Northeastern
College of Engineering

CSYE 6225 Network Structure & Cloud Computing

Fall 2025Click or tap here to enter text.

Course Information
Course Title: Network Structure & Cloud Computing
Course Number: CSYE 6225
Term and Year: Fall 2025
Credit Hour: 4 SH
CRN: 17540
Course Format: On-ground

Instructor Information
Full Name: Tejas Parikh
Email Address: t.parikh@northeastern.edu
Office Hours: By Appointment

Instructor Biography
Tejas Parikh is a Part-Time Lecturer at Northeastern University and Director of Engineering, Platform at Tamr, Inc. He has been teaching Master's level courses at Northeastern University since 2017. He received his Bachelor of Science in Computer Science from Eastern Michigan University in 2006 and a Master of Science in Computer Science from Northeastern University in 2009. He has been working on cloud computing technologies for over 10 years and in the industry for over 15 years, focusing on containers, container orchestration, and hybrid cloud architecture and design. He is passionate about all things open source, Linux, DevOps, SRE, automation, cloud, containers, and Kubernetes.

Teaching Assistant Information
Full Name: TBA
Email Address: TBA
Office Hours: TBA

Course Prerequisites
- CSYE 6200 or INFO 5100
- Web Application Development
- Familiarity with high-level programming languages such as Java, Python, JavaScript, Go, Rust, etc.
- Familiarity with RDBMS such as MySQL, PostgreSQL, Oracle, DB2, or MS SQL

Course Description
This graduate-level course covers topics and technologies related to cloud computing and its practical implementations. You will gain hands-on experience with the various features of popular cloud platforms such as Google Cloud Platform, Amazon Web Services, Microsoft Azure, etc. We will explore different models, techniques, and architectures of cloud computing and prepare you to meet current market demands. The lectures and assignments aim to help you develop skills to build, maintain, and operate highly available, highly reliable, cloud-native applications deployed using a continuous deployment pipeline. You will also learn Linux system administration, networking fundamentals, polyglot programming, polyglot persistence with RDBMS and NoSQL databases, source control management using git, microservices architecture, and serverless computing.

Course Learning Outcomes
- Understand basic concepts related to cloud computing.
- Understand cloud architecture and models such as IaaS, PaaS & SaaS.
- Obtain hands-on knowledge about Linux system administration and networking fundamentals.
- Compare cloud platform providers such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform.
- Understand cloud storage options such as file storage, CDNs, Relational Databases, NoSQL databases, etc.
- Learn to develop scalable applications using various AWS features such as auto-scaling and load balancing.
- Learn to secure SSL applications and protect user data against XSS, CSRF, and SQL injection attacks.
- Hands-on experience with microservices & APIs.
- Understand Agile development, Git version control system, Continuous Integration, and Deployment using tools like GitHub Actions, Jenkins, etc.
- High-level understanding of DevOps and Site Reliability Engineer (SRE) roles.

Required Tools and Course Textbooks.

There are no required textbooks for this course. Details about required tools and software will be posted in Canvas. *Students are solely responsible for the cost of acquiring the tools listed below. Northeastern University, College of Engineering, and the instructor will not be responsible for any charges incurred. Signups with cloud service providers might require a valid credit or debit card,* even for free tiers.

Course Schedule/Topics Covered.
- DevOps, GitOps, SRE
- Linux, Shell Scripting
- Version Control with Git
- Computer Networking
- Cloud Computing
- Microservices Architecture
- Identity & Access Management

- Infrastructure as Code
- Cloud Storage Solutions
- Continuous Integration, Continuous Delivery, and Continuous Deployment
- Operational Visibility (Logging, Metrics, Monitoring, and Alerting)
- Load Balancers
- Auto-scaling Applications
- Event-driven Architecture
- Serverless Computing
- Securing cloud applications and infrastructure

Week	Date	In Class Topic	Assignment Due
1	**9/4**	• Course Overview • Fundamentals of Cloud Computing	
2	**9/11**	• Introduction to DevOps • Overview of Public Cloud Providers • Identity & Access Management (IAM) • Networking Fundamentals	**A 00**
3	**9/18**	• Version Control with Git • 12factor Methodology for application development • The Linux Command Line	**A 01**
4	**9/25**	• Editing with Vi • Shell Scripting • Infrastructure as Code • Continuous Integration • GitHub Actions	**A 02**
5	**10/2**	• Virtualization • Custom Machine Images	**A 03**
6	**10/9**	• Cloud Storage Solutions	**A 04**
7	**10/16**	• Content Delivery Network (CDN) • Site Reliability Engineering • Observability – Logging & Metrics • Monitoring & Alerting	**A 05**
8	**10/23**	• Domain Name System (DNS) • Email Service • Load Balancing • Auto-scaling • Continuous Deployment	**A 06**
9	**10/30**	• Microservices Architecture	**A 07**

		• Serverless Computing • Event Driven Architecture	
10	**11/6**	• Cloud Security	**A 08**
11	**11/13**	• **TBD**	**A 09**
12	**11/20**	• **Final Exam**	
13	**11/27**	• **No Class. Thanksgiving Break**	
14	**12/4**	• Architecting for the Cloud: Best Practices	
15	**12/11**	• **Last Day of Class**	

Assignment Grading

- Assignments: 60%
- Exams: 40%

Grade Breakdown

Assignments: 50%

Quizzes & Exams: 50%

Students will be assigned assignments at the end of the lecture. Assignment due dates will be posted for each assignment. *Given that an assignment is due every week, if you fall behind on an assignment, it will be extremely difficult to catch up as the next assignment depends on it.*

Grading Process

- Each student will be assigned a TA for assignment grading. The assignment page will provide a link to the document to find the assigned TA.
- Students will book an appointment with their assigned TA in the Canvas calendar.
- While Canvas allows you to cancel appointments at any time, *cancellations of appointments less than 24 hours away may incur a penalty of 5%* for the assignment.
- TAs will time-box demos to the appointment period (15-60 mins). If the assignment demo cannot be finished in the allocated time, it may be assumed that the student did not meet all assignment objectives. I recommend showing up a bit early for the grading appointments and getting the laptop set up and ready for the demo.
- *Using demo time to debug/diagnose/fix assignment issues is inappropriate. The deadline has passed, and fixes applied during the demo will not help with grading.*
- TA will provide feedback on the demo and list any assignment objectives you may have missed. You are expected to meet them in the next assignment.

Grading/Evaluation Standards

Grading will be based on the absolute grading system. This grading system assigns a range of point values to a letter grade. The grading is absolute, irrespective of other students' grades in the class. I do not round scores to the closest percentage.

Grading Scale

Grade	Range
A	100% to 95.0%
A-	< 95.0% to 90.0%
B+	< 90.0% to 87.0%
B	< 87.0% to 84.0%
B-	< 84.0% to 80.0%
C+	< 80.0% to 77.0%
C	< 77.0% to 74.0%
C-	< 74.0% to 70.0%
F	< 70.0%

Incomplete Grades

An incomplete grade may be reported by the instructor when a student has failed to complete a major component of a required course, such as homework, a quiz or final examination, a term paper, or a laboratory project. Students may make up an incomplete grade by satisfying the requirements of the instructor. Be aware that instructors' policies on the granting of incomplete grades may vary and that the final decision on an incomplete grade is up to the instructor. **Instructors may deny requests for an incomplete grade.** If the missing assignment(s) have not been submitted to the instructor within 30 days from the end of the term in which the course was offered, or the agreed upon due date, the grade entered will reflect the student's grade in the course for the work completed and the missing assignments receiving no credit toward the final grade.

Attendance/Late Work Policy

Attendance Policy

In each term, students enrolled in on-ground sections are expected to be on campus and attending class beginning with the first day of classes. Students in online sections are expected to log in and participate in class beginning with the first day of classes.

Students who join a class after the first day of class during the university add period, or who are approved for late registration by the instructor and the Graduate School of Engineering, are responsible for all coursework missed prior to enrolling. In the interest of students' success, the college does not support the arrival of students to class after the university add deadline. **Enrolled students who do not attend class during the first week of a semester risk being dropped from the course.**

In cases where an enrolled student cannot arrive to campus by the first day of class due to circumstances beyond their control, it is the student's responsibility to contact the instructor for approval and notify the Graduate School of Engineering.

Students registered in MGEN courses (INFO, CSYE, and DAMG) are allowed **a maximum of 2 absences per course,** with 3 or more absences resulting in an 'F' for that course. Course instructors are not expected to make accommodations and students are expected to inform their instructors of any absences in advance of the class. Should a student anticipate being unable to attend 3 or more classes, they should discuss their situation with their Academic Advisor to explore other types of leave and accommodations in accordance with the University's academic and global entry expectations. Students may be asked to share communications about class absences with their Academic Advisor. If a student is sick long-term or experiences a medical issue that prevents class attendance, it is strongly encouraged that they speak with their Academic Advisor (coe-gradadvising@northeastern.edu) to learn more about the Medical Leave of Absence. International students should review the Office of Global Services webpage to understand their visa compliance requirements.

Teaching Assistants (TAs) or Instructional Assistants (IAs) will be present at each class to collect student attendance.

Late Work Policy

Students must submit assignments by the deadline in the time zone noted in the syllabus. Students must communicate with the faculty prior to the deadline if they anticipate work will be submitted late. **Work submitted late without prior communication with faculty will not be graded.**

Course Evaluations
Student feedback on their learning experience is valuable and helps improve future courses. We encourage all students to complete the course evaluation surveys when they become available.

Surveys are distributed at both the midterm mark and the end of the term via email and are completely anonymous and confidential. Any questions about the surveys can be directed to mgen-programs@coe.northeastern.edu

MGEN Student Feedback
Students who would like to provide the MGEN unit with anonymous feedback on this particular course, Teaching Assistants, Instructional Assistants, professors, or to provide general feedback regarding their program, may do so using this survey: https://neu.co1.qualtrics.com/jfe/form/SV_cTIAbH7ZRaaw0Ki

Academic Integrity
A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning

the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

The following is a broad overview, but not an all-encompassing definition, of what constitutes a violation of academic integrity:

*Cheating***:** The University defines cheating as using or attempting to use unauthorized materials, information, or study aids in any academic exercise. When completing any academic assignment, a student shall rely on their own mastery of the subject.

*Fabrication***:** The University defines fabrication as falsification, misrepresentation, or invention of any information, data, or citation in an academic exercise.

*Plagiarism***:** The University defines plagiarism as using as one's own the words, ideas, data, code, or other original academic material of another without providing proper citation or attribution. Plagiarism can apply to any assignment, either final or drafted copies, and it can occur either accidentally or deliberately. Claiming that one has "forgotten" to document ideas or material taken from another source does not exempt one from plagiarizing.

Unauthorized Collaboration: The University defines unauthorized collaboration as instances when students submit individual academic works that are substantially similar to one another. While several students may have the same source material, any analysis, interpretation, or reporting of data required by an assignment must be each individual's independent work unless the instructor has explicitly granted permission for group work.

Participation in Academically Dishonest Activities: The University defines participation in academically dishonest activities as any action taken by a student with the intention of gaining an unfair advantage over other students.

Facilitating Academic Dishonesty: The University defines facilitating academic dishonesty as intentionally or knowingly helping or contributing to the violation of any provision of this policy.

Please visit https://osccr.sites.northeastern.edu/academic-integrity-policy/ to access the full academic integrity policy.

University Health and Counseling Services
As a student enrolled in this course, you are fully responsible for assignments, work, and course materials as outlined in this syllabus and in the classroom. Over the course of the semester if you experience any health issues, please contact UHCS.

For more information, visit https://www.northeastern.edu/uhcs.

Student Accommodations/Disability Access Services (DAS)

Northeastern University and Disability Access Services (DAS) are committed to providing disability services that enable students who qualify under Section 504 of the REHABILITATION ACT and THE AMERICANS WITH DISABILITIES ACT AMENDMENTS ACT (ADAAA) to participate fully in the activities of the university. To receive accommodations through DAS, students must provide documentation of a disability that demonstrates a current substantial limitation. Accommodations are approved based on a review of the information that is submitted and reviews are done on a case-by-case basis.

If the course is conducted in an on-ground (in-person) format, students are expected to attend class physically as scheduled. Professors are **not required to provide virtual attendance links** unless a student has documented accommodation approved by the **Disability Access Services (DAS) office** and their **Academic Advisor**. If a student requires accommodation for remote participation, they must submit a formal request through the **Disability Office** and coordinate with their **Academic Advisor** prior to the course start date.

For more information, visit https://disabilityaccessservices.sites.northeastern.edu/

Office of Global Services
As an F-1, J-1, or Study Permit student, you must meet certain obligations in order to maintain lawful nonimmigrant status. Maintaining status is necessary in order to retain eligibility for the benefits of F-1 or J-1 status, such as employment authorization and program extension, and can be crucial to a successful application for a change or adjustment of nonimmigrant status in the future. Failure to maintain your nonimmigrant status can result in serious problems with immigration and *could lead to deportation from the U.S. or Canada.*

Students must maintain on-ground presence throughout the academic term. At Northeastern, there are four different defined instructional methods: Traditional, Hybrid, Live Cast, and Online. Traditional, Hybrid, and Live Cast courses meet the Visas' on-ground presence requirements. **Online courses do not meet the Visas' on-ground presence requirements.**

Students enrolled in Summer courses should adhere to OGS guidelines on maintaining status during the Summer term.

For more information please visit, https://international.northeastern.edu/ogs/current-students/understanding-visa-requirements/guidelines-on-maintaining-status/

Library Services
The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and for education specific resources, visit https://library.northeastern.edu
Network Campus Library Services: Northeastern University Library Global Campus Portals

24/7 Canvas Technical Help
For immediate technical support for Canvas, call 617-373-4357 or email help@northeastern.edu

Canvas Student Resources: https://canvas.northeastern.edu/student-resources/

For assistance with my Northeastern e-mail, and basic technical support:
Visit ITS at https://its.northeastern.edu
Email: help@northeastern.edu
ITS Customer Service Desk: 617-373-4357

Outreach, Engagement, Belonging

Northeastern University is committed to fostering a community of belonging, which is essential to the advancement of Northeastern University's mission of teaching and research. Our university is stronger as a result of the varied backgrounds, experiences, and perspectives that all members of our global community bring to the pursuit of knowledge. Embracing this pluralism is not the work of one office, department, or academic unit. It is a shared responsibility that spans disciplines and boundaries. By harnessing the power of our differences, we will continue to light the path to bold new ideas and life-changing discoveries.

It is my intention that students from all backgrounds and perspectives will be well served by this course, and that the diverse experiences that students bring to this class will be viewed as an asset. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, socioeconomic background, family education level, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and belonging environment for every other member of the class. Your suggestions are encouraged and appreciated.

Please visit Belonging at Northeastern – Northeastern Provost for complete information.

Title IX
Title IX of the Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance. Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty and staff. In case of an emergency, please call 911.

The Office for University Equity and Compliance (OUEC) leads Northeastern University's efforts in maintaining compliance with all federal, state, and provincial civil rights laws and prohibits discrimination within any of its programs, activities, and services. Please visit https://ouec.northeastern.edu/ for more information and for the link to file a report.