CSE 310, Fall 2020, Department of Computer Science, Stony Brook University
Computer Networks

Instructor: Christopher Kane, christopher.kane@stonybrook.edu
Office: New Computer Science, Rm. 107
Office Hours: Tuesdays: 10:00 AM – 12:00 PM, 1:00 PM – 3:00 PM; or by appointment
Class: Monday/Friday, 1:00 – 2:20 PM

Course Description:
Overview of computer networks and the Internet. Concept of end systems, access networks, clients and servers. Connection oriented and connectionless services. Circuit switching and packet switching. Description of Internet protocol layers, including application layer, transport layer, network layer and link layer. Architecture of the current Internet and the World-Wide Web. TCP/IP protocol stack. Internet routing and addressing. Local area network protocols, Ethernet hubs and switches. Wireless LANs. Multimedia networking.

Pre-requisite: CSE 214 or CSE 260; CSE 220 or ISE 218; CSE or ISE major

Course Outcomes:
At the completion of this course, students will have:
- Understanding of the conceptual foundations of computer network and layered protocol architecture.
- Understanding of different types of computer networks, such as WANs, LANs, wireless networks, and circuit-packet-switched networks, and between different paradigms of network applications (peer-to-peer/client-server).
- Understanding of the Internet architecture and the TCP/IP protocol suite, and details of representative protocols at the application, transport network and data link layers.
- Ability to use current network programming technology.

Textbook:
- James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach*, 7th Edition, Pearson, 2017.

Course Format:
This course will be conducted in a live, online format.
- Lectures will be conducted live using Zoom video conferencing software. Students are expected to attend the lectures through Zoom while they are being given. To assist students who miss lecture for technical or other reasons, recordings of each live lecture will be posted as unlisted videos to an unlisted playlist on Youtube. Links to the playlist will be shared with the class through Blackboard.
- Exams and quizzes will be conducted during class-time through Blackboard using the Respondus Lockdown browser and Monitor to make cheating more difficult.
- Assignments will be submitted through Blackboard as usual.

Technical Requirements:
The shift to a live, online format will impose some technical requirements on students wishing to complete the class:
- A reliable, broadband connection to the Internet
- A desktop or laptop computer
- A webcam
- A microphone
- The latest version of the Respondus Lockdown browser downloaded through Stonybrook: https://download.respondus.com/lockdown/download.php?id=772113517
- Zoom, 5.01+ (students should be regularly checking for updates to their Zoom client)

Course Online Resources:
- Course Homepage: https://www3.cs.stonybrook.edu/~ckane/fall2020/cse310
- Blackboard: https://blackboard.stonybrook.edu
  Blackboard will be used for most other course materials such as slides, assignments, grades, etc. These sites must be monitored and read regularly.
- PIAZZA: https://piazza.com/stonybrook/fall2020/cse310
  This term we will be using PIAZZA for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and Professors. All non-personal course-related communication should be posted to the discussion board. If you have questions about assignments, technical problems that need troubleshooting, or other questions that might be of interest to other students, they must be posted to PIAZZA and not emailed to the instructor or TA. If you have any problems or feedback for the developers, email team@piazza.com.

Course Outline:
The following topics will be covered in the lectures:
- Application Layer
  - Internet
  - HTTP
  - DNS
- Transport Layer
  - Sockets
  - UDP
  - TCP
  - TCP Flow Control
  - TCP Congestion Control
- Network Layer
  - IP Addressing (IPv4, IPv6)
  - Forwarding
- Routing/Switching
  - Routing Algorithms
  - Intra-domain Routing
  - Inter-domain Routing
  - ICMP
- Link Layer

- o Ethernet
  - o WiFi
- Network Security
  - o Cryptography
  - o TLS/SSL
  - o Firewalls/Intrusion Detection

A more detailed schedule of lectures, readings, assignments, and exams will be posted to the course homepage.

Course Announcements: Course announcements PIAZZA (they may be cross-posted to Blackboard). You are expected to be aware of all announcements.

Final Exam: Thursday, December 17th, 2020, 2:15 – 5:00 PM

Grade Distribution:
- Homework Assignments (4):   20%
- Programming Assignments (4):   30%
- Term Exams (2):   20%
- Final Exam: 30%

Course Grade Cutoffs:

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A  [94 – 100), A- [90 – 94), B+ [86 – 90), B  [82 – 86),
B- [78 – 82),  C+ [74 – 78), C  [70 – 74), C- [66 – 70),
D+ [62 – 66),  D  [58 – 62), F  [0 – 58)
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Course Policies:
- Attendance is expected and highly encouraged.
- Students are responsible for all missed work, regardless of the reason for the absence. It is also the absent student's responsibility to obtain all missed notes or materials.
- Students are expected to work independently. Offering and accepting solutions from others is an act of plagiarism, which is a serious offense and all involved parties will be penalized according to the Academic Honesty Policy. Discussion amongst students is encouraged, but when in doubt, direct your questions to the professor or TA.
- Assignments must be turned in on the day they are due. Students are urged to plan ahead to avoid problems such as congestion or failure of computer facilities at the last minute. If your assignment is incomplete or is not working by the due date, turn in whatever you have.
- **Grace Period:** You get a 48 hour grace period spanning all programming assignments and a 24 hour grace period spanning all homework assignments. You will not be penalized for lateness so long as the total hours that you are late does not exceed 48 hours across all of your programming assignments and 24 hours across all of your homework assignments.
- **Grading Issues:** All issues with grading must be emailed to christopher.kane@stonybrook.edu within 1 week of release of the graded assignment or

exam. Any requests/concerns after this date will not be honored. The email must include a detailed explanation of the specific grading issues and reason/correction. We believe students often learn by investigating and understanding their mistakes. Therefore, it is the responsibility of the student to determine the issues, not the grader/instructor/TA.

- Exams are closed book, closed notes.
- Quizzes and Exams will conducted through Blackboard using the Respondus Lockdown browser and Monitor.
- **No makeup exams will be given, except for PRIOR excused absences with official documentation approved by the University.**

Etiquette:
PIAZZA:
PIAZZA is a forum for additional learning and assistance. It is not the place for cyber-bullying, memes, grade complaints, concerns/comments/criticisms about the course, or in general, anything unrelated to the course material and your learning. Improper behavior will result in the deactivation of PIAZZA and reporting of the individual's behavior to University Office of Community Standards.

Therefore, students are expected to use the PIAZZA forum for all non-personal course-related communication. If you have questions about assignments, technical problems that need troubleshooting, or other questions that might be of interest to other students, they must be posted to PIAZZA and not emailed to the instructor or TA.

Email:
Almost all questions concerning the course should be posted to PIAZZA. The following list gives exceptions for which students should email me directly:
- If you cannot come to office hours and need to set up an appointment to meet at another time; in this case, you must include your availability for the upcoming week.
- Making arrangements for disability accommodations.
- To discuss private, personal matters that are impacting your coursework, such as physical or mental illness, death in the family, etc.
- If the instructor asks you to email them something relating to a previous conversation.

When emailing, please use the following guidelines to ensure a timely response:
- Use your official Stony Brook (@stonybrook.edu) email account.
- Use a descriptive subject line that includes "CSE 310", identifies the item you are emailing about, and a brief description of the topic of your email.
- E.g., "CSE 310: HW1 Submission error", "CSE 310: HW2 Blackboard Grade"
- Begin with a proper greeting, "Hello Prof. Kane,"
- Please be direct and concise in explaining the issue.
- End with a proper salutation that includes your full name, netid, and SBU ID number.

Student Accessibility Support Center Statement (SASC)
If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, 128 ECC Building, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website:
https://ehs.stonybrook.edu/programs/fire-safety/emergency-evacuation/evacuation-guide-people-physical-disabilities
and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at
http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

New Digital Tools:

Zoom:

You must use your stonybrook.edu email address when attending class or office hours Zoom meetings.

Respondus Lockdown Browser and Monitor:

This course requires the use of LockDown Browser and a webcam for online exams. The webcam can be the type that's built into your computer or one that plugs in with a USB cable

Watch this brief video to get a basic understanding of LockDown Browser and the webcam feature.

https://www.respondus.com/products/lockdown-browser/student-movie.shtml

Download Instructions

Download and install LockDown Browser from this link:

https://download.respondus.com/lockdown/download.php?id=772113517

Once Installed

- Start LockDown Browser
- Log into Blackboard Learn
- Navigate to the test

Note: You won't be able to access tests with a standard web browser. If this is tried, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate back to the exam to continue.

Guidelines

When taking an online test, follow these guidelines:

- Ensure you're in a location where you won't be interrupted
- Turn off all other devices (e.g. tablets, phones, second computers) and place them outside of your reach
- Before starting the test, know how much time is available for it, and also that you've allotted sufficient time to complete it
- Clear your desk or workspace of all external materials not permitted - books, papers, other devices
- Remain at your computer for the duration of the test
- If the computer, Wi-Fi, or location is different than what was used previously with the "Webcam Check" and "System & Network Check" in LockDown Browser, run the checks again prior to the exam
- To produce a good webcam video, do the following:
  - Avoid wearing baseball caps or hats with brims
  - Ensure your computer or device is on a firm surface (a desk or table). Do NOT have the computer on your lap, a bed, or other surface where the device (or you) are likely to move
  - If using a built-in webcam, avoid readjusting the tilt of the screen after the webcam setup is complete
  - Take the exam in a well-lit room, but avoid backlighting (such as sitting with your back to a window)
- Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted

Getting Help

Several resources are available if you encounter problems with LockDown Browser:

- The Windows and Mac versions of LockDown Browser have a "Help Center" button located on the toolbar. Use the "System & Network Check" to troubleshoot issues. If an exam requires you to use a webcam, also run the "Webcam Check" from this area

- [As applicable, insert information about your institution's help desk, including details about how to contact them. Some help desks want students to run the "System & Network Check" and the "Webcam Check" before they are contacted - and even, to forward the results of these checks at the time of opening a ticket.]
- Respondus has a Knowledge Base available from support.respondus.com. Select the "Knowledge Base" link and then select "Respondus LockDown Browser" as the product. If your problem is with a webcam, select "Respondus Monitor" as your product
- If you're still unable to resolve a technical issue with LockDown Browser, go to support.respondus.com and select "Submit a Ticket". Provide detailed information about your problem and what steps you took to resolve it