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**Federal State Autonomous Educational Institution of Higher Education**  
**PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA**  
**RUDN University**

*Faculty of Physics, Mathematics and Natural Sciences*

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educational division (faculty/institute/academy) as higher education programme developer

**COURSE SYLLABUS**

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**History and methodology of mathematics**

course title

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**Recommended by the Didactic Council for the Education Field of:**

**01.04.02 Applied mathematics and computer science**

field of studies / speciality code and title

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**The course instruction is implemented within the professional education programme of higher education:**

**«Mathematical models in interdisciplinary research»**

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higher education programme profile/specialisation title

## 1. COURSE GOAL(s)

The purpose of mastering the discipline "History and methodology of mathematics" is to make students acquainted with classical mathematical facts and theories in their history, to trace the methodology of mathematics on examples, to compare the "mathematical method" with methods of other fields of science (including physics, philosophy etc.) as well as different methods in the history of mathematics itself.

## 2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline "History and methodology of mathematics" is aimed at developing the following competencies (parts of competencies):

*Table 2.1. List of competences that students acquire through the course study*

Code	Competence	Competence achievement indicators (within this discipline)
GC-3	He is able to organize and manage the work of the team, developing a team strategy to achieve the goal	GC-3.1. Develops a strategy of cooperation and on its basis organizes the selection of team members to achieve the goal; GC-3.2. Plans and corrects the work of the team taking into account the interests, behavioral characteristics and opinions of its members; GC-3.3. Resolves conflicts and contradictions in business communication on the basis of taking into account the interests of all parties GC-3.4. Organizes discussions on a given topic and discussion of the results of the team's work with the involvement of opponents to the developed ideas; GC-3.5. Organizes discussions on a given topic and discussion of the results of the team's work with the involvement of opponents to the developed ideas
GC-5	Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	<b>GC-5.1.</b> Analyzes the most important ideological and value systems formed in the course of historical development; substantiates the relevance of their use in social and professional interaction; <b>GC-5.2.</b> Builds social and professional interaction taking into account the peculiarities of the main forms of scientific and religious consciousness, business and general culture of representatives of other ethnic groups and confessions, various social groups; <b>GC-5.3.</b> Ensures the creation of a non-discriminatory interaction environment when performing professional tasks
GPC-2	He is able to build and analyze mathematical models in modern natural science, technology, economics and management	<b>GPC-2.1.</b> Conducts a critical analysis of the results obtained <b>GPC-2.2.</b> Formulates conclusions and conclusions based on the results of the analysis of historical data, his own results in mathematics

### 3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "History and methodology of mathematics" refers to the part formed by the participants in the educational relations of block B1 of the EP HE.

As part of the EP HE, students also master other disciplines and / or practices that contribute to the achievement of the planned results of mastering the discipline "History and methodology of mathematics".

*Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results*

Code	Competence	Previous disciplines/modules, practices	Subsequent disciplines/modules, practices*
GC-3	He is able to organize and manage the work of the team, developing a team strategy to achieve the goal	-	
GC-5	Able to analyze and take into account the diversity of cultures in the process of intercultural interaction	-	
GPC-2	He is able to build and analyze mathematical models in modern natural science, technology, economics and management	-	Neural networks

### 4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total labor intensity of the discipline "History and methodology of mathematics " is 3 credits.

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (full-time training)\**

Type of study work	TOTAL, a.h.	Semester			
		1	2	3	4
Contact work, academic hours	36		36		
Lectures (LC)					
Lab work (LW)					

Type of study work		TOTAL, a.h.	Semester			
			1	2	3	4
Seminars (workshops/tutorials) (S)		36		36		
<i>Self-studies</i>		54		54		
<i>Evaluation and assessment (exam/passing/failing grade)</i>		18		18		
<b>Course workload</b>	a.h.	<b>108</b>		<b>108</b>		
	credits	<b>3</b>		<b>3</b>		

## 5. COURSE CONTENTS

*Table 5.1. Course contents and academic activities types*

Course Module Title	Brief Description of the Module Content	Type of study work
Section 1. Main stages and milestones of the development of mathematics	Topic 1.1. General survey of the historical development of mathematics	Seminar
	Topic 1.2. History of discovery of the non-Euclidean geometry	Seminar
	Topic 1.3. History of solving algebraic equations of the 5 <sup>th</sup> order	Seminar
	Topic 1.4. History of foundations of mathematics	Seminar

## 6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

*Table 6.1. Classroom equipment and technology support requirements*

Classroom type	Classroom equipment	Specialized educational/laboratory equipment, software and materials for mastering the discipline
Seminar	An auditorium for conducting seminar-type classes, group and individual consultations, current control and intermediate certification, equipped with a set of specialized furniture and technical means for multimedia presentations.	-
For independent work of students	An auditorium for conducting seminar-type classes, group and individual consultations, current control and intermediate certification, equipped with a set of specialized furniture	-

Classroom type	Classroom equipment	Specialized educational/laboratory equipment, software and materials for mastering the discipline
	and technical means for multimedia presentations.	

## 7. RESOURCES RECOMMENDED FOR COURSE STUDY

### Main literature:

1. Kesselman V.S. Marvelous history of mathematics. "Enas-kniga", 2014.
2. Alekseev V.B. Abel Theorem in problems and solutions. M.: MTsNMO, 2017.
3. Prasolov V.V., Tikhomirov V.M. Geometry. Electronic edition. M.: MTsNMO, 2014.

### Additional literature:

1. Ed. Yushkevich A.P. History of mathematics from antiquity till the beginning of the XIXth century. V. 1–3. M., «Nauka», 1970
2. Struik D.J. Concise history of mathematics, any edition.
3. Gindikin S.G. Stories about physicists and mathematicians, any edition.
4. Prasolov V.V. Geometric problems of the ancient world. M.: Phasis, 1997.
5. Kagan V.F. Foundations of geometry, part I. Lobachevsky geometry and its prehistory. M.-L.: 1949.
6. Fraenkel A., Bar-Hillel I. Foundations of set theory, any edition.
7. The case of Academician Nikolay Nikolayevitch Luzin. M., 1999.
8. Vereshchagin N.K., Shen A.H. Elements of set theory. M.: MTsNMO, 2006.
9. Prasolov V.V. Lobachevsky geometry. M.: MTsNMO, any edition.
10. Yefimov N.V. Higher geometry, any edition.

### Resources of the information and telecommunications network "Internet":

1. RUDN ELS and third-party ELS, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System - RUDN EBS <http://lib.rudn.ru/MegaPro/Web>
- ELS "University Library Online" <http://www.biblioclub.ru>
- EBS Yurayt <http://www.biblio-online.ru>
- ELS "Student Consultant" [www.studentlibrary.ru](http://www.studentlibrary.ru)
- EBS "Lan" <http://e.lanbook.com/>
- EBS "Trinity Bridge"

### 2. Databases and search engines:

- electronic fund of legal and normative-technical documentation <http://docs.cntd.ru/>
- Yandex search engine <https://www.yandex.ru/>
- Google search engine <https://www.google.ru/>
- abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

## **8. ASSESSMENT TOOLKIT AND GRADING SYSTEM\* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION**

Evaluation materials and a point-rating system\* for evaluating the level of formation of competencies (parts of competencies) based on the results of mastering the discipline " History and methodology of mathematics " are presented in the Appendix to this Work Program of the discipline

**Developer:**

**E.I. Galakhov**

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signature

\_\_\_\_\_  
name and surname

**HEAD  
OF HIGHER EDUCATION PROGRAMME:**

**A.V. Faminskii**

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**HEAD  
OF EDUCATIONAL DEPARTMENT**

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