

BMS Core Course Dictionary

Area	BMS Course	FU Course Name	HU Course Name	TU Course Name
1: Geometry and topology	Analysis and geometry on manifolds	Differentialgeometrie I	Differentialgeometrie I	Differentialgeometrie II
	Riemannian geometry	Differentialgeometrie II	Differentialgeometrie II	
	Algebraic topology I	Topologie I	Topologie I	Topologie
	Algebraic topology II	Topologie II	Topologie II	
2: Algebraic geometry and number theory	Commutative algebra	Algebra I	Algebra II	Algebra II
	Algebraic geometry I	Algebra II	Algebraische Geometrie I	Algebraische Geometrie I
	Algebraic geometry II		Algebraische Geometrie II	Algebraische Geometrie II
3: Stochastics and mathematical finance	Stochastic processes I: discrete time	Stochastik II	Stochastik II	Wahrscheinlichkeitstheorie II
	Stochastic processes II: continuous time	Stochastik III	Stochastische Analysis	Wahrscheinlichkeitstheorie III
4: Discrete mathematics and discrete optimization	Combinatorics and graph theory I	Diskrete Mathematik I		Diskrete Strukturen I / Kombinatorik
	Combinatorics and graph theory II	Diskrete Mathematik II - Extremal Combinatorics		Diskrete Strukturen II: Graphentheorie
	Discrete optimization I	Diskrete Mathematik II: Algorithmic Combinatorics OR Optimierung		Algorithmische Diskrete Mathematik I
	Discrete optimization II	Discrete Mathematics III: Integer Programming + Applied Integer Programming		Algorithmische Diskrete Mathematik II
5: Discrete and discrete differential geometry	Classical geometries	Geometry		Geometrie I
	Discrete differential geometry and visualization	(Scientific) Visualization		Geometrie II
	Discrete geometry I	Diskrete Geometrie I		Diskrete Geometrie I
	Discrete geometry II	Diskrete Geometrie II		Diskrete Geometrie II
6: Numerical mathematics	Nonlinear optimization		Nichtlineare Optimierung	Nichtlineare Optimierung
	Numerical methods for ODEs and numerical linear algebra	Numerik II	Numerik gewöhnlicher Differentialgleichungen	Numerische Mathematik II
	Numerical methods for PDEs	Numerik III	Numerik partieller Differentialgleichungen	Numerik partieller Differentialgleichungen
7: Applied analysis	Functional analysis	Funktionalanalysis	Funktionalanalysis	Funktionalanalysis I
	Partial differential equations	Partielle Differentialgleichungen I	Partielle Differentialgleichungen	Differentialgleichungen IIA + Differentialgleichungen IIB
	Mathematical modelling with PDEs	Mathematical Modelling with PDE + Mathematical Modelling in climate research	Mathematische Prinzipien der Kontinuumsmechanik	
8: Mathematics for AI	Statistical methods for data science		Methoden der Statistik	Statistics
	Analysis of high-dimensional data		Nichtparametrische Statistik	
	Foundations of AI			Mathematical Foundations of Machine Learning I
Complementary Core Courses	Complex analysis	Complex Analysis		Komplexe Analysis I
	Dynamical systems (ODEs)			Mathematische Physik I

*Complementary Core Courses do not count towards the Phase I Core Course requirements