

Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Ливанов Дмитрий Викторович
Должность: Ректор
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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)"

ACADEMIC PLAN

Qualification Master

Year of enrollment 2022

Statutory duration of a study course 2 years

APPROVED

Vice Rector for Academic Affairs

A. A. Voronov

Domain of study: 03.04.01 - Applied Mathematics and Physics

Orientation (specialty): General and Applied Physics/Общая и прикладная физика

Landau Phystech-School of Physics & Research

Chair of Biophysics

AGREED

Head of Landau Phystech-School of Physics & Research

A. V. Rogachev

Partner organization: University of Groningen

Specialty: Integrated Structural Biology and Genetics/Интегрированная структурная биология и генетика

| № 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 | | |
|------------|---|------------------------------------|---|----------------------------|---|--------------------|--------------------------|----------|--------------------|--|----------|--|---------------------------------------|----------------------------|---------------|----|-------|-------|-------------|---------------|----------|------|
| | | Examinations | | Graded test ("-" - simple) | | Laboratory classes | of them | | | | | Hours for preparation and examinations | Distribution by courses and semesters | | | | Total | Basic | | Elective | | |
| | | State Examination | | | | | Total classroom sessions | Lectures | 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. |
| 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) | | | | | 1 455 | 705 | 480 | | 225 | | 750 | 390 | 40 | | | | | 1 845 | 41 | 9 | 32 |
| M.1.1 | Foreign Languages/Иностранные языки | | | | | 180 | 120 | | | 120 | | 60 | | 4 | | | | | 180 | 4 | 4 | |
| | | | | | | 90 | 60 | | | 60 | | 30 | | 2 | | 4 | | | 90 | 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 | Populism, Fakes, and Post-Truth: Algorithm-Driven Media Consumption and New Social Phenome/Популизм, фейки и постправда: алгоритмизированное медиапотребление и новые социальные феномены | 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 | | | | | 1 110 | 525 | 420 | | 105 | | 585 | 330 | 32 | | | | | 1 440 | 32 | | 32 |
| M.1.B.1 | Краткое введение в биоинформатику | | | | 1 | 45 | 15 | 15 | | | | 30 | | 2 | 1 | | | | 45 | 1 | | 1 |
| M.1.B.2 | Electron Microscopy of Biological Objects/Электронная микроскопия биологических объектов | | 2 | | | 60 | 30 | 15 | | 15 | | 30 | 30 | | | | 1 | 1 | 90 | 2 | | 2 |
| M.1.B.3 | Рентгеновская кристаллография мембранных белков | | 2 | | | 60 | 30 | 15 | | 15 | | 30 | 30 | 2 | | | 1 | 1 | 90 | 2 | | 2 |
| M.1.B.4 | Basics of Synchrotron Radiation and Its Applications/Основы синхротронного излучения и его применения | 1 | | | | 105 | 45 | 30 | | 15 | | 60 | 30 | 2 | 2 | 1 | | | 135 | 3 | | 3 |
| | Профессиональные дисциплины по выбору студента 1 | | | | | 450 | 210 | 165 | | 45 | | 240 | 90 | 14 | | | | | 540 | 12 | | 12 |
| M.1.B.5 | Genetic and Metabolic Engineering, Genomics/Генетическая и метаболическая инженерия, геномика | 1 | | | | 60 | 30 | 30 | | | | 30 | 30 | 2 | 2 | | | | 90 | 2 | | 2 |
| M.1.B.6 | Intrinsically Disordered Proteins/Внутренне неупорядоченные белки | | | | 1 | 90 | 30 | 30 | | | | 60 | | 2 | 2 | | | | 90 | 2 | | 2 |
| M.1.B.7 | Mathematical and Computational Approaches to Neural Function/Математические и вычислительные подходы к функционированию нервной системы | | | | 2 | 90 | 30 | 30 | | | | 60 | | 2 | | 2 | | | 90 | 2 | | 2 |
| M.1.B.8 | Основы молекулярной геронтологии | 1 | | | | 60 | 30 | 15 | | 15 | | 30 | 30 | 2 | 1 | | 1 | | 90 | 2 | | 2 |
| M.1.B.9 | Флуоресцентная микроскопия сверхвысокого разрешения живых клеток | | | | 1 | 45 | 30 | 15 | | 15 | | 15 | | 2 | 1 | | 1 | | 45 | 1 | | 1 |
| M.1.B.10 | Происхождение жизни, клетки и эукариот | 1 | | | | 60 | 30 | 30 | | | | 30 | 30 | 2 | 2 | | | | 90 | 2 | | 2 |

| № in order | Name of disciplines, practices, State Final Examination | Form of final control by semesters | | | | Hours | | | | | | | | | | hours in week | | | | | | | | Credit points | | | | | | |
|------------|---|--|-----------------|----------------------------|---|-------------------|---|--------------------------|-------------------------|--------------------|--|----------|-------------------|--|--|--|-------|----------|-----------------|-------------------------|-----------------|----|-----------------|---------------|-----------------|-------|----------|----|----|----|
| | | Examinations | | Graded test ("-" - simple) | | State Examination | Laboratory classes | of them | | | | | | Hours for preparation and examinations | Coursework and test papers | Distribution by courses and semesters | | | | | | | | TOTAL HOURS | Total | Basic | Elective | | | |
| | | | | | | | | Total classroom sessions | Lectiоns | Laboratory classes | Practical lessons, seminars, exercises, etc. | Practice | Independent study | | | 1 course | | 2 course | | | | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 1 sem. 15 weeks | | 2 sem. 15 weeks | | 3 sem. 15 weeks | | 4 sem. 15 weeks | | 19 | 20 | 21 | 22 |
| | | lect. | lab. | sem | lect. | lab. | sem | lect. | lab. | sem | lect. | lab. | sem | lect. | lab. | sem | lect. | lab. | sem | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | |
| M.1.B.11 | Структура и динамика мембранных белков методом ЯМР | | | | | 2 | | | | | | 45 | 30 | 15 | | 15 | 15 | | | | | | | | | 45 | 1 | | 1 | |
| | Профессиональные дисциплины по выбору студента 2 | | | | | | | | | | | 390 | 195 | 180 | | 15 | 195 | 150 | | | | | | | | 540 | 12 | | 12 | |
| M.1.B.12 | Molecular Physiology Of The Nervous System/Молекулярная физиология нервной системы | | 2 | | | | | | | | | 60 | 30 | 30 | | | 30 | 30 | | | | | | | | 90 | 2 | | 2 | |
| M.1.B.13 | Геномика микроорганизмов | 1 | | | | | | | | | | 60 | 30 | 15 | | 15 | 30 | 30 | | | | | | | | 90 | 2 | | 2 | |
| M.1.B.14 | Review Of Methods Of Mathematical Physics In Biophysics/Методы математической физики в биофизике | | 2 | | | | | | | | | 60 | 15 | 15 | | | 45 | 30 | | | | | | | | 90 | 2 | | 2 | |
| M.1.B.15 | Биофизика мембранных и митохондриальных процессов | 1 | | | | | | | | | | 60 | 30 | 30 | | | 30 | 30 | | 2 | | | | | | 90 | 2 | | 2 | |
| M.1.B.16 | Решение биологических задач на языке Python | | 2 | | | | | | | | | 60 | 30 | 30 | | | 30 | 30 | | | 2 | | | | | 90 | 2 | | 2 | |
| M.1.B.17 | Биология опухолевой клетки | | | | | 2 | | | | | | 45 | 30 | 30 | | | 15 | | | 2 | | 2 | | | | 45 | 1 | | 1 | |
| M.1.B.18 | Введение в медицинскую биофизику | | | | | 2 | | | | | | 45 | 30 | 30 | | | 15 | | | 2 | | 2 | | | | 45 | 1 | | 1 | |
| M.2 | Practice/Практика | | | | | | | | | | | 3 255 | | | | | 3 255 | 30 | | | | | | | | 3 285 | 73 | | 73 | |
| M.2.1 | Industrial Practice/Производственные практики | | | | | | | | | | | 3 255 | | | | | 3 255 | 30 | | | | | | | | 3 285 | 73 | | 73 | |
| M.2.1.1 | Personal Research Project/Научно-исследовательская работа | | | | | | | | | | | 3 255 | | | | | 3 255 | 30 | | | | | | | | 3 285 | 73 | | 73 | |
| | | | | | | 1 | | | | | | 450 | | | | | 450 | | | | | | | | | 450 | 10 | | 10 | |
| | | | | | | 2 | | | | | | 405 | | | | | 405 | | | | | | | | | 405 | 9 | | 9 | |
| | | | 3 | | | | | | | | | 1 320 | | | | | 1 320 | 30 | | | | | | | | 1 350 | 30 | | 30 | |
| | | | | | | | | | | | | 1 080 | | | | | 1 080 | | | | | | | | | 1 080 | 24 | | 24 | |
| M.3 | State Final Certification/Государственная итоговая аттестация | | | | | | | | | | | 240 | | | | | 240 | 30 | | | | | | | | 270 | 6 | | 6 | |
| M.3.1 | Performance of and Defence of Graduation Thesis/Выполнение и защита выпускной квалификационной работы | | | | | 4 | | | | | | 240 | | | | | 240 | 30 | | | | | | | | 270 | 6 | | 6 | |
| Ф.1 | Факультативы | | | | | | | | | | | 465 | 225 | 90 | 60 | 75 | 240 | 30 | | | | | | | | 495 | 11 | | 11 | |
| Ф.1.B.1 | Military training/Военная подготовка | 1 | | | | | | | | | | 465 | 225 | 90 | 60 | 75 | 240 | 30 | | | | | | | | 495 | 11 | | 11 | |
| TOTAL: | | Number of examinations and pass/fail tests | | | | Obl. | Distribution of hours by type of lesson | | | | | | | 40 | Distribution of classroom hours per week by semester | | | | Total hours | Total number of credits | | | | | | | | | | |
| | Examinations | | Pass/Fail tests | | Fixed (without State Final Examination) | | Extracurriculars | | State Final Examination | | 1 course | | 2 course | | 1 198 | | | | | | | | | | | | | | | |
| | 7 | 6 | 1 | | 5 | 6 | 1 | 4 950 | 705 | 480 | | 225 | 3 255 | 990 | 450 | 24 | 23 | | | 5 400 | 120 | 88 | 32 | | | | | | | |
| | 1 | | | | | 1 | | 465 | 225 | 90 | 60 | 75 | | 240 | 30 | 7 | 8 | | | 495 | 11 | | | | | | | | | |
| | | | | 1 | | | | | | | | | | | | Distribution of hours of contact work by years and semesters | | | | Total hours | 1 198 | | | | | | | | | |
| 1 139 | | 59 | | 572 | | 567 | | 25 | | 34 | | | | | | | | | | | | | | | | | | | | |
| 60 | | 60 | | 31 | | 29 | | 30 | | 30 | | | | | | | | | | | | | | | | | | | | |

Head of Educational Department

I. R. Garayshina