LMAT2330

2015-2016

Seminar on the teaching of mathematics

4.0 credits	15.0 h + 30.0 h	1 + 2q

Teacher(s) :	Vitale Enrico ; Hauchart Christiane ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	<!--{cke_protected}{C}%3C!%2D%2D%0A%20%2F*%20Font%20Definitions%20*%2F%0A%40font-face%0A%09%7Bfont-family%3A%22Cambria%20Math%22%3B%0A%09panose-1%3A2%204%205%203%205%204%206%203%202%204%3B%0A%09mso-font-charset%3A0%3B%0A%09mso-generic-font-family%3Aauto%3B%0A%09mso-font-pitch%3Avariable%3B%0A%09mso-font-signature%3A3%200%200%200%201%200%3B%7D%0A%40font-face%0A%09%7Bfont-family%3A%22%E3%83%92%E3%83%A9%E3%82%AE%E3%83%8E%E8%A7%92%E3%82%B4%20Pro%20W3%22%3B%0A%09mso-font-charset%3A0%3B%0A%09mso-generic-font-family%3Aroman%3B%0A%09mso-font-pitch%3Aauto%3B%0A%09mso-font-signature%3A0%200%200%200%200%200%3B%7D%0A%20%2F*%20Style%20Definitions%20*%2F%0Ap.MsoNormal%2C%20li.MsoNormal%2C%20div.MsoNormal%0A%09%7Bmso-style-unhide%3Ano%3B%0A%09mso-style-qformat%3Ayes%3B%0A%09mso-style-parent%3A%22%22%3B%0A%09margin%3A0cm%3B%0A%09margin-bottom%3A.0001pt%3B%0A%09mso-pagination%3Awidow-orphan%3B%0A%09font-size%3A12.0pt%3B%0A%09font-family%3A%22Times%20New%20Roman%22%3B%0A%09mso-fareast-font-family%3A%22Times%20New%20Roman%22%3B%0A%09mso-bidi-font-family%3A%22Times%20New%20Roman%22%3B%0A%09mso-ansi-language%3AEN-US%3B%0A%09mso-fareast-language%3AEN-US%3B%7D%0Ap.Corps%2C%20li.Corps%2C%20div.Corps%0A%09%7Bmso-style-name%3ACorps%3B%0A%09mso-style-unhide%3Ano%3B%0A%09mso-style-parent%3A%22%22%3B%0A%09margin%3A0cm%3B%0A%09margin-bottom%3A.0001pt%3B%0A%09mso-pagination%3Awidow-orphan%3B%0A%09font-size%3A12.0pt%3B%0A%09mso-bidi-font-size%3A10.0pt%3B%0A%09font-family%3AHelvetica%3B%0A%09mso-fareast-font-family%3A%22%E3%83%92%E3%83%A9%E3%82%AE%E3%83%8E%E8%A7%92%E3%82%B4%20Pro%20W3%22%3B%0A%09mso-bidi-font-family%3A%22Times%20New%20Roman%22%3B%0A%09color%3Ablack%3B%0A%09mso-ansi-language%3AFR%3B%7D%0A.MsoChpDefault%0A%09%7Bmso-style-type%3Aexport-only%3B%0A%09mso-default-props%3Ayes%3B%0A%09font-size%3A10.0pt%3B%0A%09mso-ansi-font-size%3A10.0pt%3B%0A%09mso-bidi-font-size%3A10.0pt%3B%7D%0A%40page%20WordSection1%0A%09%7Bsize%3A612.0pt%20792.0pt%3B%0A%09margin%3A70.85pt%2070.85pt%2070.85pt%2070.85pt%3B%0A%09mso-header-margin%3A36.0pt%3B%0A%09mso-footer-margin%3A36.0pt%3B%0A%09mso-paper-source%3A0%3B%7D%0Adiv.WordSection1%0A%09%7Bpage%3AWordSection1%3B%7D%0A%2D%2D%3E--> Website iCampus (> http://icampus.uclouvain.be/). Under construction.
Prerequisites :	Mathematical skillsat the level corresponding to the first year of the bachelor in mathematics. Language skills : French (written and spoken) at high school level.
Main themes :	∓lt;!--{cke_protected}{C}%3C!%2D%2D%0A%20%2F*%20Font%20Definitions%20*%2F%0A%40font-face%0A%09%7Bfont-family%3A%22Cambria%20Math%22%3B%0A%09panose-1%3A2%204%205%203%205%204%206%203%202%204%3B%0A%09mso-font-charset%3A0%3B%0A%09mso-generic-font-family%3Aauto%3B%0A%09mso-font-pitch%3Avariable%3B%0A%09mso-font-signature%3A3%200%200%200%201%200%3B%7D%0A%40font-face%0A%09%7Bfont-family%3A%22%E3%83%92%E3%83%A9%E3%82%AE%E3%83%8E%E8%A7%92%E3%82%B4%20Pro%20W3%22%3B%0A%09mso-font-charset%3A0%3B%0A%09mso-generic-font-family%3Aroman%3B%0A%09mso-font-pitch%3Aauto%3B%0A%09mso-font-signature%3A0%200%200%200%200%200%3B%7D%0A%20%2F*%20Style%20Definitions%20*%2F%0Ap.MsoNormal%2C%20li.MsoNormal%2C%20div.MsoNormal%0A%09%7Bmso-style-unhide%3Ano%3B%0A%09mso-style-qformat%3Ayes%3B%0A%09mso-style-parent%3A%22%22%3B%0A%09margin%3A0cm%3B%0A%09margin-bottom%3A.0001pt%3B%0A%09mso-pagination%3Awidow-orphan%3B%0A%09font-size%3A12.0pt%3B%0A%09font-family%3A%22Times%20New%20Roman%22%3B%0A%09mso-fareast-font-family%3A%22Times%20New%20Roman%22%3B%0A%09mso-bidi-font-family%3A%22Times%20New%20Roman%22%3B%0A%09mso-ansi-language%3AEN-US%3B%0A%09mso-fareast-language%3AEN-US%3B%7D%0Aa%3Alink%2C%20span.MsoHyperlink%0A%09%7Bmso-style-noshow%3Ayes%3B%0A%09mso-style-priority%3A99%3B%0A%09color%3Ablue%3B%0A%09mso-themecolor%3Ahyperlink%3B%0A%09text-decoration%3Aunderline%3B%0A%09text-underline%3Asingle%3B%7D%0Aa%3Avisited%2C%20span.MsoHyperlinkFollowed%0A%09%7Bmso-style-noshow%3Ayes%3B%0A%09mso-style-priority%3A99%3B%0A%09color%3Apurple%3B%0A%09mso-themecolor%3Afollowedhyperlink%3B%0A%09text-decoration%3Aunderline%3B%0A%09text-underline%3Asingle%3B%7D%0Ap.Corps%2C%20li.Corps%2C%20div.Corps%0A%09%7Bmso-style-name%3ACorps%3B%0A%09mso-style-unhide%3Ano%3B%0A%09mso-style-parent%3A%22%22%3B%0A%09margin%3A0cm%3B%0A%09margin-bottom%3A.0001pt%3B%0A%09mso-pagination%3Awidow-orphan%3B%0A%09font-size%3A12.0pt%3B%0A%09mso-bidi-font-size%3A10.0pt%3B%0A%09font-family%3AHelvetica%3B%0A%09mso-fareast-font-family%3A%22%E3%83%92%E3%83%A9%E3%82%AE%E3%83%8E%E8%A7%92%E3%82%B4%20Pro%20W3%22%3B%0A%09mso-bidi-font-family%3A%22Times%20New%20Roman%22%3B%0A%09color%3Ablack%3B%0A%09mso-ansi-language%3AFR%3B%7D%0A.MsoChpDefault%0A%09%7Bmso-style-type%3Aexport-only%3B%0A%09mso-default-props%3Ayes%3B%0A%09font-size%3A10.0pt%3B%0A%09mso-ansi-font-size%3A10.0pt%3B%0A%09mso-bidi-font-size%3A10.0pt%3B%7D%0A%40page%20WordSection1%0A

	%09%7Bsize%3A612.0pt%20792.0pt%3B%0A%09margin%3A70.85pt%2070.85pt%2070.85pt%2070.85pt%3B%0A%09mso-header-margin%3A36.0pt%3B%0A%09mso-footer-margin%3A36.0pt%3B%0A%09mso-paper-source%3A0%3B%7D %0Adiv.WordSection1%0A%09%7Bpage%3AWordSection1%3B%7D%0A%2D%2D%3E--& mp;gt; Important and sensitive parts of the mathematics programme in the last three years of secondary school.
Aims :	Contribution of the course to learning outcomes in the Master in Mathematics programme. By the end of this activity, students will have made progress in: - Master the disciplinary knowledge and basic transferable skills whose acquisition began in the Bachelor programme. He will have expanded his basic disciplinary knowledge and skills to: -- Choose and use the fundamental methods and tools of calculation to solve mathematical problems. -- Recognise the fundamental concepts of important current mathematical theories. -- Establish the main connections between these theories. - Show evidence of abstract thinking and of a critical spirit. He will have expanded his skills to: -- Argue within the context of the axiomatic method. -- Construct and draw up a proof independently, clearly and rigorously. - Communicate in a scientific manner. He will have expanded his skills to: -- Structure an oral presentation and adapt it to the listeners' level of understanding. - Assume a professional role in the teaching at high school, exploiting his personal pedagogical and mathematical skills. Learning outcomes specific to the course. By the end of this activity, students will be able to: - Comparing and assimilating possible different approaches to the main subjects in the secondary school mathematics programme, and evaluating their mathematical and didactic relevance. - Identifying the key stages and sensitive points in the secondary school mathematics programme. - Comparing the mathematical content of the secondary school teaching programme to that of university training so as also to put to good use those skills acquired in non-didactic courses. - Suggesting problems that allow for the introduction, illustration and employment of the programme's mathematical concepts. - Recognising the aims of the secondary school teaching programme so as to organise a course in the light of these objectives. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods :	Student assessment is based on the two presentations given in the context of the seminar (both mathematical and didactic aspects will be taken into account), on participation in discussions, and on the quality of contributions in the context of the placement.
Teaching methods :	Every seminar session is held over two parts. - During the first part (one hour), a student presents a sequence of classes dealing with a given topic, with lesson plan, reasons, theory, examples. The student speaks to the other students and teachers as if facing an audience of secondary school pupils. During the presentation everyone may ask questions regarding immediate understanding (like pupils) but they make not make more extensive comments. Students must identify the essential points and sections that are difficult to teach. The presentation must not be a reproduction of the student's secondary class, but must be based on the skills acquired in the basic Baccalaureate classes. During the second part (one hour), all students and teachers comment on: - the mathematics presented (correction of any possible errors, important omissions) - the clarity of the presentation (structured presentation, use of correct words, grading, oral clarity, management of board) - balance between intuition, motivation and class dynamism (stimulating discovery, challenging aspect of certain problems) on the one hand and, on the other hand, sufficient rigour - choices: choice or presentation type (there is no single choice, and so, if this is the case, identifying the various possible presentations as well as their advantage and disadvantages), choice of examples, choice of points to highlight. The increasing responsibility teaching placementtakes place in the context of the exercise sessionsof a Baccalaureate level 1 class with a level similar to that of mathematics classes in at 5th and 6th year secondary levels. The placement is organised according to the sequence: - 4 hours of observation of exercise sessions, followed by a debriefing - 2 hours of participation in an exercise session or in a tutorial session in order to answer students' questions - 2 or 4 hours of active placement during one or two exercise sessions, followed by a debriefing The placement will be supervised by teachers from course LMAT2330 as well as by teachers from the Baccalaureate level 1 course.
Content :	The following arguments are discussed during the seminar. - Limits of functions and continuous functions. - Derivatives of a function (theory and applications). - Integrals and the fundamental theorem of integral calculus. - The exponential and logarithmic functions. The trigonometric functions. Real and complex number systems. - Systems of linear equations, matrix operations, determinant. - Geometry (vecteurs in R^2 and R^3). - Analytic geometry in R^3.
Bibliography :	Actimath, Espace Math and CQFD textbooks for 5th and 6th years, available to students from the administrative office of the School of Mathematics. BAC 1 syllabus and programmes for SEGEC mathematics classes (deuxième degré général and troisième degré général), available to students on the course iCampus site.
Faculty or entity in charge:	CAFC

Programmes / formations proposant cette unité d'enseignement (UE)

Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Physics	PHYS2M	4	-	
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	4	-	
Teacher Training Certificate (upper secondary education) - Physics	PHYS2A	4	-	
Teacher Training Certificate (upper secondary education) - Biology	BIOL2A	4	-	
Master [120] in Mathematics	MATH2M	4	-	
Teacher Training Certificate (upper secondary education) - Mathematics	MATH2A	4	-	
Master [120] in Biology of Organisms and Ecology	BOE2M	4	-	
Master [120] in Chemistry	CHIM2M	4	-	
Teacher Training Certificate (upper secondary education) - Chemistry	CHIM2A	4	-	