

Syllabus

Descrizione corso

Titolo insegnamento	Fondamenti della didattica disciplinare II: matematica scuola sec. I grado
Codice insegnamento	83016
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	STAT-04/A
Lingua	Tedesco
Corso di Studio	Percorso universitario di formazione iniziale dei docenti della scuola secondaria di primo e secondo grado in lingua tedesca - 60CP
Altri Corsi di Studio (mutuati)	
Docenti	Prof. Dr. rer. nat. habil. Andreas Heinrich Hamel, Andreas.Hamel@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/33708
Assistente	
Semestre	Tutti i semestri
Anno/i di corso	1
CFU	2
Ore didattica frontale	12
Ore di laboratorio	0
Ore di studio individuale	39
Ore di ricevimento previste	
Sintesi contenuti	The module "Didactics of Mathematics" teaches basic subject-specific didactic skills for the planning, implementation and reflection of lessons in mathematics in secondary schools. The aim is to enable students to professionally design competence-oriented teaching for different learning groups at secondary levels I and II.
Argomenti dell'insegnamento	In this module, students explore the fundamentals of subject-specific pedagogy Mathematics and reflect on the interplay

	<p>between subject-specific knowledge, curriculum guidelines and school practice. Building on this, they develop skills in competence-based lesson planning by analysing subject-specific competences, formulating learning objectives and structuring lesson plans.</p> <p>Principles of Experimental Mathematics will be tailor-made for designing mathematics lessons starting with hands-on experiments and leading to mathematical concepts, patterns and formulas. Topics include:</p> <ul style="list-style-type: none"> - Numbers: from stripe, rectangular, square and triangular numbers to prime number concept and Gauss' formula - Geometric figures: from sewer manhole covers to minimal perimeter - Powers: from counting rice grains to binary representation of natural numbers - Comparisons: from forming pairs to ordering almost everything - Fractions and percentages: from dividing pizza and chocolate to calculus for fractions, percentages - Arrangement and permutations: from ball games to the permutation theorem for juggling patterns
Parole chiave	Subject Didactics Mathematics, experimental Mathematics, design of lessons, educational methods
Prerequisiti	
Insegnamenti propedeutici	
Modalità di insegnamento	Interactive lectures with in-class experiments and discussions.
Obbligo di frequenza	According to the degree programme regulations
Obiettivi formativi specifici e risultati di apprendimento attesi	<p>Another focus is on the design of suitable learning settings and the methodological implementation. Students learn to use different forms of teaching and methods in a subject-specific way and to design learning processes in an active, differentiated and effective way for learning.</p> <p>Finally, the module deals with observing, giving feedback and evaluating learning processes and performance in mathematics. Forms of feedback that promote learning as well as criteria for transparent and competence-oriented performance assessment are discussed.</p>
Obiettivi formativi specifici e	Knowledge and understanding: understand the experimental

risultati di apprendimento attesi (ulteriori info.)	<p>approach to teaching mathematics</p> <p>Applying knowledge and understanding: ability to design mathematics lesson starting with hands-on experiments or games and leading to mathematical concepts, structures, formulas.</p> <p>Communications: skill to moderate the cycle "formulate question -> experiment -> pattern/formula -> new question" in class while keeping attention and curiosity of students</p> <p>Learning to learn: skill to transfer the cycle "formulate question -> experiment -> pattern/formula -> new question" to new topics</p>
Modalità di esame	Written exam of 60 minutes
Criteri di valutazione	Correctness of answers, appropriate argumentation.
Bibliografia obbligatoria	S. Lerman (editor) Encyclopedia of Mathematics Education, Springer Publishers 2014 (selected topics, material will be provided in class)
Bibliografia facoltativa	T. Leuders (editor), Mathematik-Didaktik, Cornelsen, 6. edition 2011
Altre informazioni	
Obiettivi di Sviluppo Sostenibile (SDGs)	Istruzione di qualità