

## One-year master program (60 ECTS)

Access conditions to the Master 60 ([http://www.ulg.ac.be/cms/c\\_46076/master-en-sciences-mathematiques](http://www.ulg.ac.be/cms/c_46076/master-en-sciences-mathematiques))

### Compulsory courses

SMEM0011-1 *Final thesis* - COLLÉGIALITÉ - - - **16**

### Optional courses

With the approval of the Board of Studies in Mathematics, choose courses totaling 32 ECTS from the first list below :

#### First list

MATH0463-1	<i>Functional Analysis I</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	<b>8</b>
MATH0209-3	<i>Measure Theory</i> - Samuel NICOLAY - [20h Mon. WS]	30	10	[+]	<b>8</b>
INFO0213-2	<i>Automata and formal languages theory</i> - Michel RIGO - [20h Mon. WS]	30	10	[+]	<b>8</b>
MATH0220-2	<i>Functions of complex variables</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	<b>8</b>
MATH0464-1	<i>Differential geometry II</i> - Pierre LECOMTE - [20h Mon. WS]	30	10	[+]	<b>8</b>
MATH0017-3	<i>Mathematical Logic and Set Theory</i> - Georges HANSOUL - [20h Mon. WS]	30	10	[+]	<b>8</b>
MATH0465-1	<i>Algebraic Topology</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	<b>8</b>

### Choose one module (12 ECTS) from :

#### Module : Mathematics

MATH0483-2	<i>History of mathematics</i> - Georges HANSOUL - [20h Mon. WS]	20	-	[+]	<b>4</b>
[...]	With the approval of the Board of Studies in Mathematics, choose one (several) course(s) totaling 8 ECTS from the first list below or from the second list below and, possibly, from the courses programme of other masters				

#### The second list

STAT0723-2	<i>Statistical linear models</i> - Paul GÉRARD - [20h Mon. WS]	30	10	[+]	<b>8</b>
STAT0201-3	<i>Multivariate statistics</i> - Adelin ALBERT - Suppl : Gentiane HAESBROECK - [20h Mon. WS]	30	10	[+]	<b>8</b>
INFO0902-1	<i>Data structures and algorithms</i> - Pierre GEURTS	30	30	-	<b>8</b>
INFO0054-1	<i>Functional programming</i> - Pascal GRIBOMONT	30	30	-	<b>8</b>
ASTR0201-3	<i>Astronomy</i> - Marc-Antoine DUPRET - [20h Mon. WS]	30	10	[+]	<b>8</b>
PHYS0243-2	<i>Quantum Physics I</i> - Thierry BASTIN - [20h Mon. WS]	30	10	[+]	<b>8</b>
PHYS0203-2	<i>Statistical physics</i> - Nicolas VANDEWALLE - [20h Mon. WS]	30	10	[+]	<b>8</b>
SPAT0012-1	<i>General relativity I</i> - Yves DE ROP	60	-	-	<b>8</b>
SPAT0044-1	<i>Stellar Structure and evolution I</i> - Marc-Antoine DUPRET	20	20	-	<b>4</b>
SPAT0045-1	<i>Stellar structure and evolution II</i> - Marc-Antoine DUPRET	20	20	-	<b>4</b>
MECA0203-3	<i>Continuum Mechanics</i> - Pierre DAUBY - [20h Mon. WS]	30	10	[+]	<b>8</b>

#### Module : Environmental Management

ENVT0031-2	<i>Society / Environment (epistemology, law, economics and social sciences towards the environment)</i> - François MELARD, Marc MORMONT	24	12	-	<b>3</b>
ENVT0030-2	<i>Managing the environment (transitional issues, instruments, case studies)</i> - Jean-Marie HAUGLUSTAINE, François MELARD, Marc MORMONT, Catherine MOUGENOT, Pierre M. STASSART	24	12	-	<b>3</b>
ENVT0034-1	<i>GIS data management</i> - Philippe ANDRE, Jacques NICOLAS, Anne-Claude ROMAIN, Bernard TYCHON	12	12	-	<b>2</b>
ENVT0013-3	<i>Assessment tools (impact assessment, LCA)</i> - Alain HANSON, Jacques NICOLAS, Nathalie SEMAL	12	12	-	<b>2</b>
ENVT0848-3	<i>Impacts of human activities on ecosystems and including land use</i> - Célia JOAQUIM#JUSTO, Angélique LÉONARD, Roberto RENZONI, Emmanuël SÉRUSIAUX	20	10	-	<b>2</b>

*Notice* : Students who choose the two courses from the "Environmental Science and Management" module will have direct access to the 2nd year of the Masters in Environmental Science and Management, organised on the Arlon campus. Other students will also have access to the 2nd year of the Masters in Environmental Science and Management, on the condition that they take courses corresponding to

these 12 credits in addition to the 60 credits taken during this study year.

## Two-Year Master Program (120 ECTS)

Access conditions to the Master 120 ([http://www.ulg.ac.be/cms/c\\_46076/master-en-sciences-mathematiques](http://www.ulg.ac.be/cms/c_46076/master-en-sciences-mathematiques))

### First Year

#### Compulsory course

MATH0483-2 *History of mathematics* - Georges HANSOUL - [20h Mon. WS] 20 - [+] 4

#### Optional courses

With the approval of the Board of Studies in mathematics, choose courses totaling 56 credits from the two lists below, and possibly in the courses programme of other masters :

##### First list

[...] At least 32 credits from from "Première liste"

MATH0463-1	<i>Functional Analysis I</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	8
MATH0209-3	<i>Measure Theory</i> - Samuel NICOLAY - [20h Mon. WS]	30	10	[+]	8
INFO0213-2	<i>Automata and formal languages theory</i> - Michel RIGO - [20h Mon. WS]	30	10	[+]	8
MATH0220-2	<i>Functions of complex variables</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	8
MATH0464-1	<i>Differential geometry II</i> - Pierre LECOMTE - [20h Mon. WS]	30	10	[+]	8
MATH0017-3	<i>Mathematical Logic and Set Theory</i> - Georges HANSOUL - [20h Mon. WS]	30	10	[+]	8
MATH0465-1	<i>Algebraic Topology</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	8

##### The second list

[...] At most 24 credits of courses from "Deuxième liste"

STAT0723-2	<i>Statistical linear models</i> - Paul GÉRARD - [20h Mon. WS]	30	10	[+]	8
STAT0201-3	<i>Multivariate statistics</i> - Adelin ALBERT - Suppl : Gentiane HAESBROECK - [20h Mon. WS]	30	10	[+]	8
INFO0902-1	<i>Data structures and algorithms</i> - Pierre GEURTS	30	30	-	8
INFO0054-1	<i>Functional programming</i> - Pascal GRIBOMONT	30	30	-	8
ASTR0201-3	<i>Astronomy</i> - Marc-Antoine DUPRET - [20h Mon. WS]	30	10	[+]	8
PHYS0243-2	<i>Quantum Physics I</i> - Thierry BASTIN - [20h Mon. WS]	30	10	[+]	8
PHYS0203-2	<i>Statistical physics</i> - Nicolas VANDEWALLE - [20h Mon. WS]	30	10	[+]	8
SPAT0012-1	<i>General relativity I</i> - Yves DE ROP	60	-	-	8
SPAT0044-1	<i>Stellar Structure and evolution I</i> - Marc-Antoine DUPRET	20	20	-	4
SPAT0045-1	<i>Stellar structure and evolution II</i> - Marc-Antoine DUPRET	20	20	-	4
MECA0203-3	<i>Continuum Mechanics</i> - Pierre DAUBY - [20h Mon. WS]	30	10	[+]	8
PHYS0204-3	<i>Quantum Physics II</i> - Thierry BASTIN - [20h Mon. WS]	30	10	[+]	8
PHYS0205-2	<i>Further Physical Statistics</i> - Nicolas VANDEWALLE - [20h Mon. WS]	30	10	[+]	8

##### Programme of courses for other masters degrees

[...] At the most 8 credits of courses of the University of Liege

#### Optional free course

AESS0252-1 *Introduction to mathematics didactics* - Marguerite GILOT 10 10 - 2

### Second year

#### Compulsory course

SMEM0012-1 *Final thesis* - COLLÉGIALITÉ - - - 22

#### Optional courses

With the approval of the Board of Studies in mathematics, choose course(s) totaling 8 credits from :

[...] the remaining courses not selected in the first list

MATH0463-1	<i>Functional Analysis I</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	8
MATH0209-3	<i>Measure Theory</i> - Samuel NICOLAY - [20h Mon. WS]	30	10	[+]	8

INFO0213-2	<i>Automata and formal languages theory</i> - Michel RIGO - [20h Mon. WS]	30	10	[+]	8
MATH0220-2	<i>Functions of complex variables</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	8
MATH0464-1	<i>Differential geometry II</i> - Pierre LECOMTE - [20h Mon. WS]	30	10	[+]	8
MATH0017-3	<i>Mathematical Logic and Set Theory</i> - Georges HANSOUL - [20h Mon. WS]	30	10	[+]	8
MATH0465-1	<i>Algebraic Topology</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	8
[...]	the remaining courses not taken on the second list				
STAT0723-2	<i>Statistical linear models</i> - Paul GÉRARD - [20h Mon. WS]	30	10	[+]	8
STAT0201-3	<i>Multivariate statistics</i> - Adelin ALBERT - Suppl : Gentiane HAESBROECK - [20h Mon. WS]	30	10	[+]	8
INFO0902-1	<i>Data structures and algorithms</i> - Pierre GEURTS	30	30	-	8
INFO0054-1	<i>Functional programming</i> - Pascal GRIBOMONT	30	30	-	8
ASTR0201-3	<i>Astronomy</i> - Marc-Antoine DUPRET - [20h Mon. WS]	30	10	[+]	8
PHYS0243-2	<i>Quantum Physics I</i> - Thierry BASTIN - [20h Mon. WS]	30	10	[+]	8
PHYS0203-2	<i>Statistical physics</i> - Nicolas VANDEWALLE - [20h Mon. WS]	30	10	[+]	8
SPAT0012-1	<i>General relativity I</i> - Yves DE ROP	60	-	-	8
SPAT0044-1	<i>Stellar Structure and evolution I</i> - Marc-Antoine DUPRET	20	20	-	4
SPAT0045-1	<i>Stellar structure and evolution II</i> - Marc-Antoine DUPRET	20	20	-	4
MECA0203-3	<i>Continuum Mechanics</i> - Pierre DAUBY - [20h Mon. WS]	30	10	[+]	8
PHYS0204-3	<i>Quantum Physics II</i> - Thierry BASTIN - [20h Mon. WS]	30	10	[+]	8
PHYS0205-2	<i>Further Physical Statistics</i> - Nicolas VANDEWALLE - [20h Mon. WS]	30	10	[+]	8
[...]	The programme of courses for other Masters.				

Choose one of the following focus :

#### Research Focus

##### Compulsory courses

MATH0466-1	<i>Seminars</i> - COLLÉGIALITÉ - [75h SEM]	-	-	[+]	12
SMEM0037-1	<i>Final thesis complement</i> - COLLÉGIALITÉ	-	-	-	8

##### Optional courses

With the agreement of the council of studies, choose 1 among the following :

MATH0467-1	<i>Functional Analysis II</i> - Françoise BASTIN - [20h Mon. WS]	30	10	[+]	10
MATH0468-1	<i>Algebraic Analysis</i> - Jean-Pierre SCHNEIDERS - [20h Mon. WS]	30	10	[+]	10
MATH0061-1	<i>Complementary studies in the theory of measurement</i> - Samuel NICOLAY - [20h Mon. WS]	30	10	[+]	10
MATH0469-1	<i>Differential geometry III</i> - Pierre MATHONET - [20h Mon. WS]	30	10	[+]	10
MATH0234-2	<i>Boolean Topology and Boolean Algebra</i> - Georges HANSOUL - [20h Mon. WS]	30	10	[+]	10
MATH0470-1	<i>Combinatorics on words</i> - Michel RIGO - [20h Mon. WS]	30	10	[+]	10

#### Teaching focus

##### Compulsory courses

AESS0246-1	<i>Analysis of scholastic institutions and key-players, educational policies</i> - Jacqueline BECKERS	15	-	-	1
AESS0247-1	<i>Views on cultural diversity</i> - Jérôme JAMIN	10	-	-	1
AESS0248-1	<i>Elements of sociology of education</i> - Jean-François GUILLAUME	10	-	-	1
AESS0140-1	<i>Professional ethics and training to neutrality and citizenship</i> - Anne HERLA	25	-	-	2
AESS0202-1	<i>General didactics: course and exercises ; observation placements ; reflexive practices</i> - Annick FAGNANT - [10h Internship]	30	10	[+]	4
AESS0004-1	<i>Media education</i> - Geneviève VAN CAUWENBERGE	15	-	-	1
AESS0249-1	<i>Interdisciplinary seminar</i> - Annick FAGNANT	15	-	-	1
AESS0143-1	<i>Educational Psychology of adolescents and young adults</i> - Annick FAGNANT	15	-	-	2
AESS0142-1	<i>Seminar on prevention and management of difficult school situations</i> - Jocelyne ROBERT	15	-	-	2
AESS0214-1	<i>Special didactics in mathematics (part I)</i>				6
	- Course and exercises - Marguerite GILOT	40	-	-	
	- Observation placements - Marguerite GILOT - [10h Internship]	-	-	[+]	
	- Teaching placements - Marguerite GILOT - [20h Internship]	-	-	[+]	
	- Reflexive practical work - Marguerite GILOT	-	5	-	

AESS0232-1	<i>Special didactics in mathematics (part II)</i>				<b>9</b>
	- <i>Course and exercises</i> - Marguerite GILOT	35	-	-	
	- <i>Teaching placements</i> - Marguerite GILOT - [20h Internship]	-	-	[+]	
	- <i>Reflexive practical work</i> - Marguerite GILOT	-	5	-	
	- <i>School practical outside lectures</i> - Marguerite GILOT	-	10	-	

#### Professional focus in management

##### Compulsory courses

GEST3001-1	<i>People management and organisation</i> - Jocelyne ROBERT	24	24	-	<b>4</b>
GEST3002-1	<i>Human Resources</i> - Jocelyne ROBERT	24	-	-	<b>2</b>
GEST3003-1	<i>Competitive strategy in the marketplace</i> (english language) - Michael GHILISSEN	16	16	-	<b>3</b>
GEST3004-1	<i>Marketing (operations and management)</i> (english language) - Michael GHILISSEN	16	16	-	<b>3</b>
GEST3005-2	<i>Accountancy and Finance</i> - Jacques BERWART	24	24	-	<b>4</b>
GEST3006-1	<i>Operations and supply chain management I</i> - Yasemin ARDA	16	16	-	<b>3</b>
GSTG3001-1	<i>Business plan</i> - COLLÉGIALITÉ	-	30	-	<b>4</b>
GSTG0017-1	<i>Functional analysis of a company</i> - COLLÉGIALITÉ - [30h Internship]	-	-	[+]	<b>4</b>

##### Optional courses

With the agreement of the council of studies choose a course among the following :

GEST3010-1	<i>Operations and supply chain management II</i> - Sabine LIMBOURG	16	16	-	<b>3</b>
GEST3011-2	<i>ICT for Business</i> - Alain DUBOIS	16	16	-	<b>3</b>
GEST3012-1	<i>Financial and actuarial modelling</i> - Louis ESCH	16	16	-	<b>3</b>

#### Professional focus in computer

##### Compulsory courses

INFO0062-1	<i>Object-Oriented Programming</i> - Bernard BOIGELOT	30	30	-	<b>6</b>
INFO0009-1	<i>Introduction to Data Bases</i> - Pierre WOLPER	30	30	-	<b>6</b>
INFO0045-2	<i>Cryptography and Computer Security</i> - Benoît DONNET	30	30	-	<b>6</b>

##### Optional courses

With the approval of the Board of Studies, choose 2 courses from the following :

The courses INFO0902-1 and INFO0054-1 must be taken first.

INFO0902-1	<i>Data structures and algorithms</i> - Pierre GEURTS	30	30	-	<b>6</b>
INFO0054-1	<i>Functional programming</i> - Pascal GRIBOMONT	30	30	-	<b>6</b>

If the INFO0902-1 and/or INFO0054-1 courses have already been followed, choose, with the approval of the Board of Studies, 1 or 2 courses from the following :

ELEN0040-1	<i>Digital Electronics</i> - Jacques DESTINÉ	30	30	-	<b>6</b>
INFO0085-1	<i>Compilers</i> - Pierre GEURTS	30	30	-	<b>6</b>
INFO0027-1	<i>Programming techniques</i> - Laurent MATHY	30	50	-	<b>6</b>
MATH0461-1	<i>Introduction to numerical optimization</i> (english language) - Quentin LOUVEAUX	30	30	-	<b>6</b>
SYST0002-1	<i>Linear systems</i> - Rodolphe SEPULCHRE	30	30	-	<b>6</b>
INFO0049-1	<i>Knowledge Representation</i> - Pascal GRIBOMONT	30	30	-	<b>6</b>

#### Professional focus in Statistics

##### Compulsory courses

STAT0725-2	<i>Bayesian statistics</i> - Philippe LAMBERT - [20h Mon. WS]	30	10	[+]	<b>7</b>
STAT0727-2	<i>Non-parametric statistics</i> - Cédric HEUCHENNE - [20h Mon. WS]	30	10	[+]	<b>7</b>

##### Optional courses

With the approval of the Board of Studies, choose courses from the following :

The courses STAT0723-2 and STAT0201-3 must be taken first.

STAT0723-2	<i>Statistical linear models</i> - Paul GÉRARD - [20h Mon. WS]	30	10	[+]	<b>8</b>
STAT0201-3	<i>Multivariate statistics</i> - Adelin ALBERT - Suppl : Gentiane HAESBROECK - [20h Mon. WS]	30	10	[+]	<b>8</b>

If the STAT0723-2 and/or STAT0201-3 courses have already been followed, choose, with the approval of the Board of Studies, 1 or 2 courses from the following :

MATH0221-3	<i>Analysis of time series</i> - Paul GÉRARD - [20h Mon. WS]	30	10	[+]	<b>8</b>
MATH0222-3	<i>Introduction to stochastic processes</i> - Gentiane HAESBROECK - [20h Mon. WS]	30	10	[+]	<b>8</b>