San José State University
College of Science/Computer Science Department
CS 218 – Topics in Cloud Computing, Section 1, Fall 2020

Course and Contact Information

Instructor:	Dr. Kong Li
Office Location:	Online
Email:	kong.li@sjsu.edu (Email subject starts with CS218)
Office Hours:	Tue 3:00PM – 4:00PM or by appointment
Lecture Days/Time:	Tue & Thu 1:30PM – 2:45PM (8/19/2020 - 12/7/2020)
Classroom:	Online
Prerequisites:	CS 149 (with grade C- or higher). Students who do not provide documentation of having satisfied the class prerequisite requirements by the second class meeting will be dropped from the class.

Fall 2020: this course (lectures, exams, office hours, etc.) is completely online via Zoom, and is taught synchronously at the specified meeting pattern. You may participate asynchronously based on class recordings, except you must attend a few specific sessions synchronously at the specified datetime. See the schedule for details.

Course Description

Topics in cloud computing, including distributed system models, virtual machines, virtualization, cloud platform architectures (IaaS, PaaS, SaaS), service-oriented architectures, cloud programming and software environments, peer-to-peer computing, ubiquitous cloud, cloud security and trust management. Prerequisite: CS 149.

Catalog Course Description is available at
https://catalog.sjsu.edu/preview_course_nopop.php?catoid=2&coid=7034

Faculty Web Page and Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas Leaning Management System course login website at https://sjsu.instructure.com. Each submission of any assignment (homework, report, etc.) is "self-contained" and should be made on Canvas. You are responsible for regularly (i.e. every couple of days) checking with the messaging system (email, announcements, discussions) through Canvas and through MySJSU on Spartan App Portal at https://one.sjsu.edu to learn of any updates. Students are encouraged to use the Canvas discussion boards for collaboration.

- Canvas information at https://www.sjsu.edu/ecampus/teaching-tools/canvas/index.html
- Canvas student resources at https://www.sjsu.edu/ecampus/teaching-tools/canvas/student_resources/index.html

- If you are having problems logging on, please [submit a ticket](#) at https://isupport.sjsu.edu
- [View instructor's comment](#) at https://guides.instructure.com/m/4212/l/54359-how-do-i-view-instructor-comments, and [view annotated comment](#) at https://guides.instructure.com/m/4212/l/352349-how-do-i-view-annotation-feedback-comments-from-my-instructor-directly-in-my-assignment-submission

Course Goals

- To learn the cloud definition, service models (IaaS, PaaS, SaaS), and deployment models
- To learn cloud enabling technologies: web, web service (SOAP, REST), virtualization, and data center
- To learn cloud infrastructure mechanisms, specialized mechanisms, and management mechanisms
- To learn fundamental cloud architectures, and advanced cloud architectures
- To learn and practice cloud programming environments, including VMware ESXi, Google App Engine, Amazon AWS, Microsoft Azure, Hadoop MapReduce, and NoSQL
- To learn concepts and theories from parallel and distributed systems
- Time-permitted: to learn other advance topics in cloud computing

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:
- Understand the above covered topics through completion of homework, quizzes, and examinations.
- Successfully complete labs and projects.
- Work in a team to complete a term project, including independent research, oral presentation, and programming on one latest advancement in cloud computing.

Required Texts/Readings

Textbook
- T. Erl, R. Puttini, and Z. Mahmood, *Cloud Computing: Concept, Technology & Architecture*, Pearson, 2013. ISBN-13: 9780133387520.
  - https://www.pearson.com/us/higher-education/program/Erl-Cloud-Computing-Concepts-Technology-Architecture/PGM239182.html
  - http://www.cloudpatterns.org

- Dan C. Marinescu, *Cloud Computing: Theory and Practice, 2/E*, Elsevier Science & Technology, 2017. ISBN-13: 9780128128107.
  - https://textbooks.elsevier.com/web/product_details.aspx?isbn=9780128128107

Other Readings
- Thomas Erl, Robert Cope, and Amin Naserpour, *Cloud Computing Design Patterns, 1/E*. Prentice Hall 2015. ISBN-13: 9780133858563 (Print), 9780133858624 (Online).
  - https://www.pearson.com/us/higher-education/product/Erl-Cloud-Computing-Design-Patterns/9780133858624.html

- Eric Redmond, and Jim Wilson, *Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement, 2/E*, Pragmatic Bookshelf, 2018. ISBN-13: 9781680502534.
  - https://pragprog.com/book/pwrdata/seven-databases-in-seven-weeks-second-edition

- D. Sitaram and G. Manjunath, *Moving to The Cloud: Developing Apps in the New World of Cloud Computing*, Syngress, 2011. ISBN-13: 9781597497251.
  - https://www.elsevier.com/books/moving-to-the-cloud/sitaram/978-1-59749-725-1

- B. Sosinsky, *Cloud Computing Bible*, Wiley, 2011. ISBN-13: 9780470903568.
  - https://www.wiley.com/en-us/Cloud+Computing+Bible-p-9780470903568

- J. Rosenberg and A. Mateos, *The Cloud at Your Service*, Manning, 2010. ISBN-13: 9781935182528.
  - https://www.manning.com/books/the-cloud-at-your-service

Additional reading material will be distributed to the class as appropriate.

Course Requirements and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Homework and Lab: Each homework/Lab is *individual*. See separate document for assignment. Bring your machine to practice during lab sessions.

Exam and quiz: Midterm Exam, Final Exam, and quiz is *individual* and will be in the form of, but not limited to, short answer questions, design questions, programming questions, etc., and will be based on the individual assignments and course material. Close book; close notes; no calculator.

Projects: See separate document for projects.
Each team consists of a few students and will work on two projects. The first project involves paper-study with in-class presentation. The second project with a self-proposed topic includes research, design, implementation, and testing. Projects have deliverables throughout the semester. Each group member is expected to participate in every phase of the projects. The quality and completeness of all the deliverables will be considered in grading the projects. All projects will be demonstrated in class.

Final Examination or Evaluation

Refer to the Course Schedule for the datetime of the Final Exam.

Technology Requirements

- To work on homework, Lab, and term project, you must have access to recent 64-bit x86 computers running Windows, macOS, or Linux. The CPU must have hardware assisted virtualization (VT-x/AMD-V) that is enabled in BIOS and the computer must have 6+ GB RAM. SJSU has a free equipment loan program available for students.
- Familiarity with Java and Eclipse IDE
- For any online exams (Midterm Exam, Final Exam, etc.), you must have a smart phone, and your computer must have a webcam and must run either Windows or macOS. Linux and Virtual Machine are not supported.
- Students are responsible for ensuring that they have access to reliable Wi-Fi during tests. See Learn Anywhere website for current Wi-Fi options on campus.
- We will use iClicker Cloud to take attendance and conduct polls in class. In order to participate in these activities, you must bring a device (laptop, tablet, or smart phone) to class. Follow the instructions to

setup an iClicker account (or use your existing one if you already have one), and add this course to your account. You can use either the web browser or the iClicker Reef app for free. Visit iClicker at https://www.iclicker.com for more information.

Grading Information

Except the final course grade which is posted on MySJSU, all other grades (assignments, projects, quizzes, exams) are posted on Canvas.

Student Assessment

Homework and Quiz		20%
Project 1 (paper-study) – slides/presentation		5%
Project 2 (Term Project)		20%
Implementation/testing	10%	
Report/demo/slides	10%	
Midterm Exam		25%
Final Exam (comprehensive)		30%

- The instructor reserves the right to change the percentages.
- The final grade of this class is final, and *solely* based on *your* performance in *this* class.
- *Failure to obtain 50% of each component, or failure to take Midterm Exam or Final Exam, will result in a failing grade in this class.*
- The exam dates are final.

Determination of Grade

Grade	Overall Score
A+	95-100
A	90-94.99
A-	85-89.99
B+	80-84.99
B	75-79.99
B-	70-74.99
C+	65-69.99
C	60-64.99
C-	55-59.99
F	0-54.99

Late Penalty

Based on the clock of Canvas, assignments submitted after the deadline earn no credit.

Makeup Exam

NO makeup exams will be given unless (1) you are pre-approved by the instructor before the exam, (2) you have urgent medical excuse for yourself (with medical doctor's written notes covering the exam date), and (3) you bring the proof to the instructor within a week.

Your request WILL NOT be granted if you come back after the scheduled exam date and request a makeup exam.

Classroom Protocol

- Students are encouraged to ask questions in the class.

- Each student is required to engage in classroom activities, submit assignments and reports on time, *and* take exams and tests on time.
- Zoom classroom etiquette: mute your microphone; be mindful of background noise and distractions; Position your camera properly; Limit your distractions/Avoid multitasking.
- You may use your computer for class-related activity only. Web-browsing in class is not allowed.
- During any exams you must power off all mobile devices; any form of communication is treated as cheating.
- Audio/video recording, or taking pictures are not allowed.
- Student causing disruption in the class will be asked to leave the class.

Use of Zoom

- Camera: You must enable your camera during any online exam and project presentations. You should disable the camera during regular lecture in class.
- Recording: You are not allowed to record any class sessions (audio and video). The instructor records lecture/presentation sessions and share them with you through Canvas. You are permitted to only view recordings but not download them. These recordings will be deleted at the end of the semester.
- Online Exam: Exams will be proctored through Respondus Monitor, LockDown Browser, and recorded Zoom sessions. Please note it is the instructor's discretion to determine the method of proctoring. If cheating is suspected the proctored videos may be used for further inspection and may become part of the student's disciplinary record. Note that the proctoring software does not determine whether academic misconduct occurred, but does determine whether something irregular occurred that may require further investigation. Students are encouraged to contact the instructor if unexpected interruptions (from a parent or roommate, for example) occur during an exam.

Refer to a separate document "Online Course Guidelines" for more details.

Academic Integrity and Collaboration Policy

Any course materials such as slides, homework, projects, tests, recordings, etc. are the instructor's intellectual property and you are not allowed to share them in any form with any one or any web site (coursehero.com, chegg.com, etc.), in this semester or any future semester.

The work that you turn in must be original - Every single byte must come from you. You are not allowed to look at anyone else's solution in any form (from other students, web sites, etc.). You may discuss assignments with instructor, grader, and your classmates, provided such discussion is at the high level only, and you still must write your solution yourself.

You must take reasonable steps to protect your work (source code, solution, etc.). You must not share your work in any form with any one or any web sites (github.com, sourceforge.net, coursehero.com, etc.), in this semester or any future semester. Github repositories are public by default, do not put your code there unless you make the repository private. Any projects on sourceforge.net must be set to private.

Each assignment submission including programming code will be checked for similarity.

Any cheating incident will result in the reporting of such incident to the university office of Student Conduct & Ethical Development, will result in academic sanctions (including failing the course), as well as possible administrative sanctions, in accordance to the University Academic Integrity Policy at http://www.sjsu.edu/senate/docs/F15-7.pdf.

University Policies

Per University Policy S16-9 (http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on Syllabus Information web page (http://www.sjsu.edu/gup/syllabusinfo), which is hosted by the Office of Undergraduate Education. Make sure to visit this page to review and be aware of these university policies and resources.

CS 218 Topics in Cloud Computing, Section 1, Fall 2020, Course Schedule

The schedule is tentative and subject to change with fair notice. *The final exam date is firm and cannot be changed.* *Any changes will be announced in due time in class and on the course's web site. The students are obliged to consult the most updated and detailed version of the reading material and syllabus, which will be posted on the course's web site.*

Course Schedule

Week	Date	Topics	References	HW & Projects
1	8/20 #	Course Logistics & projects		
2	8/25	Introduction	Erl 3, 4	8/24 Prerequisites due
2	8/27	Introduction (cont'd)	Erl 3, 4	8/26 Honesty pledge due Marinescu 7 & slides
3	9/1	Concepts: CAP, Paxos	Marinescu 3,4	8/31 Last day to drop classes
3	9/3	Concepts: CAP, Paxos (cont'd) Web Services	Marinescu 3,4 Notes, Erl 5.4, 5.6	(Team size)
4	9/8	Web Services (cont'd)	Notes, Erl 5.4, 5.6	9/8 Last day to add classes
4	9/10	Virtualization (cont'd)	Notes, Erl 5.3, Marinescu 10	9/9 Team Formation due
5	9/15	Virtualization (cont'd)	Notes, Erl 5.3, Marinescu 10	
5	9/17	LAB Docker Container*	Notes	
6	9/22	VMware	Notes	
6	9/24	VMware (cont'd)	Notes	9/23 HW1 due (Project 1 paper assignment)
7	9/29	LAB ESXi *	Notes	
7	10/1	LAB ESXi * (cont'd) Data Center	Notes Erl 5.2, 5.5	9/30 Project 2 proposal due
8	10/6	Cloud Mechanisms 1	Erl 7, 8	
8	10/8	Cloud Mechanisms 1 (cont'd), 2	Erl 7, 8, 9	10/7 HW2 due
9	10/13	Amazon AWS	Notes, Marinescu 2,3, 2.4	
9	10/15	Google, HW1 & HW2 discussion	Notes, Marinescu 2.5	

Week	Date	Topics	References	HW & Projects
10	10/20 #	**MIDTERM EXAM (close book, close notes). Bring student ID**	up to AWS, exclude papers	
10	10/22	LAB Google App Engine*	Notes	
11	10/27	LAB Google App Engine* (cont'd)	Notes	
11	10/29	Cloud Architecture 1	Erl 11	
12	11/3	Cloud Architecture 1 (cont'd)	Erl 11	(Project presentation length & order)
12	11/5	Cloud Architecture 2	Erl 12	11/4 HW3 due
13	11/10	Microsoft Azure	Notes, Marinescu 2.6	
13	11/12	Microsoft Azure (cont'd)	Notes, Marinescu 2.6	
14	11/17	Hadoop	Notes, Marinescu 7.7	11/16 Project 1 due
14	11/19	Trends, HW3 discussion	Notes	
15	11/24 #	Project 1 presentation & discussion	Project 1 papers	11/23 Project 2 due
15	11/26	(no class - Thanksgiving Holiday)		
16	12/1 #	Project 2 presentations		
16	12/3 #	Project 2 presentations (cont'd)		12/3 Last office hour
17	12/8	(no class – last day of instruction 12/7)		
Final Exam	12/9 #	**FINAL EXAM Wed, Dec 9, 12:15 – 14:30 (close book, close notes). Bring student ID**	All (including Project 1 papers)	

http://www.sjsu.edu/up/docs/holiday-calendar.pdf

https://www.sjsu.edu/classes/final-exam-schedule/fall-2020.php

synchronous sessions.
* lab sessions. Bring your machine to class.