Module title			Abbreviation
Overview Stochastics and Applied Mathematics (Numerical Mathematics 1 or Discrete Mathematics) for Teaching Degree (German Gymnasium)			10-M-HSA-Ü-162-m01
Module coordinator		**Module offered by**	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
8	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Stochastics (discrete stochastics, in particular stochastic modelling, motivation of conceptualisation and discussion of basic assumptions: basic notions of descriptive statistics, discrete probability spaces, random variables, important discrete distributions, elements of combinatorics, principle of inclusion and exclusion, multistage experiments, conditional probability, stochastic independence, common distributions, expected value and variance, covariance and correlation, waiting time problems, law of the large numbers, central limit theorem, confidence intervals and statistical tests in binomial models, stochastical paradoxes)
and either
Numerical Mathematics 1 (solution of systems of linear equations and curve fitting problems, nonlinear equations and systems of equations, interpolation with polynomials, splines and trigonometric functions, numerical integration)
or
Discrete Mathematics (techniques from combinatorics, introduction to graph theory including applications, cryptographic methods, error-correcting codes).

Intended learning outcomes

The student is acquainted with fundamental concepts and methods in stochastics and a further topic in applied mathematics (numerical mathematics or discrete mathematics). He/She is able to relate these concepts with one another, and realises the advantages of thinking across the borders of different branches in mathematics.

Courses (type, number of weekly contact hours, language — if other than German)

V (4) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

oral examination of one candidate each (20 to 40 minutes)
Language of assessment: German and/or English

Allocation of places

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Additional information

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Workload

240 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

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