

Module Handbook (<https://modhb.uni-kl.de/>)

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Course MAT-70-13-K-7

Inverse Problems (4V+2U, 9.0 LP)

Course Type

SWS	Type	Course Form	CP (Effort)	Presence-Time / Self-Study
-	K	Lecture with exercise classes (V/U)	9.0 CP	186 h
4	V	Lecture		56 h
2	U	Exercise class (in small groups)		28 h
(4V+2U)			9.0 CP	84 h 186 h

Basedata

SWS	4V+2U
CP, Effort	9.0 CP = 270 h
Position of the semester	1 Sem. irreg.
Level	[7] Master (Advanced)
Language	[EN] English
Lecturers	Steidl, Gabriele, Prof. Dr. (PROF DEPT: MAT) (/staff/35/) + further Lecturers of the department Mathematics
Area of study	[MAT-SPAS] Analysis and Stochastics
Lifecycle-State	[NORM] Active

Contents

- introductory examples,
- ill-posed operator equations,
- regularisation methods (singular value decomposition, Tikhonov regularization, iterative methods, multi-resolution techniques).

Literature

- D. Colton, R. Kress: Inverse Acoustic and Electromagnetic Scattering Theory,

- A. Kirsch: An Introduction to the Mathematical Theory of Inverse Problems,
- A. Louis: Inverse und schlecht gestellte Probleme,
- A. Rieder: Keine Probleme mit inversen Problemen.

Materials

Further literature will be announced in the lecture; Exercise material is provided.

Registration

Registration for the exercise classes via the online administration system URM (<https://urm.mathematik.uni-kl.de> (<https://urm.mathematik.uni-kl.de>)).

Requirements for attendance (informal)

Modules:

- [MAT-10-1-M-2] Fundamentals of Mathematics (M, 28.0 LP) (</mhb/modules/MAT-10-1-M-2/>)

Courses

- [MAT-12-23-K-3] Introduction to Functional Analysis (2V+1U, 4.5 LP) (</mhb/courses/MAT-12-23-K-3/>)

Requirements for attendance (formal)

None

References to Course [MAT-70-13-K-7]

Module	Name	Context
[MAT-70-13-M-7 (/mhb/modules/MAT-70-13-M-7/)]	Inverse Problems	P: Obligatory 4V+2U, 9.0 LP