

Curriculum of the program

UNIVERSITY OF BUCHAREST

FACULTY OF MATHEMATICS

Master Study Domain: Mathematics

Master Study Program: Algebra, Geometry and Cryptography

Type of studies: full-time

Duration of studies - 4 semesters / 120 ECTS

Academic year 2015-2016 (First year of studies) – 60 ECTS

Crt. no.	Mandatory courses	1 st semester (14 weeks)				2 nd semester (14 weeks)			
		C	S	EV	ECTS	C	S	EV	ECTS
1	Ob.11. Rings and Categories of Modules	2	2	E	7	-	-	-	-
2	Ob.12. Algebraic Curves	2	2	E	7	-	-	-	-
3	Ob.13. Introduction to Algebraic Topology	2	2	E	7	-	-	-	-
4	Ob.14. Riemannian Geometry	2	2	E	7	-	-	-	-
5	Ob.21. Homological Algebra	-	-	-	-	2	2	E	7
6	Ob.22. Introduction to Commutative Algebras	-	-	-	-	2	2	E	7
7	Ob.23. Groups and Representations	-	-	-	-	2	2	E	7
8	Ob.24. Introduction to Sheaf Theory	-	-	-	-	2	2	E	7
9	Ob.25. Research activity (practical training)	-	2	V	2	-	2	V	2
TOTAL		8	8	4E 1V	30	8	8	4E 1V	30

C = lecture/course; S = Practicals/Tutorials; Ob.xx = compulsory; Op.Xxx = elective;

EV=Evaluation; E = exam; V = verification; ECTS = number of European transferable credits;

Academic year 2016-2017 (Second year of studies) – 60 ECTS

Crt. no.	Elective courses	1 st semester (14 weeks)				2 nd semester (10 weeks)			
		C	S	EV	ECTS	C	S	EV	ECTS
1	Op.11. Elective course on Algebra	2	1	E	5	-	-	-	-
2	Op.12. Elective course on Geometry	2	1	E	5	-	-	-	-
3	Op.13. Elective course on Cryptography	2	1	E	5	-	-	-	-
4	Op.14. Elective	2	1	E	5	-	-	-	-
5	Op.15. Elective	2	1	E	5	-	-	-	-
6	Op.21. Elective course on Algebra	-	-	-	-	2	1	E	5
7	Op.22. Elective course on Geometry	-	-	-	-	2	1	E	5
8	Op.23. Elective course on Cryptography	-	-	-	-	2	1	E	5
9	Op.24. Elective	-	-	-	-	2	1	E	5
10	Op.25. Elective	-	-	-	-	2	1	E	5
11	Research work for the Dissertation Thesis (practical training)	-	2	V	5	-	2	V	5
TOTAL		10	7	4E 1V	30	10	7	4E 1V	30

C = lecture/course; S = Practicals/Tutorials; Ob.xx = compulsory; Op.Xxx = elective;

EV=Evaluation; E = exam; V = verification; ECTS = number of European transferable credits;

Selection of the elective courses

- 1) In order to choose the elective courses for the third semester, every student presents a list of five options, chosen from the first table below.
- 2) The list must contain at least one elective course on each of the three packages: Algebra, Geometry and Cryptography.
- 3) All courses from the table are ranked in descending order of the number of options.
- 4) The elective courses that will be taught in the third semester will be:
 - a) The highest ranked course coded Op.Axx;
 - b) The highest ranked course coded Op.Gxx;
 - c) The highest ranked course coded Op.Cxx;
 - d) Other two courses, namely the highest ranked ones which have not been already chosen (these two courses can be from any package).
- 5) To determine the elective courses for the fourth semester one proceeds in a similar way.

The list of the elective courses

3rd semester

Algebra	Geometry	Cryptography
Op.A31. Hopf Algebras	Op.G31. Algebraic Geometry	Op.C31. Computational Cryptography
Op.A32. Lie Algebras	Op.G32. Complex Geometry	Op.C32. Elliptic Curves
Op.A33. Special Topics in Category Theory	Op.G33. Lie Groups	Op.C33. Algebraic Number Theory with Applications to Cryptography.
Op.A34. Combinatorics in Commutative Algebra	Op.G34. Submanifolds of Riemannian Manifolds	-
Op.A35. Analytic Methods in Number Theory	Op.G35. Differential Topology	-

4th semester

Algebra	Geometry	Cryptography
Op.A41. Computational Algebra	Op.G41. Vector Bundles and Applications	Op.C41. Applied Cryptography
Op.A42. Introduction to Quantum Group Theory	Op.G42. Algebraic Groups	Op.C42. Information Flow Security
Op.A43. Representation Theory of Algebras	Op.G43. Relativity Theory	Op.C43. Theory of Codes
Op.A44. Valuation Theory and Local Fields	Op.G44. Variational Methods in Riemannian Geometry	-
Op.A45. Multiplicative Ideal Theory	Op.G45. Kaehler Manifolds	-