

Module Handbook

TUK MODHB Homepage

Module MAT-70-10-M-6

Spline Functions (M, 3.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MAT-70-10-M-6	<i>Spline Functions</i>	3.0 CP (90 h)

Basedata

CP, Effort	3.0 CP = 90 h
Position of the semester	1 Sem. irreg.
Level	[6] Master (General)
Language	[EN] English
Module Manager	Steidl, Gabriele, Prof. Dr. (PROF DEPT: MAT)
Lecturers	The Lecturers of the department Mathematics
Area of study	[MAT-SPAS] Analysis and Stochastics
Reference course of study	[MAT-88.105-SG] M.Sc. Mathematics
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V	MAT-70-10-K-6	P	-	PL1	3.0	irreg.

- About [MAT-70-10-K-6]: Title: "Spline Functions"; Presence-Time: 28 h; Self-Study: 62 h

Examination achievement PL1

- Form of examination: **oral examination (20-30 Min.)**

- Examination Frequency: irregular (by arrangement)
- Examination number: 84223 ("Spline Functions")

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From [MAT-70-10-K-6] Spline Functions:

- Spline functions and spline spaces,
- B-splines,
- Bézier splines (Bézier polynomials, Algorithm of de Casteljau, Bézier curves, Bézier polynomials over triangles, tensor product Bézier surfaces),
- B-spline smoothing (deBoor Algorithm).

Competencies / intended learning achievements

Upon successful completion of this module, the students are familiar with the theory of spline functions and have become acquainted with essential algorithms based on them and used e.g. in CAGD. They understand how multivariate functions can be approximated, resp. interpolated, by spline functions and are able to apply this knowledge to various examples. They understand the proofs presented in the lecture and are able to comprehend and explain them.

Literature

From [MAT-70-10-K-6] Spline Functions:

- C. de Boor: A Practical Guide to Splines,
- C. de Boor: Grundlagen der Geometrischen Datenverarbeitung,
- G. Farin: Curves and Surfaces for Computer Aided Design,
- G. Nürnberger: Approximation by Spline Functions,
- L. Schumaker: Spline Functions: Basic Theory.

Materials

Further literature will be announced in the lecture.

Requirements for attendance of the module (informal)

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)

Requirements for attendance of the module (formal)

None

References to Module / Module Number [MAT-70-10-M-6]

Course of Study	Section	Choice/Obligation
[MAT-88.105-SG] M.Sc. Mathematics	[Core Modules (non specialised)] Applied Mathematics	[WP] Compulsory Elective
[MAT-88.706-SG] M.Sc. Mathematics International	[Core Modules (non specialised)] Applied Mathematics	[WP] Compulsory Elective
Module-Pool	Name	
[MAT-GM-MPOOL-5]	General Mathematics (Introductory Modules M.Sc.)	