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| **Al-Farabi Kazakh National University**  **Syllabus**  **Teaching method of mathematics for high school**  **Autumn, 2016-2017 years** | | | | | | | | | | | | |
| **code** | | **Course** | **type** | **Hours** | | | | | **credits** | | **ECTS** | |
| **Lect** | **Semin** | **Lab** | | |
|  | | Teaching method of mathematics for high school |  | 2 | 0 | 1 | | | 3 | |  | |
| **Prerequisites** | | Mathematical analysis, algebra, mathematical logic | | | | | | | | | | |
| **Lecturer** | | S. Serovajsky, doctor of science, professor | | | | | | | **Office yours** |  | | | |
| **e-mail** | | [serovajskys@mail.ru](mailto:serovajskys@mail.ru) | | | | | | |
| **phone** | | +7 7-1-831-51-97 | | | | | | | **lecture room** |  | | | |
| **Course description** | | The logical construction of mathematics | | | | | | | | | | |
| **Aim of the course** | | The idea of mathematics as a unified science. | | | | | | | | | | |
| **Results** | | Formation of common views on mathematics | | | | | | | | | | |
| **References** | | 1. Серовайский С.Я. Архитектура математики. – Алматы, Print-S, 2005. 2. Букур И., Деляну А. Введение в теорию категорий и функторов. – М., Наука, 1972. 3. Бурбаки Н. Алгебра. Алгебраические структуры. Линейная и полилинейная алгебры. – М., Наука, 1962. 4. Бурбаки Н. Общая топология. Основные структуры. – М., Наука, 1968. 5. Бурбаки Н. Очерки по истории математики. – М., ИЛ, 1962. 6. Вейль Г. Математическое мышление. – М., Мысль, 1984. 7. Гелбаум Б., Олмстед Дж. Контрпримеры в анализе. – М., Наука, 1967. 8. Общая алгебра. Под ред. Л.А.Скорнякова. Том 1. – М., Наука, 1990; Том 2. – М., Наука, 1990. | | | | | | | | | | |
| **Course organization** | | The course includes an introduction to the theoretical part of the analysis and practical examples. Upon completion of analysis of each example is given the task as planned. | | | | | | | | | | |
| **Requirements** | | Students must prepare for each lecture. In the course of the lecture held polls. At the seminars carried out an independent analysis of the examples of the course. After each class are given homework. | | | | | | | | | | |
| **Assessment of knowledge** | |  | | | | |  |  | | | | |
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| Ваша итоговая оценка будет рассчитываться по формуле  Ниже приведены минимальные оценки в процентах:  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 | | | | | | | | | | |
| **Discipline policy** | | Appropriate timing of homework or projects may be extended in the event of extenuating circumstances (such as illness, emergencies, emergency, contingency, etc.) in accordance with the University's academic policies. Student participation in discussions and exercises in the classroom will be taken into account in its overall assessment of the discipline. Design issues, dialogue and feedback on the subject matter of discipline are welcomed and encouraged in the classroom, and the teacher in the derivation of the final grade will take into account the participation of each student in class | | | | | | | | | | |
| **Graph of course** | | | | | | | | | | | | |
| week | subject | | | | | | | | hours | | | marks |
| 1 | Lecture 1. **Introduction.** **Language.** Alphabet. Syntax. Semantics | | | | | | | | 2 | | | 0 |
|  | 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 | | | | | | | |  | | | 10 |
| 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 | | | | | | | |  | | | 10 |
| 6 | **Lecture 6. Ordered objects.** Differentordered 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 | | | | | | | |  | | | 10 |
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|  | Border control 1 | | | | | | | |  | | | 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 | | | 8 |
| 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 | | | | | | | |  | | | 8 |
| 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 | | | | | | | |  | | | 8 |
| 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 | | | | | | | |  | | | 8 |
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|  | Border control 2 | | | | | | | |  | | | 100 |

Dean of the faculty M. Bektemesov

Head of the methodical department

Head of the DE&OT department S. Muhambetzhanov

Lecturer S. Serovajsky