San José State University
College of Science/Department of Computer Science
CS 218, Topics in Cloud Computing, Sec 1, Fall, 2015

Course and Contact Information

Instructor:	Dr. Melody Moh
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Office Hours:	MW 1115 to 1145 and 1500 to 1530 *[See University Policy S12-1 at http://www.sjsu.edu/senate/docs/S12-1.pdf for guidelines]*
Class Days/Time:	MW 1330 to 1445
Classroom:	MQH 422
Prerequisites:	CS 149 or instructor consent

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.

Topics Covered

- Introduction
- Parallel and Distributed Systems
- Cloud Infrastructure
- Cloud Computing: Applications and Paradigms
- Cloud Resource Virtualization
- Cloud Resource Management and Scheduling
- Networking Support and Storage Systems
- Cloud Security

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. **SLO 1** = Understand advanced and emerging cloud computing technologies.
2. **SLO 2** = Obtain skills to do advanced cloud computing research and programming.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. **CLO 1 -** Understand the above covered topics through completion of homework, quizzes, and examinations.
2. **CLO 2 -** Successfully complete programming projects on advanced cloud computing systems.
3. **CLO 3 -** Work in a team to complete group projects, including independent research, oral presentation, and programming on a latest advancement in cloud computing systems.

Required Texts/Readings

Textbook

Paul Goransson and Chuck Black, *Software Defined Networks: A Comprehensive Approach, 1ˢᵗ edition*, 2014, Morgan Kaufmann Publishers, Inc., San Francisco. ISBN-13: 978-0124166752, ISBN-10: 012416675X

REQUIRED REFERENCE

*   Dan C. Marinescu, Cloud Computing: Theory and Practice, Elsevier Science, 2013
*   T. Erl, R. Puttini, and Z. Mahmood, Cloud Computing: Concepts, Technology & Architecture
*   ISBN-10: 0133387526 • ISBN-13: 9780133387520 ©2013 • Prentice Hall • Cloth, 528 pp

Other Readings [Optional]

MAJOR REFERENCES
*   Sosinsky, _Cloud Computing Bible,_ Wiley, 2011.
*   J. Rosenberg and A. Mateos, The Cloud at Your Service, Manning, 2011
*   Other references for specific topics/projects, especially for advanced topics in cloud computing, will be given along with topic/project assignment sheets.

Other equipment / material requirements (include if applicable)

None.

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

Homework is due typewritten (include source code, but not executable files) by class starting time on the due date. Each assigned problem requires a solution and an explanation (or work) detailing how you arrived at your solution. Cite any outside sources used to solve a problem. When grading an assignment, I may ask for additional information. A subset of the assigned problems will typically be graded.

ASSIGNMENTS
*   **HW**:   Weekly homework assignments and several in-class quizzes
*   **PROJ:** Several individual and group research and programming projects will span the entire semester
*   **Oral Presentation:** Included in projects (PROJ)

EXAMS
One mid-term exams (**Mid**) scheduled approximately at the end of 8th week, and a final exam (**FIN**).

Refer the course website for latest information of homework assignments.

NOTE that University policy F69-24 at http://www.sjsu.edu/senate/docs/F69-24.pdf states that "Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading."

Grading Policy

- *I will determine letter grades for the course, including +/- grades based on*

Percentage	Grade
92 and above	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
59 and below	F

- *Percentage weight [or point value] assigned to various class assignments*
  - HW - 20%, PROJ- 40%, Mid - 20%, FIN - 20%.
- *No make-up exams will be given and no late homework will be accepted.*

Note that "All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades." See University Policy F13-1 at http://www.sjsu.edu/senate/docs/F13-1.pdf for more details.

Classroom Protocol

- **The pre-requisites to this course (CS 158A or instructor's consent) will be monitored.**
- No make-up exams will be given and no late homework will be accepted.
- To encourage participation from students, no recording is allowed.
- Students are responsible for all materials distributed and discussed in the class.
- Most handouts are available on the web; hard copy distribution will be kept minimized.
- Attendance is crucial to doing well on assignments and examinations.
- Office hours are on a 90% basis; they may be rescheduled or canceled due to conflicting department/university or other professional meetings.
- Cheating will not be tolerable; a ZERO will be given to any cheated assignment/exam, and will be reported to the Department and the University.

University Policies

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU's policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See University Policy S90–5 at http://www.sjsu.edu/senate/docs/S90-5.pdf. More detailed information on a variety

of related topics is available in the [SJSU catalog](), at http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies]() section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage]() at http://www.sjsu.edu/provost/services/academic_calendars/. The [Late Drop Policy]() is available at http://www.sjsu.edu/aars/policies/latedrops/policy/**.** Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub]() at http://www.sjsu.edu/advising/.

Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](), http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

- "Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material."
    - o It is suggested that the greensheet include the instructor's process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
    - o In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- "Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent."

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2]() at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website]() is available at http://www.sjsu.edu/studentconduct/.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03]() at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center]() (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.

CS 258, Fall 2015, Course Schedule

The schedule is subject to change with fair notice and the notice will be made available in class.

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	8/24	Green sheet
1	8/26	Introduction to Cloud Computing (1 of 2)
2	8/31	Introduction to Cloud Computing (2 of 2)
2	9/2	Parallel and distributed systems (1 of 3)
3	9/7	No school – Labor Day
3	9/9	Parallel and distributed systems (2 of 3)
4	9/14	HW 2 presentation (Preview Project 1 topics)
4	9/16	Parallel and distributed systems (3 of 3)
5	9/21	Going through Project 1 proposals Cloud Infrastructure (1 of 2)
5	9/23	Cloud Infrastructure (2 of 2)
6	9/28	Cloud computing applications and paradigms (1 of 2)
6	9/30	Cloud computing applications and paradigms (2 of 2)
7	10/5	VM Migration for Green Cloud (authors: Hwang and Wu)
7	10/7	Project 1 outline presentation
8	10/12	Cloud resource virtualization
8	10/14	Cloud resource management and scheduling
9	10/19	Networking support for cloud
9	10/21	Project 2 Proposal presentation
10	10/26	Storage systems for cloud
10	10/28	Cloud security (1 of 2) Exam Review
11	11/2	Advance topic 1 – Spark
11	11/4	Cloud security (2 of 2)
12	11/9	Midterm Exam
12	11/11	No School – Veteran's Day
13	11/16	Advance topic 2 – Container

Week	Date	Topics, Readings, Assignments, Deadlines
13	11/18	Advance topic 3 – Cloudlet
14	11/23	Advance topic 4 – Federated ID Management
14	11/25	Advance topic 5 – Cloud + SDN Thanksgiving Day Eve
15	11/30	Advance topic 6 – Resource management of cloud computing
15	11/2	Advance topic 7 – Algebraic data types for delta encoding in cloud computing
16	11/7	Exam Review
Final Exam		December 16, 1215-1430.