CSCI 5372:001, Cloud Computing, Fall 2024, CRN: 11731
Department of Computational, Engineering, and Mathematical Sciences
College of Arts and Sciences

Course Syllabus

Class Meeting Time & Location:	**R 04:00 - 6:45PM, STEM 279**
Class Duration:	08/26/2024 - 12/13/2024
Instructor:	Dr. Jeong Yang
	Office: STEM 211 R
	Tel: 210-784-2315
	E-Mail: jeong.yang@tamusa.edu
	Student emails will receive a reply within two business days.
Course Website:	https://tamusa.blackboard.com/
Office Hours:	W 1:00 pm – 3:00 pm via Zoom
	R 1:00 pm – 3:00 pm in person, or by appointment

Catalog Course Description: This course educates the students about building cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers (physical, virtual, control, orchestration, and service) and three cross-layer functions (business continuity, security, and service management) for building a cloud infrastructure. For each layer and cross-layer function, this course covers the comprising technologies, components, processes, and mechanisms. This course takes an open approach to describe the concepts and technologies. The course follows the U.S. National Institute of Standards and Technology as a guide for all definitions of cloud computing.

Prerequisite: A grade of "B" or better in each of CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Course Objectives: The objective of the course is to provide an understanding of cloud infrastructure with fundamental layers and cross-layer functions. The course gives students an overview of cloud computing, its enabling current technologies, and hands-on experiences with lab projects utilizing public cloud computing services such as Google Cloud Platform (GCP) and Amazon Web Services (AWS).

After successful completion of this course, students will be able to:
1) Understand fundamental layers and cross-layer functions
2) Understand cloud service models such as Iaas, Paas, Saas
3) Create and manage cloud resources
4) Perform fundamental infrastructure tasks in cloud
5) Explore different storage options in cloud
6) Build and secure a network in cloud
7) Perform foundational data, ML, and AI tasks in cloud

Useful Materials:
- **NIST Definition of Cloud Computing** https://csrc.nist.gov/publications/detail/sp/800-145/final
- **Google Cloud Qwiklabs Skills** https://www.cloudskillsboost.google/
- **Google Cloud Skill Badges** https://cloud.google.com/training/badges
- **AWS Educate** https://aws.amazon.com/education/awseducate/?nc2=sb_ep_edu
- **Blackboard:** Connect to http://tamusa.blackboard.com. You will have lecture notes and other supplementary materials on Blackboard. All class communications will be through Blackboard and students should monitor this several times a week.
- **Time:** You are expected to spend 4-8 hours per week on the course. Based on the background, some students may require more time. Time spent may be longer when assignments/exams are due.

Course Requirements every student must fulfill in order to succeed in course:
1. Students should check the Course Calendar, and Announcements in Blackboard on a regular basis.
2. Students should keep current with all course assignments.
3. Students should communicate with the instructor either in class, online, offline or in office hours.
4. Students are expected to attend the online session at the given time when it is not possible to attend in person with extraordinary circumstances.

Grading Policy: The final course grade will be based on your performance on the exams, assignments, and a term paper with a presentation using the following weights:

Term Paper & Presentation	20%
Individual Lab Assignments	20%
Project Assignment	10%
Mind-term Exam	25%
Final Exam (as per University Schedule)	25%
Total	100%

The final letter grades will be assigned as follows:
Above 90% ⇒ A; 80 – 89% ⇒ B; 70 – 79% ⇒ C; 60 – 69% ⇒ D; Below 60% ⇒ F.

Examinations: There will be mandatory Mid-Term and Final exams (as per university schedule). Being absent for an exam will result in a grade of zero for that exam and may result in a failing grade in the course. The exams will consist of conceptual problem-solving questions and short essay questions. The exam materials will come from lecture notes, the text, and class discussions. Questions will emphasize understanding and applications of concepts and topics covered in class.

Assignments: There will be several assignments during the course. All assignment statements and due dates will be posted through Blackboard. For all assignments, ALL intermediate work of the problem solution steps MUST be shown. This includes the use of the formula, the values substituted in the formulas for problem solution, as well as the intermediate steps of the arithmetic computation. The units of measurement are extremely important and MUST be shown at each stage of the computation. Considerable points will be taken off for not following these requirements.

Make Up and Late Assignment/Exam policy: All assignments will have a clearly indicated due date. Late assignments will be penalized 10% per day, but no assignments will be accepted more than three days late. As a general rule, make-ups or late submissions will **NOT** be offered or accepted for any missed exams. Late submissions or make-ups may be accepted/administered only in extraordinary circumstances such as an excused official university activity, a severe illness, or a dire emergency. However, you must provide comprehensive documentation before the missed assignment or exam.

Fall 2024 CSCI 5372:001 Class Schedule

The provisions and information set forth in the schedule below are intended to be informational and not contractual in nature. The instructor reserves the right to amend, alter, change, delete or modify the provisions of the schedule.

Week	Dates	Chapter and Topic	Note
1	Aug 26 – Aug 30	• Cloud infrastructure – understand fundamental layers and cross-layer functions, security	• Individual & group assignments throughout the semester • Term paper: 1st draft by 10/25/24 2nd draft by 11/15/24
2	Sept 2 - Sept 6		
3	Sept 9 – Sept 13	• Build and manage cloud resources	
4	Sept 16 – Sept 20	• Perform fundamental infrastructure tasks in cloud	
5	Sept 23 – Sept 27	• Cloud service models such as Iaas, Paas, Saas, Iaas	
6	Sept 30 – Oct 4	• Build & manage virtual machines, build elastic applications, build event-driven services	
7	Oct 2 – Oct 6		
8	Oct 7 – Oct 11	• Identify containerizing and orchestrating applications, deploy containerized applications **Mid-term Exam (Thursday, October 10)**	
9	Oct 164– Oct 18	• Explore different storage options in cloud - Structured and unstructured cloud data storage	
10	Oct 21– Oct 25		
11	Oct 28 - Nov 1	• Build and secure network in cloud, examine network architecture, explore different encryption options, and configure authentication & authorizations	
12	Nov 4 – Nov 8		
13	Nov 11 – Nov 15		
14	Nov 20 – Nov 24	• Perform foundational data, ML, and AI tasks in cloud	
15	Nov 25 - Nov 29	• Understand big data managed service, use APIs, explore ML & AI tasks with models **Thanksgiving Holiday – No Classes (Nov 27-Nov 29)**	
16	Dec 2 – Dec 6	**Term Paper Presentation, Final Exam Review**	Final Paper
17	Dec 7 – Dec 13	**Final Exam: Thursday, December 12 at 4:00 pm – 5:50 pm**	

IMPORTANT POLICIES AND RESOURCES

No Use of Generative AI Permitted:
This course assumes that all work submitted by students will be generated by the students themselves, working individually or in a group. Students should not have another person/entity do the writing of any portion of an assignment for them, which includes hiring a person or a company to write assignments and/or using artificial intelligence (AI) tools like ChatGPT. Use of any AI-generated content in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.

Academic Accommodations for Individuals with Disabilities: Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, Disability Support Services is located in the Central Academic Building, Suite 210. You can also contact us via phone at (210) 784-1335, visit us https://www.tamusa.edu/Disability-Support-Services/index.html or email us at **dss@tamusa.edu**. Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Support Services and their instructors as soon as possible.

Academic Learning Center: The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the *Tools* section of Blackboard. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu, calling (210) 784-1307, or visiting the Central Academic Building, room 202.

Counseling/Mental Health Resources: As a college student, there may be times when personal stressors interfere with your academic performance and negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment, call 210-784-1331 or visit Madla 120.

All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case management, and prevention services. For more information on SCC services visit tamusa.edu/studentcounseling

Crisis support is available 24/7 by calling the SCC at 210-784-1331 (after-hours select option '2').

Additionally, the TELUS Student Support App provides a variety of mental health resources to including support for in the moment distress, an anonymous peer to peer support network, mental health screenings, podcasts, and articles to improve your mental wellbeing.
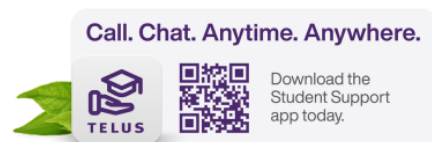
Emergency Preparedness: JagE Alert is Texas A&M University-San Antonio's mass notification. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit: https://tamusa.bbcportal.com/.

More information about Emergency Operations Plan and the Emergency Action Plan can be found here: https://www.tamusa.edu/about-us/emergency-management/.

Download the SafeZone App (https://safezoneapp.com/) for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900.

Financial Aid and Verification of Attendance: According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended the first week of class. Any student receiving federal financial aid who does not attend the first week of class will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

Writing, Language, and Digital Composing Center: The Writing, Language, and Digital Composing Center supports graduate and undergraduate students in all three colleges as well as faculty and staff. Tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in

Spanish for any assignment. Our digital studio tutors support students working on digital projects such as eportfolios, class presentations, or other digital multimedia projects. Students can schedule appointments through JagWire under the Student Services tab. Click on "Writing, Language, and Digital Composing Center" to make your appointment. The Center offers face-to-face, synchronous online, and asynchronous digital appointments. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on our website at https://www.tamusa.edu/academics/.

Meeting Basic Needs: Any student who has difficulty affording groceries or accessing sufficient food to eat every day or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to submit a CARE referral (https://www.tamusa.edu/university-policies/Student-Rights-and-Responsibilities/file-a-report.html) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to visit the Office of Military Affairs for any question involving federal or state VA Education Benefits. Visit the Patriots' Casa building, room 202, or to contact the Office of Military Affairs with any questions at military.va@tamusa.edu or (210)784-1397.

Religious Observances: Texas A&M University-San Antonio recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or course work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

The Six-Drop Rule: Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

Statement of Harassment and Discrimination: Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equal opportunity, and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual within our state, nation, and world. All decisions and actions involving students and employees should be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, gender expression, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university as a whole. If you have experienced any form of sex- or gender-based discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking, know that help and support are available. A&M-San Antonio's Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment, sexual violence, or other related misconduct, the faculty member must share that information with the university's Title IX

Coordinator (titleix@tamusa.edu, 210-784-2061, CAB 439K). If you wish to speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

Pregnant/Parenting Students: Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student's studies; (3) participate in an alternative program; (4) change the student's major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide such reasonable accommodations to pregnant students as would be provided to a student with a temporary medical condition that are related to the health and safety of the student and the student's unborn child. These could include maintaining a safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status (titleix@tamusa.edu; 210-784-2061; CAB 439K).

Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources.

Students' Rights and Responsibilities: The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

Students' Rights
1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, gender identity, gender expression, and pregnancy/parenting or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university student rules shall be assured a fundamentally fair process.

Students' Responsibilities
1. A student has the responsibility to respect the rights and property of others, including other students, the faculty, and administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, Student Code of Conduct, on our website, and University Catalog, and to comply with them, as well as with federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide a safe environment for learning.

5. A student has the responsibility to check their university email for any updates or official university notifications.

We expect that students will behave in a manner that is dignified, respectful, and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation, or disability. Conduct that infringes on the rights of another individual will not be tolerated.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the Student Code of Conduct (https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/documents/Student-Handbook-2022-23.pdf) or visit the resources available in the OSRR website (https://www.tamusa.edu/university-policies/student-rights-and-responsibilities/academic-integrity.html).

Key Dates For Fall 2024 Semester The complete academic calendar is available online: https://www.tamusa.edu/academics/academic-calendar/index.html

Fall 2024 Regular 16-Week Session

March 25	Monday	Registration opens
August 19	Monday	Tuition & fee payment deadline
August 22	Thursday	Drop for non-payment
August 23	Friday	Last day for students withdrawing to receive 100% refund (0% responsibility) for tuition
August 26	Monday	First class day
September 2	Monday	Labor Day Holiday - No classes
September 3	Tuesday	Last day to register
September 11	Wednesday	Census Date
September 12	Thursday	Drop for non-payment
October 7-October 18	Monday-Friday	Midterm grading period
November 11	Monday	Last day to drop with an automatic grade of "W"
November 19	Tuesday	Last day to withdraw from the university
November 27	Wednesday	Study day - No classes
November 28-November 30	Thursday-Saturday	Thanksgiving Holiday - No classes
December 5	Thursday	Last day of scheduled classes for weekday classes
December 6	Friday	Study day - No classes
December 7-December 13	Saturday-Friday	Final examinations
December 13	Friday	End of term
December 16	Monday	All grades due by noon
December 17	Tuesday	Commencement
December 19	Thursday	Grades available in JagWire
December 24-January 1	Tuesday-Wednesday	Winter Break