

SCHOOL OF ELECTRICAL ENGINEERING

Signal Theory: EQ1220 / EQ1210

Reading Assignment: Power Spectrum (3/9) 2012–09–05,

Notice:

To be collected before Lecture 4.

The essay consists of five questions. If you successfully answer all questions, you obtain 1 bonus point for part A of the final exam. An essay with partially correct answers will give you 1/2 point.

For the answers you should not copy text from a textbook. Group work is also not allowed, but feel free to discuss with your fellows. The reports will be checked against plagiarism.

Be brief, i.e., at most 1 page.

Explain (in your own words) ...

1. ...how you interpret the Fourier transformation of time-valued signals. What is the meaning of the frequency? Why, in your opinion, is it useful to analyze the signals in the frequency domain?
2. ...what the *power spectrum* of a random process is, what information it provides about the process and what its properties are.
3. ...why this concept is called *power spectrum*.
4. ...what *white noise* means. Does it exist in nature or is it a model?
5. ...what AR, MA and ARMA processes are and how they are related to each other. Do you know any phenomena that can be modeled as ARMA processes?

Good luck!