Module plan for courses in summer semester 2023

For more specific provisions, please refer to the respective examination regulations (PO).

As of: 19.12.202	2				Bac	helor n	nathema	tics	Mas	ter mathe	matics	BA /	MA tea	cher education	ADILT
	Lecture	Lecturer	SWS (weekly teaching hours)	Credits	Obligatory module (previous PO: basic/advanced module)	Elective module B.Sc.	(previous PO: Supplementary module)	(previous PO: Specialization module)	Main module	Elective module M.Sc.	Specialisation module	Basic module BA teacher edu.	Advanced module BA	Specialisation module (final oral examination)	1: Basics 2: Applications, 3: Reflection
	Analysis II	Racke	4+2	9	х							х			
in/from the	Computational Mathematics	Frei	2+1	4,5	x							х			1
2nd semester	Linear Algebra II	Michalek	4+2	9	х							х			
bachelor's	Mathematical Modelling	Junk	2+1	4,5	х										
programme	Vectors, Matrices and Tensors for Data Analysis with Julia (ADILT course)	Schweighofer	2+1	4,5		x h)									1
	Numerics for ordinary differential equations	Junk	2+1	4,5	x b)	x	х			х				x d)	
	Optimisation I	Volkwein	2+1	4,5	x b)	х	х			х				x d), e)	
	Statistics	Bürkel	2+1	4,5	х								x a)		1
	Probability Theory	Neamtu	2+1	4,5	х								x a)		
	Geometry I for teacher education	Berchtold	3+1	4,5									x c)		
	Stochastics for teacher education	Kupper	4+2	9									x a)		1
in/from the	Algebra II	Schweighofer	2+1	4,5		х	х			х				х	
4th semester	Algebraic Number Theory	Schweighofer	2+1	4,5		х	х			х				х	
bachelor's	Functional Analysis	Gmeineder	2+1	4,5		х	х			х				х	
programme	Function Theory	Gmeineder	2+1	4,5		х	х			х			х		
	Stochastic Processes	Neamtu	2+1	4,5		х	х	x g)	xg)	х				х	
	Advanced Set Theory: Forcing and the Independence of the Cont. Hypothesis	Brickhill	2+0	3		x				х				x i)	1
	Fourier Analysis	Denk	2+1	4,5		х				х				x	
	Verification Numerics	Garloff	2+0	3		х	х			х					
	Subject to change: Model theory	Bagayoko, Kuhlmann	2+1	4,5		x				X					

in/from the	Commutative Algebra	Scheiderer	4+2	9	x		х			х	
6th semester bachelor's	Mathematical foundations of quantum mechanics	Denk	2+1	4,5	×		x			х	
programme	Functional Analysis II (operator theory)	Denk	2+1	4,5	x		х			х	
	Finite Elements Methods practical training	Junk	2+0	3			х				
	Subject to change: PDE III (Regularity theory à la De Giorgi-Nash-Moser)	Jankowiak	2+0	3			x				
	Toric Varieties	Michalek	2+2	6			х				
	Dynamic Systems	Freistühler, Schropp	4+2	9		x j)					
	Real Algebraic Geometry II	Kuhlmann	4+2	9		х	х	х			
	Time Series Analysis	Beran	4+2	9		x	х	х			
	Analysis of Dynamic Systems	Freistühler	2+1	4,5			х	х		х	
	Mathematical Finance	Kupper	4+2	9			х	х			
Master's	Geometric analysis and variational problems	Gmeineder	2+1	4,5			x	x			
programme	Subject to change: Introduction to Elliptic Curves	Kuhlmann, Serra	2+1	4,5			x	x			
	Multivariate Statistics	Bürkel	2+2	6			х	x i)			1
	Hyperbolic Systems of Second Order	Freistühler	2+1	4,5			х	х			
	Numerics of dynamic systems and branching	Schropp	2+1	4,5			x	x			
	<u>Block course in October 23:</u> Numerical Methods in Fluid Mechanics	Frei	2+1	4,5			x	x i)			
	PDE-constrained optimisation (Optimization 4)	Azmi	2+1	4,5			x	x			
	Riemannian Geometry	Treude	2+1	4,5			х	x i)			

(not guaranteed)

a) As advanced module in stochastics, either "Stochastics for Teachers" (every 2 years) or the combination "Probability Theory" + "Statistics" must be taken

b) As obligatory module in Practical Mathematics II, students can complete either "Numerics for Ordinary Differential Equations" or "Optimisation I". The other course may be taken as an elective module.

c) As advanced module in Geometry, either "Geometry I for Teachers" or the first half of "Algorithmic Algebraic Geometry" (winter) or "Differential Geometry I" (irregular) must be taken.

d) Only one of the bachelor modules Optimization I or Numerics for Ordinary Differential Equations can be chosen as a specialisation module in teacher education.

e) Optimisation I may be combined as specialization module with the first half of Optimization II (winter) (for a total of 9 Cr).

g) Previous PO: Can be credited together with "Stochastic Analysis" (winter) as a specialisation module in the bachelor's programme. Starting in winter semester 22/23, the lecture Markov Chains is available in the BSc instead. Stochastic Analysis is for the MSc only.

(h) Can be credited in the area of <u>non-obligatory</u> electives only.

i) If the course is taken as a specialisation module, please find potential examiners for the final examination before taking the course.

j) The main module "Dynamical Systems" consists of the two lectures "Analysis of Dynamical Systems" and "Numerics of Dynamical Systems and Branching". As a main module, these two lectures can <u>only</u> be taken <u>together</u> (as elective or specialiation modules also separately).

Seminars and other courses in summer semester 2023

If you would like to participate in one of the semin the lecturers in good time (before the start of lect Title of seminar	ticipate in one of the seminars, please contact me (before the start of lectures) by email. Lecturer		Mathematics BSc Advanced seminar	Mathematics MSc Advanced seminar	Mathematics teacher education Seminar	Mathematical Finance BSc Seminar	Mathematical Finance BSc Seminar for BSc thesis	Mathematical Finance MSc Seminar
Numerics	Frei, Schropp, Junk		x	x	x			
Seminar for teacher education	Junk				х			
Algebraic methods for physics	Michalek		х	х				
Algebra	Scheiderer		х					
Long time behaviour for the Keller-Segel model	Trussardi			x				
Fractals and Fractal Processes	Beran		х	х		х		х
Seminar Optimisation	Azmi, Volkwein		х	х	х	х	х	x
Seminar Stochastic Differential Equ.	Neamtu			х				х

Subject-specific didactics	
Subject-specific didactics 1 (2 parallel groups)	Racke, Schühle
Subject-specific didactics 3	Schühle

Mathematical service						
Mathematics II for Chemistry, Life Science and	Froi					
Nanoscience	FIEI					
Mathematics 2 for physics students	Kunze					
Mathematics II for economics students	Schropp					

Start of studies	
Introduction to mathematics 2	Freistühler, Pippich
Plenary exercise Analysis II	Pippich
Plenary exercise Linear Algebra II	Pippich

Research seminars and colloquia						
Real Geometry and Algebra	Kuhlmann, Michalek, Scheiderer, Schweighofer					
Complexity, Model Theory, Set Theory	Kuhlmann, Michalek, Antos-Kuby (Philosophy)					
Stochastic Analysis	Denk, Kunze, Kupper, Neamtu					
Partial Differential Equations	Freistühler, Gmeineder, Racke, Trussardi					
Doctoral researcher seminar: Stochastics	Beran, Kupper					

Numerical Optimisation	Azmi, Volkwein
Interdisciplinary Logic Colloquium	Kuhlmann, Antos-Kuby (Philosophy)
Department Colloquium	Lecturers of the department