Pace University

CS 488: Computer Networks and the Internet

Spring 2019

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Office Hours: **Monday & Wednesday: 1:50-3:20PM; Tuesday & Thursday: 11:00-12:00**

Prerequisite CS 241 C or above
Credits 4

Description

This course provides a top-down study of modern computer networking and the Internet. Application layer topics include the Web, HTTP, FTP, SMTP, DNS, and socket programming. Transport layer topics include UDP, TCP, and congestion control. Network layer topics include link state routing, distance vector routing, IPv4, RIP, OSPF, BGP, IPv6, multicasting and IGMP, and mobile IP. Local area network topics include Ethernet, IEEE, 802.11, and bluetooth.

Textbook

[Required] ***Computer Networking: A Top-Down Approach*****,** *By James F. Kurose; Keith W. Ross. Edition: 6, ISBN:9780132856201*
[Suggested] ***TCP/IP Illustrated, Vol. 1: The Protocols;*** *By Richard Steves. ISBN: 978-0201633467*

Learning Outcomes and Major Topics [assessed student outcomes: a, h, j]

After taking this course, students should be able to:

1) Understand the fundamental concepts of computer networks, particularly as related to the Internet [a];
2) Understand the multi-layer model of modern network architecture and its advantages and complexities [a];
3) Understand application layer messages and protocols, and write application layer software using sockets [i];
4) Understand transport layer functionality and explain how congestion control is implemented on the Internet [i];
5) Understand inter-networking and network layer functionality, and explain how routing is implemented on the Internet and network management [i];
6) Understand local area networks and link-layer issues including the details of the Ethernet and IEEE 802.11 protocols [h];
7) Demonstrate knowledge of network security issues, including encryption and authentication, as well as areas of weakness and emerging threats [h].

Evaluation

Participation	**15%**
➔ Participation in class	10%
➔ Participation in online discussion	5%
Assignments	**45%**
➔ homeworks	20%
➔ Projects	25%
Exam(Midterm & Final)	**40%**

- ❑ All assignments **due at 11:59:59pm on specific dates**. Any work submitted after the deadline will receive a **25%** late penalty each calendar day (not business day).

  Please start your assignment early. *Generally speaking, in order to do well in class students are expected to study 2 to 3 hours outside of class per week for every credit hour they are registered.* This is a high-level hands-on course and some coding assignments could be **time-consuming**.

- ❑ **NO MAKEUP** exams are given except for extreme emergency with solid evidence. If you are ill, you have to provide a doctor's note that **must specify** that you were unable to take the exam on the specific test date. For immediate family emergencies: provide valid documentation, e.g., an obituary, a doctor's note, a certified note from your parent or guardian. For official Pace business, such as a business trip, an academic conference/workshop/seminar, a sports activity where you are a participant, you must provide the relevant **official Pace documentation** noting your absence. If you have to attend a job interview, you must provide the official email from HR. This applies to all the quizzes, midterm and final.

- ❑ **Extra credits.** There may be limited bonus points in one or two assignments. There are bonuses for good attendance.

- ❑ **Exam Policy.** Cell phones, laptops and some calculators can NOT be used to communicate with others and access Internet sites. Using any of these items during an exam is considered an unauthorized aid and a major offense to the academic honesty policies. Any use of a cell phone, pager, laptop or other electronic device during an exam is considered an act of cheating. If you must bring any of these items with you to the exam, turn it off and keep it in your backpack and make sure your backpack is out of sight. You may not make a call, receive a call or message, or otherwise keep any of these items in plain sight. You are allowed to **use both sides of one 8.5x11" page of notes to assist you during the exams** in this course.

- ❑ If you have a question about an assignment evaluation, or if you have a question about an exam or a quiz grade, you must raise those questions **within two week** after the assignment evaluation or the exam or quiz was graded or returned. **Waiting until the end of the semester is too late.** Any appealing request that is made within 2 weeks of receiving the grade is promised to be processed in 3 days. Please also note the procedure of processing an appealing involves regarding the entire exam, quiz, or homework instead of just a subset of questions.

The final decision will be reviewed by another faculty, and the new grade could be the same as, or less than, or greater than the old grade.

- **Grading Criteria.**

Letter	Weighted Total	**AND**	Weighted average of projects
A	>=90%		>=85%
B	[80%, 90%]		No requirements
C	[70%, 80%)		No requirements
D	[60%, 70%)		No requirements
F	<60%		No requirements

Exam grade. Because the final exam is cumulative but the midterm only covers half of the semester, your exam grade follows this ethos: acing the final demonstrates you have mastered the material regardless of a possibly poor midterm grade. Correspondingly, your exam grade is ***max(final, avg(final, midterm))***.

Participation in class. There will be several in-class labs and exercises through the semester. It is important for students to participate in them in order to gain an in-depth understanding of materials and apply knowledge learned from lectures. ***All in-class activities are designed to be accomplishable in-class, and they are due at the end of the same day***. Submitted in-class activities will be graded and receive points according to the following coarse-grained rubric:

correct	of max possible points
>=75%	100%
[50%, 75%)	80%
Participation with genuinely good effort	50%

I will drop the lowest grade among all in-class participation grades.

Participation in online discussion. This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates and instructor. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. Sign up at: https://piazza.com/pace/spring2019/cs488/home .

The evaluation of your online Participation is based on two categories:

1) Participating weekly discussions. If you miss 50% of weekly discussions, you will lose 50% of your participation (which is 2.5% of total).
2) Asking and answering questions on Piazza. If you never ask nor answer any question on Piazza, you will lose the other 50% of your participation.

In other words, you will receive full points of participation as long as you participate at least 50% of weekly discussions, AND ask and/or answer questions on Piazza.

All the evaluations are percentage scores. Your weighted total grade will be rounded up to two decimals, with 0.005 percent being the cut-off point. If your average is 87.985%, it will be averaged up to 87.99%, and if you receive an 87.99%, your grade will be reported as "B+". If your final grade is 88.00% (the cutoff of A-), your course grade will be reported as "A-". **There are no exceptions.**

Curve. I may or may not curve dependent on the overall class performance. If the class works hard and actively participates, then I usually curve the mean of the class to B- or B. For instance, If the class mean falls below 78%(B-), a curve will be added to bring the class mean up to 78%. For example, if the class mean is 75%, then a 3% curve will be added to each score to bring the class mean up to 78%.

Student Attendance (and good attendance bonus policy)

Attendance is not mandatory. Students are responsible for fulfilling all course requirements and completion of all course assignments to receive credit for the course. If classes are missed for any reason, the student is not excused for any missed work. Lectures and discussions are an integral part of this class. A lot of helpful hints about the projects and exams will be made in lecture, so you are highly encouraged to attend lectures.

Please be courteous and arrive ON TIME for class. The attendance are taken during the first 10 minutes of the class. **An excused absence, a late-arrival or an early departure equals to 0.5 absence**. An excused absence must accompany an official document, such as a doctor's notes. Students are not required to attend all classes for which they are registered. **Anyone with a good attendance record (maximum of 2 absences throughout the semester)** is entitled to receive the following bonuses:

1) a minimum of 50% weighted exam grade guarantees "D" grade in the class.
2) a minimum of 60% weighted exam grade guarantees "C" grade in the class.
3) 50% of raised points from resubmission of some projects/homeworks. For instance, if your initial submission receives 50 and your resubmission receives 100, then final score is adjusted to 50+(100-50)*50% = 75.

Please keep in mind there is no penalty for skipping classes but these bonuses are designed to reward students who come to class regularly on-time. There is no partial bonus for students with 2.5 absences or more, and I will make no exceptions to it under any circumstances.

Class conduct

It's important that you and your classmates not be distracted from learning. Please turn off all pagers, music players, cell phones, and laptops during class. If you violate the class conduct rule, you will be asked to provide your name and to leave the class. If you must bring food or beverage, please only bring nuts free food and make it a silent meal.

Procedure for Students with Disabilities Who Wish to Obtain Reasonable Accommodations for a Course:

The University's commitment to equal educational opportunities for students with disabilities includes providing reasonable accommodations for the needs of students with disabilities. To request a reasonable accommodation for a qualified disability a student with a disability must self-identify and register with the Office of Disability Services for his or her campus. No one, including faculty, is authorized to evaluate the need for or grant a request for an accommodation except the Office of Disability Services. Moreover, no one, including faculty, is authorized to contact the Office of Disability Services on behalf of a student. For further information, please see Resources for Students with Disabilities at http://www.pace.edu/counseling-center/resources-students-disabilities.

Continuity Plan

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to change when necessitated by revised course delivery, semester calendar or other circumstances. Information will be communicated online. If the course is not able to meet face-to-face, students should immediately read any announcements and/or alternative assignment. Students are also encouraged to continue the readings and assignments as outlined on this syllabus or subsequent syllabi. The instructor can also be reached at the alternate email address: junyuan@cs.stonybrook.edu

Academic integrity

All the work, unless otherwise noted, are individual work.

For the projects you may work in a group of maximum 3 students . If you work alone, you submit your own work. If you work in a team, you will submit your assignments jointly with your team. Whether or not you work in a team, you *may discuss* the programming assignments with anyone you like in general terms, but you *may not* share *code* with anyone other than your partners. The code you and your partners submit must be your own work, and only your own work. Any evidence that source code has been copied, shared, or transmitted *in any way* between non-partners (this includes using source code written by others in previous semesters, or at other universities!) will be regarded as evidence of academic dishonesty.

Handing in someone else's work is expressly forbidden.

The following are some more specific guidelines for assignments with non-partners.

1. All the work you submit for assignments must **be your own** with the following permissible exceptions, which are considered as the **only authorized sources**:

- code/solution distributed in class,
- code/solution exercised/discussed in labs,
- code/solution post in the assignment instructions and solutions,
- code/solution found in the course textbooks,
- code/solution explained by the instructor during office hour.

2. Cheating includes **not only asking for or receiving** unauthorized assistance **but also giving** unauthorized assistance. Under any circumstances,

- You should not discuss actual code or show your solution, in any form. You may not discuss code at a whiteboard. You may not help each other debug your code.
- You must write down the names of people with whom you have discussed the assignment and what you discussed with them. If student A gets an idea from student B, both students must write down that fact and also what the idea was.
- You must further acknowledge any other contributions (for example, ideas from Web sites or other sources).
- Take suitable precautions to protect your written work. For instance, do not leave printouts lying around, lest you be suspected as an accessory to cheating.
- You may not look at code from previous years of this course.
- You may not look at code from similar courses at other universities.
- Do not show any non-partners (other than the instructor or TA) your work until after the semester end. Because of the lateness policy, you should not assume that another student has completed an assignment after the deadline.

Note that the course staff will do both auto-grading and manual code review to detect cheating. The course staff will also use MOSS tools, which are very good at comparing large sets of programing assignments and correlating those that have a shared code basis, *even* if the code has been changed significantly!

You are welcome to use existing public libraries in your programming assignments (such as public classes for queues, trees, etc.) You may also look at TCP/IP implementation or networking stack code for public domain software such as Linux Kernel. Such activities qualify under approved collaboration practices, and you are welcome to take advantage of them. Note that you must cite and acknowledge those sources properly. Not doing so constitutes academic plagiarism, and will not be tolerated.

I am very serious about not tolerating academic dishonesty. When I am able to establish that academic dishonesty has occurred, I generally assign the student in question a grade of "F" for the course and forward the particulars to the Undergraduate Program Director for inclusion in the student's folder. If the student is a repeat offender, I ask that the director initiate proceedings to dismiss the student from the degree program.

Intellectual dishonesty can end your career, and it is your responsibility to stay on the right side of the line. If you are not sure about something, ask.

Students in this course are required to adhere to Pace University's Academic Integrity Code (Please see the following links). The Academic Integrity Code supports honesty and ethical conduct in the educational process. It educates students about what constitutes academic misconduct, helps to deter cheating and plagiarism, and provides a procedure for handling cases of academic misconduct.

Students are expected to be familiar with the Code, which can be found under "University Policies" in the Student Handbook: http://www.pace.edu/academicintegritycode. Individual schools and programs may have additional standards of academic integrity.

Pace University Academic Integrity Code
http://www.pace.edu/sites/default/files/files/Pace%20University%20Academic%20Integrity%20%20%20Code_9_1_2017.pdf

University Policies in the Student Handbook
http://www.pace.edu/student-handbook/university-policies-disciplinary-and-grievance-procedures

Students are required to be honest and ethical in satisfying their academic assignments and requirements. Academic integrity requires that, except as may be authorized by the instructor, a student must demonstrate independent intellectual and academic achievements. Therefore, when a student uses or relies upon an idea or material obtained from another source, proper credit or attribution must be given. A failure to give credit or attribution to ideas or material obtained from an outside source is plagiarism. Plagiarism is strictly forbidden. Every student is responsible for giving the proper credit or attribution for any quotation, idea, data, or other material obtained from another source that is presented (whether orally or in writing) in the student's papers, reports, submissions, examinations, presentations and the like.

Individual schools and programs may have adopted additional standards of academic integrity. Therefore, students are responsible for familiarizing themselves with the academic integrity policies of the University as well as of the individual schools and programs in which they are enrolled. A student who fails to comply with the standards of academic integrity is subject to disciplinary actions such as, but not limited to, a reduction in the grade for the assignment or the course, a failing grade in the assignment or the course, suspension and/or dismissal from the University.

The spirit of the Pace University Academic Integrity Code applies to all the assignments and exams in this course. 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. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary.