

Description of the appointment process of a tenure track position (assistant/associate/full professor)

Semiconductor Physics and Component Reliability

Location: School of Engineering Sciences, Department of Physics, Lappeenranta or Lahti campus

The rector has approved the description and initiated the appointment process on 3 April 2025.

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Applied statutes

Universities Act (558/2009)

Government decree on universities (770/2009)

Regulations of LUT University (8 December 2022, amended 5 April 2024 and 17 June 2024)

Rector's decision: Academic career tracks of the Lappeenranta–Lahti University of Technology LUT (16 January 2025)

Additional information

Further information on the duties of the professor is provided by Panja Luukka, professor and head of the Department of Physics, tel. +358 50 428 82 90, e-mail: panja.luukka@lut.fi.

1 Background

LUT University is a challenger university aiming to conduct high-quality research that is relevant to society and industries. As a compact, agile, and highly focused university, together with its partners, LUT contributes to an economically, ecologically, and socially sustainable society in its focus areas.

Clean energy, water and air are life-giving resources for which we at LUT University seek new solutions with our expertise in technology, business and social sciences. We help society and businesses in their sustainable renewal.

LUT University was established in 1969. Our entrepreneurially thinking scientific and international community comprises approximately 8500 students and 1500 experts engaged in scientific research and academic education. There are more than 100 nationalities present on our modern campuses in Lappeenranta and Lahti.

In our schools – the LUT School of Energy Systems, the LUT School of Engineering Sciences and the LUT School of Business – we conduct research and provide education that are internationally recognised and relevant to both society and business.

Times Higher Education (THE) has ranked LUT among the top 11 small universities across the globe in 2022. The THE university rankings present the world's top universities for interdisciplinary research.

LUT School of Engineering Sciences (LENS)

Our mission is to train problem-solvers in engineering and contribute to a wider understanding of our world through research in technology. Our research and education are characterised by an entrepreneurial, global and sustainable mindset. The LUT School of Engineering Sciences serves industry and society with its international expertise in separation, process technologies, computer vision and pattern recognition, industrial mathematics and physics, industrial engineering and management, and software engineering. Our strength lies in our close collaboration with companies combined with strong theoretical and methodological expertise. Our unit pursues a sustainable future in a world where climate change, diminishing natural resources, the availability of clean water, the use of materials, and environmental issues pose significant challenges. By specialising in our strengths, we create sustainable technologies and business for the future.

Department of Physics

The position is located at the Department of Physics of the LUT School of Engineering Sciences (LENS). The mission of the Department of Physics at LUT is to provide expertise in the areas of material physics, measurement technologies, nanotechnology, experimental physics instrumentation and data analysis.

2 Vacant professorship

We are looking for an assistant/associate/full professor of semiconductor physics and component reliability. The position offers a unique opportunity to engage in groundbreaking research within the expanding field of applied semiconductor physics and component reliability, especially in the domain of power electronics. Key objectives in power electronics applications include reliability, performance, energy efficiency, and cost efficiency.

You will work in a cutting-edge, interdisciplinary research environment in a diverse academic setting, fostering collaborations across multiple disciplines. You will benefit from LUT's international community and networks that enable global partnerships and offer insights into different cultures and perspectives. You will have great possibilities for career growth and development.

As a professor, you will be expected to demonstrate a high level of academic competence in semiconductor physics, especially in semiconductor component physics related to power electronics, reliability, and semiconductor manufacturing process. Your objective will be to set up your own research group and offer expertise in the field of your professorship.

Your duties will include basic and advanced education in key areas of the field of the professorship. The exact educational responsibilities will be agreed on with the head of the degree programme. Professors are expected to supervise theses and doctoral dissertations.

We expect proof of high-impact international research and publishing – one of the most important duties of professors at LUT University. Skills for collaborating within LUT and with national and international partners are crucial to the position, and you will be expected to provide evidence of successful international collaboration and the acquisition of research funding. Preparations for national and especially international research and education projects are part of the work of professors at LUT University. The duties of a professor also include societal engagement that serves industry, the economy, and society, and general administrative work related to the university's operation.

The field of the professorship includes themes such as the following:

- semiconductor physics including deep understanding of the physics of power components
- semiconductor power component reliability and failure mechanisms
- semiconductor device fabrication processes, including component design
- processing steps such as mask design, lithography, atomic layer deposition, thin film metals
- chip packaging and thermal management
- characterisation of semiconductor components

Expertise in all these areas is considered an advantage. You should present proof of successful project work and research collaboration with research institutions and industry. In addition, we require experience in acquiring competitive funding. Experience in managing a research group is considered an asset.

The duties related to the field of research include the following:

- high-impact international research
- planning and implementation of bachelor's, master's, and doctoral education
- supervision of final theses and doctoral studies
- preparation of national and international research and education projects
- increasing awareness in a way that serves industries and society
- taking part in the preparation of projects in other LUT units as an expert
- general administrative work related to the university's operation
- acquisition of research funding
- cost-conscious leadership and project management
- close collaboration and interaction with businesses in the field
- teamwork, as most of the research and work takes place in research groups and teams

The position is at the assistant/associate/full professor levels of the tenure track and will be filled through an open call for a fixed term of four years (assistant/associate professor) or permanently (full professor). The tenure track system offers researchers a possibility to advance to a full professorship. LUT is committed to providing tenure track researchers the

possibility to advance to the next level, provided they meet the requirements in the promotion reviews, are suitable for the position, and conduct research that fits LUT's strategy and operation.

More information on the LUT tenure track system:

<https://www.lut.fi/en/research/research-career-lut/tenure-track>

The position starts with a six-month trial period. The position is based in Lappeenranta or Lahti and may require travel to the university's other locations as needed.

3 Qualifications

According to the administrative regulations of LUT University, adopted on 8 December 2022 (amended 5 April 2024 and 17 June 2024), assistant / associate / full professors are required to have a doctorate, high-level scientific qualifications, experience in heading scientific research, the ability to acquire funding, the ability to provide high-level instruction based on research, the ability to supervise final theses, proof of international cooperation in their field of research, and when relevant to the duties of the position, practical experience in the field of the professorship.

Practical experience in the field is not a requirement in this position at the assistant / associate professor level, but it is considered an advantage. At the full professor level on the tenure track, it is a requirement. Applicants should demonstrate their willingness to collaborate with industry in their application.

The applicant must have research and teaching merits, proof of effective research and the acquisition of external research funding, and international experience. The appointed applicant will be the immediate supervisor of a research group and may need to perform other demanding management duties assigned by the university. Therefore, related skills will be taken into consideration in the appointment, and attention will be paid to the applicant's merits as defined in LUT's tenure track system (Annex).

Under the universities decree (770/2009), persons in teaching and research positions at universities are required to master the language, Finnish or Swedish, in which they teach. According to the university regulations, section 28, foreign or naturalised Finnish citizens may be appointed to teaching or research positions even if they have not demonstrated skills in Finnish and/or Swedish. Applicants for professorships may demonstrate their language skills with a language certificate accepted by the academic council and/or in an interview.

According to the university regulations, section 28, professors are required to have the language skills needed for the successful completion of their duties.

In this position, spoken and written fluency in English is required. The appointed person is encouraged to acquire the necessary Finnish skills during the employment relationship. For that purpose, LUT offers in-house Finnish language courses to staff members.

4 Applying for the position

Application

The application must specify the tenure track level applied to. The deadline for applications is indicated in the vacancy announcement. The application and material for expert assessors should be submitted through the online recruitment system mentioned in the vacancy announcement.

All application documents must be in English and in PDF format. The application must include:

- a curriculum vitae (max. 10 pages)
- a copy of the applicant's doctoral diploma
- a full list of publications including the total number of publications in the Scopus database, the total number of citations, the h-index and Scopus ID. In addition, equivalent information from the applicant's Google Scholar profile is required
- a separate list of the 10 publications selected for expert evaluation
- the 10 publications mentioned above
- a teaching portfolio or an equivalent account of the applicant's teaching qualifications, presenting courses taught by the applicant, related feedback, the applicant's pedagogical training and teaching philosophy, and courses that the applicant is able to or prefers to teach
- an account of the applicant's merits and activities of significance to the vacancy (max. 3 pages)
- an account of the applicant's vision on the development of education, research and projects in the field of the professorship at LUT University (max. 3 pages)

Contact information

Applicants must give the university an email address at which they can be reached. Applicants who do not wish to be contacted by email must give a postal address at which they can be reached during the appointment process. The university prefers email.

5 Expert evaluators

Selection of experts

The experts must be impartial. Before the selection of expert evaluators, the applicants must be provided the possibility to comment on their possible disqualification.

Based on the proposal of the selection committee, the dean invites at least three internationally recognised experts to submit a statement on the qualification of the applicants. The university's staff members may not be invited as expert evaluators. To the extent possible, the experts should be chosen with the applicants' fields of specialisation in mind and with a view to impartiality.

Sections 27–29 of the Administrative Procedure Act (434/2003) apply to the disqualification of an expert evaluator.

Applications forwarded to expert evaluators

The selection committee may limit the number of applications forwarded to expert evaluators if there are four applicants or more. At least three applications must be forwarded to the experts. The applications may be limited to the most suitable candidates for the position in the view of the person making the decision. The selection committee must state the grounds for its decision. The applicants will be informed if any applications are excluded from the evaluation.

Expert statements

The expert evaluators must give their statements in writing within the agreed timeframe. More specific dates will be sent to the evaluators along with instructions. In their statement, the experts must evaluate especially the scientific qualification of the applicant, and if possible, also other merits related to the professorship, and rank the applicants in order of preference.

Expert evaluators may not take part in the appointment process at a later stage.

The statement must be submitted to the university (separate instructions issued) by the deadline.

6 Interview and trial lecture

Applicants deemed qualified for the position by the experts will be invited to an interview. The selection committee may ask the applicants to give a public trial lecture.

7 Appointment

The selection committee makes an appointment proposal to the tenure track committee, which then makes its own proposal to the dean. The dean then makes a proposal to the rector on filling the position or leaving it vacant. The proposal shall be based on the merits presented by the applicants, expert statements, possible trial lectures and other related matters.

The evaluation of the applicant's qualifications takes into account scientific publications and other research results with scientific value, pedagogical expertise, teaching experience, teaching-related merits, a trial lecture if needed, the number of supervised dissertations, and management and leadership skills. In addition, the applicant's activity in the scientific community, success in raising research funding, scientific work abroad and international positions of trust are considered.

The rector decides either to appoint an applicant or to leave the position vacant.

The appointment proposal may be made or let lapse even if all of the experts have not submitted their statements, provided that the time limit for the statements has expired, at least three experts have submitted their statements, and the impartial treatment of the applicants is not compromised by doing so.

After the rector has made the appointment decision, an employment contract is concluded with the appointed person. If no employment contract is concluded, the rector may, based on the proposal by the dean, make a new decision and appoint another applicant. The rector may also leave the position vacant. When the employment contract is concluded with the person appointed, the final decision is made known to all applicants.

Tenure track appointment criteria

The positions below require a doctorate in an applicable field, a research field that fits the LUT strategy (see LUT Strategy 2030), a goal-oriented plan for the work in question, teaching experience and an up-to-date account of teaching merits (teaching portfolio).

LUT has joined the international CoARA Agreement on Reforming Research Assessment (<https://coara.eu/agreement/the-agreement-full-text>), which emphasises qualitative assessment in recruitments and promotions to specialist positions. This is highlighted especially in the assessment of peer-reviewed scientific publications. We require high-level publications. The quality of publications is evaluated based on their content, such as novelty and impact. High-level publications have also passed a high-level peer review, where only the best manuscripts are accepted for publication.

In the tenure track criteria below, we apply the classification of the Finnish Publication Forum (JUFO) as a guiding indicator of high-level publications (ratings 2 and 3), but applicants always select their best publications for a qualitative evaluation by experts. The applicant's work will be evaluated in light of LUT's high ethical standards for research.

In international recruitments, the evaluation must take into account that applicants from beyond Finland and Europe may not have been involved in Finnish or European research projects and may not have taken into consideration the Finnish Publication Forum classification. Such applicants are evaluated in terms of their success in acquiring competitive funding through their own national channels or through international ones, and in terms of impact factors of scientific journals in their own field. Only in promotion and tenure reviews are the same criteria be applied to them as to Finnish persons.

The following qualifications are to be considered in the recruitment of researchers for different levels.

Assistant professor:

- peer-reviewed scientific publications
- contacts with the international scientific community in the field
- the ability to take part in applying for external funding in the research group and for fellowships of the Research Council of Finland
- the ability to participate in teaching and final thesis supervision

Associate professor:

- successful publication history after the doctoral defence, target of three high-level publications a year
- proof on international cooperation
- successful acquisition of external funding and acting as, e.g., a project manager in externally funded projects
- applying for the Research Council of Finland's research fellow positions
- participation in the supervision of doctoral students
- participation in the commercialisation of research results
- participation in teaching, the development of teaching and the supervision of final theses

Full professor:

- proof of the successful performance of duties
- 1. Scientific research
 - publications: target of three high-level publications a year; emphasis on publications from recent years
 - supervised dissertations: target of approximately one doctorate a year
 - other scientific publications, such as books and chapters
 - citations
 - important keynote/plenary presentations and scientific awards
 - editorial work in scientific journals
- 2. Academic teaching experience
 - high-quality teaching proven in different ways, such as feedback received
 - up-to-date teaching portfolio
 - development of teaching modules
 - supervision of final theses
- 3. Academic leadership
 - establishing and heading a research group
 - leadership experience and evidence of leadership and interpersonal skills
 - other leadership experience and feedback received
- 4. Acquisition of external funding
 - EU, ERC, Research Council of Finland, and Business Finland
- 5. Work in the scientific community
 - international scientific societies and expert advisory duties
 - duties with an impact on the scientific community
- 6. Societal impact
 - presence in societal dialogue
 - corporate funding and external funding not referred to in point 4 above
 - professional experience beyond universities
 - innovations, patents, collaboration with companies (e.g., board memberships)
 - activity in the university's stakeholder groups