**Syllabus***Fall semester, 2018-2019 Academic year*

Academic course information

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| --- | --- | --- | --- | --- | --- |
| Discipline’s code | Discipline’s title | Type | No. of hours per week | Number of credits | ECTS |
| Lect. | Pract. | Lab. |
| MPMVSh5205 | Methods of Teaching Higher Education Mathematics  | MC | 2 | 1 | 0 | 3 |  |
| Lecturer  | S. Serovajsky  | Office hours | Scheduled |
| e-mail | serovajskys@mail.ru  |
| Telephone number | +7 701 8315197 | Auditory | Scheduled |

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| --- | --- |
| Academic presentation of the course | **Type of university**: The main purpose of the course is to familiarize students with the fundamental concepts of mathematics as a unified science.**Aim of course:**  By the end the course, students should be able to: 1. To know the applications basis of mathematics;
2. To know the general mathematical directions;
3. To know the general classes of mathematical objects;
4. To know the principle of the unification of mathematics;
5. To know the logical structure of mathematics
 |
| Prerequisites | Mathematical analysis, algebra, mathematical logic |
| Post requisites | Numerical methods |
| Information resources  | **literature**:1. Букур И., Деляну А. Введение в теорию категорий и функторов. – М., Наука, 2012.
2. Гелбаум Б., Олмстед Дж. Контрпримеры в анализе. – М., Наука, 2007.

Общая алгебра. Под ред. Л.А.Скорнякова. Том 1. – М., Наука, 1990; Том 2. – М., Наука, 2009.1. Бурбаки Н. Общая топология. Основные структуры. – М., Наука, 2008.
2. Серовайский С.Я. Архитектура математики. – Алматы, Print-S, 2005.
3. Вейль Г. Математическое мышление. – М., Мысль, 2004.
4. Бурбаки Н. Алгебра. Алгебраические структуры. Линейная и полилинейная алгебры. – М., Наука, 2002.
5. Бурбаки Н. Очерки по истории математики. – М., ИЛ, 2002.

**Internet-resources:** [http://www.newlibrary.ru/book/budylin\_a\_m\_/variacionnoe\_ischislenie.html](http://www.newlibrary.ru/book/budylin_a_m_/variacionnoe_ischislenie.html%20) .  |
| Academic policy of the course in the context of university moral and ethical values | **Academic Behavior Rules:** Obligatory attendance of classes, intolerance for being late, commitment to deadlines for completion and delivery of assignments (CDS, Practical classes, midterm exams, individual projects).**Academic values:** According to Article 5 of the Code of Honor of students of Al-Farabi Kazakh National University, a student must strictly fulfill his academic duties and prevent academic and legal violations (plagiarism, forgery, use of cribs, deceit of and disrespectful attitude to teaching stuff, absenteeism and coming late without respectful reasons).All students can receive counseling assistance in person, by phone at the numbers indicated or by e-mail provided. |
| Evaluation and attestation policy | **Criteria-based evaluation:** evaluation of achieving learning outcomes in accordance with the descriptors (checking competencies acquired at weeks of the intermediate control, midterm and final examinations)**Summative evaluation:** Final score of the discipline =$\frac{IC1+IC2}{2}∙0.6+0.1MT+0.3 FE$IC1, IC2 are intermediate controls, МТ is Midterm, FE – final exam.Percent-rating letter system for assessing of achievements of leaning outcomes by students:95% - 100%: А 90% - 94%: А- 85% - 89%: В+ 80% - 84%: В 75% - 79%: В-70% - 74%: С+ 65% - 69%: С 60% - 64%: С- 55% - 59%: D+ 50% - 54%: D- 0% -49%: F |

Calendar (schedule) the implementation of the course content**:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Topics** | **Hours** | **Max point** |
| 1 | Lecture 1. Introduction. Language. Alphabet. Syntax. Semantics | 2 | 1 |
| Practical work 1. Language. Examples | 1 | 3 |
| Homework 1. Language. Examples |  | 10 |
| 2 | Lecture 2. Sets. Sets. Subsets. Sets product. Correspondences. | 2 | 1 |
| Practical work 2. Sets. Examples | 1 | 3 |
| Homework 2. Sets. Examples |  | 10 |
| 3 | Lecture 3. Sets. Relations. Operators. Equivalence | 2 | 2 |
| Practical work 3. Relations and operators. Examples | 1 | 3 |
| Homework 3. Relations and operators. Examples |  | 5 |
|  | **TSIS-1:** Sets. Relations. Operators. Equivalence |  | 5 |
| 4 | Lecture 4. Numbers. Cardinal numbers. Solutions | 2 | 1 |
| Practical work 4. Natural, integer and rational numbers. Examples | 1 | 3 |
| Homework 4. Natural, integer and rational numbers. Examples |  | 10 |
| 5 | Lecture 5. Numbers. Cuts. Vectors | 2 | 2 |
| Practical work 5. Real and complex numbers. Examples | 1 | 3 |
| Homework 5. Real and complex numbers. Examples |  | 5 |
| **TSIS-2:** Numbers. Cuts. Vectors |  | 5 |
| 6 | Lecture 6. Ordered objects. Different ordered sets | 2 | 1 |
| Practical work 6. Ordered sets. Examples | 1 | 3 |
| Homework 6. Ordered sets. Examples |  | 10 |
| 7 | Lecture 7. Algebraic objects. Groupoids. Rings | 2 | 2 |
| Practical work 7. Groupoids. Examples | 1 | 3 |
| Homework 7. Groupoids. Examples |  | 5 |
| **TSIS-3:** Algebraic objects. Groupoids. Rings |  | 5 |
| Border control 1  |  | 100 |
| Midterm |  | 100 |
| 8 | Lecture 8. Algebraic objects. Linear spaces. Abstract algebras | 2 | 1 |
| Practical work 8. Linear spaces. Examples | 1 | 3 |
| Homework 8. Linear spaces. Examples |  | 8 |
| 9 | Lecture 9. Topological objects. Topological spaces | 2 | 2 |
| Practical work 9. Topological spaces. Examples | 1 | 3 |
| Homework 9. Topological spaces. Examples | 0 | 4 |
| **TSIS-4:** Topological objects. Topological spaces |  | 4 |
| 10 | Lecture 10. Topological objects. Metric spaces | 2 | 1 |
| Practical work 10. Metric spaces. Examples | 1 | 3 |
| Homework 10. Metric spaces. Examples |  | 8 |
| 11 | Lecture 11. Measurable objects. Measures | 2 | 2 |
| Practical work 11. Measures. Examples | 1 | 3 |
| Homework 11. Measures. Examples |  | 4 |
| **TSIS-5:** Measurable objects. Measures |  | 4 |
| 12 | Lecture 12. Measurable objects. Integrals | 2 | 1 |
| Practical work 12. Integrals. Examples | 1 | 3 |
| Homework 12. Integrals. Examples |  | 8 |
| 13 | Lecture 13. Composite objects. Topological groups. Linear topological spaces. Linear normalized spaces  | 2 | 2 |
| Practical work 13. Topological groups. Examples | 1 | 3 |
| Homework 13. Topological groups. Examples |  | 4 |
| **TSIS-6:** Linear topological spaces. Linear normalized spaces  |  | 4 |
| 14 | Lecture 14. Synthesis. Structures | 2 | 1 |
| Practical work 14. Structures. Examples | 1 | 3 |
| Homework 14. Structures. Examples |  | 8 |
| 15 | Lecture 15. Synthesis. Categories | 2 | 2 |
| Practical work 15. Categories. Examples | 1 | 3 |
| Homework 15. Categories. Examples |  | 4 |
| **TSIS-7:** Synthesis. Categories |  | 4 |
| Border control 2 |  | 100 |
| EXAM |  | 100 |
| TOTAL |  | 100 |

Lecturer S. Serovajsky

Head of the department of Kh. Khompysh

 Chairman of the Faculty Methodical Bureau U.R.Kusherbayeva