

# Aircraft aerodynamics

Samara National Research University

Degree or qualification is awarded: **Master's Diploma**

Language of study: **Russian**

Mode of study: **full-time**

Duration: **2 years**

Availability of free education: **yes**

Price: **210 100 RUB per year**

Programme curator: **Ekaterina Stepanova**

Tel.: **8 (846) 267-49-90**

E-mail: [admission@ssau.ru](mailto:admission@ssau.ru)

The program is designed to train highly skilled specialists ready to solve research and engineering problems in the field of study and improvement of aerodynamic features of atmospheric aircrafts (AC).

Graduates of the program possess theoretical knowledge and practical skills for application of advanced methodologies, means and ways of aerodynamic load calculation.

The process of training is supported by unique training facilities, state-of-the-art laboratory equipment and software products. Students can combine classes, research and professional activity by taking part in ongoing projects of the graduation department.

Master's degree program graduates are able to take on engineering jobs in industrial companies and research centers and institutions at all stages of aviation engineering – from pre-design studies to serial manufacturing and aftersales support.

## **Brief characterisation of the programme**

The program is designed to train highly skilled specialists ready to solve research and engineering problems in the field of improvement of aerodynamic features of atmospheric aircrafts (AC).

Graduates of the program possess theoretical knowledge and practical skills for application of advanced methodologies, means and ways:

- for aerodynamic design and calculation of loads experienced by aircrafts;
- for development of mathematical models, computer modeling of flows in the vicinity of aircrafts, calculation of loads experienced by ACs.

Graduates are prepared to be employed in one of the following professional fields:

- testing and research;
- science;
- calculation and design.

## **Features (advantages) of the programme**

The graduation department is well-known in the Russian aerospace industry for its research and academic school of automated design of load-carrying structures, solving problems of interference and boundary layer.

The results of research activity of the Institute of Aeronautical Engineering are reflected in the content of academic disciplines.

The process of training is supported by unique training facilities and state-of-the-art laboratory equipment of the graduation department.

The education process is based on the principle “education through research.” Students can combine classes, research and professional activity by taking part in ongoing projects of the graduation department. For instance, master's degree graduates performed a number of simulations of flows near aircraft airfoil, wings and body, which were published in various academic periodicals.

The students' scientific educational activity occurs in the following laboratories:

- aircraft design;
- design automation;
- aerohydrodynamics (three subsonic and one supersonic wind tunnel);

- composite materials and structures;
- aircraft equipment systems;
- aeromodelling student design bureau.

Industrial practical training (including pre-degree practical training) is organized in head offices and branches of Russian aerospace industry leaders. These are: Irkut Corporation, Sukhoi Company PJSC, Tupolev PJSC, SRC Progress JSC, Aviaagregat PJSC, Aviastar-SP JSC, Volga-Dnepr Group of Companies, V. M. Myasitshev Experimental machine-building plant JSC.

The program ensures high academic mobility of Master's program graduates in the following areas:

- extensive cooperation of the graduation department with foreign professional research and academic centers in the framework of educational and research projects;
- studying the content of Master's academic programs proposed by the leading professional educational national and global institutions;
- participation in international exchange and trainee programs;
- co-training with foreign students;
- participation of Master's degree students in international academic competitions in the field of study.

The academic process is supported by up-to-date licensed software packages, such as ANSYS CFX, FLUENT and others. There is a possibility to study at the military department under a related professional program with promotion as a reserve officer.

### **Academic programme structure (curriculum features)**

The academic program consists of four blocks with an overall volume of 120 credit course units (CCU):

- Disciplines (General sciences cycle) – 20 CCU;
- Disciplines (Professional cycle) – 25 CCU;
- Practical training, research work – 57 CCU;
- Thesis work – 18 CCU.

General sciences cycle and Professional cycle core part constitutes 40%, while the remaining 60% are optional disciplines.

### **Future profession**

Upon graduation the students are awarded with Master's degree and are prepared to solve the following basic professional tasks:

- calculation of aerodynamic loads experienced by aircrafts;
- aerodynamic design of new aircrafts;
- experimental research of aircraft models in the aerodynamic laboratory.

The graduates can participate in development of:

- new aircraft designs of a variety of purposes;
- aircraft components' aerodynamic configuration;
- new design of launcher rockets and their components.

Master's degree program graduates are able to take on engineering jobs in industrial companies and research centers and institutions at all stages of aviation engineering – from pre-design studies to serial manufacturing and aftersales support.

Profound knowledge of computing in the field of design automation, engineering analysis and simulation of aircraft physical flows opens a range of employment opportunities for the graduates, including various mechanic engineering applications, science and education.

### **Specializations within this programme**