Skoltech
Skolkovo Institute of Science and Technology

Course Syllabus

Course Title (in English)	Research seminar "Modern problems of mathematical physics"
Course Title (in Russian)	Научно-исследовательский семинар "Современные проблемы математической физики"
Lead Instructor(s)	Marshakov, Andrei

Status of this Syllabus	The syllabus is a final draft waiting for form approval
Contact Person	Pavlo Gavrylenko
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1. Annotation

Course Description	Course "Modern problems of mathematical physics" is a student seminar, so participants are expected to give talks based on the modern research papers. Current topic of the seminar can vary from time to time: now it is devoted to the study of N=2 supersymmetric gauge theory and its links with random matrix models, ABJM theory, localization, complex curves, and integrable systems. Other topics that were already covered, or can be covered in the future, are: classical integrable equations, complex curves and their theta-functions, quantum integrable models (quantum-mechanical and field-theoretical), models of statistical physics.
Course Prerequisites	Basic knowledge of classical/quantum mechanics and classical/quantum field theory: Lagrangian/Hamiltonian formalism, operator formalism in quantum mechanics, Gaussian integration.

2. Structure and Content

Course Academic Level	Master-level course suitable for PhD students
Number of ECTS credits	12

3. Assignments

Assignment Type	Assignment Summary
Report	Student chooses some subject that fits into the current topic of the seminar and gives a few talks.

4. Grading

Type of Assessment	Graded

Grade Structure

Activity Type	Activity weight, %
	30
Attendance	70

Grading Scale

A:	86
B:	76
C:	66
D:	56
E:	46
F:	0

5. Basic Information

Attendance Requirements	Mandatory with Exceptions

Maximum Number of Students

	Maximum Number of Students
Overall:	35
Per Group (for seminars and labs):	35

Course Stream	Science, Technology and Engineering (STE)
Course Term (in context of Academic Year)	Term 1 Term 2 Term 3 Term 4

Students of Which Programs do You Recommend to Consider this Course as an Elective?

Masters Programs	PhD Programs
Mathematical and Theoretical Physics	Mathematics and Mechanics

Please List the Teaching Assistants (TAs) You Propose for Your Course	First Name	Last Name
	Pavlo	Gavrylenko

Course Tags	Math Physics

6. Textbooks and Internet Resources

7. Facilities

8. Learning Outcomes

Knowledge
Content of a part of talks presented at the seminar

Skill
Reading and understanding of research papers
Making scientific talks

Experience
Participation in the research seminar
Scientific presentations

Do you want to specify outcomes in another framework?	Knowledge-Skill-Experience is good enough

9. Assessment Criteria

Select Assignment 1 Type	Report
Input Example(s) of Assignment 1 (preferable)	Talk on a given subject
Assessment Criteria for Assignment 1	Results of the research papers are understood and presented.
Select Assignment 2 Type	Other
Input Example(s) of Assignment 2 (preferable)	Participation in discussions
Assessment Criteria for Assignment 2	Student should be interested in some talks given by the other participants of the seminar.

10. Additional Notes