TECHNISCHE UNIVERSITÄT KAISERSLAUTERN

Module Handbook

TUK MODHB Homapage

Module MAT-40-26-M-6

Riemannian Surfaces (M, 3.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MAT-40-26-M-6	*Riemannian Surfaces*	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	Decker, Wolfram, Prof. Dr. (PROF | DEPT: MAT)
Lecturers	Decker, Wolfram, Prof. Dr. (PROF | DEPT: MAT) Zintl, Jörg, PD Dr. (EXT | DEPT: MAT)
Area of study	[MAT-AGCA] Algebra, Geometry and Computer Algebra
Reference course of study	[MAT-88.105-SG] M.Sc. Mathematics
Livecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V	MAT-40-26-K-6	P	-	PL1	3.0	irreg.

- About **[MAT-40-26-K-6]**: Title: "Riemann Surfaces"; 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: 84154 ("Riemannian Surfaces")

Evaluation of grades

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

Contents

From [MAT-40-26-K-6] Riemann Surfaces:

- Riemann surfaces and holomorphic images,
- topological properties, fundamental groups, coverings,
- sheaves, differential forms, integration,
- cohomology and exact sequences,
- Riemann-Roch theorem and Serre duality.

Competencies / intended learning achievements

Upon successful completion of this module, the students are familiar with the classical theory of Riemann surfaces which has had an influence on subsequent mathematical theories, such as the ambiguous theory of functions (e.g. radical and logarithm), differential geometry or the geometry of algebraic curves. Vice versa, by a specific example which is close to intuition (the Riemann surfaces), the students have learnt to apply general concepts related to complex analysis and geometry. They are able to name and to prove the essential statements of the lecture as well as to classify and to explain the connections.

Literature

From [MAT-40-26-K-6] Riemann Surfaces:

- S. Donaldson: Riemann Surfaces,
- R. Miranda: Algebraic Curves and Riemann Surfaces,
- O. Forster: Lectures on Riemann Surfaces,
- R.C. Gunning: Lectures on Riemann Surfaces.

Requirements for attendance of the module (informal)

Modules:

- [MAT-10-1-M-2] Fundamentals of Mathematics (M, 28.0 LP)

Courses

- [MAT-12-24-K-3] Introduction to Complex Analysis (2V+1U, 4.5 LP)

Requirements for attendance of the module (formal)

None

References to Module / Module Number [MAT-40-26-M-6]

Course of Study	Section	Choice/Obligation
[MAT-88.105-SG] M.Sc. Mathematics	[Core Modules (non specialised)] Pure Mathematics	[WP] Compulsory Elective
[MAT-88.706-SG] M.Sc. Mathematics International	[Core Modules (non specialised)] Pure Mathematics	[WP] Compulsory Elective

Module-Pool	Name
[MAT-GM-MPOOL-5]	General Mathematics (Introductory Modules M.Sc.)