

Evaluation report

Evaluated point	Grade	Comments
Scientific impact of research	Very good	<p>The University of Tartu (TU) offers a large scientific spectrum in natural sciences, partly due to the fact that it is historically the first university in Estonia, and partly due to the needs in teaching. The scientific impact of the research is very good, and excellent in many cases. An excellent example is the Estonian Genome Center, where DNA analysis is used to track new diseases. This has been highly recognized by the creation of the Centre of Excellence for “Genomics and Translational Medicine”. Excellence is also evident in the other CoE’s, for example in “Advanced Materials and High-technology Devices for Sustainable Energetics, Sensorics and Nanoelectronics“, and there is also excellent research in a range of other institutes. The TU plays an important role for fundamental disciplines such as physics and mathematics by proposing a complete curriculum and having trained a large part of the corresponding scientific community. The institute of mathematics and statistics has sufficient expertise and size to gradually interact more with other scientists. Other areas that should be mentioned are cell biology, bioinformatics, mostly in relation with the genome analysis, geology and Earth resources and the chemistry of super acids. Among the positive developments over the reporting period is the growth in Computer Science. The department has been successful in attracting talent from abroad which is notable. While student numbers are in decline in Estonia, computer science has bucked the trend. Science and Technology is the biggest Faculty with ~42 % of the university’s academic staff. Scientific impact is considerable through a large output of publications with over 80% of published documents being cited of which ~16 % represent publications in the top 10 %. TU trains a high number of PhD students in diverse fields of science, with the Faculty of Science and Technology producing the highest number of graduates in the university.</p>
Sustainability and potential of research	Very good	<p>TU clearly recognises the natural sciences as an area of strength and importance. It has made significant investment in infrastructure, for example the Chemicum. Integration of Tartu Observatory and the Estonian Biocentre is under development, both excellent institutes that will add value. Large staff and student numbers ensure sustainability of certain areas of research within the Science and Technology framework, although this is highly dependent on obtaining external research funding. It is clear there are areas of research of international significance but this is not consistent throughout the Faculty. Sustainability and</p>

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		<p>research potential will be improved by new initiatives for attraction of international researchers and experts, and repatriation of Estonian researchers who have been working on international centres of excellence outside Estonia. Laboratories seen during the review are well-equipped and staff have a relatively high success rate in obtaining research grant funding compared to other Estonian universities. While the investment in infrastructure has been very good, the system for academic recruitment, appointment and progression is not as well developed and will need attention in order to make the University even more attractive on an international level. At the same time, it is difficult not to speak of negative issues that do not depend on the researchers. The researchers at TU have been confronted with many changes in the organization of the university and the funding of research during the last few years.</p>
Societal importance of research	Very good	<p>Most of the research carried out at TU has a clear societal impact. This takes shape in many forms, including for instance leadership in defining national strategy in Earth resources, economic impact through commercialisation of results, and addressing specific needs such as for natural language processing tools for Estonian. The range of research carried out in the various institutes cover many important areas in natural sciences which are of societal interest and potential. These include research into the sustainable use of natural resources, climate change effects on landscape and ecology, biodiversity in forest and agricultural systems, electro-catalysis, genomic studies of humans and environmentally- and medically-important microorganisms, and plant-water relationships. While basic research is less directly related to societal issues, it plays a central role for the long-term evolution and for knowledge. In addition, TU provides expert training and mentoring of PhD students in diverse areas of natural sciences. The Estonian Genome Centre provides expert training in modern genomic technologies for new generations of PhD students.</p>
Scientific basis in the field is sufficient to conduct doctoral studies. (This question should be answered only if: a) institution being evaluated is		<p>Yes, for all fields of doctoral studies. The conditions for doctoral research appear very good. The evaluation committee has seen separately a certain number of PhD students and the impression was positive. As in other institutions, one sees that PhD training may be really attractive in Estonia. The advisors make efforts to guarantee sufficient funding to complement the state funding allocation. They have excellent conditions for research, with weekly seminars that they attend, a good library and</p>

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<p>conducting doctoral studies and; b) The field being evaluated is proposed to grant positive evaluation. If these conditions are met then: a) If the level of scientific basis is sufficient for conducting doctoral studies in every structural unit being evaluated, then the answer should be „yes“; b) If the scientific basis is not sufficient in some structural units, then those units should be listed.)</p>		<p>experimental material. Each of them attends at least one conference or summer school per year. They have no difficulty to have this financed. Negative points concern the rigidity of the condition of having 3 published papers before the defence of the thesis. Some students were pessimistic because of a perceived decrease in research funding.</p>

Summary assessment

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<p>Areas of special note as appropriate (Where necessary indicate sub-fields, assessment criteria, and/or structural units which, in the committee's opinion, were of a notably high level.)</p>		<p>Fields of excellence have already been mentioned and are highly visible. The general quality of research should also be underlined. Cryptography and internet security is also an area of special note, which is present in collaboration with Cybernetica. The extensive international collaboration by the Estonian Genome Centre, and its relationship with the Estonian Biocentre are very successful. Forthcoming merging of Tartu Observatory and the Estonian Biocentre with TU will consolidate research activities and may provide further opportunities for collaborative research and grant funding. Staff met by the review panel were committed and motivated for the research carried out. PhD students that we met were generally satisfied with their projects and research environment.</p>
<p>Areas in need of improvement as appropriate (Where necessary indicate sub-fields of the field being evaluated, assessment criteria, and/or structural units which, in the committee's opinion, revealed significant shortcomings.)</p>		<p>As in other institutions, research is very dependent on research project funding. There were uncertainties expressed over future changes in R&D funding after 2020, with no real scope for TU to provide contingency funds. In addition, there is no provision for academic progression from junior to senior positions. The University needs to consider how to create a more attractive environment for career development.</p>
<p>Assessment proposal to the Minister of Education and Research</p>	<p>To grant positive evaluation</p>	<p>The research in natural sciences is very good and has found its place in the international scientific community, and some of the research enjoys distinct visibility.</p>

Feedback

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<p>Feedback for institution (This question should be answered only if the institution asked for feedback from the evaluation committee in the self-report (about up to three specific areas of R&D which it finds to be currently important, e.g., related to its development plan).)</p>	<p>NA</p>
<p>Suggestions for unit, institution, state etc (As appropriate, committee can give additional feedback for the structural unit, the institution, or the State (please specify whom feedback is directed to) according to the directive assessment criteria for regular evaluation (article 7).</p>	<p>Recruitment constitutes a main issue for improvement. The evaluation committee understood that this is mainly conducted by institutes. Larger discussions may be helpful also regarding the strategic planning. One other issue is the coming merger with both Tartu Observatory and the Estonian Biocentre. There are some natural concerns over loss of research identity and independence, and financial effects through this merger with the TU. Such mergers should be sensitive to the research needs and requirements of the individual institutions and not affect future research activity. Any new teaching burdens should be carefully considered. To be successful it is necessary to take time for discussions, so that all researchers take part in these changes. In addition, the assessment revealed little industrial research connections or development.</p>