CSE 199: How the Internet Works

Description

The internet is changing every aspect of our lives, including how we communicate, learn, navigate, organize, work, play, and love. The internet also represents a crowning achievement of computing: a single system uniting hardware and software, theory and implementation, standards and innovation, engineering and science, protests that topple governments and stupid cat videos. This course provides an overview of how the internet works. Along with its technologies, we will delve into the internet's past and future, the driving forces behind it, and societal implications. The course is targeted at a general audience, but because the internet reflects contributions from many areas of computer science and computer engineering, it also provides a good overview for potential majors. Familiarity with the web and access to a personal computer are assumed, but no technical background is required.

Course Format

The course consists of 2 lectures and 1 recitation per week. There are 7 modules, and each module is for 2 weeks taught by a different CSE faculty member.

Both lecture and recitation attendance are required. Tardiness to lecture or recitation will result in grade deductions, as described in Grading, below.

Instructors

Kenneth Joseph, Alan Hunt, Jesse Hartloff, Jennifer Winikus, Ethan Blanton, Jingjing Meng. Office hours for each instructor can be found on the [course website](#).

Modules

Introduction

In the first two weeks, all sections discuss the history of the Internet, how the internet and computing impacts society, and the effects of diversity and identity on the field.

Social Media

Instructor: Kenneth (Kenny) Joseph
Topics discussed: What's the history behind social media? What is machine learning and how is it used by social media companies? How have world and US politics been impacted by social media? Would we have been better off without social media?

Web Design

Instructor: Alan Hunt
Topics discussed: What is the most basic method of composing a Web page (HTML)? How do you make a Web page prettier (CSS)? How do you make a Web page more dynamic (JavaScript)?

Signals

Instructor: Jennifer Winikus
Topics discussed: What is a signal? How do we represent internet information to allow for transmission? How do signals work with hardware in the transmission of the internet?

Infrastructure & Protocols for the Internet

Instructor: Jesse Hartloff
Topics discussed: What kinds of hardware components are there in the Internet infrastructure? What kinds of software components are there in the Internet infrastructure?

Compression

Instructor: Jingjing Meng
Topics discussed: What is data compression? Why do we need it for the internet? How do we compress multimedia data (e.g., text, image, video)?

Embedded Systems and Ubiquitous Computing

Instructor: Ethan Blanton

Topics discussed: What is an embedded system, and what is Ubiquitous Computing? How do embedded systems differ from other computing systems?

Grading

The grading is entirely based on four things - recitation activities, lecture questions, assignments, and attendance.

Recitation Activities

- You will do activities during recitations. For example,
    - First week: You will discover more about your identity, and form teams.
    - Second week: You will write an essay to present it to other people (more on this soon).
- Each recitation is graded **generally** as follows.
    - 0 pts: No attendance
    - 1 pt: Attendance but clearly no effort for the activity
    - 2 pts: Attendance and partial effort for the activity
    - 3 pts: Attendance and full effort for the activity
    - (Following Bill Rapaport's scheme: https://www.cse.buffalo.edu/~rapaport/howigrade.html)
- Each activity will detail the grading rubric specific to it.

Lecture Questions

During each lecture, one or more questions will be asked via TopHat to ensure that you are grasping the material. These questions will count towards your final score in the course, and will be allotted one point per question.

Assignments

Each instructor may decide to assign additional work as part of their module. Those assignments (if graded) will be worth 3 points each, and will have a grading rubric similar to that of recitation activities.

Attendance

- We will take attendance for every lecture and recitation.
- Arrival in lecture more than ten minutes tardy will be counted as an absence.
- Arriving at recitation more than five minutes late will result in a maximum recitation score of 1 point for the day.
- For every 3 lectures or recitations that you miss, we will downgrade your letter grade by one.

Breakdown

Grade	Quality Points	Percentage
A	4.0	92.0% -100.00%
A-	3.67	88.0% - 91.9%
B+	3.33	84.0% - 87.9%
B	3.00	80.0% - 83.9%
B-	2.67	76.0% - 79.9%
C+	2.33	72.0% - 75.9%
C	2.00	66.0% - 71.9%
C-	1.67	62.0% - 65.9%
D+	1.33	58.0% - 61.9%
D	1.00	50.0% - 57.9%
F	0	49.9% or below

Incompletes (I/IU)

The course follows the university undergraduate incomplete policy.
A grade of incomplete ("I") indicates that additional coursework is required to fulfill the requirements of a given course. Students may only be given an "I" grade if they have a passing average in coursework that has been completed and have well-defined parameters to complete the course requirements that could result in a grade better than the default grade. An "I" grade may not be assigned to a student who did not attend the course.

Prior to the end of the semester, students must initiate the request for an "I" grade and receive the instructor's approval. Assignment of an "I" grade is at the discretion of the instructor.

The instructor must specify a default letter grade at the time the "I" grade is submitted. A default grade is the letter grade the student will receive if no additional coursework is completed and/or a grade change form is not filed by the instructor. "I" grades must be completed within 12 months – see the Incomplete Grade Policy for the schedule. Individual instructors may set shorter time limits for removing an incomplete than the 12-month time limit. Upon assigning an "I" grade, the instructor shall provide the student specification, in writing or by electronic mail, of the requirements to be fulfilled, and shall file a copy with the appropriate departmental office. Students must not re-register for courses for which they have received an "I" grade.

Academic Integrity Policy

The course follows the university [undergraduate academic integrity policy](). Students will be asked to confirm that they have followed the policy when submitting work online, and all final papers will be uploaded to TurnItIn.com for online grading and originality checks.

Please note that as attendance is part of your grade, submission of attendance codes if you are not present, or submission of attendance codes for any person other than yourself, or submitting an attendance code and then leaving is a violation of academic integrity policy, and can result in an F grade in the course.

Communication & Email Policy

Students are responsible for email sent to their official University at Buffalo email address. Also, we will use the course website for all course-related communication.

Accessibility Resources

If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the [Office of Accessibility Resources](), 25 Capen Hall, 645-2608, and also the instructor of this course. The office will provide you with information and review appropriate arrangements for reasonable accommodations.

Required Textbook

All course materials will be available online.

Copyright Policy

Materials used in connection with this course may be subject to copyright protection under Title 17 of the United States Code. Under certain Fair Use circumstances specified by law, copies may be made for private study, scholarship, or research. Electronic copies should not be shared with unauthorized users. If a user fails to comply with Fair Use restrictions, he/she may be liable for copyright infringement.

For more information on the SUNY policy of copyright ownership regarding materials in courses:
http://system.suny.edu/academic-affairs/faculty/faculty-ownership/

University Policies

You are expected to adhere to all university policies, including those listed below and not listed.

Academic Integrity Policy:
https://catalog.buffalo.edu/policies/integrity.html

Policy on Accommodations:
https://www.buffalo.edu/administrative-services/policy1/ub-policy-lib/reasonable-accommodation.html

The Office of Equity, Diversity and Inclusion provides many resources including the following policies to be followed:

Discrimination and Harassment:
http://www.buffalo.edu/administrative-services/policy1/ub-policy-lib/discrimination-harassment.html

Religious Accommodation and Expression:
http://www.buffalo.edu/administrative-services/policy1/ub-policy-lib/religious-accommodation-expression.html

Departmental Academic Integrity Policy
https://engineering.buffalo.edu/computer-science-engineering/undergraduate/resources-for-current-students/academic-integrity-students.html

Student Code of Conduct
http://www.buffalo.edu/content/dam/www/studentlife/units/uls/student-conduct/ub-student-code-of-conduct.pdf

Classroom Behavior Expectations
https://catalog.buffalo.edu/policies/obstruction.html

Explanation of Grades
https://catalog.buffalo.edu/policies/explanation.html

Meeting Times & Locations

Lecture Sections

Section	Time	Location
A	MW5	NSC 222
B	MW 4	Hochstetter 114
C	MW 4	Cooke 121
D	MW 5	NSC 218
E	MW 5	Nsc 228
F	MW 4	Knox 110

Recitation Sections

Section	Time	Location	Instructor
A1	F 5	Cooke 127A	Jennifer Winikus
A2	F 12	Clemens 206	Kenny Joseph
A3	F 10	Alumni 90	Alan Hunt
A4	R 5	Norton 214	Jennifer Winikus
B1	F 5	Norton 216	Jesse Hartloff
B2	R 10	Baldy 125	Jingjing Meng
B3	R 11	Clemens 204	Jesse Hartloff

B4	R 12	Norton 210	Jingjing Meng
C1	F 12	Norton 209	Jennifer Winikus
C2	F 11	Talbert 112	Jesse Hartloff
C3	R 1	Alumni 88	Jesse Hartloff
C4	R 2	Clemens 107	Jingjing Meng
D1	F 4	Cooke 127A	Jennifer Winikus
D2	R 4	Alumni 88	Jingjing Meng
D3	F 2	NSC 222	Ethan Blanton
D4	F 3	Cooke 127B	Jennifer Winikus
E1	F 5	Cooke 248	Kenny Joseph
E2	R 5	Cooke 127A	Jesse Hartloff
E3	R 3	Alumni 88	Jingjing Meng
E4	F 4	Norton 216	Jesse Hartloff
F1	F 10	Norton 213	Ethan Blanton
F2	F 11	Alumni 90	Alan Hunt
F3	R 10	Capen 108	Jennifer Winikus
F4	R 11	Baldy 109	Jingjing Meng