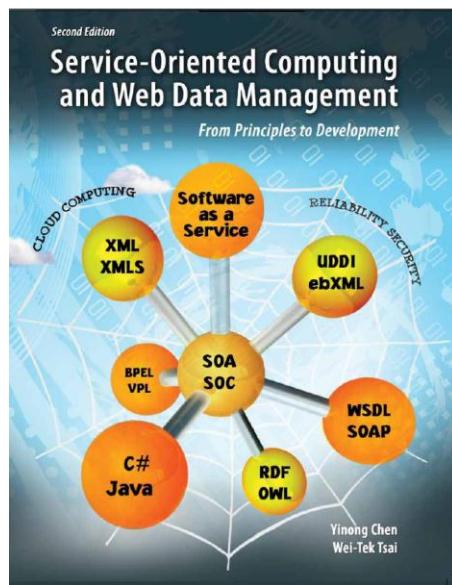
Web-based software development using services and data resources as infrastructure, architecture design, composition, messaging, data representation, information management, and with quality of service consideration.

### Textbook

Y. Chen and W.T. Tsai, Service-Oriented Computing and Web Data Management (Second Edition), Kendall/Hunt Publishing, 2010, ISBN 978-0-7575-7747-5.

This book is used for both CSE445/598 (Distributed Software Development) and CSE494/598 (Service-Oriented Computing and Information Management). CSE445/598 will teach from Chapters one through six, while CSE494/598 will teach from Chapters 7 through 14. Some basic materials in the first six chapters will be briefly reviewed in CSE494/598, so that this course does not have CSE445/598 as a prerequisite. The table of the contents of the book is at:

<http://www.public.asu.edu/~ychen10/book/socwdm.html>



## **Course Objectives and Outcomes**

1. To understand web-based collaborative software architecture including development processes and techniques
  - Students understand the current software architecture and techniques in web-based development.
  - Students can identify advantages and disadvantages of different software architectures and their trade-offs.
  - Students can identify engineering and quality issues in developing web-based software
  - Students understand the collaborative nature of web-based development including sharing, publishing, and cooperation
2. To understand and apply service-oriented approach in web-based software development
  - Students can apply service-oriented approach in software development
  - Students can develop service-oriented applications using different composition methods
  - Students can compose service-oriented applications using service resources
3. To understand and apply information management in web-based software development
  - Students can compose service-oriented applications using different data resources
  - Students can apply state management to develop web-based applications with state information
  - Students can apply advanced development and management tools to develop web-based software effectively.
4. To understand the dependability issues in service-oriented software and apply techniques to enhance dependability
  - Students can apply reliability design in web-based software development
  - Students can apply security design in web-based software development
  - Students can apply verification and testing process in web-based software development

## **Topics Covered in the Course (Tentative)**

The course will be delivered in 26 lectures, with 75 minutes each lecture.

1. Introduction and Overview of Service-Oriented Computing and Information Management (4 lectures)
  - Service-oriented computing and Web-based computing
  - Web application architecture
  - Application composition based on existing services
  - Data representations
  - Data management in service-oriented software
  - Cloud Computing
2. Advanced Web Service and Workflow Development (6 lectures)
  - Service Standards
  - Service development in Windows Communication Foundation
  - Service hosting and consuming

- REST concept and RESTful services
  - Service and Application Development in Workflow
3. Software composition (4 lectures)
- Introduction to application composition languages
  - Application development in BPEL
  - Environment supporting BPEL application development
  - Application development in Mashup
  - Other composition methods
4. Event-Driven and Service-Oriented Computing in Robotics Application (3 lectures)
- Event and data-driven architecture
  - Robotics Developer Studio
  - Visual Programming Language VPL
  - Robotics Simulation
  - Robot as a Service
5. Interfacing Service-Oriented Applications with Databases (4 lectures)
- Databases in service-oriented software
  - Interfacing with relational database
  - Native XML database and query
  - LINQ to objects, LINQ to SQL, and LINQ to XML
6. Ontology and Semantic Web (2 lectures)
- Introduction to ontology and semantic Web
  - Ontology Languages RRF and RDFS
  - Ontology Language OWL
7. Cloud Computing (3 lectures)
- Concepts: SaaS, IaaS, and PaaS.
  - Service virtualization
  - SaaS in detail
  - Developing cloud computing applications in different environments: Amazon.com, Azure platform, Google App Engine, Salesforce.com,

### **Assignments and Projects:**

Software development projects on selected topics.

- Service development in SOAP and RESTful styles
- Software composition in Workflow Foundation
- Software composition in BPEL
- Robotics application development in VPL
- Interfacing to database through LINQ
- Research on a selected topic

## **Weight and Grading Scale**

The performance will be assessed by assignments, programming projects, quizzes, a mid-term and a final exam. Their weights are:

Homework Assignments / Projects	35%
Lecture Exercises	6% (Test what is covered in the lecture)
Quizzes 1, 2, 3, 4	15%
Mid-Term Exam	20%
Final Exam	24%
Total	100%

The final letter grade is decided according to the percentage points obtained as follows:

A-, A, A+	90-92, 93-95, 96-100%
B-, B, B+	80-82, 83-86, 86-89%
C, C+	70-75, 76-79%
D	60-69%
E	less than 60%

The grade of "I" (incomplete) can be given ONLY when a student, who is doing otherwise acceptable work (passing grade), is unable to complete a part of work (e.g., the final exam) because of documented illness or other conditions beyond the student's control. In the latter case, the student must discuss with the instructor and complete an application form from the department before the part of work is due or as soon as the circumstances are known. Please see ASU grading policies at: <http://students.asu.edu/grades-grading-policies>

## **Extra Credit and Alternative Activity**

Missing a graded activity will be given zero credit. In-class exercises and quizzes may not be made up. No extra credit-activities will be given to any individual. Extra credit-activities may be given to the entire class. An alternative to the assignment and exam may be arranged if a student misses the activity and the absence is caused by documented illness or personal emergency that made the completion/attending impossible. A written explanation (including supporting documentation) must be submitted to the instructor before the part of work is due or as soon as the circumstances are known.

## **Grading Appeals**

Any inquires or appeals on grades of homework, projects, or tests must be done in writing by completing the "Grade Inquiry Form" within a week from the day the assignment was returned or comments were published on-line. State the problem and the rationale for any change in grade in your appeal.

## **Cooperation**

You are encouraged to cooperate in study group on preparing assignments, projects, tests and exams where permitted. However, anything that you turn in must be your own work: You must write up your own solution with your own understanding. If you use an idea that is found in a book or from other sources, or that was developed by someone else or jointly with some group, make sure you acknowledge the source and/or the names of the persons in the write-up for each problem.

The instructor and the TA will **CAREFULLY** check any possible proliferation or plagiarism. We will use the document/program comparison tools like MOSS (Measure Of Software

Similarity) to check any assignment that you submitted for grading. The Ira A. Fulton School of Engineering and the Department of Computer Science and Engineering expect all students to adhere to ASU's policy on Academic Dishonesty. These policies can be found in the Code of Student Conduct:

[http://www.asu.edu/studentaffairs/studentlife/judicial/academic\\_integrity.htm](http://www.asu.edu/studentaffairs/studentlife/judicial/academic_integrity.htm)

ALL cases of cheating or plagiarism will be handed to the Dean's office. Penalties include a failing grade in the class, a note on your official transcript that shows you were punished for cheating, suspension, expulsion and revocation of already awarded degrees.

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