# Composition and Design of Gas Turbine Engines and Power Plants (Nanjing University of Astronautics and Aeronautics, China)

Samara National Research University

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

Language of study: **Russian, English**
Mode of study: **full-time**
Duration: **4 years**
Availability of free education: **no**
Price: **167 000 RUB per year**

Programme webpage at the university website:
https://ssau.ru/english/education/programs/449/825607ac-7abf-11e9-aa08-005056a7430c#program-desc

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The program "Engineering and Design of Gas-Turbine Engines and Propulsion Systems" boasts international status and has been developed in conjunction with the Nanjing University of Aeronautics and Astronautics (China). The aim of the program is to train top-class specialists with deep theoretical and practical knowledge in the engineering of aviation gas-turbine engines and propulsion systems. Over the educational process, students undertake a full cycle of work with the design of a gas-turbine engine or gas-turbine propulsion system, starting with the idea and thermogasdynamic calculations, and ending with the detailed design.

The program offers the opportunity to earn two diplomas – from both Samara University and the Nanjing University of Aeronautics and Astronautics.  Students taking part in the exchange program on the basis of competitive selection spend the first two years studying at their home university, and the third and fourth preparing their thesis work at the partner university.

Immediately upon completing their studies, graduates can assume technical, engineering and research-and-development positions at major industrial enterprises and field-specific holdings whose business involves high-tech aviation engine-building.

**Brief characterisation of the programme**

The program trains top-flight professionals with deep theoretical and practical knowledge in the engineering of aviation gas-turbine engines and propulsion systems. The knowledge and experience they gain in the program allow graduates to realize their potential as design-engineers, secure jobs in the area of real-world production, or assume management positions at companies and institutions pursuing aircraft engine-building.

The study process encompasses an array of disciplines in different areas: aside from specialized subjects, a great deal of attention is paid to general-engineering training, proficiency in the natural sciences and the humanities, as well as information technologies.

Classes are taught by candidates and doctors of science with extended educational and industrial experience, allowing students to gain a solid theoretical foundation while also mastering the applied aspects.

The study process also features the active use of multimedia education.

**Features (advantages) of the programme**

The main advantage of the program lies in its comprehensiveness. Over the course of the study process, students gradually master the full cycle of engine design:

- thermodynamic calculations,
- gasdynamic modeling of the flow path of gas-turbine engines and blade profiles,
- calculation of the force diagram of engines,
- design of main units,
- calculation of the main parts of engines (blades, disks, shafts) for strength and oscillation.

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Graduates work successfully at Russia's leading aviation engine-building enterprises, as well as at foreign companies engaged in the development of gas-turbine equipment.

Students distinguishing themselves in the research field have unique opportunities to participate in grant programs, as well as in competitions for sponsored, advanced and academic scholarships and in innovation contests.

**Academic programme structure (curriculum features)**

A critical element of the educational process is the study and widespread use of different specialized software packages for the solution of engineering tasks, as well as for the calculation of the parts and units found in aviation gas-turbine engines and propulsion systems. In particular, students are familiarized with the design-engineering editor KOMPAS, ADEM, SolidWorks, Unigrafics, the finite-element program suite ANSYS for the calculation of strength and oscillation, the system-kinetics calculation package ADAMS, CAM-systems ADEM, Unigrafics, Simatron (study versions) and many others.

What's more, the program includes a high volume of general-engineering disciplines, thanks to which students become universal specialists capable of applying their knowledge, ability and skills in any field.

Consistent with the State Educational Standard for higher education, the core academic program consists of three blocks: Disciplines (modules), Practical Training, State Final Certification.

The volume of the first block consists of 215 course credit units (CCU), which are distributed as follows:

- 20% humanities,
- 25% natural sciences,
- 30% engineering,
- 25% specialized disciplines.

Volume of practical training – 19 CCUs.
Volume of State Final Certification – 6 CCUs.

**Future profession**

Immediately upon completing their studies, graduates can assume engineering-design positions at major industrial enterprises and field-specific holdings involved in machine-building production and high-tech manufacturing.

In their professional pursuits, graduates have the chance to apply a broad range of their occupational competencies in terms of:

- making thermogasdynamic calculations;
- designing products;
- making product calculations for strength and oscillation;
- calculating product kinetics;
- preparing tasks for the development of efficient new technologies for the manufacture of machine-building products.

## Specializations within this programme