









4.00 credits

37.5 h + 10.0 h

Q1 and Q2

Teacher(s)	Coyette Cécile ;Ghorbal Sonia ;Ninove Laure (coordinator) ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Mastery of the subject to be taught, i.e. mathematics at the 2nd and 3rd level of secondary education in mathematics (basic and general mathematics). Clear and correct communication in the language of instruction both orally and in writing. The interpersonal skills and professional postures normally expected of a teacher.
Main themes	Through the study of specific subjects of the secondary school curriculum, as well as various ways of approaching them, questions relating to the construction of mathematical knowledge will be addressed. In particular : - How to use the everyday notions that prefigure them in the pupils' minds to teach the mathematical concepts and theories of the programme? The role of epistemological obstacles. - How to encourage an ability to reason and argue that is adapted to the level of the pupils? Levels of rigour. Need for correct expression in the French language. - Identify obstacles and difficulties related to learning mathematics. - Need to install a minimum of automatisms in students, without reducing their mathematical activities to routine. Some subjects will be informed by an examination of their development in the history of mathematics. Students will be expected to be actively involved in, for example, researching and analysing teaching sequences, solving problems, etc. Students will also be required to undertake a 10 hour observation of mathematics lessons in upper secondary education.
Learning outcomes	At the end of this learning unit, the student is able to : This course is part of the didactics and epistemology of mathematics course. It is intended for agrégation students with a major in geography, physics or natural sciences. This course, complementary to the general didactics course, aims to : 1 - to develop in future teachers the ability to produce teaching that meets the requirements of the programme, that is meaningful for the students and that encourages maximum real activity on the part of the latter; - to provide them with the tools to analyse existing textbooks and materials for students and teachers - to help them analyse their own practice and adapt it accordingly.

Evaluation methods	<p>In this course, students are assessed in several ways :</p> <ul style="list-style-type: none"> • Continuous assessment during the first term (5% of the final grade): preparations, readings, assignments, active participation in the course; this part of the grade will be used for each session and may not be repeated; • a written examination, open-ended and closed-book, in the January and/or September term covering both <ul style="list-style-type: none"> • the concepts to be taught in the 2nd and 3rd grades in mathematics, in transitional (basic and general mathematics) and qualifying education (35% of the final mark) • and on the basic concepts of didactics and epistemology of mathematics covered in the course (35% of the final mark) • the compulsory report on the observation period, to be submitted at the end of the second term (25%). <p>In order to pass this course, both the written exam and the report must be passed.</p> <ul style="list-style-type: none"> • In the event of failure in at least one of these two parts, the overall grade for the unit will be calculated as the minimum between the weighted average of the different parts according to the coefficients indicated above and a 9/20. • In the event of a serious deficiency (score less than or equal to 6/20) in at least one of these two parts, the overall score will be equal to the minimum of the scores of the different parts. <p>Attendance is required. From the 2d unjustified absence over the year or in the event of preparations not being made on time, the mark for the continuous evaluation part will be set to 0. Moreover, in accordance with article 72 of the General Regulations for Studies and Examinations, the course instructors may propose to the jury that it refuse to register a student who has not attended at least 80% of the courses during the January, June and/ or September session.</p> <p>The use of generative AI as part of the work to be produced in this teaching unit is not authorized.</p>
Teaching methods	<p>The course is largely based on interactions with students. Students will be actively involved, for example, in problem solving and in the research and analysis of teaching sequences. Attendance is therefore essential and mandatory. Readings will be offered to enrich and deepen the interaction between students and teachers. Students will also be required to complete an observation period in a variety of classes.</p>
Content	<p>This teaching unit consists of "equipping" students to become future teachers of mathematics at the upper secondary level (basic and general mathematics options only). The aim is not only to present the elements of didactics and epistemology related to the teaching of mathematics but also to ensure the transfer and appropriation of these tools by future teachers.</p> <p>We will deal with the construction of mathematical knowledge in students through the study of themes from the secondary school program, addressing, for example, questions such as :</p> <ul style="list-style-type: none"> - How to exploit students' representations and errors to teach mathematical concepts and theories? - How to identify epistemological obstacles to learning? - What types of learning situations can be proposed in a mathematics course? - What is the role of the teacher in the context of a research activity on a problem? - How can we encourage students to develop a real capacity for reasoning and arguing? - What should we look for when evaluating students' learning? <p>...</p>
Inline resources	<p>The documents related to the courses are deposited on the online educational platform.</p>
Bibliography	
Other infos	<p>Complementary course to the general didactics course, to be taken preferably in parallel or after the latter. An elective course for Aggregation students with a major in Geography, Physics, Chemistry or Biology. The course is only given in Q1. The observation period may be taken in Q1 and/or Q2.</p>
Faculty or entity in charge	CAFC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Teacher Training Certificate (upper secondary education) - Physics	PHYS2A	4		
Master [120] in Biology of Organisms and Ecology	BOE2M	4		
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	4		
Teacher Training Certificate (upper secondary education) - Geography	GEO2A	4		
Teacher Training Certificate (upper secondary education) - Biology	BIOL2A	4		
Master [120] in Chemistry	CHIM2M	4		
Master [120] in Physics	PHYS2M	4		
Teacher Training Certificate (upper secondary education) - Chemistry	CHIM2A	4		
Master [120] in Geography : General	GEOG2M	4		