



KEY FACTS

▶ Admission requirements	Applicants are required to hold a Bachelor's, Specialist or Master's degree in related subject area, all applicants should demonstrate English skills at B+ level.
▶ Admission tests	Examination in the field of mechanics and an interview in English with a programme coordinator (option - via Skype).
▶ Admission procedure	Written on-line application. Application deadline – July, 15. Applicants may find more information available at the official website of SPbSPU <a href="http://www.spbstu-eng.ru">www.spbstu-eng.ru</a> .
▶ Semester start	Winter semester – September 1
▶ Length of programme	2 years
▶ Degrees awarded	Master of science (MSc)
▶ Tuition fees	175 000 RUR for 1 year.

Contact details:

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MASTER OF SCIENCE IN MECHANICS AND MATHEMATICAL MODELLING

**ADVANCED DYNAMICS OF DISCRETE AND CONTINUUM SYSTEMS**

International master degree programme in English

Key information about the study programme in Saint-Petersburg



- Education at one of the famous Russian universities.
- World-famous professors from SPbSPU and leading European universities.
- Unique opportunities for international academic mobility. One semester abroad at academic partners of SPbSPU.
- The participation in international scientific projects.
- Support of students individual research projects and technical ideas.



St. Petersburg State Polytechnic University

St. Petersburg State Polytechnic University was founded in 1899. Recently SPbSPU gained the status of the "National Research University" also known as Polytech, an acknowledged leader in Russian engineering education. Nobel Prize winners P.L. Kapitsa, N.N. Semenov, Zh.I. Alferov are only a few of hundreds of gifted and talented scientists whose professional activities are associated with Polytechnic University.

SPbSPU's Institute of Applied Mathematics and Mechanics was founded on the basis of the faculty of Physics and Mechanics. The combination of academic learning and scientific research is a principle stated by A.F. Ioffe, the founder of the faculty of Physics and Mechanics. Nowadays this principle is fundamental in the Institute's educational process. The Institute's academic staff are highly qualified specialists - professors, associate professors, scientists, among whom there are more than 30 members of Russian, International and Industrial Academies of Science.

## Curriculum

### 1st SEMESTER (30 credits)

- Computational mechanics
- Fundamentals of nanomechanics
- Modern problems of mechanics
- IT technologies in mechanics
- Algebra and analysis of tensors
- Integral equations and variations calculus
- Foreign language

### 2nd SEMESTER (30 credits)

- Statistical Physics
- History and methodology of mathematics and mechanics
- Waves in solids
- IT technologies in mechanics
- Biomechanics
- Dynamics of discrete media
- Mechanics of thin shells
- Nonlinear dynamics processes
- Foreign language

### 3rd SEMESTER (30 credits)

- Dynamics of discrete media
- IT technologies in mechanics
- Personal research project

### 4th SEMESTER (30 credits)

- Personal research project / industrial internship
- MSc thesis completion



## MSc Advanced Dynamics of Discrete and Continuum Systems

The programme is implemented with the participation of the leading professors of SPbSPU's Institute of Mathematics and Mechanics and leading European technical universities. The underlying concept of MSc programme "Advanced Dynamics of Discrete and Continuum Systems" is a balanced combination of fundamental and practical approaches, with the use of methods of mechanics for the description of dynamic processes in different fields such as physics, biology, sociology, economy etc. All lectures and seminars are delivered in English.

### Objective of the programme

The program is designed for training highly professional scientists and engineers with the theoretical background and practical experience in theoretical mechanics, computational mechanics, IT, mathematical modelling and simulations, and distributed computing. The programme also develops leadership, analytical, cross-cultural and organizational skills. Upon graduation the participants will develop practical skills and acquire the fundamental knowledge for a further professional career in international engineering and research companies.

### KEY ADVANTAGES

The graduates will have an opportunity to get a challenging and well-paid job at research institutes, centres and labs. They will be able to find employment at R&D and engineering departments of oil and gas, car-making, power and engineering, aerospace and other companies.

The combination of theoretical courses in mechanics and mathematics with the practical experience in the field, workshops and training sessions in IT, simulations and distributed computing. Our graduates develop theoretical and practical competences enabling them to participate in research and development in the field of mathematical modelling and simulations and distributed computing.

Unique opportunities for international academic mobility. One semester abroad at academic partners of SPbSPU. Double degree options with the European universities.

The programme offers a unique opportunity for the joint study of Russian students with students from other countries, as well as the opportunity to participate together in academic and extracurricular activities at SPbSPU.

### Length of the program

Training period of 2 years.

### Total workload

Not less than 120 credits

### TEACHING METHODS

World famous professors are invited to give short- and long-term courses. Individual training plan gives the possibilities to individually profile the education depending on the field of interest. Special resources of SPbSPU supercomputing center and a digital fabrication laboratory FabLab SPbSPU will be available for students. Every student enrolled in MSc Advanced Dynamics of Discrete and Continuum System is offered to study semester abroad at European universities. Double degree options with the European university.

### PROGRAMME PARTNERS

1. The University of Aberdeen is a public research-focused university in the city of Aberdeen, Scotland.



2. The Hamburg University of Technology is one of the youngest and most successful universities in Germany.



3. Institute for Problems in Mechanical Engineering of Russian Academy of Sciences



Semester thesis

4. Leibniz Universität Hannover is one of the largest and oldest science and technology universities in Germany



Master program "Double degree"

5. Lappeenranta University of Technology was established in 1969. Nowadays, LUT's strategic focus areas are green energy and technology.



Masters short and long-time internships

