



# OFDM Project Instructions

Telecommunications Circuits Laboratory  
EPFL

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## 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 provided template, but can reuse part of the code developed for 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 **emulated AWGN channel** mode for transmission with a high SNR. If your system does not work in a simple channel without noise, it will not work with a real channel.
- Plot the constellation and the frequency component of your signal at different stages of the system to verify that the signal is as expected.

## Report Instructions

- 10-20 pages presenting your implementation and discussing the different tasks described in the 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.

## Presentation Instructions

- The last week of the semester: 10 minutes for presentation, 5 minutes for questions.
- The presentation should essentially be a summary of the report providing the key answer and observations for each task described in the instructions.
- All students of the group should present approximately equal amount of content.
- All students of the group should know all the content.
  
- **Presentation is short:**
  - ① Spend around one minute per slide.
  - ② Do not overcrowd your slides.
  - ③ Do some practice runs.

## Project Hand-in

Each group should upload to 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 (c.f. Submission deadline on Moodle):
  - ① One report
  - ② The MATLAB code
  - ③ The presentation slides (unmodified from what was used during the presentation)
- **During the exam session:** return the material borrowed.