Modules:

astro830 **Elective Advanced Lectures**
astro840 **Observational Astronomy**

Course: The Fourier-Transform and its Applications (OA)

Course No.:

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

Requirements:

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