

## The Fourier-Transform and its Applications (OA) - FTA

<i>Course</i>	The Fourier-Transform and its Applications (OA)
<i>Course No.</i>	FTA

Category	Type	Language	Teaching		Semester
			hours	CP	
Elective	Lecture with exercises	English	2+1	4	ST

### Requirements for Participation:

**Preparation:** Elementary Physics (Bachelor level); Elementary QM

**Form of Testing and Examination:** Exercise and written test; or oral examination

**Length of Course:** 1 semester

**Aims of the Course:** Strengthen insight into how the mathematical principles of Fourier Theory as a common principle affect many areas of physics (optics: diffraction/interference; QM: Heisenberg principle; statistics of noise and drifts; data acquisition: sampling) and other applications (data compression, signal processing).

### Contents of the Course:

- introduction to the principles of Fourier Transform mathematics
- Delta-function and more general distributions
- diffraction optics and interferometry
- uncertainty principle in QM as application of FT
- theory of noise, drifts and their statistics
- intro to wavelet analysis and data compression

**Recommended Literature:** Bracewell: The Fourier Transform and its Applications

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