

Module Handbook

TUK MODHB Homepage

Course MAT-65-14-K-7

Distributions and Wavelets (2V, 4.5 LP)

Course Type

SWS	Type	Course Form	CP (Effort)	Presence-Time / Self-Study	
2	V	Lecture	4.5 CP	28 h	107 h
(2V)			4.5 CP	28 h	107 h

Basedata

SWS	2V
CP, Effort	4.5 CP = 135 h
Position of the semester	1 Sem. irreg.
Level	[7] Master (Advanced)
Language	[EN] English
Lecturers	Steidl, Gabriele, Prof. Dr. (PROF DEPT: MAT) + further Lecturers of the department Mathematics
Area of study	[MAT-SPAS] Analysis and Stochastics
Lifecycle-State	[NORM] Active

Contents

- test functions and distributions,
- operations on distributions (translation, dilation, differentiation, folding),
- Schwartz functions and tempered distributions,
- Fourier transformations of tempered distributions,
- wavelets and wavelet frames.

Literature

- W. Walter: Einführung in die Theorie der Distributionen,
- I. M. Gelfang, G. E. Schilow: Verallgemeinerte Funktionen I,
- W. Rudin: Functional Analysis,
- R. Strichartz: A Guide to Distribution Theory and Fourier Transform,
- G. B. Folland: Fourier Analysis and its Applications,
- I. Daubechies: Ten Lectures on Wavelets,
- S. Mallat: A Wavelet Tour of Signal Processing.

Materials

Further literature will be announced in the lecture.

Requirements for attendance (informal)

Knowledge in the field of image processing (e.g. from the module [MAT-65-11-M-7]) is helpful, but not necessarily required.

Modules:

- [MAT-10-1-M-2] Fundamentals of Mathematics (M, 28.0 LP)
- [MAT-14-11-M-3] Introduction to Numerical Methods (M, 9.0 LP)

Courses

- [MAT-12-23-K-3] Introduction to Functional Analysis (2V+1U, 4.5 LP)
- [MAT-12-28-K-3] Measure and Integration Theory (2V+1U, 4.5 LP)

Requirements for attendance (formal)

None

References to Course [MAT-65-14-K-7]

Module	Name	Context	
[MAT-65-14-M-7]	Distributions and Wavelets	P: Obligatory	2V, 4.5 LP