

Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Ливанов Дмитрий Викторович
Должность: Ректор
Дата подписания: 03.11.2023 16:53:33
APPROVED
Уникальный программный ключ:
Vice Rector for Academic Affairs
c6d909c49c1d2154fa5a0156c4eaa51e7252a3a2
A. A. Voronov

Ministry of Science and Higher Education of the Russian Federation
The Federal State Autonomous Educational Institution of Higher Education
"Moscow Institute of Physics and Technology (National Research University)"

Qualification Master
Year of enrollment 2023
Statutory duration of a study course 2 years

ACADEMIC PLAN

Domain of study: 03.04.01 - Applied Mathematics and Physics
Orientation (specialty): Applied Bioinformatics/Прикладная биоинформатика
Phystech School of Biological and Medical Physics
Center for educational programs in bioinformatics

AGREED
Head of the Phystech School of Biological and Medical
Physics D. V. Kuzmin

| № in order | Name of disciplines, practices, State Final Examination | Form of final control by semesters | | | Hours | | | | | | | | | Coursework and test papers | hours in week | | | | | | | | TOTAL HOURS | Credit points | | |
|------------|--|------------------------------------|----------------------------|----|-------|-------------------|--------------------|--------------------|--------------------------|-----------|--------------------|--|--|----------------------------|---------------------------------------|-------------------|----------|------|-------|-----|----------|------|-------------|---------------|-------|----------|
| | | Examination | Graded test ("-" - simple) | | | State Examination | Laboratory classes | of them | | | | | Hours for preparation and examinations | | Distribution by courses and semesters | | | | | | | | | Total | Basic | Elective |
| | | | | | | | | Laboratory classes | Total classroom sessions | Lectiions | Laboratory classes | Practical lessons, seminars, exercises, etc. | | | Practice | Independent study | 1 course | | | | 2 course | | | | | |
| | | 1 | 2 | 3 | 4 | 1 | 2 | | | | | | 3 | | | | 4 | lect | lab. | sem | lect | lab. | | sem | lect | lab. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | |
| M.1 | Courses (Modules)/Дисциплины (модули) | | | | | 1 425 | 660 | 360 | | 300 | | 765 | 240 | 8 | | | | | 1 665 | 37 | 15 | 22 | | | | |
| M.1.1 | Foreign Languages/Иностранные языки | | | | | 180 | 120 | | | 120 | | 60 | | 4 | | | | | 180 | 4 | 4 | | | | | |
| | | | | -1 | | 90 | 60 | | | 60 | | 30 | | 2 | 4 | | | | 90 | 2 | 2 | | | | | |
| | | | | 2 | | 90 | 60 | | | 60 | | 30 | | 2 | | 4 | | | 90 | 2 | 2 | | | | | |
| | Humanitarian and Social Cycle/Гуманитарный и социальный цикл | | | | | 165 | 60 | 60 | | | | 105 | 60 | 4 | | | | | 225 | 5 | 5 | | | | | |
| M.1.2 | Global Trends and Methods for Strategic Development in the Era of Uncertainty/Глобальные тренды и методы стратегического развития в эпоху неопределенности | 1 | | | | 60 | 30 | 30 | | | | 30 | 30 | 2 | 2 | | | | 90 | 2 | 2 | | | | | |
| M.1.3 | Digital Transformation: Social and Economic Challenges/Цифровая трансформация: социальные и экономические вызовы | 2 | | | | 105 | 30 | 30 | | | | 75 | 30 | 2 | | 2 | | | 135 | 3 | 3 | | | | | |
| | Core science/Профильные дисциплины | | | | | 1 080 | 480 | 300 | | 180 | | 600 | 180 | | | | | | 1 260 | 28 | 6 | 22 | | | | |
| M.1.4 | Basic Biostatistics/Базовая биостатистика | 1 | | | | 105 | 60 | 30 | | 30 | | 45 | 30 | 2 | 2 | | | | 135 | 3 | 3 | | | | | |
| M.1.5 | Introduction to Molecular Biology and Genetics/Введение в молекулярную биологию и генетику | 1 | | | | 105 | 30 | 30 | | | | 75 | 30 | 2 | | | | | 135 | 3 | 3 | | | | | |
| M.1.B.1 | Data Visualization/Визуализация данных | | 2 | | | 105 | 45 | 30 | | 15 | | 60 | 30 | | | 2 | 1 | | 135 | 3 | | 3 | | | | |
| M.1.B.2 | Microbiology and Metagenomics/Микробиология и метагенетика | | | 2 | | 90 | 30 | 30 | | | | 60 | | | | 2 | | | 90 | 2 | | 2 | | | | |
| M.1.B.3 | Machine Learning in Biology/Машинное обучение в | | | 1 | | 90 | 30 | 15 | | 15 | | 60 | | 1 | 1 | | | | 90 | 2 | | 2 | | | | |
| M.1.B.4 | NGS Data Analysis/Анализ данных NGS | | 2 | | | 60 | 30 | 15 | | 15 | | 30 | 30 | | | 1 | 1 | | 90 | 2 | | 2 | | | | |
| M.1.B.5 | Transcriptomics, Epigenomics and OMICS Data Analysis/Транскриптомика, эпигеномика и анализ ОМИКСных данных | | | 2 | | 90 | 30 | 30 | | | | 60 | | | | 2 | | | 90 | 2 | | 2 | | | | |
| M.1.B.6 | Algorithms of Bioinformatics/Алгоритмы биоинформатики | | | 1 | | 90 | 45 | 30 | | 15 | | 45 | | 2 | 1 | | | | 90 | 2 | | 2 | | | | |
| M.1.B.7 | Data Structures and Algorithms/Структуры данных и алгоритмы | | | 1 | | 135 | 60 | 60 | | | | 75 | | 4 | | | | | 135 | 3 | | 3 | | | | |
| M.1.B.8 | Analysis of OMICS Data/Анализ омиксных данных | | 2 | | | 60 | 30 | | | 30 | | 30 | 30 | | | | 2 | | 90 | 2 | | 2 | | | | |
| M.1.B.9 | Deep Learning in Biology/Глубокое обучение в биологии | | 3 | | | 105 | 60 | 30 | | 30 | | 45 | 30 | | | 2 | 2 | | 135 | 3 | | 3 | | | | |
| | Elective Set of Courses 1/Блок дисциплин по выбору 1 | | | | | 45 | 30 | | | 30 | | 15 | | | | | | | 45 | 1 | | 1 | | | | |
| M.1.B.10 | Models and Methods of Quantitative Genetics/Модели и методы количественной генетики | | | 2 | | 45 | 30 | | | | | 15 | | | | | | | 45 | 1 | | 1 | | | | |
| M.1.B.11 | Genetic and Genomic Engineering/Генная и геномная инженерия | | | 2 | | 45 | 30 | | | 30 | | 15 | | | | | 2 | | 45 | 1 | | 1 | | | | |
| M.1.B.12 | Introduction to Cancer Biology/Основы биологии рака | | | 2 | | 45 | 30 | | | | | 15 | | | | | | | 45 | 1 | | 1 | | | | |
| M.2 | Practice/Практика | | | | | 3 375 | | | | | | 3 375 | | | | | | | 3 375 | 75 | 75 | | | | | |
| M.2.1 | Industrial Practice/Производственная практика | | | | | 3 375 | | | | | | 3 375 | | | | | | | 3 375 | 75 | 75 | | | | | |

| № in order | Name of disciplines, practices, State Final Examination | Form of final control by semesters | | | | | | | | Hours | | | | | | Coursework and test papers | hours in week | | | | | | | | TOTAL HOURS | Credit points | | | | | | | |
|------------|---|--|---|---|---|----------------------------|---|---|---|---|--------------------|--------------------|--------------------------|---------|--------------------|--|--|--|----------|-------------------|-----------------|-----|-----------------|-------------|-------------------------|---------------|-------|-------|----------|-----------------|----|-----------------|-----|
| | | Examination | | | | Graded test ("-" - simple) | | | | State Examination | Laboratory classes | of them | | | | | Hours for preparation and examinations | Distribution by courses and semesters | | | | | | | | TOTAL | Total | Basic | Elective | | | | |
| | | 1 2 3 4 | | | | 1 2 3 4 | | | | | | Laboratory classes | Total classroom sessions | Lectons | Laboratory classes | | | Practical lessons, seminars, exercises, etc. | Practice | Independent study | 1 course | | | | | | | | | 2 course | | | |
| | | 1 2 3 4 | | | | 1 2 3 4 | | | | | | | | | | | | | | | 1 sem. 15 weeks | | 2 sem. 15 weeks | | | | | | | 3 sem. 15 weeks | | 4 sem. 15 weeks | |
| 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | lect | lab | sem | lect | lab | sem | lect | lab | sem | lect | lab | sem | 19 | 20 | 21 | 22 |
| M.2.1.1 | Personal Research Project/Научно-исследовательская работа | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| M.3 | State Final Certification/Государственная итоговая аттестация | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M.3.1 | Performance of and Defence of Graduation Thesis/Выполнение и защита выпускной квалификационной работы | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ф.1 | Elective Subjects/Факультативы | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ф.1.B.1 | Theory of Probability/Теория вероятностей | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ф.1.B.2 | Game Theory/Теория игр | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL: | | Number of examinations and pass/fail tests | | | | | | | | Distribution of hours by type of lesson | | | | | | Distribution of classroom hours per week by semester | | | | | | | | Total hours | Total number of credits | | | | | | | | |
| | | Examinations | | | | Pass/Fail tests | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3 | 4 | 1 | | 5 | 5 | 1 | 1 | Obl. | 5 | 130 | 660 | 360 | | 300 | 3 | 375 | 1 | 095 | | 270 | 8 | 21 | | 19 | | 4 | | | | 5 | 400 |
| | | 1 | | | | 1 | | | | ECs. | 240 | 135 | 60 | | | 75 | | | 105 | | 30 | | | 9 | | | | | | | | | 270 |
| | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | Distribution of hours of contact work by years and semesters | | | | | | | | Total hours | | | | | | | | | |
| | | | | | | | | | | | | | | | | 880 | | | | 126 | | | | 1 006 | | | | | | | | | |
| | | | | | | | | | | | | | | | | 528 | 352 | 92 | 34 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | Distribution of credits by years and semesters | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | 58 | | | | 62 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | 29 | 29 | 27 | 35 | | | | | | | | | | | | | | |

И.о. начальника учебного управления Т. F. Artemenko