Design of Aircraft Engines and Power Plants

Samara National Research University

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

Language of study: **Russian, English**
Mode of study: **full-time**
Duration: **2 years**
Availability of free education: **no**
Price: **175 000 RUB per year**

Programme webpage at the university website:
https://ssau.ru/english/education/programs/660/9a297cd1-3f07-11e9-bbc6-005056a7430c#program-desc

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The master's program "Aircraft Propulsion and Power Systems," implemented within the scope of the "Aircraft Engines" area, boasts international status and has been developed in conjunction with the Nanjing University of Aeronautics and Astronautics (China). The program is aimed at training high-caliber specialists in the design of aviation gas-turbine engines and power-system drives. Students learn the fundamental aspects of the creation of aerospace equipment, and participate in the design of an aviation gas-turbine engine, starting with the initial idea and thermogasdynamic calculations and ending with the detailed design. The advantage of the program is the opportunity to learn how to take a comprehensive approach to the design of engines and their parts, and to master the techniques used in solving interdisciplinary tasks with the broad use of IT technologies and full-scale experiments.

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 year studying at their home university, and the second year 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 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. Specialized subjects encompass a high volume of practical knowledge, as well as the mastery of cutting-edge software. Engineering training makes use of the world's largest collection of domestically-manufactured and foreign-made engines.

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.

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

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Graduates get the chance to work 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)

The truly-distinctive feature of the program's academic plan lies in the end-to-end study of aviation engines. While pursuing their end-to-end project, encompassing all coursework in specialized disciplines, students perform the full scope of work with the project, from idea, feasibility study and design-calculation work and ending with a "virtual" engine complete with 3D modeling of the construction and the processes unfolding within it.

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 75 course credit units (CCU), which are distributed as follows:

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

Volume of practical training – 37.5 CCUs.
Volume of State Final Certification – 7.5 CCUs.

Future profession
Upon completing their studies, program graduates have the opportunity to work at large industrial enterprises and holdings engaged in the development and production of gas-turbine equipment.
While engaging in design-engineering work, graduates can:

- analyze the status of gas-turbine engines and propulsion systems;
- perform the technical work involved in the creation of a database of modern engineering and technology;
- elaborate the technical tasks involved in the design and engineering of the parts found in gas-turbine engines and propulsion systems, as well as the tools required for their production.

Every program graduate has a professional command of:

- design and engineering of an entire engine and its individual parts, including 3D modeling;
- thermogasdynamic design;
- strength, dynamic and kinetic calculations using the ANSYS and ADAMS software suites;
- thermal and hydraulic calculations.

Specializations within this programme