

General Information	
Academic subject	Methodology and Technology for Mathematics Education
Degree course	Mathematics
Curriculum	
ECTS credits	7
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Antonella Montone	antonella.montone@uniba.it	01/A1

ECTS credits details			
Basic teaching activities	Lecture	Workshop	Laboratory approach

Class schedule	
Period	Semestre II
Year	IV
Type of class	Lecture- workshops

Time management	
Hours measured	60 minute
In-class study hours	60
Out-of-class study hours	140

Academic calendar	
Class begins	18/02/2019
Class ends	31/05/2019

Syllabus	
Prerequisite requirements	
Expected learning outcomes (according to Dublin Descriptors)	<p><i>Knowledge and understanding</i> Possession and critical knowledge of the methodologies, theoretical foundations and languages of mathematics.</p> <p><i>Applying knowledge and understanding</i> Planning learning paths in mathematical context. Knowing methodologies suitable for Mathematics teaching-learning paths Reading, interpreting, and analysing dissemination and research articles in mathematics teaching, demonstrating the ability to grasp, evaluate and use the results of empirical studies in order to build knowledge and improve interventions. Working in a group to design organization and verification of educational-didactic interventions.</p> <p><i>Making informed judgements and choices</i> Recognizing arguments, and demonstrations correct procedures and reasoning to identify incorrect or incomplete, possibly by correcting or supplementing them; informative articles pertaining to interpret and possibly translate and comment mathematical texts from other languages;</p>

	<p><i>Communicating knowledge and understanding</i> Communicating and arguing with clarity and relevance issues mathematical formulations consistent with the public they serve being able to draw conclusions with accuracy both in writing and oral</p> <p><i>Capacities to continue learning</i> acquiring a flexible mindset and being able to fit in quickly in the workplace, adapting easily to new problems and quickly gaining the necessary skills.</p>
<p>Contents</p>	<p>The contributions of pedagogy on the evolution of Mathematics Education as a science. The foundations of constructivism. Teaching-learning models and their influence on the specific teaching of the discipline. Learning difficulties in Mathematics: analysis of affective and metacognitive aspects. The Conceptual Fields theory. The theory of situations (according to Brousseau). The Didactic Transposition according to Chevallard. Student / teacher interaction: the educational contract. Student / knowledge interaction: obstacles and errors. Cooperative Learning and Peer Tutoring. The Transalpine Mathematical Rally as a research tool in Didactics. The semiotic mediation theory. Use of digital artifacts and manipulative artifacts to mediate the construction of mathematical meanings. Educational planning of a classroom intervention with the use of artifacts. Software analysis of dynamic geometry: potentiality of the digital tool for argumentation and demonstration. Problem solving to teach: problem posing and problem solving as an educational strategy for overcoming and preventing difficulties; problem solving activity; the stereotypes of the standard school problem; the concrete / abstract contrast; the "good" problems and the level of the formulation. Evaluation of mathematical learning. Communication in mathematics: characteristic aspects of the mathematical discourse.</p>
<p>Course program</p>	
<p>Bibliography</p>	<p>The bibliography references are often the source used by the teacher to deepen the topics covered in class. Therefore the consultation is at the discretion of the student.</p> <p>Slides e materiali a cura del docente (caricati in rete durante lo svolgimento del corso).</p> <p>Baccaglini Frank et al, Didattica della Matematica, Mondadori Università M.G. Bartolini Bussi, i numeri e lo spazio, Edizioni Junior. Zan, R. (2007). Difficoltà in matematica. Osservare, interpretare, intervenire. Springer Verlag. Zan, R. (2016). I problemi di matematica. Difficoltà di comprensione e formulazione del testo. Carocci Faber. V. Villani, Cominciamo da Zero, Pitagora, 2003. V. Villani, Cominciamo dal punto, Pitagora, 2006. - U.M.I. Matematica 2001- Materiali per un nuovo curriculum di matematica con suggerimenti per attività e prove di verifica: http://umi.dm.unibo.it/old/italiano/Matematica2001/matematica2001.html</p>

Notes	
Teaching methods	<p>Lecture, workshop</p> <p>Laboratory approach</p> <p>Working group</p> <p>Problem solving activity</p>
Assessment methods	<p>Through intermediate tests the possession and the critical knowledge of the theoretical foundations and of the mathematical languages and the didactic knowledge related to the basic didactic theories, with attention to interdisciplinary connections, will be verified.</p> <p>The final oral exam will serve to ascertain the communication skills and organization of the acquired knowledge, the ability to be able to work with a wide autonomy, even assuming scientific and organizational responsibilities.</p>
Further information	