

Course Assessment Document for CS 331 Computer Networks

Departmental Outcomes

1. Proficiency in computational thinking
2. Ability to analyze systems at the three levels of computer science: theory, software, and hardware
3. Proficiency in the design and implementation of algorithms using multiple programming languages
4. Ability to apply computational thinking to a diverse set of problems and disciplines
5. Ability to communicate effectively and collaborate with others
6. Ability to adapt to new challenges and computational environments

Course Description

An introduction to fundamental concepts of computer networks and widely-used networking technologies. Topics include application protocol design; principles of congestion and error control protocols; network routing; local, wireless, and access networks; and network programming. An in-depth discussion of the Internet suite of protocols will be given. Students will engage the material through programming projects and written assignments.

Prerequisites: CS 231, CS 232

Rationale for prerequisites: Students need to have seen common data structures and algorithms, and basic knowledge of bits and binary in order to engage the material properly.

Desired Course Outcomes

- A. Students demonstrate an understanding of the fundamental concepts of computer networks and widely-used networking technologies.
- B. Students demonstrate an understanding of the Internet suite of protocols.
- C. Students demonstrate an ability to utilize the commonly used networking tools.
- D. Students demonstrate an ability to analyze the network performance.
- E. Students present methods, algorithms, results, and designs in an organized and competently written manner.

We will disseminate the desired course outcomes to students via the course web page, syllabus and in class.

Course Matrix

Outcome	Activities	Method of Assessment	Departmental Outcome
A	Lectures, Homework, Projects	Exams, graded homework, and graded projects	1, 2, 3, 4
B	Lectures, Homework, Projects	Exams, graded homework, and graded projects	1, 2, 4
C	Lectures, Homework, Projects	Graded homework and projects	1, 3, 4, 6
D	Lectures, Homework, Projects	Exams, graded homework, and projects	1, 2, 4
E	Homework, Project Reports	Graded homework and projects	5

Grade Calibration Matrix

Outcome	Meaning of the grade A
A	The student understands the fundamental concepts of computer networks and widely-used networking technologies, and can critically analyze their strengths and weaknesses.
B	The student understands the Internet suite of protocols, and can outline the main protocols.
C	The student can apply the networking tools to understand network behaviors and to address problems.
D	The student can critically analyze the network performance from various perspectives.
E	Reports are well written, concise and clear. The reports clearly describe the algorithms used and show images and figures to support the text. Presentations are clear, use appropriate presentation materials, demonstrate comprehension of the material and are effective at conveying the concepts to their fellow students.

Outcome	Meaning of the grade B
A	The student understands the fundamental concepts of computer networks and widely-used networking technologies and can identify possible strengths and weaknesses.
B	The student understands the Internet suite of protocols.
C	The student can apply the networking tools to understand network behaviors.
D	The student can critically analyze the network performance from main perspectives.
E	Reports are well written and clear. The reports describe some or all of the algorithms used. Presentations are clear, presentation materials are adequate, and the student demonstrates comprehension of most of the material. The presentation conveys the main points to other students in the course.

Outcome	Meaning of the grade C
A	The student understands most of the fundamental concepts of computer networks and some widely-used networking technologies, and may be able to identify some strengths or weaknesses.
B	The student understands most of the Internet suite of protocols.
C	The student can apply the networking tools.
D	The student can analyze the network performance from one/two main perspectives.
E	Reports describe the work, but may take the form of a narrative of what went wrong rather than focusing on the algorithms. The reports describe at least the primary algorithm used in the assignment. The presentations are not well organized and may not contain all of the main points. The presentation materials may be incorrect, insufficient, or hastily created. Students following the presentation may have difficulty following the main points.

Outcome	Meaning of the grade D
A	The student understands some of the fundamental concepts of computer networks and widely-used networking technologies, but has difficulty analyzing or comparing different mechanisms.
B	The student understands some of the Internet suite of protocols, but has difficulty identifying the purpose of those protocols.
C	The student has difficulty applying the networking tools.
D	The student has difficulty to analyze the network performance.
E	The student's reports are incomplete or not well written. The report includes the required images but no description of how they were made or their significance. The report contains little information about the algorithms and methods. Presentations are unclear or made without preparation. Presentation materials are poor or missing. Other students in the course have difficulty following the presentation.

A student who receives an F does not meet the criteria for a D or any higher grade.