

CS-435 Assignment 5
802.11, Wireless Channel Analysis

Deadline: 22/06/2026 23:59 via elearn

Assigned: 15/06/2026

General Information

The goal of this assignment is to become familiar with wireless network hardware and 802.11 channels. You will use the **LINKSYS WRT 1200 AC** wireless router.

Lab Exercise

In this exercise you will use the wireless router as a 802.11 channel analyzer.

- Connect the antennas and the power supply to the **WRT1200AC** and turn it on. Make sure that the power LED is **ON**. Connect an Ethernet cable from your PC to the Ethernet port of the **WRT1200AC**. Make sure that the corresponding LED is **ON**.
- Launch your web browser and enter the default IP address of the router, "**192.168.1.1**". Make sure to set your IP and routing appropriately in order to be able to access the router's IP address.
- Analyze the channel analysis graphic provided by the web interface and discuss the following:
 - Evaluate the level of **channel overlap** and the **signal strength** of the detected wireless networks.
 - What changes would you make to the configurations of the wireless networks of the department in order to optimize their performance?
 - Based on your analysis, identify the channel you would select for operation in both the **2.4 GHz** and **5 GHz** frequency bands, and justify your choice.
 - Compare the **2.4 GHz** and **5 GHz** spectra in terms of congestion. Which band appears to be more congested and **why**?

Support your answers with evidence from the channel analysis including a screenshot of the corresponding analysis in your report.

Theoretical Exercise

- Compare the characteristics of the **2.4 GHz** and **5 GHz** frequency bands. Discuss their advantages and disadvantages in terms of coverage range, interference, and achievable data rates.
- Explain the concept of **channel bandwidth** in wireless networks. Compare the use of 20 MHz, 40 MHz and 80 MHz widths discussing the trade-offs between throughput, spectrum efficiency, and susceptibility to interference. Under what circumstances would a wider or narrower channel bandwidth be preferable?

About Submission

The submission of the Assignments will be done through the **elearn** platform. If needed, more info will be sent to the list prior to the deadline. You can turnin this assignment until **Monday 22/06 23:59**.

You should provide a report as a **single pdf file**, containing your comments, screenshots or anything that you believe will be helpful for your grading.

About Oral Examination

All the students who have submitted their exercises are requested to attend the oral exam session, in order to present their solutions. A short quiz will also take place during that time. You will need to choose a timeslot for the oral exam using Doodle. More details will be sent to you via email.

Attention

- Each student will only be examined during the timeslot choosed.
- During this session the Assignment 3, 4 and 5 will be examined.
- Both the timely submission and the oral exam session will contribute to the grading of the assignment.