



OFDM Project Instructions

Telecommunications Circuits Laboratory
EPFL

November 26, 2024

OFDM project

You will implement an OFDM system and use it to transmit and receive data using a loudspeaker and microphone.

Advices

- You should start from the template provided for the single carrier lab and add the OFDM transmission on top of the single carrier system (the preamble is still single carrier).
- Add element incrementally. Implement both the transmitter and receiver part side by side to be able to verify that each addition works.
- Start using the **bypass** mode for transmission (i.e. ideal channel). If your system does not work without noise, it will not work with it.
- Plot the constellation and the frequency component of your signal at different stages of the system to verify that the signal is as expected.

What to hand in

Each group should upload to the Moodle (only one student in each group needs to submit, and all group members' name should be in the report/presentation slides):

- **After** the presentation:
 - ① One report
 - ② The MATLAB code
 - ③ The presentation slides

Report Instructions

- Do not copy content verbatim from lecture slides, Wikipedia, etc. Describe in **your own words** (also for your presentation slides).

- It should be clearly visible whether your systems works.
 - **It works:** Provide some results proving that it works.
 - **It does not work:** Describe the problem. Describe your attempts at solving the problem. Explain what possible causes you have excluded and how/why.

- **Advice:**
 - ① Clearly structure into sections. Short introduction to OFDM and the system setup, then focus on implementation and results.
 - ② Graphics: Use lossless raster graphics (e.g., PNG) or vector graphics (e.g., EPS, SVG).
 - ③ Consistent formatting (text size, text font, spacings, etc).
 - ④ **Ideally:** Use $\text{\LaTeX}$.

Presentation Instructions

- **Duration:** 10 minutes for presentation, 5 minutes for questions.
- All students of the group should present approximately equal amount of content.

- **Questions:** All students of the group should know all the content.

- **Advice:**
 - ① Spend around one minute per slide.
 - ② Do not overcrowd your slides.
 - ③ Do some practice runs.