**Faculty of Mechanics and Mathematics**

**Department Mathematical Modelling and Simulation**

**PROGRAM of "MATHEMATICAL MODELLING OF PHISICAL PROCESSES"**

**Final exam**

**for the specialty "­­­­ Magistr-Mathematical and Computer Modelling "**

**(fall semester, 2023/2024)**

**Almaty 2023**

**DEVELOPED:**

**ABDIBEKOV UALIKHAN CEIDILDAEVICH - professor**

PROGRAM of SUBJECT

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| 1. The mathematical modeling physical prosesses. Introduction. |
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| 2. Mathematical modeling of atmospheric processes |
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| 3. Mathematical modeling of pollution of oceans and seas. |
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| 4. Mathematical modeling of short-term weather forecast. |
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| 5. Mathematical modeling of tropical cyclones (tornadoes). |
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| 6. Mathematical modeling of near space. |
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| 7. Mathematical modeling of the hydrodynamics of aluminum electrolyzers |
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| 8. Modeling the dynamics of ionospheric plasma |
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| 9. Mathematical modeling of internal flows. |
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| 10. Mathematical modeling of chemical processes in a confined space |
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| 11. Fractional-Step Methods for three-dimensional parabolic equation. |
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| 12. Fourier method for the three-dimensional pressure equation. |
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| 13. RANS for nonstationare physical processes |
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| 14. A Reynolds stress model for velocity and scalar fields. |
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| 15. LES for physical processes. |
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1. Book MKMPhysicsProcess\_Real-1
2. kniga\_gdr\_modelirovanie\_turbulentn\_techeniy\_Ievlev\_1990
3. Кольман - Методы расчета турбулентных течений
4. Фрост-Турбулентность.Принципы и применения

**CONSIDERED and APPROVED**

**at the meeting of the department from " " 2023, protocol №**