

**PROFESSORSHIP FOR
FLUID MECHANICS AND
HEAT TRANSFER**



INFORMATION FOR APPLICANTS

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1. The Johannes Kepler University Linz (Austria)

Firmly anchored in the region, the Johannes Kepler University Linz (JKU) also considers itself a university with a strong international outlook, pursuing an unwavering commitment to quality in research and education. The JKU aims to consistently move forward and advance to become one of Europe's top universities.

JKU researchers (approximately 170 professors and 2,700 academic employees) continuously pursue new knowledge and insight, deepening our insight in terms of what we know and understand today. The university also places great value on knowledge transfer, further deepening dialogue with members of society, the business community, and cultural establishments. As Upper Austria's largest research and educational institution, the JKU not only focuses on both education and research, but also on the regional and global challenges of our time, particularly those as outlined in the JKU's third mission (science with and for society).

Today, as an effectively positioned university, the JKU hones core skills and expertise in technology (engineering, computer sciences, natural sciences), social sciences, economics & business, education, law, and medicine. The JKU is predestined to engage in the academic and scientific challenges of our time, particularly in regard to digitalization and sustainability as well as values in support of diversity and inclusion. We not only foster a visionary approach, the JKU emphasizes and practices interdisciplinary and transdisciplinary research and academics.

The JKU is strongly committed to supporting social responsibility that extends beyond research and education. For example, meat served at the university's award-winning cafeteria stems from organic farms. The university established the LIT Open Innovation Center on campus, a facility at the crossroads of academia, science, research, and real-world practices designed to support and bring about a circular economy and sustainable polymers. Recent campus enhancements complement the quality of university facilities, providing a contemporary infrastructure that not only inspires creativity, but also serves as a dynamic work, recreational, and living space for university employees, students and local residents alike.

We also offer a comprehensive onboarding process for new employees. Whether you are coming to the JKU from elsewhere in Austria or from abroad, our staff at the Office of Dual Career Services and at the JKU Welcome Center can assist to find housing, provide information about local schools and, of course, help your spouse or partner find suitable employment so everyone feels more quickly at home in Linz.

The JKU aims to pursue its objectives and embrace the coming challenges by attracting students and faculty who also aspire to play a key role in contributing toward a future that not only supports technological advancement and progress, but a future that also serves the people and conserves the environment.

2. The Faculty of Engineering and Natural Sciences

Students enrolled at the JKU can choose from over 30 academic degree programs in engineering and natural sciences offered at 59 institutes. The JKU has a strong tradition of conducting advanced, cutting-edge research at the forefront of technology and engineering. Always a step ahead, the JKU introduced the world's first academic degree program in Mechatronics in 1990 and in 2019, the university launched two unique academic degree programs, one in Artificial Intelligence and another in Medical Engineering. Both programs bring medical and engineering expertise together. A high number of publications, research contracts, Austrian Science Fund projects, EU projects, special research areas, and dissertations are a testament to the Faculty's scientific and scholarly achievements. By creating competence centers, housing Christian Doppler laboratories, and supporting spin-off companies, technology-oriented companies appreciate the JKU Faculty of Engineering and Natural Sciences as an internationally valued partner.

3. The Subject Area of “Mechatronics”

The Subject Area of “Mechatronics” stands for consistent interdisciplinary mechatronic research and research-led university teaching. It is regarded as an internationally recognized spearhead of mechatronic research, both in fundamental and applied research.

In addition to the Bachelor's and Master's degree programs in Mechatronics and Electronics and Information Technology, Mechanical Engineering has been offered as a Bachelor's degree program since the winter semester 2020/21 and as a Master's degree program since the winter semester 2022/23. In addition, the Subject Area of Mechatronics also offers key courses in Polymer Engineering and Medical Engineering.

The Subject Area of Mechatronics consists of the following institutes and departments:

- Institute of Automatic Control and Control Systems Technology
- Institute of Biomedical Mechatronics
- Institute of Communications Engineering and RF-Systems
 - Department of Communications Engineering
 - Department of RF-Systems
- Institute of Design and Control of Mechatronical Systems
- Institute of Electrical Drives and Power Electronics
- Institute of Fluid Mechanics and Heat Transfer
 - Department of Particulate Flow Modelling
- Institute of Measurement Technology
- Institute of Metallic Engineering Materials

- Institute of Machine Design and Hydraulic Drives
- Institute of Mechatronic Design and Production
- Institute of Microelectronics and Microsensors
- Institute of Robotics
- Institute of Structural Lightweight Design
- Institute of Technical Mechanics
- JKU HOERBIGER Research Institute for Smart Actuators

4. General Requirements for the Professorship of Fluid Mechanics and Heat Transfer

The professorship is to represent the field of “Fluid Mechanics and Heat Transfer” in both research and teaching and is located at the Institute of Fluid Mechanics and Heat Transfer (www.jku.at/isw). The successful candidate is expected to head this institute. Coordination of research and teaching activities with the Department of Particulate Flow Modeling (www.jku.at/pfm) is expected.

4.1. Research

We are looking for a person who conducts research in the field of fluid mechanics and heat transfer with a strong connection to mechatronics. The applicant must have an excellent international scientific track record in one or more specific research fields of fluid mechanics and heat transfer. Research fields relevant to the open professorship are, for example (in no particular order)

- Modeling and numerical simulation of single-phase and multiphase flows
- Modeling of flows with mass and heat transfer
- Experimental methods of fluid mechanics and heat transfer
- Numerical modeling of turbulent flows
- Artificial intelligence, machine learning and data-driven models in thermo-fluid dynamics
- Flow control methods (e.g., magnetohydrodynamics)
- Fluid-structure interaction

Areas of application include, for instance: metallurgy, process engineering, sustainable energy technology and aerodynamics.

Experience in the acquisition of funding or in the application and coordination of funded projects is also expected.

The following criteria in particular are used to assess applicants' qualifications in research:

- Relation to mechatronics and synergetic integration into the existing Subject Area of “Mechatronics”

- Research expertise in a specific research field of fluid mechanics and heat transfer
- “Habilitation” (*venia legendi*) in the field of fluid mechanics and/or heat transfer or an equivalent qualification
- Scientific reputation, substantiated by high-quality publications, patents, scientific lectures, editor and reviewer activities, organization of conferences, service in the scientific community, etc.
- International experience related to fluid mechanics and/or heat transfer shown e.g. through longer stays abroad or through cooperation with foreign universities and research institutions
- Organization, acquisition and management of third-party funded research projects
- Research concept on a maximum of 7 pages outlining the future work as a professor of fluid mechanics and heat transfer in the context of the JKU research landscape, especially regarding the subject areas of the Faculty of Engineering and Natural Sciences

The JKU university-wide research priorities “Digital Transformation” and “Sustainable Development: Responsible Technologies & Management” as described in the development plan must be taken into account in the research concept.

When assessing the candidates’ accomplishments, performance, and future potential, the JKU will take the candidates’ individual background and personal history into account by acknowledging that academic and professional success and accomplishments can happen at different stages in life (and can include periods of reduced employment, or career interruption on account of having to provide care, childcare, etc.). In this regard, qualifications are assessed and evaluated in terms of equal opportunity, taking life-course factors, such as academic age, into account.

4.2. Teaching

The JKU commits itself to research-led teaching. The professorship is associated with teaching in the Bachelor's and Master's degree programs in Mechatronics, Mechanical Engineering, Medical Engineering as well as in the degree programs of the Subject Area of Chemistry and Polymer Engineering (in particular BSc. in Sustainable Polymer Engineering & Circular Economy and MSc. in Polymer Engineering and Science).

The ability and willingness to contribute responsibly in the Institute's teaching activities is required. The successful candidate is required to hold the course "Fundamentals of Thermo-Fluid Dynamics" (4.5 ECTS, 3.0 semester hours per week) in the bachelor programs Mechatronics, Mechanical Engineering and Sustainable Polymer Technology & Circular Economy. This course covers the basics of technical thermodynamics, heat transfer and fluid mechanics. Further courses in the bachelor and master studies (particularly in the specialization Thermo-fluid dynamics and Fluid power technology) build on the fundamentals taught in this course.

In addition to above-mentioned mandatory course, compulsory optional courses should be offered. The current range of electives covers various topics such as turbomachinery, heat exchangers, potential

flows, fundamentals of aerodynamics, Navier-Stokes equations, energy transport equations and convective heat transfer, fundamentals of numerical solution methods for transport equations, finite volume discretization, numerical modeling of turbulent and multiphase flows. The successful candidate shall adapt and further develop the range and content of optional courses on the basis of a teaching concept in coordination with the study commissions. Details on the existing curricula and courses can be found in the study handbook ("Studienhandbuch") at <http://studienhandbuch.jku.at>.

The future holder of the professorship will be expected to contribute to the further development of an attractive range of courses, in particular for the newly introduced Master's program in Mechanical Engineering.

Cooperation in teaching with national and international universities is desirable. Due to the internationalization of education at JKU, teaching and lecturing activities are expected not only in German but also in English.

The following criteria in particular are used to assess applicants' qualifications in teaching:

- The ability to teach the mentioned courses
- The ability to teach courses in both languages German and English
- Experience in supervising students' academic work, such as diploma/master and PhD theses
- Teaching concept for future work as a professor of fluid mechanics and heat transfer in the context of the JKU's course offerings, especially regarding the subject areas of the faculty of engineering and natural sciences
- Concept for the use of new and digital media in teaching

4.3. Additional Requirements

The willingness to cooperate with the institutes of the subject area Mechatronics as well as with other related institutes of the JKU (e.g., in the area of polymer technology, process engineering, medicine) is of high importance.

Equally important is the willingness to acquire third-party-funded projects with industry and with research institutions in the vicinity of JKU (e.g., the Linz-based competence centers K1MET and LCM).

Management competence as well as experience in leadership of teams are required. Experience in personnel development and the advancement of women (see JKU's Women's Advancement Plan) as well as participation in gender mainstreaming projects are further relevant selection criteria. The willingness to take on tasks within the university's self-administration is also expected.

The following criteria in particular will be used to assess the additional requirements:

- Experience in managing organizational units

- Experience in human resources management and development
- Experience in the advancement of women and participation in gender mainstreaming activities

5. Legal Contingencies

Effective as of January 1, 2004, the structure of Austrian universities has been completely re-organized. They are independently financed on the basis of a three-year service level agreement with the Austrian government, have a global budget at their disposal, and are not subject to any directives by the Austrian Federal Ministry of Science and Research.

5.1. Terms of Employment

All terms of employment, including a university professorship, are subject to the Private Sector Employees Act. A work contract between the university and the appointed professor confirms the professor's appointment. The Salaried Employees Act and the collective agreement for university employees provide the legal framework for all related labor, social, and pension conditions. An evaluation of all teaching and research activities will be conducted after a 5-year period to assess the fulfillment of all target agreements.

5.2. Pension Regulations

5.2.1. Pension

A pension account at the Pension Insurance Company for Employees (PVA) provides the basis to calculate the amount of pension. All pension account holders are registered for annual partial credits during insurance periods in the amount of 1.78 % of the annual contribution basis and these are capped at the maximum assessment basis. The sum of the partial credits is the total credits that are re-valued annually. The total credit divided by 14 equals the amount of gross monthly pension. More information about the pension you receive directly from the state, please contact the PVA.

5.2.2. Company Pension Fund for University Professors

In compliance with the Universities Act 2002, a special pension scheme is provided for university professors and has been agreed upon in a Collective Agreement. The contribution payment made by the university is 10 % for the set minimum salary as stated in the collective agreement. Voluntary salary payments agreed upon aside from the collective agreement minimum salary are not a part of the base calculation of the contribution payments.

6. Salary

The amount of the minimum salary for Group A 1 (Professorship) has been determined in the collective agreement for university employees and is a gross annual salary of 89,075.00 Euros per year (last update: 2024). Payment is allocated in 14 equal amounts, whereby two parts are special allocated payments.

The position as Professor for Fluid Mechanics and Heat Transfer provides a provision (on a voluntary basis) to agree on a salary over the minimum salary set by the collective agreement

After a positive evaluation every six years – 4 times in total – there will be an advance to the next pay grade in accordance to the salary bracket in collective agreement for job category A 1.

7. Application Procedure

Prospective applicants for the professorship position Fluid Mechanics and Heat Transfer are requested to send the following application and requested documentation in electronic form to: application@jku.at. Since international reviewers will be consulted, all documents must be prepared in English.

7.1. General Information

- Applicant form
- Letter of Intent (1 page)
- Tabular Curriculum Vitae
- Academic diplomas (Doctorate, Post-Doctorate [Habilitation])

7.2. Research

- Research concept (max. 7 pages)
- Proof of Habilitation or an equal qualification
- Complete list of publications and indication of the 5 most important publications (with reasons for selection)
- Google Scholar or Scopus profile (must be free of errors)
- Patent list
- List of third-party funding acquired (function, project volume, project duration, funding body)
- Overview of national and international collaborations with universities, research organizations and industrial companies
- List of activities and services in the scientific community (e.g. invited lectures, editor and reviewer activities, organization of conferences and related activities)

7.3. Teaching

- Teaching concept (including aspects related to the use of new and digital media)
- List of courses taught including activities in the field of higher education didactics
- Results/certificates for teaching evaluation (if any)
- List of supervised academic theses

7.4. Miscellaneous

- Evidence of qualification for cooperative leadership, for human resources development, and the advancement of women as well as the participation in gender mainstreaming projects

8. Information

If you have any questions about the position, please contact Univ. Prof. Dr. Marco Da Silva (+43 (732) 2468 5921, marco.dasilva@jku.at).