University of Wisconsin-Stevens Point
College of Letters and Science
Department of Computing and New Media Technologies
Computer Information Systems
Networking Track

CIS460:
Advanced Topics in Networking

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Course Description

As we move further into the 21st century, wireless becomes the new paradigm for user-centric networking. Today, laptops, PDAs, smartphones, and sensor networks are used to connect to data networks anytime, anywhere, mobile. This course will introduce you to the fundamental concepts at the bottom of the different wireless networks, how mobility of users is incorporated, and what the special characteristics and requirements of mobile devices are. Instructor-guided lab units and student projects that target different areas of wireless networking will give deeper insights into different content areas.

The course is structured into modules, with each module covering a part of the overall course content

- **Prerequisites: CIS360 or instructor approval**
- **Rental course text: N/A**
- **Helpful: Some knowledge in programming for the student project, depending on the chosen topic.**

Gathered data from student activities in this course will be part of an anonymous evaluation for research purposes. Please contact the instructor if you do not wish to have your data included.

Course Goals

At the end of the course, you will have a broad understanding of current multimedia networking technologies and how those are implemented.

Course Outline

The First Lecture

This serves as a general introduction and overview of the course. It will provide guidelines on how to successfully complete the course.

The First Part of the Course

The first part of the course focuses on the theoretical foundations of this class. The class will cover instructor-provided materials in the content domains of multimedia networking and content distribution. After this initial part of the course, you will be able to:

- Explain the particularities of multimedia streaming
- Understand different network-layer delivery methods
- Understand common frameworks for the delivery of multimedia streams
- Explain how Quality of Service architectures can improve the current situation
- Explain the general principles of overlay networks

We will also read several research papers and Internet requests for comment covering the different topics that we will investigate in class. From these exercises you will be able to:

- Learn how to read/evaluate research papers
- Practice creative problem solving skills
- Identify common issues in protocol design

The Second Part of the Course

In the second part of the course, we will meet in the lab for several instructor-guided labs. Guided labs will be graded. As outcome of these labs, you will be able to:

- Perform network socket programming in Java
- Analyze the packet-level characteristics of multimedia traffic

As you work through the guided labs, try to identify areas that are of interest to you and a peer. After we worked through these lab modules, you have to pick from one of the student projects that the instructor suggests – or you can suggest your own in an area that is of interest to you. Example projects are:

- Design and implement your own application-layer protocol
- Design and implement a streaming media player
- Perform an investigation of streaming media properties

Course Activities

Reading

You will need to perform a large amount of reading in the first part of the course, as outlined before. Make sure that you keep up with reading assignments and come prepared to class.

Labs

Several instructor-guided labs will be prepared for you to get a hands-on experience in this course. Several of these labs will require you to perform additional preparation steps or read material prior to the lab.

Student Projects

Different student projects will be offered, some of them require you to have lab access and others can be performed completely at home (you may have to install required software). Student projects are group-based and you are to work as a team – every team member has to know what and how the project goals were achieved. Questions will be asked from each team member.
Equipment will be available for you to check out and work on outside of the lab in your group.

> ***You are encouraged to develop your own ideas for projects!***

Online Discussions and Chats

The course will utilize online discussions/forums and chats during the course and especially for the student projects. Please limit your discussions to the appropriate sections. You are to solemnly use the online discussion and/or chat to communicate for your projects using the assigned project spaces in the discussion/chat areas of D2L.

> ***The instructor will monitor conversations for appropriate content and reserves the right to delete inappropriate postings.***

Professional Responsibilities

Upon graduation, you will be the amongst less than 30% of Americans that hold an academic degree. It is part of the responsibilities and duties of that degree to uphold high ethical and moral standards in society.

You should follow the outlined reading, class activities, and homework assignments, and be prepared for class. You are solely responsible for class attendance and participation and you are responsible for anything you missed. No make-up examinations will be given unless approved before the scheduled date or for validated medical or personal emergencies.

All assignments, quizzes, and lab sheets have a due date. You will typically have several days for their completion. If you do not complete items by the assigned due date, you have 2 days to submit late, but with reduced grade, see below.

Please see the University of Wisconsin-Stevens Point Student Academic Standards document for an overview of the university's policies and requirements. Also, refer to the professional societies of our area for definitions and how to properly cite other people's work:

- The IEEE: The Five Levels Of Plagiarism
- The ACM: ACM Policy and Procedures on Plagiarism

Written assignments will be checked for plagiarism and collaboration. Unless noted, you are to complete your assignments individually.

> ***If you use other people's work, you have to clearly point this out in any submitted work. Cheating and plagiarism will not be tolerated.***

Assessment, Points, and Grading

Each section (or module) of the course will have one online quiz, which you are required to take in the allotted time frame, a maximum of 20 minutes. By their nature, online quizzes are open-book, which means that you are assumed to have fulfilled all reading assignments, know the content and have asked questions you might have. Each quiz will be made available online at the end of a module and is worth 10 points. The quizzes will be available for multiple days; no submissions are allowed after the due date without any exception.

There will be several hands-on experiences allowing you to use your theoretical knowledge in a practical context. Each of these instructor-guided labs has additional graded questions and/or exercises. Each lab will be worth 10 points and you will have several days after the lab to complete the questions; no submissions are allowed after the due date without any exception.

There is a comprehensive final exam, which will be completely online and cover the entire material of the course, including any assignments and labs.

Mapping to Letter Grade

Your final letter grade will be awarded according to the following mapping scheme, based on the percentage of points that you have earned during the course.

When mapped to letter grades, the following fixed mapping scheme will be applied.

Letter Grade	*Percent of Points*
A	>= 94
A-	>= 90
B+	>= 87
B	>= 84
B-	>= 80
C+	>= 77
C	>= 74
C-	>= 70
D+	>= 67
D	>= 60
F	< 60