AUBURN UNIVERSITY

COMP 4320 Syllabus

Course Information

Course Number & Title: COMP 4320 Introduction to Computer Networks (3 credits)
Section 01: TR 2:00-3:15pm, **in** Shelby 1103

Instructor: Saad Biaz, Shelby 3101-Q, **Office Hours**: Tuesday 8-9:3 and Thursday after the class quiz in classroom or by appointment for private/personal matters

GTA: Peijie Chen pzc0018@auburn.edu, **Office Hours**: TR 9:30-11am **Room** Shelby 3130

Prerequisites: COMP 3500 (3510) and Java.

Essential

If I offend you in any way, form, or shape, please rest assured I never intend to offend anyone. Just let me know in case I offend you. What is acceptable to me may be utterly unacceptable to you and *vice versa*. We need to mutually learn about each other.

Instructional Mode

The instructional mode for this course is in person.

- *Lecture meetings*: For each class meeting, I will hold an in-person class meeting during the scheduled lecture time. This in-person class meeting is **optional** but **encouraged (In general, students who attend lectures and actively participate perform better)**. About every three Tuesday, there will be an examination that is administered in class.

- *Examinations (Exams, Final)*: all examinations will be administered on Tuesday except the final that is scheduled by the University (See University Calendar for Finals). All examinations must be taken in the usual classroom. Taking them remotely is an Honesty Code violation.

Description

This course covers the fundamentals of networking to understand well today's Internet. The *OSI reference model* is studied to understand how today's devices communicate. This course will illustrate how software is a key to network performance and the user's experience. The focus is mainly on the Internet and the TCP/IP suite protocols. Hands on activities will involve *socket programming* and *packet tracing*.

This course will adopt the *in-person* instructional mode: the instructor will present in class material available online. The students *should* study the material using online resources and the office hours. Live lectures and videos overlap, but the live lectures do not cover all material in the videos, and videos do not cover all material presented during the live lectures. Each student will use the videos as adapted to their needs. Online resources consist of video clips with associated *Self Study Questions (SSQs)*, Reviews, examinations, homework, and lab programming assignments.

The evaluation will consist of examinations: SSQs, reviews, exams, and the final that aligned with the online resources. Students are strongly encouraged to collaborate when working out the self-study or review questions.

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Course Objectives:

Upon completion of the course, you should be able to:

- understand fundamental concepts and principles of computer communication networks
- understand computer networks from the perspective of the TCP/IP Internet framework
- understand network protocol design decisions
- predict frames that would appear on a network for any scenario (packet tracing)
- be able to apply basic network performance analysis techniques (data link)
- gain (if interested) understanding of switching, packet scheduling and queue management

Program Information

Program Educational Outcomes

The overall objective of the computer science program is to prepare graduates who will be successful in their chosen career paths. Within a few years of graduation, alumni of the computer science program will attain:

- **PEO 1**: Success in their chosen profession as evidenced by career satisfaction, promotions/raises, and leadership at levels appropriate to their experience.

and/or

- **PEO 2**: Success in post-undergraduate studies as evidenced by satisfaction with the decision to further their education, advanced degrees earned, and professional visibility (e.g., publications, presentations, awards, etc.).

Course Details

Required Books:

- Andrew Tanenbaum, David Wetherall . *Computer Networks* (5th ed.).
    - (ISBN-13: 978-0132126953 or ISBN-10: 0132126958)

Additional Readings

Articles pertinent to each week's topics may be posted for students on Canvas.

Course Structure

The course will follow this general pattern for each **module (week)**:

1. By the start of each module, students must complete the assigned readings
2. The instructor will offer a live lecture to present the big picture and to guide students about how to best study and use the online resources. **Attendance is optional**.
3. Students must watch a series of lectures on the topic covered by the module
4. Each lecture has graded ***Self Study Questions*** to assess and *extend* understanding.
5. A graded ***review*** closes the series of lectures,
6. A graded **fast** paced class exam (one exam every three weeks)
7. Students will complete and submit a ***homework assignment*** for a grade.

Outline of Course

This course will be broken up into fifteen modules (three are optional). The following outline presents the topics to be covered in each module.

Module 1: Introduction to Computer Networks
Module 2: Introduction to TCP/IP Sockets Programming
Module 3: Physical Layer
Module 4: (Data) Link Layer : Logical Link Layer **sublayer**
Module 5: (Data) Link Layer : Medium Access Control **sublayer**
Module 6: Network Layer
Module 7: Transport Layer
Module 8: Application Layer
Module 9: TCP/IP Internetworking Review (Part I)
Module 10: TCP/IP Internetworking Review (Part II)
Module 11: Putting Everything Together: Packet Tracing (Part I)
Module 12: Putting Everything Together: Packet Tracing (Part II)
Module 13: [**Optional**] Introduction to Data Link Protocols Evaluation
Module 14: [**Optional**] MAC Protocols Evaluation
Module Break: [**Optional**] Packet Scheduling and Buffer Management (only for those interested)

Faculty Communication and Feedback

At the beginning of each course, make sure that you understand the instructor's preferred mode of communication and any specific communication protocol. For **ALL** questions, issues, or concerns you **MUST** Use **Piazza** (**UP!**). **Questions of interest to other fellow classmates MUST be public (you can be anonymous)**. Use private Piazza messages for private logistics questions/issues ("send to *Instructors Only*)). **Do NOT expect any response to emails or Canvas messages unless Piazza is down.** One of the best ways to be effective as a student is to understand the instructor's expectations and operate within those boundaries. Students should give the instructor 48 hours to get back to them on any communication, and one week for grading turnaround time on major assignments. If students have concerns about communication or feedback, they should always go to the professor first. Students should ***courteously*** explain their concerns as clearly as possible without judgment or emotion. Effective communication is an important skill, and every interaction in this program is an opportunity to develop this skill

Do not expect a response to emails or Canvas messages unless Piazza is down.
Use Piazza to communicate with instructors or to get answers.

Grading Methodology

Achievement in this course will be assessed through completion of the following activities:

Assignment Type	Grade %
Self-Study Questions	10%
Reviews	2%
Homework Assignments	15%
Programming Assignments	10%
Exam 1	6%
Exam 2	8%
Exam 3	10%
Exam 4	12%
Final (Online Canvas Quiz)	21%
Final (Packet Tracing)	6%
Total	100%

Activities

Activities are intended to guide you through thinking about computer networks.

Active Participation

Participation **in class** and through Piazza is expected and *appreciated*. A weak participation will **NOT** hurt your final score or letter grade. Active (more than [two questions + one response] per week) and beneficial (to your classmates) participation will be considered by the instructor in case your score is ***borderline (within 0.25 of cut-off)*** at the end of the term.

Self-Study Questions

Self-study questions (SSQs) are in general multiple-choice questions that make you think about the material just covered and are designed to help you understand it better. Some questions push you **to investigate and search on your own material not covered**. You will have enough time to review or research online for help. You will be allowed to take SSQs twice and keep the highest score. When your answer is wrong, consider reviewing the material and think about why your answer was wrong **before** the second attempt. Take always the second SSQ attempt **before the deadline**: if the second attempt is late, a **late penalty** will be applied to the highest score **EVEN** if the highest score was earned before the deadline. Except for Module 1, all SSQs are due at midnight on Wednesdays and Fridays.

SSQs are not designed to trick you or to lose points. No! They are designed to **draw your attention** to facts and **pitfalls** that a linear video presentation and simple REPETITION cannot highlight.

Reviews

Each module will have at least one Review that is similar to the Self-Study Questions. Take the Review **before the deadline**: if the second attempt is late, a **late penalty** will be applied to the highest score **EVEN** if the highest score was earned before the deadline. Reviews are due at midnight on Fridays.

"Class" Exam

Every three modules/weeks you will have one "Class" Exam. A "class" exam is comprehensive and similar to the Review. Class exams are administered on **Tuesdays at the beginning of the class**. **To avoid any late penalty and test taking during the lecture**, start the Class Exam as soon as it is available at the beginning of the class.

Homework Assignments

You will have a group **homework assignment** every week to explore new concepts not covered in class or deepen some concepts presented in the lectures. Homework assignments are due on **Fridays.** A homework assignment can be completed by a **team** of up to 2 students. **It is strongly advised to work in groups pf two students**. It is your responsibility to select a partner and to join a team **before submitting the first assignment.** After the first assignment, you cannot join or change a group. You can only drop from a group**.** One submission per group**.**

Programming Assignments

Three programming group assignments: one every about 5 weeks. Programming assignments can be completed the same group formed to work on homework assignments. **It is strongly advised to work in groups of two students**. One submission per group. Programming assignments are due on **Mondays**.

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Grading Scale

Grades are determined on straight percentages as follows:

Letter	Range
A	90%+
B	80%, <90%
C	70%, <80%
D	60%, <70%
F	<60%

Auburn uses a 4.0 grade scale. An A equals 4.0; B, 3.0; C, 2.0; D, 1.0; and F equals 0.0. Students must maintain a 2.0 average GPA in all courses in order to progress in this program. If addition, students must earn at least a D in each individual course in order to earn credit and progress to the next course. For more detailed information about university grading standards, please refer to information on the following link:

- Auburn University Undergraduate Academic Policies on Grades

Course Policies

Late Assignment Policy

It is very important that students submit work on time, or they will find it very difficult to keep up. All work in the course (e.g., self-study questions, reviews, and homework/programming assignments) will be due by 11:59 **pm** CT on the date noted on the class calendar. Assignments may be submitted up to 4 days late with a **25 POINTS** late penalty per day. Students should reach out to their instructor immediately to discuss any concerns or to submit documentation of university-excused lateness. Note that submitting **AT** or after 11:59:00pm will rightly be flagged late by Canvas.

All due dates and times in this course are specified in Central Time. For example, assignments are due no later than 11:59 **PM** Central Time, not your local time. If you prefer, you can set Canvas to display dates and times adjusted for your local time zone. See the following URL for more information: https://community.canvaslms.com/docs/DOC-10622-4212717410

Program Policies

Citation Expectations

All research work submitted should be properly cited using the ACM Style Guide (https://www.cs.ucy.ac.cy/~chryssis/specs/ACM-refguide.pdf). For more information and tools to assist you in writing and research, refer to the citation management tools provided through the Ralph Brown Draughon Library.

Be Patient and Courteous. Stay Calm!

Problems with technology will inevitably arise. Don't worry and just keep smiling. Some answer keys (rarely) may turn out unclear, incomplete or wrong. They may appear as tricky. The objective of the instructor is NOT to trick you. The objective is to draw attention and stress on some aspects of the lecture that simple presentation or simple repetition cannot highlight. Take these incidents as opportunities to discuss them on Piazza. In any case, your score will always be promptly adjusted, if justified. Be **patient** and **courteous** with your instructor and your instructor will be **prompt** and **courteous** with you. Your instructor will always take technical problems into account if the situation warrants it. If the instructor offends, please consider pointing it out to your instructor. Make of it an opportunity to learn more about each other.

Logging On

The learning activities for each week are carefully sequenced and offered in small chunks so you can accomplish reasonable amounts throughout the week. You should log on to the course website regularly to work through course materials and participate in Piazza discussions.

Posting Responses

You are responsible for all public communications on Piazza within of 24 hours of posting. Interaction between students is an important part of this course and requires prompt postings and responses. In an attempt to be efficient with our time and considerate of everyone's schedules—beyond the requirements of this course—we will operate under a consistent time structure for posting assignments and responses to **Piazza** discussions. **Questions by email or Canvas messages may remain unanswered**.

Submitting Assignments

You will submit all written assignments by strictly following the turn in instructions spelled out in the assignment. Unless otherwise noted, assignments will be due by 11:59 pm CT (check on Canvas) on the date noted on the class calendar. **ADVICE**: always download and check your submissions to insure that you submitted the RIGHT files and versions. We grade what IS submitted, NOT what SHOULD have been submitted. Should you submit the wrong version, **lateness penalty will be applied with no exception**.

Academic Integrity

Auburn University has adopted an Honor System proposed by its students and faculty to promote academic integrity and has enacted the following code:

"We, the faculty, instructors, and students of the (University course here) pledge to fulfill our mutual responsibilities to each other and the academic community at large with honor and integrity in order to build and maintain a climate of respect and trust that will enhance our research, teaching, and learning. We will support the Honor System of the School, and will not tolerate activities that undermine academic integrity."

Academic dishonesty is an offense that will be reported to the Academic Honesty Committee. Please refer to the following document for further information regarding academic honesty:

- Auburn University Student Academic Honesty Code

In case a violation is committed, the instructor will report it (no exception) and will require **at least** :

1) A 0 on the assignment/quiz/exam…. in question and one letter downgrade for the first time
2) A grade of F with a mention of the violation on the transcript for the second time.

Accessibility

Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are immediately needed. If you need accommodations but have not established them, make an appointment with the Office of Accessibility, 1228 Haley Center, 334-844-2096.

Leniency Policy for Borderline Incidents

The instructor **systematically** and **consistently** deals with **BORDERLINE** incidents like: light delays, submitting wrong versions, retaking quizzes after deadlines.....

When deemed by the instructor as borderline and **reasonable**,

1) The syllabus/penalty **is strictly applied**

2) If the student does not have **ANY** other borderline or honesty incident (as defined above) throughout the term, they can claim back the penalty. Make sure to claim back your penalty at the end of the term. Just send on Piazza a private message to the instructor to claim back the penalty.

3) **For fairness,** if a student never has any incident, I will take this in consideration if their final score is borderline (close within 0.25% to those scores determining the letter grades, i.e., 90 (A), 80(B), 70(C)....).

This leniency policy applies **only** if you do not repeat similar incidents and do not have any late **assignment** (SSQs, Reviews, ...Examinations), any incident, or academic honesty code violation throughout the term.

What is borderline?

Borderline is as commonly defined: you almost met some requirement, but definitely violate it based on the syllabus. For example, Canvas flags your assignment late because you submitted an assignment one second late. This is a borderline incident.

Covid-19 Issues

All students enrolled in this course are required to properly wear a face covering that covers the nose and mouth while inside the classroom, laboratory, studio, or office. Failure to comply with this requirement represents a potential Code of Student Conduct violation and may be reported as a non-academic violation. Please consult the Classroom Behavior Policy (Links to an external site.) for additional details.

Contingency Plans Covid-19

Extended Student Absence

If illness causes you to be unable to participate in the course, please contact me as soon as possible to discuss your options.

Extended Instructor Absence

If illness causes me to be unable to continue teaching the course, a back-up instructor has been selected who will assume all teaching responsibilities to ensure that the course will proceed uninterrupted.