



MINISTERUL EDUCAȚIEI
UNIVERSITATEA „AUREL VLAICU” DIN ARAD
310130 Arad, B-dul Revoluției nr. 77, P.O. BOX 2/158 AR
Tel : 0040-257- 283010; fax. 0040-257- 280070
<http://www.uav.ro>; e-mail: rectorat@uav.ro
Operator de date cu caracter personal nr.2929

SYLLABUS

1. Study programme

1.1. Higher education institution	„Aurel Vlaicu” University of Arad
1.2. Faculty	of Exact Sciences
1.3. Department	Department of Mathematics and Computer Science
1.4. Field of study	Mathematics
1.5. Study level	2024-2025
1.6. Ciclul de studii	Bachelor
1.7. Study programme / Qualification	Mathematics-Informatics
1.8. Form of education	Full – Time study

2. Course details

2.1. Name of the course	History of mathematics
2.2. Course coordinator	Prof. Adrian Palcu
2.3. Seminar/laboratory/project coordinator	Prof. Adrian Palcu
2.4. Study year	1
2.5. Semester	1
2.6. Evaluation type	ES
2.7. Course type	As

3. Estimated total time (hours per semester)

3.1. Hours per week	2
3.2. Lecture hours per week	1
3.3. Seminar/laboratory/project hours per week	1
3.4. Total hours per curriculum	28
3.5. Lecture hours per semester	14
3.6. Seminar/laboratory/project hours per semester	14
Time division [hrs]	
3.4.1. Independent study from textbooks, course support, bibliography and notes	10
3.4.2. Additional reading (libraries, specialized electronic platforms and field research)	5
3.4.3. Preparing of seminars/laboratories/projects, homework, papers, portfolios and essays	5
3.4.4. Tutorial coaching	-
3.4.5. Examinations	2
3.4.6. Other activities	-
3.7. Total individual study hours	22
3.8. Total hours per semester	50
3.9. Number of ECTS credits	2

4. Prerequisites (if applicable)

4.1. Curriculum related	
4.2. Competence related	

5. Conditions (if applicable)

5.1. for the lecture	Projector, blackboard
5.2. for the seminar	Projector, beackboard, LAN
5.3. for the laboratory	-
5.4. for the project	-

6. Specific educational objectives (competences to be acquired)

6.1. Competențe profesionale	<p>C3. Synthesizes information</p> <p>C4. Thinks abstractly</p> <p>C5. Communicates mathematical information</p> <p>C6. Applies scientific methods</p> <p>C13. Teach mathematics</p>
6.2. Competențe transversale	<p>TC1. Shows initiative</p> <p>TC4. Works in teams</p> <p>TC5. Shows confidence</p>

7. Course outcomes (resulting from the specific educational objectives to be acquired)

7.1. General outcomes	At the end of the course, the student should understand the tendencies and reasons for the development of mathematics.
7.2. Specific outcomes	<p>The student should understand the methods of ancient mathematicians, and the ideas behind modern mathematical branches.</p> <p>The student should learn the landmark problems that lead to breakthroughs in mathematical practices;</p> <p>The student should learn about the works of great mathematicians in the past and present.</p> <p>Finally, the student should polish his/her skills in writing essays.</p>

8. Outline (if applicable)

8.1 Lecture Outline	Teaching methods	Remarks
<p>1. Antique Mathematics</p> <p>Introduction. Structure and roots of modern math. Prehistoric math, Numeral system</p> <p>Mathematics in Bronze Age: 2nd millennium BCE. Mesopotamia, Egypt</p> <p>Early Greek math: Thales, Pythagoras, Euclid.</p> <p>Math in China, India, Medieval Muslim world and Europe</p> <p>2. Origins of Modern math. 16-18th centuries</p> <p>Arabic-Hindu notations, Cubic equation and complex numbers. Logarithms.</p> <p>Works of Fermat, Pascal, Descartes: Number theory, Probability, Analytic geometry.</p> <p>Newton and Leibniz: Function, Calculus and Differential Equations, first computer.</p> <p>3. Some branches of modern math. 19th century</p> <p>Complex Analysis, Differential equations in mechanics and physics, Functional</p>	<p>Presentations, Debate</p> <p>Presentations, Debate</p> <p>Presentations, Debate</p>	<p>4 hours</p> <p>4 hours</p> <p>4 hours</p>

spaces Algebra: vectors, matrices, Boolean logic, number theory Differential and non-Euclidean geometry 4. 20th-21st century Continuum hypothesis, Goedel theorem. Fermat's theorem, Penrose tiling, Kepler's conjecture Limits: Hilbert space, Distributions, Measures in PDEs, Fractals, Chaos, Homogenization. Math modeling. Optimization, Game theory, Transport problem, Metamaterials. Probability and Statistics. Big Data. Numerics, Machine learning and computer-aided proofs.	Presentations, Debate	2 hours
8.2 Lecture References 1. C. B. Boyer and U. C. Merzbach: <i>A History of Mathematics</i> (Wiley, 2011). 2. D. Burton: <i>The History of Mathematics – An Introduction</i> (McGraw-Hill, 2010). 3. V. Katz – <i>A History of Mathematics</i> (Pearson, 2009).		

8.3 Seminar Outline	Teaching methods	Remarks
Various problems (chosen by students)) from topics presented in lectures	Solving problems, debate, writing a scientific paper	14 hours
8.4 Seminar References 1. C. B. Boyer and U. C. Merzbach: <i>A History of Mathematics</i> (Wiley, 2011). 2. D. Burton: <i>The History of Mathematics – An Introduction</i> (McGraw-Hill, 2010). 3. V. Katz – <i>A History of Mathematics</i> (Pearson, 2009).		
8.5 Laboratory Outline	Teaching methods	Remarks
8.6 Laboratory Outline		
8.7 Project Outline	Teaching methods	Remarks
8.8 Project Outline		

Correlation of course outline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

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Evaluation / Grading (if applicable)

Activity type	Evaluation criteria	Evaluation methods	Percentage of the final grade
10.1. Lecture	Essay on a topic regarding a certain mathematical concept's development .	Written	70%
10.2. Seminar	Homework problems	Written	30%
10.3. Laboratory			
10.4. Project			
10.5 Minimal performance standard A fair essay on the chosen topic.			

Course coordinator
Prof. Adrian Palcu, PhD

Seminar/laboratory/project coordinator,
Prof. Adrian Palcu, PhD

Head of the Department
Lector Lorena-Camelia Popa, PhD

Dean,
Prof. Sorin-Florin Nădăban, PhD