

## Block view of the study programme

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### Block 1

#### Compulsory course

MATH0112-1 *Preparation for the final thesis* - COLLÉGIALITÉ Q2 - - - 4

*Notice* : this course can be taken either in block 1 or block 2.

#### Optional courses

En accord avec le Jury, choisir des cours non déjà suivis pour un total de 56 crédits dans les listes ci-dessous, un minimum de 44 crédits de la liste Mathématique devant être acquis sur l'ensemble du cycle :

##### Mathematics

[...] at least 44 credits from the courses of Mathematics

##### Other disciplines

[...] maximum 12 credits from the courses of other disciplines (B1)

*Notice* : compatibility of the timetable with the courses in the Mathematics list cannot be guaranteed.

##### Other courses

[...] a maximum of 10 credits in the curriculum of the University of Liège or another institution (B1)

### Block 2

#### Compulsory course

SMEM0012-1 *Final thesis* - COLLÉGIALITÉ TA - - - 18

#### Optional courses

En accord avec le Jury, choisir des cours non déjà suivis pour un total de 12 crédits dans les listes ci-dessous, un minimum de 44 crédits de la liste Mathématique devant être acquis sur l'ensemble du cycle :

##### Mathematics

[...] at least 44 credits from the courses of Mathematics

[...] the remainder of the courses not chosen from the 'Mathematics' list

##### Other disciplines

*Notice* : compatibility of the timetable with the courses in the Mathematics list cannot be guaranteed.

[...] the remainder of the courses not chosen from the 'Other subjects' list

##### Other courses

[...] The course programme at the University of Liège or another institution

#### Choose one focus from the following :

##### Research Focus

In agreement with the Jury, choose complementary courses not already selected for a total of 30 credits from the study programmes of the ULiège.

[...] courses for a total of 30 credits

##### Teaching focus

AESS0246-1 *Analysis of scholastic institutions and key-players, educational policies* - Q1 15 - - 1  
Dominique LAFONTAINE - Suppl : MarieThérèse DELHOUNE

AESS0248-1 *Elements of sociology of education* - JeanFrançois GUILLAUME Q2 10 - - 1

AESS0140-1 *Professional ethics and training to neutrality and citizenship* - Q2 25 - - 2

ERLA							
AESS0202-1	<i>General didactics: course and exercises ; observation placements ; reflexive practices</i> - Annick FAGNANT - [10h Internship]	TA	30	10	[+]		<b>4</b>
AESS0004-1	<i>Media education</i> - Jérémy HAMERS	Q1	15	-	-		<b>1</b>
AESS0249-1	<i>Interdisciplinary seminar</i> - Annick FAGNANT	Q1	15	-	-		<b>1</b>
AESS0143-1	<i>Educational Psychology of adolescents and young adults</i> - Annick FAGNANT, Christelle GOFFIN	Q1	15	-	-		<b>2</b>
AESS0339-1	<i>Understand and manage the diversity of public schools</i> - Ariane BAYE	Q2	10	15	-		<b>3</b>
AESS1214-1	<i>Special didactics in mathematics : course and exercises (1st part)</i> - Kevin BALHAN, Pierre MATHONET	TA	40	-	-		<b>3</b>
AESS1215-1	<i>Special didactics in mathematics : placements (1st part)</i> - <i>Observation placements</i> - Kevin BALHAN, Pierre MATHONET - [10h Internship] - <i>Teaching placements</i> - Kevin BALHAN, Pierre MATHONET - [20h Internship] - <i>Reflexive practical work</i> - Kevin BALHAN, Pierre MATHONET	TA				[+]	<b>3</b>
AESS2214-1	<i>Special didactics in mathematics : course and exercises (2nd part)</i> - Kevin BALHAN, Pierre MATHONET	TA	35	-	-		<b>4</b>
AESS2215-1	<i>Special didactics in mathematics : placements (2nd part)</i> - <i>Teaching placements</i> - Kevin BALHAN, Pierre MATHONET - [20h Internship] - <i>Reflexive practical work</i> - Kevin BALHAN, Pierre MATHONET - <i>Extra-scholar teaching activities</i> - Kevin BALHAN, Pierre MATHONET	TA				[+]	<b>5</b>

#### Professional focus in finance and management

Only accessible to students who have chosen this focus before the academic year 2019-2020.

#### Professional focus in computer

Only accessible to students who have chosen this focus before the academic year 2019-2020.

#### Professional focus in Statistics

Only accessible to students who have chosen this focus before the academic year 2019-2020.

#### Bloc d'aménagement du programme de l'année

### Additional ECTS Master in mathematics (120 ECTS)

[...] The update course, worth a maximum of 60 credits, will be determined based on students' prior training.

#### Mathematics

##### Mathematical analysis

MATH0074-1	<i>Theory of distributions</i> - Françoise BASTIN	Q2	25	15	-		<b>4</b>
MATH0257-2	<i>Complex analysis</i> - JeanPierre SCHNEIDERS	Q1	30	30	-		<b>6</b>
MATH0220-2	<i>Complements to complex analysis</i> - JeanPierre SCHNEIDERS - [20h Mon. WS] (Odd years) <b>Corequisite :</b> MATH0074-1 - Théorie des distributions	Q2	30	10	[+]		<b>8</b>
MATH0463-1	<i>Functional analysis</i> - Céline ESSER - [20h Mon. WS] (Even years)	Q2	30	10	[+]		<b>8</b>
MATH0209-3	<i>Measure Theory</i> - Samuel NICOLAY - [20h Mon. WS] (Odd years)	Q1	30	10	[+]		<b>8</b>

MATH0061-1	<i>Complement of studies in the theory of measurement</i> - Samuel NICOLAY - [20h Mon. WS] <b>Prerequisite :</b> MATH0209-3 - Théorie de la mesure	Q2	30	10	[+]	<b>8</b>
MATH0082-1	<i>Research problems in analysis (english language)</i> - Françoise BASTIN, Céline ESSER, Samuel NICOLAY, JeanPierre SCHNEIDERS - [20h Mon. WS]	TA	30	10	[+]	<b>10</b>
<b>Discrete mathematics</b>						
MATH0075-1	<i>Discrete mathematics</i> - Emilie CHARLIER - Suppl : Manon STIPULANTI (Even years)	Q2	30	20	-	<b>8</b>
MATH0076-1	<i>Discrete mathematics project</i> - Emilie CHARLIER, Julien LEROY, Michel RIGO (Even years) <b>Corequisite :</b> MATH0075-1 - Mathématiques discrètes	TA	-	-	-	<b>4</b>
MATH0083-1	<i>Ergodic theory</i> - Julien LEROY (Even years)	Q1	30	20	-	<b>8</b>
INFO0212-2	<i>Algorithmics and computability</i> - Emilie CHARLIER (Odd years)	Q1	30	20	-	<b>8</b>
MATH0470-1	<i>Combinatorics on words (english language)</i> - Julien LEROY (Odd years)	Q2	30	20	-	<b>8</b>
MATH0077-1	<i>Project on combinations</i> - Emilie CHARLIER, Julien LEROY, Michel RIGO (Odd years) <b>Corequisite :</b> INFO0212-2 - Algorithmique et calculabilité MATH0470-1 - Combinatorics on words	TA	-	-	-	<b>4</b>
MATH0078-1	<i>Research problems in discrete mathematics</i> - Emilie CHARLIER, Julien LEROY, Michel RIGO - [20h Mon. WS]	TA	30	10	[+]	<b>10</b>
<b>Probability and statistics</b>						
STAT0725-2	<i>Bayesian statistics</i> - Philippe LAMBERT - [20h Mon. WS] (Even years)	Q2	30	10	[+]	<b>8</b>
STAT0723-2	<i>Linear models</i> - Gentiane HAESBROECK - [20h Mon. WS] (Even years)	Q2	30	10	[+]	<b>8</b>
MATH2021-1	<i>High-dimensional data analysis (english language)</i> - Gentiane HAESBROECK - [30h Proj.] <b>Corequisite :</b> STAT0082-1 - Compléments de statistique multivariée	Q1	30	15	[+]	<b>5</b>
STAT0082-1	<i>Complement to multivariate statistics</i> - Gentiane HAESBROECK - [10h Mon. WS] <b>Corequisite :</b> MATH2021-1 - High-dimensional data analysis	Q1	10	10	[+]	<b>3</b>
STAT0078-1	<i>Practice of statistical consultancy</i> - Marie ERNST - [20h Mon. WS] (Odd years) <b>Corequisite :</b> MATH2022-2 - Large sample analysis : theory and practice	Q2	20	-	[+]	<b>4</b>
GEST5006-1	<i>SAS Certification applied analytics (english language)</i> - Michael SCHYNS - [25h Mon. WS]	Q2	15	-	[+]	<b>4</b>
MATH2022-2	<i>Large sample analysis : theory and practice, General course (english language)</i> - Arnout VAN MESSEM - [10h Proj.]	Q2	24	12	[+]	<b>8</b>
STAT0727-2	<i>Non-parametric statistics</i> - Amir ABOUBACAR - [20h Mon. WS] (Even years)	Q1	30	10	[+]	<b>8</b>
MATH0079-1	<i>Stochastic process</i> - Céline ESSER - [20h Proj.] (Even years)	Q1	30	10	[+]	<b>8</b>
ELEN0062-1	<i>Introduction to machine learning (english language)</i> - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	Q1	30	5	[+]	<b>8</b>
MATH0084-1	<i>Research problems in probability and statistics (english language)</i> - Amir ABOUBACAR, Céline ESSER, Gentiane HAESBROECK, Arnout VAN MESSEM - [20h Mon. WS]	TA	30	10	[+]	<b>10</b>

#### Other fields

MATH0017-3	<i>Mathematical Logic and Set Theory</i> - Julien LEROY - [20h Mon. WS]	Q1	30	10	[+]	<b>8</b>
MATH0212-2	<i>General topology</i> - Céline ESSER - [10h Mon. WS]	Q2	30	20	[+]	<b>6</b>
MATH0465-1	<i>Algebraic Topology</i> - JeanPierre SCHNEIDERS - [20h Mon. WS] (Even years)	Q2	30	10	[+]	<b>8</b>
MATH0464-1	<i>Differential geometry II</i> - Pierre MATHONET - Suppl : Naïm ZENAÏDI - [20h Mon. WS] (Even years)	Q1	30	10	[+]	<b>8</b>
MATH0489-1	<i>Lie algebra</i> - Pierre MATHONET - [20h Mon. WS] (Odd years)	Q2	30	10	[+]	<b>8</b>
MATH2250-1	<i>Galois theory</i> - Emilie CHARLIER - Suppl : Georges HANSOUL	Q2	30	30	-	<b>6</b>
MATH2483-1	<i>History of mathematics</i> - Kevin BALHAN, Pierre MATHONET, Naïm ZENAÏDI	Q2	25	20	-	<b>4</b>

#### Other disciplines

##### Computer science

INFO2009-2	<i>Introduction to computer science</i> - Bernard BOIGELOT	Q1	24	14	-	<b>4</b>
INFO0061-4	<i>Computers organization</i> - Bernard BOIGELOT	Q2	15	15	-	<b>3</b>
INFO0009-2	<i>Database (general organisation)</i> - Samuel HIARD - [25h Proj.]	Q2	26	26	[+]	<b>6</b>
INFO0902-1	<i>Data structures and algorithms</i> - Pierre GEURTS - [40h Proj.]	Q2	26	20	[+]	<b>6</b>
INFO0027-2	<i>Programming techniques</i> (english language) - Laurent MATHY - [70h Proj.]	Q2	24	24	[+]	<b>6</b>
INFO0054-1	<i>Functional programming</i> - Pascal GRIBOMONT - [15h Proj.]	Q2	28	24	[+]	<b>6</b>
INFO0062-1	<i>Object-oriented programming</i> (english language) - Bernard BOIGELOT - [20h Proj.]	Q2	25	20	[+]	<b>5</b>
INFO0085-1	<i>Compilers</i> (english language) - Pascal FONTAINE - [75h Proj.]	Q2	25	-	[+]	<b>6</b>
MATH0462-1	<i>Discrete optimization</i> (english language) - Quentin LOUVEAUX - [25h Proj.]	Q2	30	20	[+]	<b>6</b>
ELEN0040-1	<i>Digital electronics</i> (english language) - JeanMichel REDOUTÉ	Q2	26	26	-	<b>6</b>
SYST0002-2	<i>Introduction to signals and systems</i> - Guillaume DRION - [15h Proj.]	Q1	26	26	[+]	<b>6</b>
INFO0049-1	<i>Knowledge representation</i> (english language) - Pascal GRIBOMONT - [50h Proj.]	Q2	28	4	[+]	<b>6</b>

##### Astrophysics and astronomy

ASTR0204-2	<i>Astrophysics and geophysics</i> - MarcAntoine DUPRET	Q1	30	30	-	<b>8</b>
SPAT0012-1	<i>General relativity, Part 1: Introduction</i> - Yves DE ROP - Suppl : Andrea CAMPOLEONI	Q1	20	-	-	<b>2</b>
SPAT0012-2	<i>General relativity, Part 2: Mathematics methods</i> - Yves DE ROP <b>Corequisite :</b> SPAT0012-1 - Relativité générale	Q1	20	-	-	<b>3</b>
SPAT0012-3	<i>General relativity, Part 3: supplement</i> - Yves DE ROP - Suppl : Andrea CAMPOLEONI <b>Corequisite :</b> SPAT0012-2 - Relativité générale	Q2	20	-	-	<b>3</b>
SPAT0044-1	<i>Stellar structure and evolution I</i> (english language) - MarcAntoine DUPRET	Q1	35	-	-	<b>4</b>
SPAT0045-1	<i>Stellar structure and evolution II</i> (english language) - MarcAntoine DUPRET	Q2	20	20	-	<b>4</b>

##### Finance and management

GEST0832-4	<i>Financial Markets</i> - Danielle SOUGNÉ	Q2	40	15	-	<b>5</b>
FINA0053-1	<i>Investments and Portfolio Management</i> (english language) - Georges HÜBNER <b>Corequisite :</b> GEST0832-4 - Marchés financiers	Q2	30	-	-	<b>5</b>
MQGE0001-6	<i>Operations Research</i> (english language) - Yves CRAMA	Q1	45	-	-	<b>5</b>

LOGI0010-1	<i>Supply Chain Management</i> (english language) - Yasemin ARDA <b>Corequisite :</b> MQGE0001-6 - Operations Research	Q2	45	-	-	<b>5</b>
MQGE0002-3	<i>Computational Optimization</i> (english language) - Yves CRAMA <b>Corequisite :</b> MQGE0001-6 - Operations Research	Q2	30	-	-	<b>5</b>
MQGE0007-1	<i>Financial Mathematics and Stochastic Calculus</i> (english language) - Célia PAQUAY <b>Corequisite :</b> GEST0832-4 - Marchés financiers	Q2	30	-	-	<b>5</b>
LOGI0012-1	<i>Logistics and Transportation</i> (english language) - Sabine LIMBOURG	Q2	30	-	-	<b>5</b>
LOGI0013-1	<i>Operation Planning</i> (english language) - Yasemin ARDA <b>Corequisite :</b> LOGI0010-1 - Supply Chain Management	Q2	30	-	-	<b>5</b>
FINA0052-1	<i>Financial Derivatives</i> (english language) - Julien HAMBUECKERS <b>Corequisite :</b> GEST0832-4 - Marchés financiers	Q2	30	-	-	<b>5</b>
FINA0064-1	<i>Financial Risk Modeling</i> (english language) - Fabien BONIVER <b>Corequisite :</b> FINA0053-1 - Investments and Portfolio Management MQGE0007-1 - Financial Mathematics and Stochastic Calculus	Q1	30	-	-	<b>5</b>
FINA0051-1	<i>Banking and Insurance</i> (english language) - Fabien BONIVER, Georges HÜBNER <b>Corequisite :</b> GEST0832-4 - Marchés financiers	Q2	30	-	-	<b>5</b>
<b>Physics</b>						
MECA0203-3	<i>Continuum Mechanics</i> - Pierre DAUBY - [20h Mon. WS]	Q1	30	10	[+]	<b>8</b>
PHYS0212-2	<i>Statistical physics</i> - Nicolas VANDEWALLE	Q2	30	30	-	<b>8</b>
PHYS0205-2	<i>Complement of physical statistics</i> - Nicolas VANDEWALLE - [20h Mon. WS]	Q2	30	10	[+]	<b>8</b>
PHYS3033-1	<i>Quantum physics I</i> - Thierry BASTIN	Q1	35	25	-	<b>8</b>
PHYS3034-1	<i>Quantum physics II</i> - Thierry BASTIN	Q2	20	10	-	<b>4</b>
<b>English</b>						
LANG0082-1	<i>English 3</i> (english language) - Véronique DOPPAGNE, Ellen HARRY, ISLV	Q1	45	-	-	<b>4</b>