

SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	Babeş-Bolyai University
1.2 Faculty	Faculty of Mathematics and Computer Science
1.3 Department	Department Mathematics
1.4 Field of study	Mathematics
1.5 Study cycle	Bachelor
1.6 Study programme / Qualification	Mathematics and Computer Science/ Mathematician

2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)	Complements of geometry Complemente de geometrie						
2.2 Course coordinator	VĂCĂREȚU DANIEL						
2.3 Seminar coordinator	VĂCĂREȚU DANIEL						
2.4. Year of study	2	2.5 Semester	4	2.6. Type of evaluation	VP	2.7 Type of discipline	DS
2.8 Code of the discipline	MLE0041						

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	4	Of which: 3.2 course	2	3.3 seminar/laboratory	2
3.4 Total hours in the curriculum	56	Of which: 3.5 course	28	3.6 seminar/laboratory	28
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					20
Additional documentation (in libraries, on electronic platforms, field documentation)					20
Preparation for seminars/labs, homework, papers, portfolios and essays					20
Tutorship					14
Evaluations					10
Other activities:					10
3.7 Total individual study hours			94		
3.8 Total hours per semester			150		
3.9 Number of ECTS credits			6		

4. Prerequisites (if necessary)

4.1. curriculum	•
4.2. competencies	•

5. Conditions (if necessary)

5.1. for the course	•
5.2. for the seminar /lab activities	•

6. Specific competencies acquired

Professional competencies	<ul style="list-style-type: none"> • Systematic solving of problems • Interdisciplinary approach and thinking • Modeling and abstraction
Transversal competencies	<p>Aptitude of moving from abstract theory to concrete problems</p> <ul style="list-style-type: none"> • Critical thinking • Discussing obtained knowledge • Applying obtained knowledge

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	<ul style="list-style-type: none"> • Development creative thinking • Developing spatial view • Development learning skills
7.2 Specific objective of the discipline	<p>To identify configurations of collinear points and concurrent lines To applied Menelaus and Ceva theorems To identify configurations Simson -Wallace line and S triangles To use in problems Izometries, Homotety and Inversion</p>

8. Content

8.1 Course	Teaching methods	Remarks
1) Menelaus Theorem applications ([2] pag. 11-17)	Exposition, proofs, examples	
2) Ceva Theorem, applications ([2] pag. 18-30)	Exposition, proofs, examples	
3)Izogonal cevians, Steiner Theorem ([2] pag.30-36)	Exposition, proofs, examples	
4) Carnot lema , orthopol theorem, orthologic triangles ([2] pag .36-40)	Exposition, proofs, examples	
5) Power of a point with respect o a circle ([2] pag.41-49)	Exposition, proofs, examples	
6) ” Five lei coin problem” of Țițeica, generalization, ([2] pag.51-55)	Exposition, proofs, examples	
7) Lemoine circles ([2] pag. 56-63, [5] pag. 75-81 si [6] pag.370-388)	Exposition, proofs, examples	

8) Simson-Wallace line, Lalescu triangles(S triangles or orthopolars triangles) ([2] pag.63-72 si [6] pag.125-203)	Exposition, proofs, examples	
9)i Brocard angle and Brocards points ([2] pag. 72-81 si [5] pag.66-74)	Exposition, proofs, examples	
10) metrics relations, Stewart theorem ([2] pag.81-96)	Exposition, proofs, examples	
11) Plane izometries ([1] pag.93-104)	Exposition, proofs, examples	
12) simmetries, translation, rotation ([2] pag.100-118)	Exposition, proofs, examples	
13) Homothety ([2] pag.119-122)	Exposition, proofs, examples	
14) Inversion ([2] pag.135-140)	Exposition, proofs, examples	

Bibliography

1. ALBU A.C., col., Geometrie pentru perfecționarea profesorilor, Ed. Didactică și Pedagogică, București,1983..
2. D.ANDRICA, CS.VARGA, D.VĂCĂREȚU, Teme si probleme alese de geometrie, Ed. Plus, București, 2002.
3. D.ANDRICA, CS.VARGA, D.VĂCĂREȚU, Teme de geometrie, Ed. Promedia-Plus, Cluj-Napoca, 1997
4. D.BRANZEI, COL., Planul si spațiul euclidian, Editura Academiei, București, 1986.
5. LALESCU,T., Geometria triunghiului, Ed.Tineretului,1958
6. MIHALESCU,C., Geometria elementelor remarcabile, Ed.Tehnica,Bucuresti,1957 sau Ed. Societății de Științe Matematice din Romania București, 2007, sau XYZ Press, 2016 (în engleză)
7. NICOLESCU, L.-BOSKOFF, V., Probleme practice de geometrie, Editura Tehnica, București, 1990

8.2 Seminar / laboratory	Teaching methods	Remarks
1) problems with Menelaus Theorem([2] pag. 11-17)	Dialog, problem solving	
2) problems with Ceva theorm ([2] pag. 18-30)	Dialog, problem solving	
3) applications ([2] pag.30-36)	Dialog, problem solving	
4) applications ([2] pag.30-36)	Dialog, problem solving	
5) applications ([2] pag.41-49)	Dialog, problem solving	
6) nine point circle ([2] pag.49-50)	Dialog, problem solving	
7) Tucker circles([2] pag. 56-63, [5] pag. 75-81 si [6] pag.370-388)	Dialog, problem solving	
8) Examples of S triangles ([2] pag.63-72 si [6])	Dialog, problem solving	

pag.125-203)		
9) applications ([2] pag. 72-81 si [5] pag.66-74)	Dialog, problem solving	
10) applications ([2] pag.81-96)	Dialog, problem solving	
11) applications ([1] pag.93-104)	Dialog, problem solving	
12) applications ([2] pag.100-118)	Dialog, problem solving	
13) applications ([2] pag.122-133)	Dialog, problem solving	
14) applications ([2] pag.140-149)	Dialog, problem solving	

Bibliography

1. ALBU A.C., col., Geometrie pentru perfecționarea profesorilor, Ed. Didactică și Pedagogică, București,1983.
2. D.ANDRICA, CS.VARGA, D.VĂCĂREȚU, Teme si probleme alese de geometrie, Ed. Plus, București,2002.
3. D.ANDRICA, CS.VARGA, D.VĂCĂREȚU, Teme de geometrie, Ed. Promedia-Plus, Cluj-Napoca,1997
4. D.BRÂNZEI, COL., Planul si spațiul euclidian, Editura Academiei, București, 1986.
5. LALESCU,T., Geometria triunghiului, Ed. Tineretului, 1958
6. MIHALESCU, C., Geometria elementelor remarcabile, Ed. Tehnică, București, 1957 sau Ed. Societății de Științe Matematice din Romania, București, 2007 sau XYZ Press, 2016 (în engleză)
7. NICOLESCU, L., BOSKOFF, V., Probleme practice de geometrie, Editura Tehnică, București, 1990

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

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10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	Critical grasp of the learned material, ability to use what was learned	Two written partial exams at the middle and end of the semester	1/2
10.5 Seminar/lab activities	Active participation at the seminars, ability to use the methods learned	Two written partial exams at the middle and end of the semester	1/4
		Homework	1/4

10.6 Minimum performance standards

To identify configurations of collinear points and concurrent lines
To applied Menelaus and Ceva theorems
To identify configurations Simson -Wallace line and S triangles
To use in problems Izometries, Homotety and Inversion

Date

22 apr. 2021

Signature of course coordinator

lect. univ. dr. Văcărețu Daniel

Signature of seminar coordinator

lect. univ. dr. Văcărețu Daniel

Date of approval

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Signature of the head of department

prof. dr. Agratini Octavian