Fourier-optics, SK2340, 2020-2021

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General info

The course was taken over after it was taught by Prof. Ulrich Vogt in recent years. Thus, there existed an established course content and planning that was very helpful for the course transferring to another teacher.

The course is optional, i.e. not included as a compulsory module in any study program. It results in that very few students select this course based on their practical needs for thesis projects or with projection on their further educational/professional interests.

Course design

The course was planned to include several moments – learning the course topics (based on the textbook chapters), student presentations of a selected topics with following discussions, completing simulation assignments, and final examination in oral form.

Practical realization

Although several students have registered for the course, only few have completed it and got the final grade. There are several reasons for the course outcome was below expectations.

The first one is global disturbances related to covid-19 restrictions. The course planning was changed to run it in on-line mode, and finally, due to very small number of students, it turned to be done practically in "self-study" mode. A number of active students was far from enough to cover the course content with student presentations. There were several personal discussions organized via zoom to clarify challenging questions to students on their requests, but it could not efficiently substitute a regular and systematic teaching scheme.

On the other hand, the course content requires advanced knowledge of mathematics (calculus, Fourier-transform, basics of signal processing) and certain topics on physics (wave and electromagnetic phenomena, geometrical optics). For students interested on this course, but not possessing an appropriate background, it was very challenging to understand subjects and complete the course. In addition, practical implementation of Fourier analysis in optics is significantly different from its interpretation in signal processing. The latter is somehow known for students with proper background, but not, for example, for students with background in chemistry, who had problems with both mathematics background and the course itself.

Summary and possible further development

After the covid-19 restrictions will be abandoned and teaching process will run again in alive mode, hopefully the course can be more successful.

To make it useful and efficient for students´ understanding, there might be suggested compulsory prerequisites for solid knowledge of advanced math and necessary topics on physics.

Since there were only few students, distributing the questionnaire and statistical analysis was irrelevant. The student feedback was obtained during personal discussions at the end of examination.