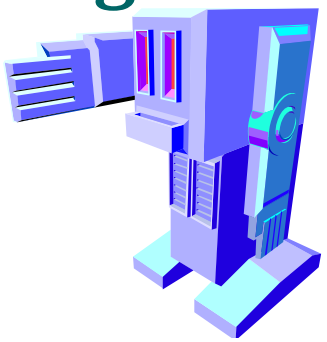
CSE 446 / 598

Software Integration and Engineering

Day One Itinerary

About the Course



Dr. Yinong Chen

https://myasucourses.asu.edu/

ASU IRA A. FULTON SCHOOLS OF engineering

school of computing, informatics, & decision systems engineering

Day One Itinerary

- About the instructor
- Course objectives & outcomes
- Syllabus discussion
- Unit 1

Instructor: Yinong Chen

Joined ASU CSE in 2001

- This Semester:
  - CSE 240 Intro to Programming Languages
  - CSE 446 / 598 Software Integration and Engineering
- Before this semester at ASU
  - CSE101/FSE100: Every semester from Fall 06 to Fall 11, S16
  - CSE230: F11, F12, S13, F13, F14
  - CSE220: S2017, S2017, S2018
  - CSE 240: F01, S02, F02, S03, F03, S03, SS04, F04, S05, F05, S06, S07, S12, S13, F13, F14, S15, F15, S16, F16, S17, F17, S18
  - CSE 310: SS01, F01, SS02
  - CSE 225/EEE225: F02, S03, F03, S04; CSE 330: S02, SS 03 □ CSE230
  - CSE 420/598: S01
  - CSE 423: (Capstone) S08, F09; CSE485 F15
  - CSE 445/598: Almost every semester and summer since 2006
  - CSE 446/598: Every Spring and Summer since 2010.

Yinong Chen

Before joining ASU

- Taught for six years

  Department of Computer Science

  Wits University of Johannesburg, South Africa
- Postdoc at LAAS-CNRS, Toulouse, France
- Ph.D. from University of Karlsruhe (KIT), Germany
- Contact and more …

  http://www.public.asu.edu/~ychen10/

Heinrich **Hertz** worked at KIT *from 1885 to 1888, where he discovered* electromagnetic waves

Yinong Chen

- More than 10 books
- 200 research papers, 150 of which are after 2005 in service-oriented computing and computer science education
- Editor of international journals
- Chair of international conferences
- Keynote, panel talks
- Teach high school students to program robots

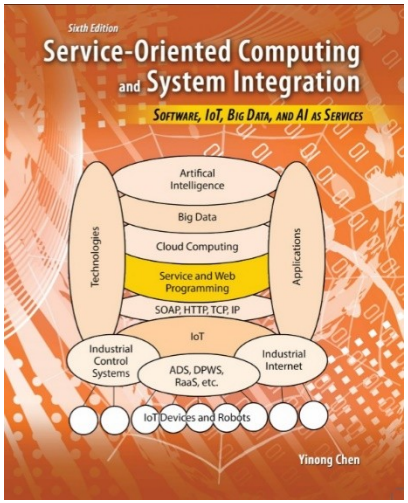
CSE 445 DSD vs. CSE446 SIE

CSE446 Software Integration and Engineering

Catalog Description

Software development using architecture design, composition, workflow, services, data resources, data representations, data management, and development tools.

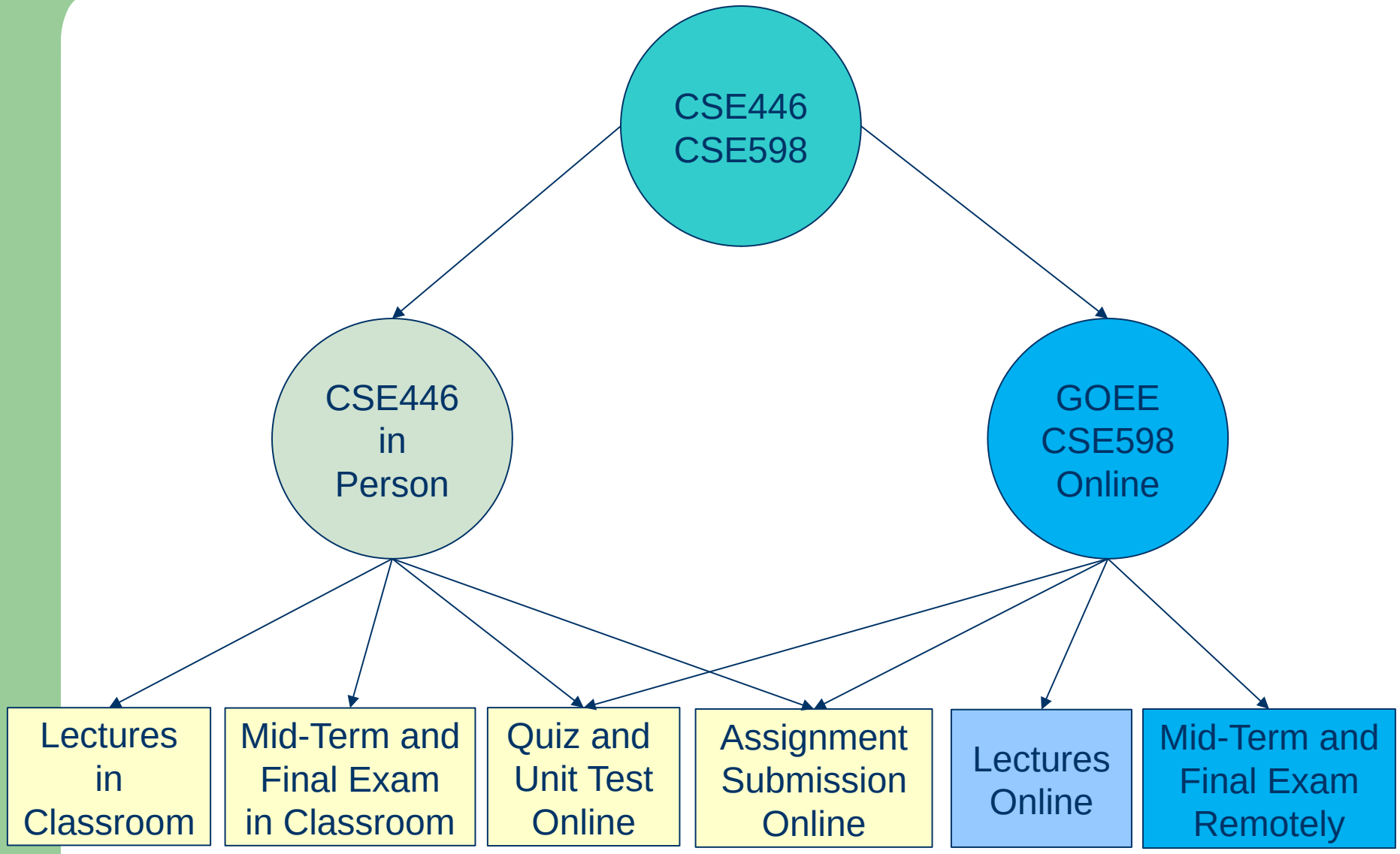
Co-requisite: CSE445 (Does not apply to CSE598)



Key differences with CSE445

- Composition and workflow: architecture-driven software integration from existing components, cloud computing;
- Data sources and data management: Integration of computing with large data sources – databases and other data files, big data, and ontologies,

Sections in Spring 2019



Objectives and Outcomes

1. **To understand software architecture and software process**
   - Students understand the requirement and specification process in problem solving.
   - Students understand software life cycle and process management
   - Students can identify advantages and disadvantages of software architectures and their trade-offs in different applications

Standard objective and outcomes in any software engineering course

Objectives and Outcomes

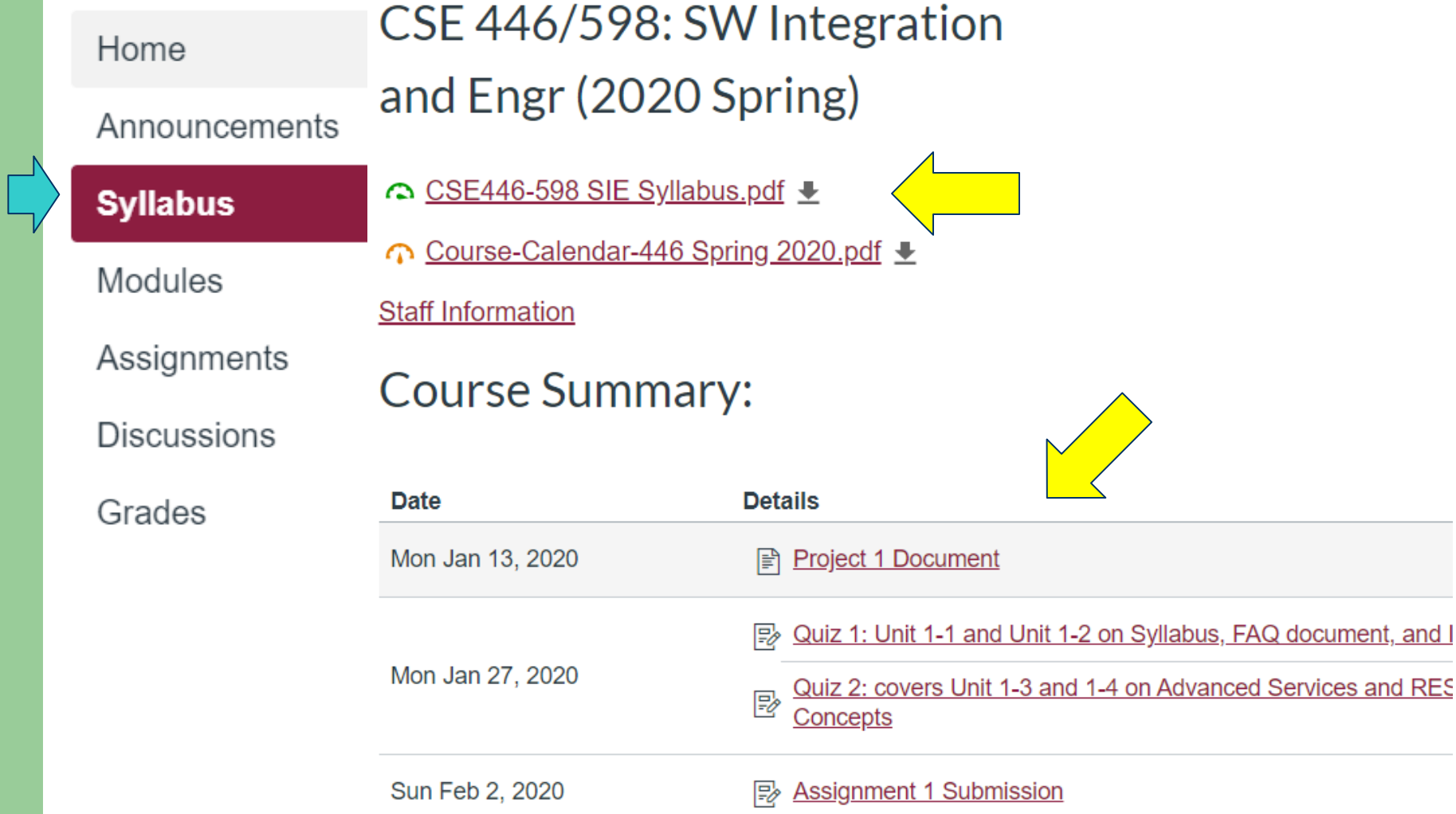
2. **To understand and apply composition approach in software development**

   - Students can apply software architecture to guide software development in the problem solving process.
   - Students understand interface requirement of software services
   - Students can compose software based on interfaces of services and components
   - Students can develop software system using different composition methods and tools

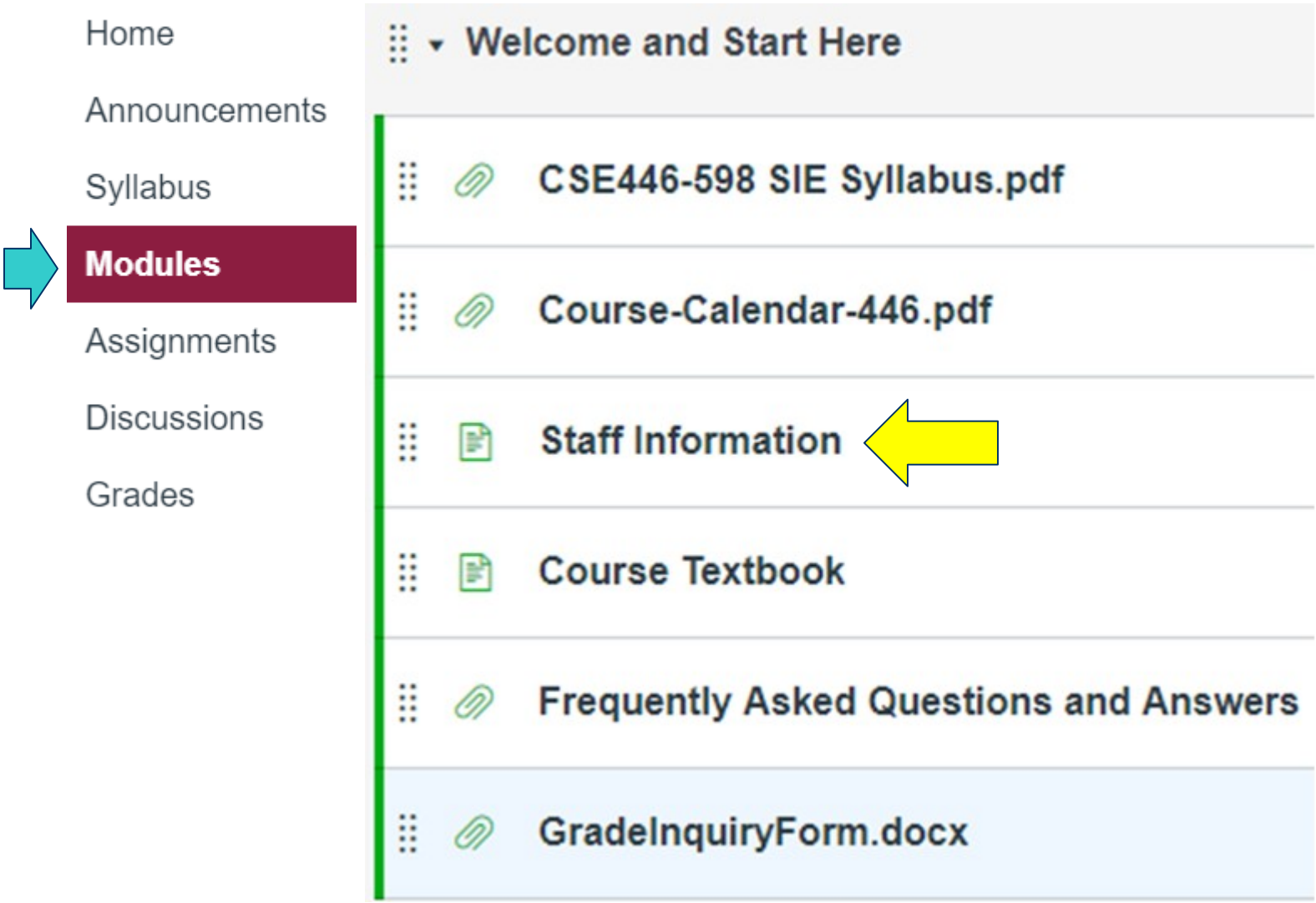
Objectives and Outcomes

3. **To understand and apply data and information integration in software development**
   - Students can compose software systems using different data resources in different data formats.
   - Students can integrate application logic with different databases.
   - Students can apply the entire software life cycle to develop working software systems.

Canvas: Syllabus and Course Summary



Canvas: Modules and Course Information



Canvas Course Modules: Staff Information

Staff Information

Home
Announcements
Syllabus
Modules
Assignments
Discussions
Grades

Dr. Yinong Chen

Email yinong@asu.edu (Please use Canvas mail for course related issues,
Work Phone 4809652769
Office Location BYENG M1-06
Office Hours M: 2:30 - 5:30pm and F: 9:15 - 11:30am, or by appointment.
Personal Link http://www.public.asu.edu/~ychen10/

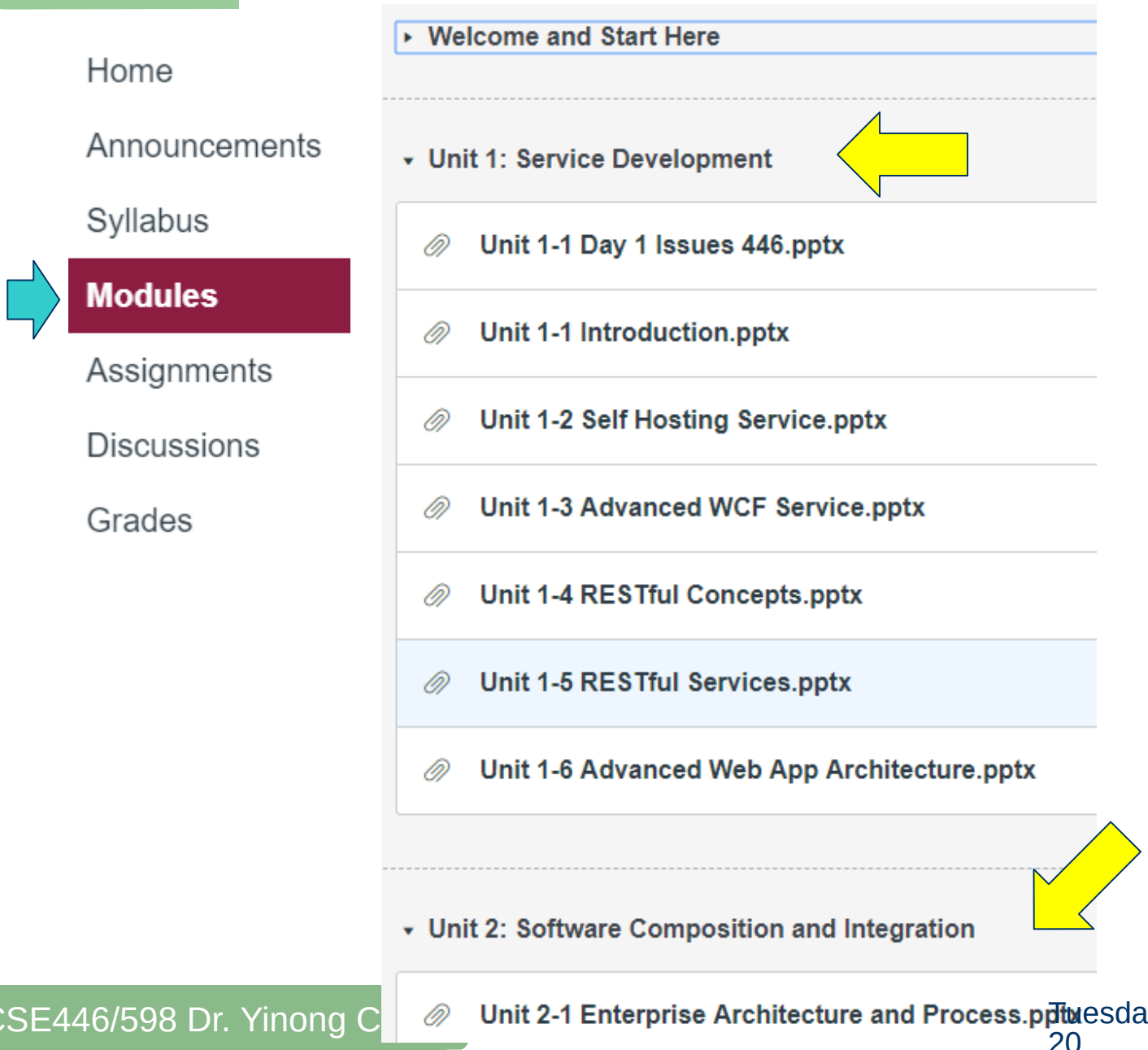
Please use the discussion board for general questions.

When you email me, please always mention the class you are in. This will sa
be applied to answer your and other's questions in more detail. I work 12 ho

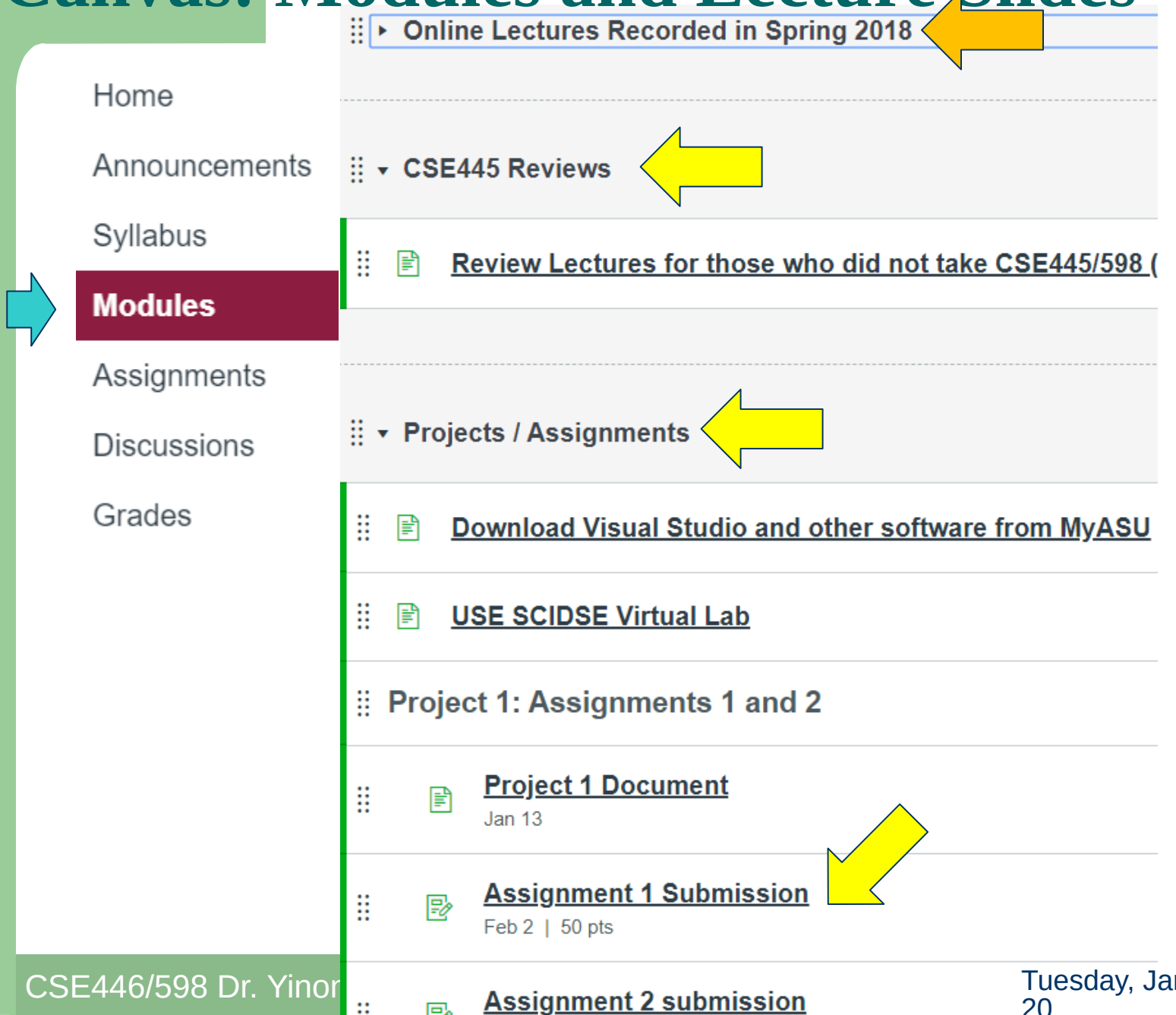
TA Information

Name, contact, and office hours will be announced

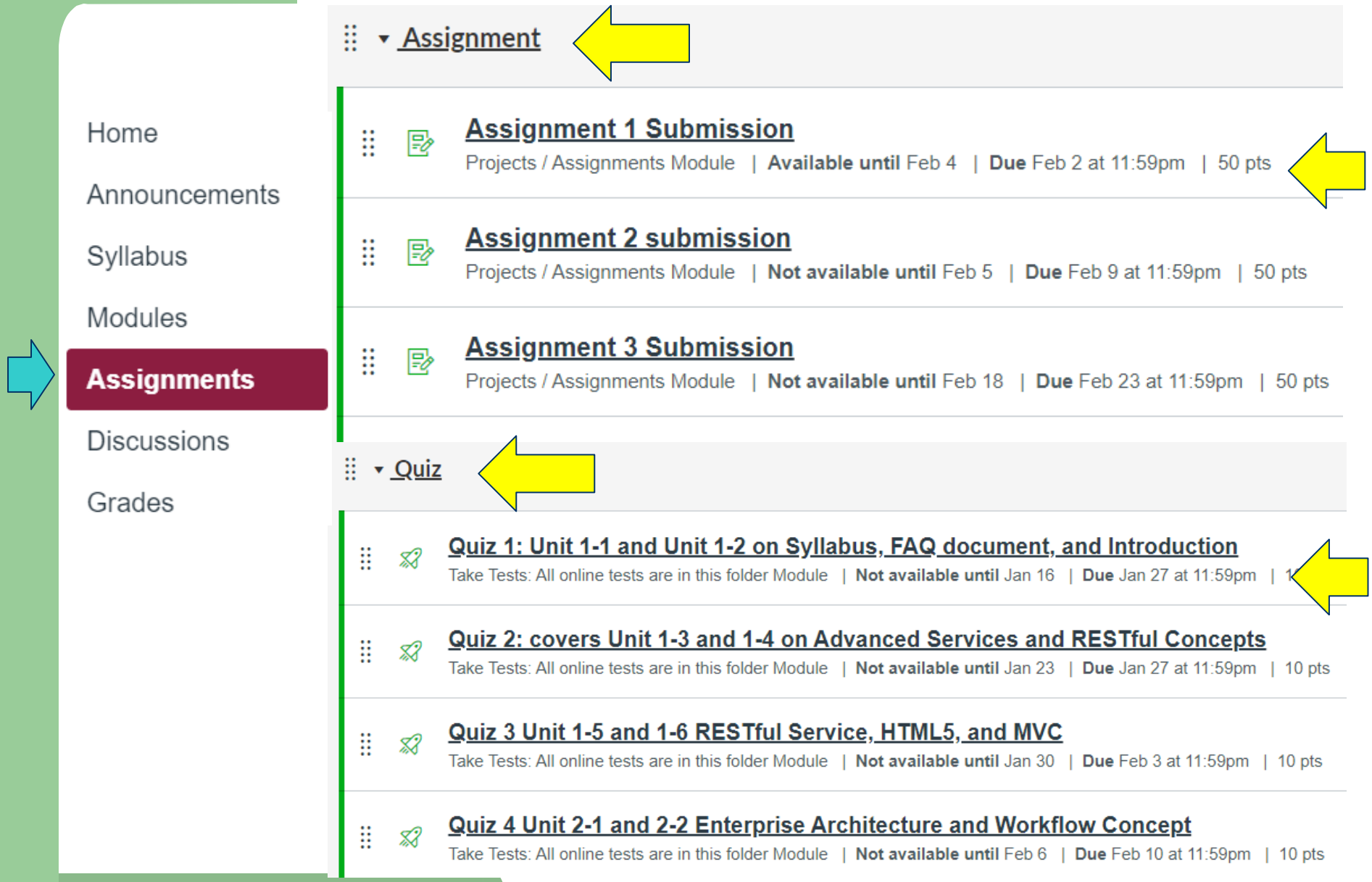
Canvas: Modules and Lecture Slides



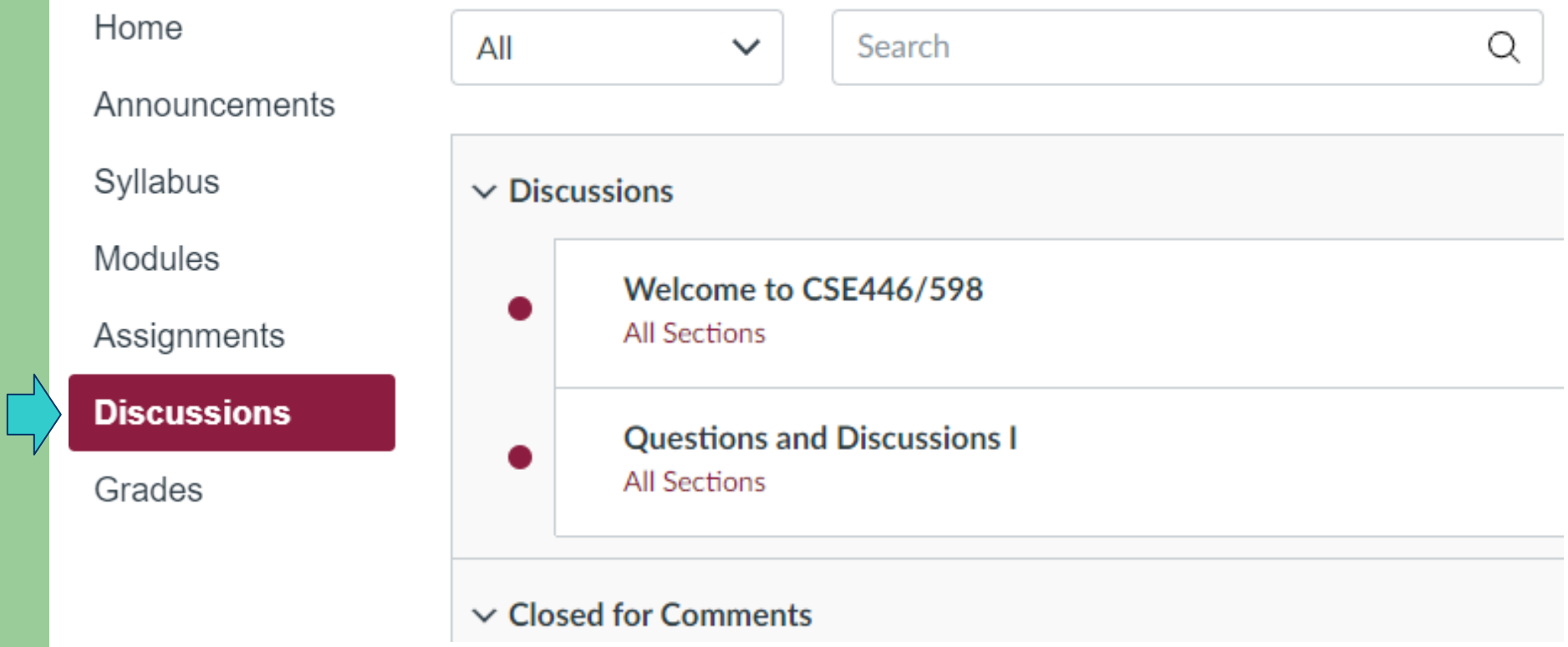
Canvas: Modules and Lecture Slides



Canvas: Upcoming Tests and Submissions



Canvas: Discussion Board



Weight and Grading Scale

Quizzes and unit tests will be given online for all students. You can take them in the lecture week.

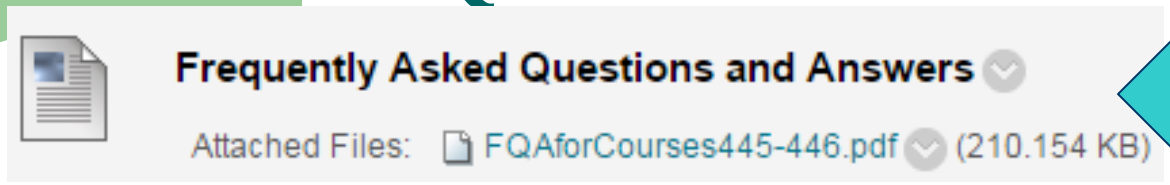
Graded Activity	Weight
Assignments*	30%
Weekly Quizzes**	11%
Unit Tests 1, 2, 3, 4, 5*	12%
Mid-Term Exam	22%
Final Exam	25%

Percentage	Symbol Grade
96.5-100%	A+
92.5-96.4%	A
89.5-92.4%	A-
86.5-89.4%	B+
82.5-86.4%	B
79.5-82.4%	B-
75.5-79.4%	C+
69.5-75.4%	C
59.5-69.4%	D
Below 60%	E

* The lowest one will be dropped, no make up and no reset

** The lowest two will be dropped, no make up and no reset.

Read FAQ document in Course Web



Q: If I missed the deadline for taking an online test, can I make up the missed test?
A: No. Online tests may not be taken after the due date. However, the two lowest scores of the quizzes AND the lowest score of the chapter/unit tests will be dropped. If you missed two quizzes and one chapter/unit test, the zero grades will be dropped automatically in calculating the weighted average grade.

Q: If I missed the deadline for taking online quizzes/tests, can I get their solutions for study purposes?
A: No. Online test questions are generated automatically from a pool of questions. If you do not take them, they are not generated. Therefore, do not miss online quizzes/tests! You can use the sample questions and solutions in the textbook for study purposes.

Q: I need extra credit to improve my grade. Can you please give me extra assignments for the extra credit?

A: No extra credit-activities will be given to any individual. Extra credit-activities are given to the entire class through dropping one chapter/unit test and two quizzes.

As written in the syllabus, 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.

Q: I missed 1% point to receive a B (for example) grade. This is important to me and to my family. If I do not receive a B in this course, I will lose my scholarship, and I have to drop from the university. Can you please take this situation into account to move my grade up?

Standard Classroom Expectation

- Silent your cellular phone; If your phone happens to ring, stop it immediately and do not answer your phone!
- Use computer for directly related activities only, e.g., taking notes. No computer is allowed during any tests (lecture exercises quizzes, exams).
- Do not talk to each other during the lecture. If you have a question that needs to be resolved immediately, you must ask the instructor.
- Enter the classroom before the lecture's starting time.
- Do not leave the classroom during the lecture, unless there is an emergency situation.

Policies

- Interaction: You are encouraged to ask the instructor questions during the lectures.
- Outside class help welcome and encouraged:
  - Discussion board (effective and fair);
  - Instructor's and the TA's office hours;
  - Request appointments if you can not make the office hours;
  - Email/phone call, if necessary.
- Tests and exams: Missing tests and exams will be giving zero credit and may not be made up.
- Assignments: Late submission will be accepted with grade deduction: 1% of grade deduction for every hour after the due time.

Extra credit, alternative, and inquires

- No extra credit-activities will be given to any individual. Extra credit-activities may be given to the entire class.
- An alternative to a graded activity may be arranged if a student's absence is caused by **documented illness or personal emergency**. 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.
- 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 grades and/or comments were published on-line. State the problem and the rationale for any change in grade in your appeal

Cooperation and Code of Conduct

- You are encouraged to cooperate in study group on learning course materials.
- You may not cooperate on preparing the individual assignments**.** Anything you turn in must be your own work. If you use an idea that is found in a book or other sources, make sure you acknowledge the source and/or the names of the persons in the write-up for each problem.
- All assignment questions must be asked in the course discussion board. Asking assignment questions or making your assignment available in the public websites before the assignment due will be considered AI policy violation.
- The instructor and the TA are required to CAREFULLY check any possible proliferation or plagiarism. We will use the software tools like MOSS (Measure Of Software Similarity) to check any assignment. The university expects all students to adhere to ASU's policy on Academic Dishonesty. These policies can be found in the Code of Student Conduct:

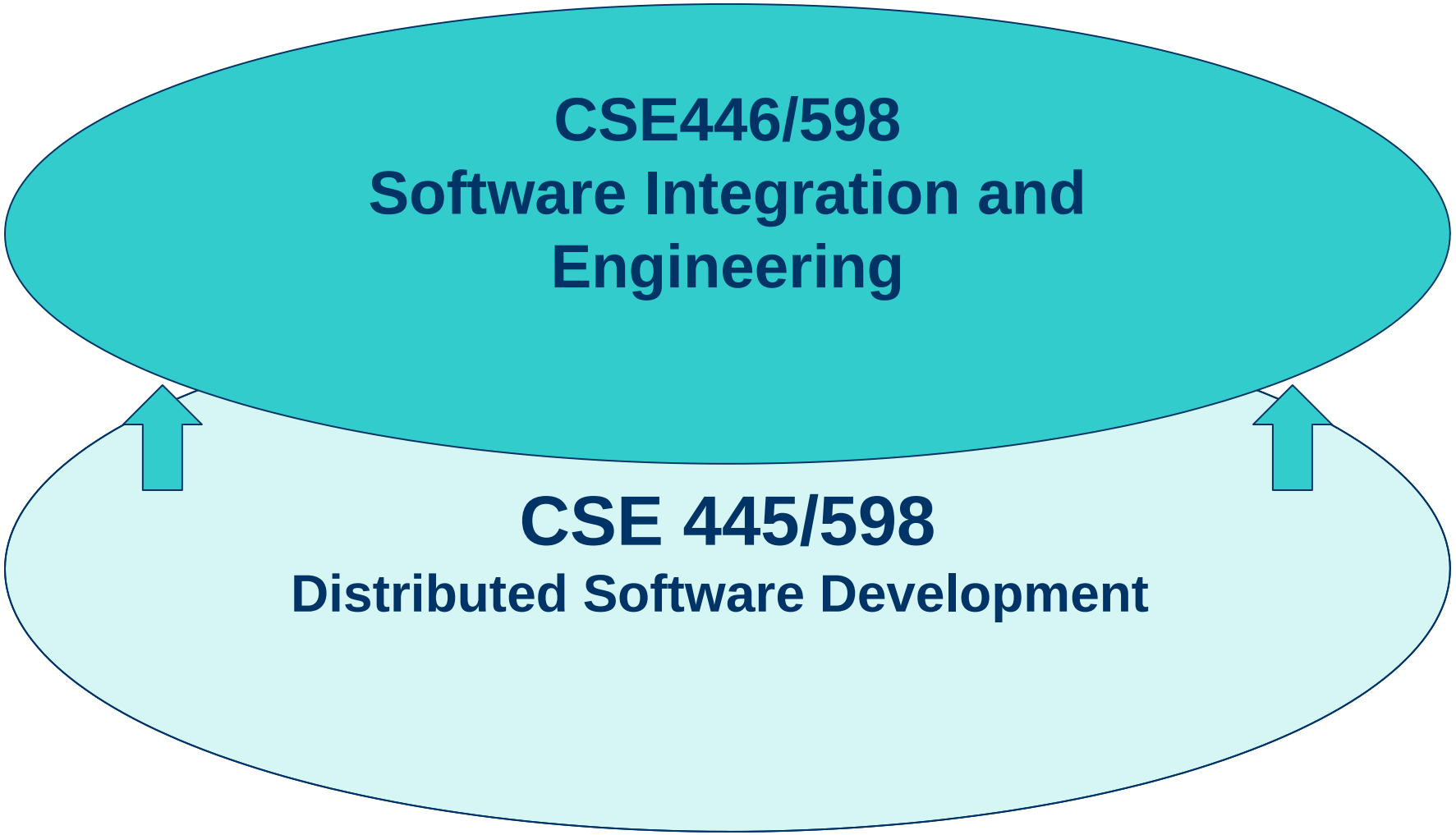
  https://provost.asu.edu/academicintegrity/policy

  ALL cases of AI policy violation will be handed to the Dean's office. Penalties include a failing grade in the class, a note on your official transcript (XE) that shows you were punished for AI policy violation .

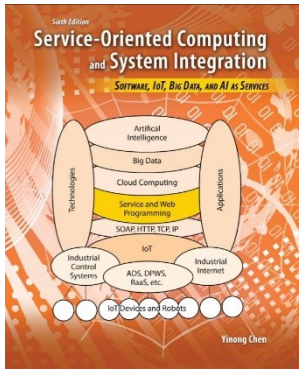
Announcement and Information

- Official announcements will be made either in the class or in the “Announcement” part of the course web page.
- Articles or answers in the discussion board by the instructor, the TA, or other students are not official announcement.
- Make sure you regularly (at least once every two days) check the course web page for any announcements.

CSE 445/598 (DSD) vs. CSE446/598 (SIE)



One Text for Two Courses



DSD

Part I	Distributed Service-Oriented Software Development and Web Data Management
Chapter 1	Introduction to Distributed Service-Oriented Computing
Chapter 2	Distributed Computing with Multithreading
Chapter 3	Essentials in Service-Oriented Software Development
Chapter 4	XML and Web Data Formats
Chapter 5	Web Application and Data Management
Chapter 6	Dependability of Service-Oriented Software

Reading

Assignment 1

SIE

Part II	Advanced Service-Oriented Computing and Large System Composition
Chapter 7	Service-Oriented and REST Architecture
Chapter 8	Enterprise Software Development and Integration
Chapter 9	IoT, Robotics, and Device Integration via Visual Programming
Chapter 10	Interfacing Service-Oriented Software with Database
Chapter 11	Big Data, Artificial Intelligence, and Cloud Computing

Topics To be Covered

- Unit 1 - Chapter 7:
  Introduction, Advanced SOA and REST Architecture
- Unit 2 - Chapters 7 and 8:
  Software Development by Composition and Integration
- Unit 3 - Chapter 9:
  IoT, Robotics, and Device Integration
- Unit 4 - Chapter 10:
  Web Application and Data Integration
- Unit 5 - Chapters 11:
  Big Data and Ontology, AI, Cloud Computing and Software as a Service

Unit 1

Advance SOA and REST Architecture

1. Day 1 Issues and Introduction
2. Self-Hosting Services
3. Advanced WCF Services
4. REST Concepts
5. RESTful Services
6. Advanced Web Application Architecture

Unit 2

Software Development by Composition and Integration

1. Enterprise Application Architecture
2. Workflow-based Software Development 1
3. Workflow-based Software Development 2
4. BPEL Process
5. BPEL Case Study
6. BPEL Frameworks
7. Message-Based Integration
8. Other Composition Languages

Unit 3

Event-Driven Development and Device Integration

1. Device Integration
   - Internet of Things
   - Service-Oriented Robotics Computing
   - Event-Driven Robotics Applications
   - Robot as a Service in Cloud Computing
2. Different Visual Programming Languages
3. ASU VIPLE and Workflow-based IoT App Development
   - Developing IoT and Service-Oriented Robotics Applications
   - Finite State Machine and VIPLE Diagram
   - VIPLE Workflow on different Platforms (Intel and EV3)

Unit 4

Application and Data Integration

1. ADO
2. XML Database
3. LINQ 1
4. LINQ 2
5. LINQ 3

Unit 5 Big Data, AI and Cloud Computing

1. Big Data Concepts and Domains
   - Concepts
   - Infrastructure
2. Big Data Processing
   - MapReduce and Hadoop
   - Analytics
3. AI and Machine Learning
   - AI Development and Domains
   - Automation vs. machine-learning software
   - Case Study: Image recognition
   - Case Study: Flight pattern training and recognition

Unit 5 (Contd.)

4 Ontology for AI and Semantic Web
- Ontology Languages RDF and RDF Schema
- Web Ontology Languages and IDEs

5 Cloud Computing and Software as a Service
- Software as a Service, Platform as a Service, and Infrastructure as a Service,
- Multi-tenancy

6 Cloud Computing Case Studies
- Google Cloud: from concepts to implementation
- Microsoft Azure from development to deployment
- Oracle Cloud
- Amazon Cloud