



Tallinna Pedagoogikaülikool
Tallinn Pedagogical University

FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF NATURAL SCIENCES

SELF-EVALUATION REPORT

GENERAL PART

CURRICULA:

GEOECOLOGY BSc, CODE 6420012

GEOECOLOGY MSc, CODE 7420001

ECOLOGY PhD, CODE 8420207

BACHELOR OF NATURAL SCIENCES, CODE 6420287

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Table of Contents

GENERAL PART	3
Brief Overview of Estonian Higher Education System and Tallinn Pedagogical University	3
1. A Brief Overview of Estonian Higher Level Education System.....	3
2. A Brief Overview of Tallinn Pedagogical University (TPU).....	4
3. Study Process at Tallinn Pedagogical University (TPU)	7
4. Curricula Development at Tallinn Pedagogical University (TPU)	8
5. Faculty of Mathematics and Natural Sciences	13
6. Department of Natural Sciences	15
Appendix G1	21
Location on contact of Tallinn Pedagogical University.....	21
Appendix G2	22
Location of Tallinn Pedagogical University buildings.....	22
Appendix G3	23
Structure of Tallinn Pedagogical University	23
Appendix G4	24
Structure of Department of Natural Sciences and Faculty of Mathematics and Natural Sciences of Tallinn Pedagogical University.....	24
Appendix G5	25
Research and development in chairs of Department of Natural Sciences.....	25
Appendix G6	28
Publications (2001-2004) of Teaching Staff from Department of Natural Sciences, Tallinn Pedagogical University.....	28
Appendix G7	49
Development plan of the department of natural sciences for 2004-2012.....	49
Appendix G8	58
Curricula Vitae of the teaching staff of the Department of Natural Sciences.....	58
Appendix G9	94
The Regulation for the Organisation of Studies at Tallinn Pedagogical University.....	94
Appendix G10	132
TPU Academic Calendar for the 2004/05 academic year	132
Appendix G11	135
List of full-time teachers of Department of Natural Sciences.....	135
Appendix G12	137
List of support personnel of Department of Natural Sciences	137
Appendix G13	138
Requirements for term papers in the Department of Natural Sciences	138

GENERAL PART

Brief Overview of Estonian Higher Education System and Tallinn Pedagogical University

1. A Brief Overview of Estonian Higher Level Education System

Estonian higher educational institutions are regulated by *the Law of Universities, the Law on Private Schools, the Law on the Organization of Research and Development, the Standard of Higher Education*.

The Estonian post-secondary system is undergoing radical changes, which among other factors takes into consideration the integration with the European Union. In accordance with the international education standards classification of UNESCO, education has the following levels: Pre-education, Basic education (the Primary level), Middle level of education (Secondary level) and Higher education (Higher level).

For each level there are standards, which are articulated in the state guidelines for educational programmes. The curriculum guidelines determine the content of the compulsory programmes, the time to be spent on teaching and description of the demanded knowledge and materials.

The Parliament of Estonia proclaims the principles of the educational system and general structure. The government is responsible for the state side of the programmes and regulates the funding of Universities and other learning institutions. The Ministry of Education and Research is responsible for the curriculum and development of standards as well as implementation.

Institutions providing post-secondary education in Estonia are divided in two: the universities and institutions of applied higher education. The University is an educational, cultural and research institution where students can acquire an academic education. The purpose of the university is to advance knowledge through academic methods; create and develop on the basis of integrated learning and research opportunities to acquire an up-to-date post-secondary education which is up to standards; arrange for continuing education and provide society with needed knowledge and research services. Since 2002 academic higher education is provided at three levels: Bachelor's degree (a 3-year programme); Master's degree (usually a 2-year programme) and a Doctor's degree (usually a 4-year programme).

The institutions of applied higher education are schools where students can obtain a higher education through studies toward diplomas. Their responsibilities are to provide an opportunity for post-secondary education, continuing education, and for conducting studies in applied research and development in their area (diplomas can usually be acquired in three years).

Noteworthy is the concept of state-commissioned education, which on one hand brings in financing from the public sector to post-secondary education and on the other hand allows direct education policy on a local and regional basis. Laws were passed, which gave the right to universities to charge fees for providing education, where either the student or some organisation pays for the student. The universities are using this to a large extent and this undoubtedly helps to increase educational funding.

As of January 1, 2005 there were 6 public universities in Estonia (Estonian Academy of Arts, Estonian Academy of Music, Estonian Agricultural University, Tallinn Pedagogical University, Tallinn Technical University, University of Tartu) and 10 private universities. In addition, there are 18 institutions of applied higher education.

2. A Brief Overview of Tallinn Pedagogical University (TPU)

Name of institution: Tallinn Pedagogical University

As at 01.01.2005.

Number of students: Diploma studies/BA: 5543 MA: 1310 PhD: 148

Facilities' area: 44760 m²

Number of teaching staff: full-time teachers 209, part-time teachers: 121

Faculties: 6 **Institutes:** 5 **Colleges:** 2 **Chairs:** 76

Number of curricula: BA: 44 MA: 70 PhD: 17

Average number of graduates during 2004: Diploma studies/BA: 863 MA: 286 PhD: 12

Location and contact data of Tallinn Pedagogical University are given in Appendices G1 and G2.

The Tallinn Teachers' Seminary, the forerunner of Tallinn Pedagogical University, celebrated its inauguration on the 15th of September, 1919. With this date modern teacher training in Estonia started. Estonia's most widely known and prominent schoolmasters worked in this seminary. In 1928 the establishment changed its structure and was renamed as **Tallinn Pedagogium**. The courses lasted for two years and grammar school, technical college and art college graduates were admitted. The academic reorganization at the Pedagogium followed the university model, as a result of which, craft, singing and music courses became available, with domestic crafts, horticulture and primary teacher training courses following a year later.

However, in 1937, this system was declared inefficient and the Pedagogium reverted to being Tallinn Teachers' Seminary. In 1940 the seminary moved from Vene Street to Narva Road, into the newly finished premises of the State English College (the present main building of the TPU). Seven years later the establishment was reorganized as the Tallinn Teachers' Institute with a 6-year course. The first 4 years of the course had a general syllabus, years 5 and 6 focused on teacher training. Departments were opened specializing in the Estonian language and literature, the Russian language and literature, English, history, physics and mathematics, and natural history and geography. Music and singing, art and technical drawing and physical education were also offered. Graduates were qualified to teach classes 5 to 7 (ages 11 to 13).

In 1952 the **Tallinn Teachers' Institute** became an establishment of higher education with 4-year full-time and 5-year part-time courses. In the course of time the scope of the establishment broadened. In 1965 the department of cultural studies opened and the librarianship and bibliography course was transferred from University of Tartu; two years later the courses in pre-school education and psychology were opened. Besides teacher training, one of the main functions of the institute was the development of academic research and passing of knowledge to future generations.

In 1992 the establishment was renamed **Tallinn Pedagogical University** (Appendices G1 and G2). In April of that year the first honorary doctors were inaugurated. In 1995 TPU was granted one of six official state charters under Estonian law. In 1997 the Institutes of International and Social Studies and the Institute of Ecology joined TPU from the Academy of Sciences. In 1998 the TPU Haapsalu College was founded and in 1999 the TPU Rakvere College followed.

TPU has formal agreements of co-operation (including co-operation in research) with a number of universities in Finland (University of Helsinki, University of Jyväskylä, University of Tampere, University of Turku, University of Lapland), in Sweden (the Stockholm Educational Institute, University of Göteborg, University of Karlstad, the Lund University), in Germany (the University of Kiel), in the Netherlands (the Delft University of Technology), in Belgium (the Gent University), in France (the University of Rouen), in the USA (the Armstrong Atlantic State University, the California State University) and others.

The last few years have been characterized by a wide reform of the learning programme for which a modular curriculum has been instituted, new Masters' and doctorate courses have been opened. The importance of TPU in Estonian educational and scientific life has been growing with every year. TPU is the fastest developed Estonian public university over the past decade. At the present moment: 6,864 students study at our university and the number of alumni reaches around 16,000.

The mission of the University is to prepare intellectuals and via research and development activities to increase the intellectual capital of Estonian society. The activities of the University support the formation of the human-centred and knowledge evaluating society in Estonia, where knowledge is held in high regard, where modernization and internationalisation are in keeping with the development of Estonian national culture, and where social security and economic advancement are equally valued. The primary task of the University is to generate a sufficient number of competent specialists for both the public and the third sector, especially in the sphere of education and culture. Promoting research activity enables the University to participate in the scientific discussion of Estonia and the world. The development activities are directed towards solving topical problems of society. The University sees its leading role in the development of teacher training in Estonia and thus recognizes its responsibility for granting the consistency of Estonian national culture.

In order to fulfil its mission the University cooperates with the general public, the City of Tallinn, media and politicians, but also with interest groups active in the sphere of education.

The University has got four distinct directions in its recent educational political resolutions:

- To increase the proportion of science and information technology;
- To increase the importance and capacity of the University (many institutes of the Academy of Sciences have joined, colleges in Haapsalu and Rakvere have been founded, new curricula are opened, the admission of students is growing, the amount of in-service training is on the increase, *etc.*);
- Cooperation with foreign universities and educational institutions, participation in international projects;
- Transition to the 3+2 curricula system according to the Bologna Declaration.

Academic Structure at TPU. There are six faculties at the university: Philology, Educational Sciences, Physical Education, Fine Arts, Mathematics and Natural Sciences, Social Sciences. The university has two colleges: Haapsalu and Rakvere. In addition, the Open University Continuing Education Centre and the Centre for Vocational Education belong to the university, as well as four research institutes: the Estonian Institute of Demography, the

Institute of International and Social Research, the Institute of Ecology, and Institute for Educational Research.

Management Structure at TPU. TPU is administrated according to the traditions within the context of Estonian laws and charters of European universities. TPU has a moderately centralised organisation with a three-level management structure (Appendix G3). The Rector of the University is the Head of Board of the University, which membership includes vice-rectors, deans, appointed professors, elected representatives from faculties and from the student body. The Board forms commissions (development, research, study, economics, information, ethics and others) that prepare issues within their areas of competence for discussion in the Board of the TPU and University Government. The University Government includes the members of the Rector's office, heads of administrative departments, deans of faculties and the heads of university institutions. The membership of the faculty councils includes a dean, vice-deans, heads of departments, professors and student representatives. The general departmental meeting includes all academic and administrative staff members of the department.

The development plans, policies and the organization of practical work at TPU are dealt with by: the Rector, Vice-Rectors, Board of University and Government of TPU.

Board of TPU:

- decides about the opening and closing of a speciality;
- approves of the general structure of curricula; Diploma, Bachelor's, Master's and Doctor's curricula and teaching regulations;
- establishes degree defence regulations and conditions, admission and graduation requirements;
- approves of the university budget and development plan.

When the Board ratifies a curriculum, it means that the curriculum is compatible with the Higher Education Standard and the general structure of the curricula at University. The Department of Natural Sciences is represented by 2 members in the Board of TPU: Prof. H. Kukk and Prof. J.-M. Punning.

Government of TPU:

- decides about all important educational political questions;
- works out the project of the university budget;
- prepares proposals about university admission and financing of student places.

The deans of all faculties belong to the University Government.

TPU Vice-Rector for Academic Affairs – her task is to manage the study activities in the university.

TPU Board's Study Commission:

- deals with development plans of teaching, educational policies and principles of the compilation of curricula;
- implements the expert analysis of curricula, taking into consideration the mission and orientation of specialities;
- works out proposals about the rationalization of curricula and organization of studies;
- deals with principles of quality assurance.

In the Study Commission there are representatives from all faculties.

TPU Research and Development Commission together with the Study Commission provides the Board of University with proposals about study and research activities, degree

studies and requirements for the academic staff. Works out the development plan, the code of law and projects about the structural changes of the University.

TPU Economic Commission is engaged in general issues of the University's budget, including large-scale purchases and sales (particularly concerning finances in connection with construction and real estate). Commission also keeps a watch on adhering to financial regulations, arrangement of public procurement competitions, etc.

Council of Faculty:

- solves the problems connected with study and research activities inside the faculty;
- deals with educational political questions in its field;
- provides the Board of University with proposals for the ratification of the curricula and study programmes of the faculty.

Dean is the head of a faculty, who is responsible for the development and condition of the faculty.

Academic department is the smallest administrative unit at TPU. A department is responsible for the design and realization of the curricula of its curated specialities. The head of a department is responsible for the development, condition and study activities of that department.

Chair or lectureship ensures the realization of studies and research work and their quality in its own field.

3. Study Process at Tallinn Pedagogical University (TPU)

The head of the academic department which conducts studies in a particular programme is responsible for fulfilment of the programme and quality assurance. The Faculty of Educational Sciences is responsible for the achievement of the aims in teacher training, coordinating its activities with the departments in charge of the programme and the respective subject methodologists. Chairs and lectureships conduct the study process and quality assurance within narrower fields and particular subjects.

Study Department

- Coordinates and organises the study process in the University, organises allocation of rooms and monitors their use. The department keeps the register of subjects and training programmes, improves and corrects the database. The department maintains the student database and prepares the required reports, issues documents confirming the studies and completion thereof and maintains the register of graduates of the University.

Dean's Office of the Faculty

- Documents students' academic progress, issues academic reports and nominates the grants, the grant committee also **includes a representative of the Student Board**.
- Prepares examination timetables by the beginning of the examination session and monitors completion of the curriculum.

Programme coordinator of the academic department

- Prepares timetables according to standard timetables.
- Organises registration of students in the studies and issues assessment sheets.

As of 2004 students use the electronic subject registration system. The system will soon be improved to allow students a rapid search for an overview of their academic progress.

The Board of the Department of Natural Sciences is responsible for the strategic organisation of studies (curricula, policies, *etc.*) and daily management of studies. The board also organises inspection and analysis of the practical organisation of studies. Achievement of subject-specific aims is the task of the head of the chair (lectureship) and members of the chair (lectureship).

The chair (lectureship) prepares a syllabus/subject programme for each particular subject which includes the content and volume of class and independent work, conditions of assessment, list of required reading, timetable of topics by lectures and/or seminars. The syllabi with conditions for taking examination/assessments are made available for the students at the beginning of the semester/first lecture.

The course system has been replaced by a system of subjects and the students have the right to select subjects according to self-designed study plans formulated on the basis of established requirements (pre-requisite subjects, require number of credit points, *etc.*).

The academic counsellor helps students with the above-mentioned activities; the dean's office exercises control.

The Department of Natural Sciences takes part in studies of other curricula, e.g. teaches chemistry and physics to students of vocational education, natural sciences (incl. biology) to students of educational sciences and didactics, physics to students of the Department of Mathematics, subjects in chemistry to students of craft and home economics, subjects of biology and geography to students of recreation, and services general and interdisciplinary electives e.g. *Developmental Studies, A Sustainable Baltic Region, Chemistry of Life, Introduction to Environmental Studies, etc.*

4. Curricula Development at Tallinn Pedagogical University (TPU)

Curricula development is tightly connected with developments in the Estonian education, including higher education, as well as in the European Union and the world.

The general structure of curricula is uniform and it has been worked out by the Study Commission of the Board of the University and approved by the Board of the University. The respective departments according to certain confirmed rules draw up the objectives of the curricula and education programmes within them. After the discussion in the faculty council they are presented to the Study Commission for amendments and additions. The final version of the curriculum is presented to the Board of the University for approval. The fact that curricula are published in the University Catalogue both on paper and in electronic version indicates that their objectives are made fully open to public.

Before June 1, 2002 the so-called **old 4 or 4+2 curricula** were registered by the Ministry of Education and Research and have been built up according to the scheme given in Figure 1.

Until the school-year 2002/03 the admission into Bachelor's level took place according to the following principles:

- The aim of Bachelor's studies is to deepen general education, to provide the students with sufficient theoretical knowledge and skills to start work in the chosen field of study or to continue their studies.
- The volume of Bachelor's programmes is 160 to 200 (together with teacher training) credit points (4-5 years).
- Bachelor's studies end with the defence of a Bachelor's thesis and receiving of either the *baccalaureus artium* or *baccalaureus scientiarum* degree according to the curriculum.
- A person who has completed Bachelor's studies shall be awarded a diploma certifying the Bachelor's degree together with an academic report. The university shall also issue, free of charge, a diploma supplement in English if the person so requests.

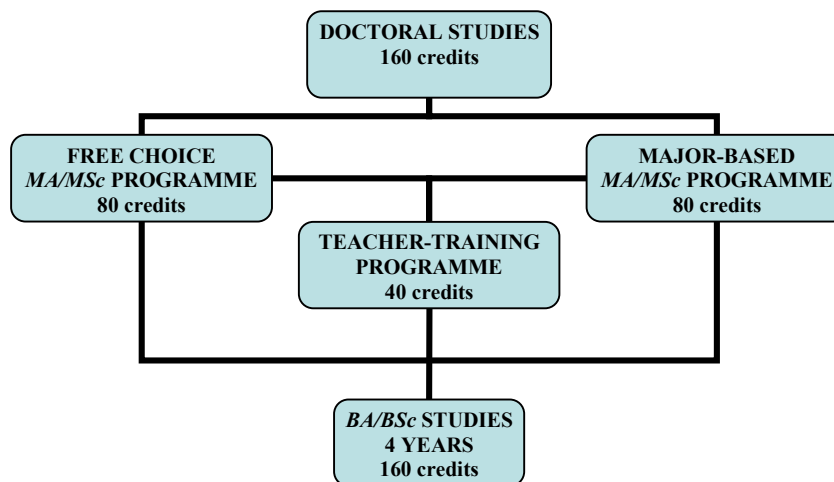


Figure 1. The system of studies in the Tallinn Pedagogical University (TPU) (before 2002)

The mentioned Bachelor's curricula have the following structure:

- **general subjects** (~20 CP)
(foreign language, informatics, social sciences);
- **major** at Bachelor's level (75 – 95 CP)
a block of subjects in the curriculum which determines the conferred degree;
- **minor** (additional curriculum) (30 - 40 CP)
a block of subjects that a student can choose in addition to his/her major and which is offered as a part of the major curriculum;
- **elective subjects** (5-10 CP)
subjects which are independently chosen by a student from the subjects taught at TPU or other universities in addition to major and minor courses to complete one's curriculum;
- **(teacher training 40 CP)**

In each complete Bachelor's programme one can distinguish the following levels, and moreover, each level contains the ones preceding it:

- lower level (*approbatur*) 15 CP
- intermediate level (*cum laude approbatur*) 35-45 CP
- upper level (*laudatur*) 70-95 CP

At lower level the aim is to provide a systematic introduction to the curriculum, at intermediate level to give basic knowledge about the curriculum. The studies at upper level ensure advanced knowledge in the curriculum and at the same time prepare the student to continue his/her studies at Master's level.

The main emphasis lies on a major subject. If at intermediate or upper level a major branches off, the curriculum may arise from the chosen branch. In other cases, the items in the curriculum and major coincide. A major programme ends with the compilation and defence of a Bachelor's thesis (10–15 CP). Thus, the volume of studies in a major is 85-110 CP.

In addition to the major programme and general subjects a student has to study also one or more minor subjects, the volume of which depends on the curriculum (30 - 40 CP). Students choose minors according to their interests and also take into consideration the needs of their future employers. Minors are formed by the lower and intermediate levels of any major programme. Students can take up a minor also in another university if that is accepted by the department. The curriculum might contain recommendations about the choice of minors. At Bachelor's level at least one minor (15 CP) should be available for students to choose freely. The combination of major and minor subjects also determines whether it is possible to continue one's studies at Master's level.

A student who wants to acquire the teacher's profession should take up a special teacher training programme (40 CP), which involves educational subjects and didactics of the major together with a professional placement at school. It is possible to pass that programme also after graduation – this means studying for one more year.

According to the **Master's curricula** registered among the curricula of the Ministry of Education and Research before June 1, 2002, the studies are based on the following principles:

- The Master's programme involves studies at the second level of academic education with the objective of creating opportunities for Master students to acquire an education with a more focused professional specialization, to develop skills for planning, performing and applying the results of research, and to write and defend a Master's thesis.
- Master's degrees are divided into research and professional degrees.

Both the Master's and the Bachelor's curricula to be accredited contain the following material:

1. Study programme (consists of subjects)
2. Course description
3. Syllabus (the calendar plan of the course which is given to students by the Chair)

Each study programme consists of certain subjects. The outline of a subject is given by the course description together with a list of required and recommended reading. It also contains the code of the subject, title, volume, method of assessment, prerequisites, short description of the subject and name of the instructor. Learning methods include a lecture, seminar, practical class, report, work on literature and other types of auditory and independent work. The amount of independent work makes up about 50 % of the time spent on the subject.

The process of teaching the subject is reflected in the syllabus, which the students receive from their Chair. In addition to the information given in the course description, the syllabus also includes the description of independent work, methods of checking work during the semester, a list of study literature, topical plan of practical classes and seminars, requirements

for exams and assessments. The syllabus is made available for students right at the beginning of a semester.

Since the academic year 2002/2003 curricula of the university have undergone fundamental changes. Transition to the 3+2 study system (3 years of Bachelor's studies + 2 years of Master's studies) brought along new curricula that do not merely offer the students knowledge in the area of specialisation, but also guarantee their sufficient social competence, develop readiness for lifelong learning and create the opportunity of transition between the curricula as well as universities. By now the transition process from the local credit point system to the European one (ECTS) has been initiated. One academic credit in Estonia is calculated as 40 hours of work. This may be awarded for the participation in lectures, independent work or any other combination of 40 hours of student work. **One academic credit in Estonia equals approximately to 1.5 ECTS credits. ECTS credits express a relative measure of the student workload.** In ECTS, 60 credits represent the workload for the full academic year of study. In order to obtain a Bachelor's degree at the TPU, the students are required to achieve minimum 120 credits (180 ECTS) over the three years of study and a Master's degree either in one year study – 40 credits (60 ECTS) or two-year study – 80 credits (120 ECTS).

General objectives of the curricula in the University are the following:

- To create conditions, at all levels of study at the University, for obtaining education based on the integration of educational, research and creative activities, at all levels of study.
- To promote science in the University's fields of study.
- To enable opportunities for lifelong learning and offer necessary service for education, research and development.

The new 3+2 system gives the students a wider range of choice after completing the Bachelor's programmes. For instance, the graduates of *Biology (With Second Subject)* Bachelor's programme can choose between several programmes at Master's level: *Biology, Geo-Ecology, Teacher of Biology, Teacher of Natural Sciences, Environmental Management, etc.* The most successful graduates of the Master's programme can apply for the doctoral studies. In addition, they may continue their studies on the basis of open master's programmes of TPU (e.g. Communication, Educational Management, Teacher of Creative Activities, Conference Interpreting, Translation, Recreation Management, etc.).

The system 3+2 can be illustrated as follows (*Regulations for the Organization of Studies* <http://www.tpu.ee/editmode/english/studies/regStudies.pdf>):

General subjects	15-20 credit points
Focus subjects	15-20 credit points
Core subject	45-60 credit points
Bachelor's thesis or exam	4 credit points
Minor subject I	15 credit points and/or
Minor subject II	15-30 credit points
Electives	6-9 credit points

Updated versions of the Regulations for the Organization of Studies are published in the Subject Catalogue of TPU and are also displayed at the website of the University (www.tpu.ee). Changes in the organization of studies are made with the resolutions of TPU Board or the Vice-Rector of Academic Affairs.

The students are admitted to the *BSc* studies; however, the graduates of a *BSc* programme can continue their studies in an *MSc* programme corresponding to their specialisation. The public educational demand compiled by the state determines the number of Master's degree specialists required. At the same time, the state obligates the University to create 1.5 times more *BA/BSc* student vacancies than *MA/MSc* vacancies. For example, if the state demand for Biology (With Second Subject) *MSc* students is 20, based on this, the University has to create 30 student vacancies at *BSc* level. The *BA/BSc* curricula of Tallinn Pedagogical University have been compiled according to the fields of study.

According to the new curricula proceeding from the Bologna Declaration the system of studies at the university can be characterised as follows:

The study load is calculated in credits (CR). One credit corresponds to 40 hours of studies, from which at least 50 per cent is individual work.

The *MA/MSc* curricula are specialisation-based and illustrated in Figure 2:

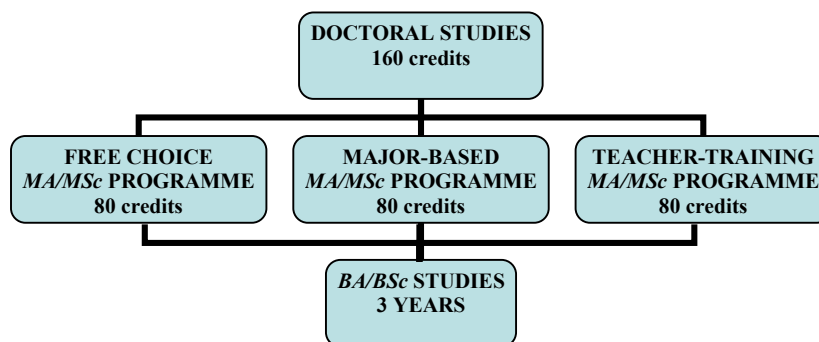


Figure 2. The system of studies in the Tallinn Pedagogical University (TPU)
(since 2002)

The fields of study in the TPU are:

- Humanitarian sciences
- Social sciences
- Natural sciences
- Exact sciences
- Teacher training.

The *BA/BSc* curricula are specialisation-based and consist of following modules:

- **General subjects** (15-20 CP) are the subjects that apply for the whole field of study. Besides the basic subjects, electives (3-6 CP) offering social competence required at contemporary labour market are available.
- **Focus subjects** (15-20 CP) are combined within the field of study (combined between some of the curricula of the study field).
- **Major subject** (45-60 CP) gives the student systematic knowledge of the theories, research methods, current achievements and main discussion topics of the study field, as well as skills to implement this knowledge in practical work

- **Minor (15 CP)** consists of a whole block of subjects that offer required knowledge and skills for a specific segment of the labour market. Minor is not a part of any other curriculum, but a specially created independent block of subjects (for example Adult Education, Project Management, Public Relations, Literary Translation and Editing, Language Editor, Non-Profit Management, Multimedia, etc). The objective of the minor is to offer additional knowledge that is likely to be required in the students' future work. The minor can contain subjects that are taught within some other curricula. The 15 CR minor can be chosen freely.
- **Minor (30 CP)** is a part of those teacher-training curricula that are focused on preparing teachers of several subjects. The minor of 30 credit points is a part of the major curriculum in a module form. The choice of minor of 30 credit points can be limited due to the objectives set by the major curriculum (often require compulsory or recommended minors).
- **Elective subjects** can be chosen from amongst any TPU or other university's subjects. In case of student's poor computer- and/or language skills, it is recommended that one of these subjects is selected.

At the end of BA/BSc programme, a Thesis is defended or an exam given. All graduates are free to apply for the Masters studies, but they can also enter the labour market and receive in-service training already at work.

The objective of the curricula of future University of Tallinn is to prepare individuals with comprehensive education and wide range of knowledge, with competence in one or several specialisations. The future university would also value both, research and creative potential.

After the completion of the curriculum and defence of the final paper or gaining a pass in the final examination, the graduate of the university shall be issued a diploma and academic report documenting the issuance of the degree and/or the completion of the curriculum. The statute and procedure for the issuing of diplomas and academic reports is enacted by the regulation of the Government of the Republic, "Statute and Forms for Diplomas and Academic Reports" (RTI, 19.03.2003, 29, 175).

5. Faculty of Mathematics and Natural Sciences

The number of BA/BSc, MA/MSc and PhD students in the Faculty as of November 2004: 1118.

The number of curricula: 10 BA, 21 MA and 1 PhD curriculum.

There are 14 PhD students.

In the last three years 91 MA/MSc theses and 7 PhD dissertations have been defended in the Faculty.

The Faculty of Mathematics and Natural Sciences was established in 1952 and is one of the oldest faculties of the University.

In 2004 there are four departments in the Faculty:

- Department of Mathematics
- Department of Natural Sciences
- Department of Computer Science
- Department of Craft and Vocational Education

The Faculty of Mathematics and Natural Sciences (see Figure 3 and Appendix G4) prepares teachers and specialists in mathematics, computer science, physics, geocology, biology, environmental sciences, natural sciences, craft and home economics, vocational pedagogics, craft and technology education. The research of the **Department of Natural Sciences** focuses on the following topics: natural and man-generated factors of the development of landscapes and ecosystems; describing and modelling the processes of substance circulation in coastal sea and different lake types of Estonia; stochastic processes and their interdisciplinary applications; interdiffusion in metal systems; structural research and biotechnology of algal polysaccharides. The department is involved in international cooperation with Helsinki, Uppsala, Stockholm, Kiel, Turku and other universities.

The main areas of research of the **Department of Mathematics** are: algebraic structures; geometry of figures; summation theory of lines; harmonic analysis and approximation theory; problems of the curricula and textbooks of school mathematics; methods of educational research. TPU has been very successful in training teachers of mathematics. Most school textbooks of mathematics in Estonia are written by the members of the Department of Mathematics of Tallinn Pedagogical University.

The main areas of research of the **Department of Computer Science** are information technology and its methods of teaching.

The topics of research of the **Department of Craft and Vocational Education** are of scientific or applied character and are mainly focused on modernising the study process at the university, general educational schools and vocational schools: “The concept of contemporary tuition of Craft and Home Economics, which takes into account the development of an informed consumer and promoting his/her social maturity”, “The didactic system of craft in the conditions of Estonian folk traditions”, “Theoretical and practical sources of the reciprocal relationship between theoretical and practical vocational education”.

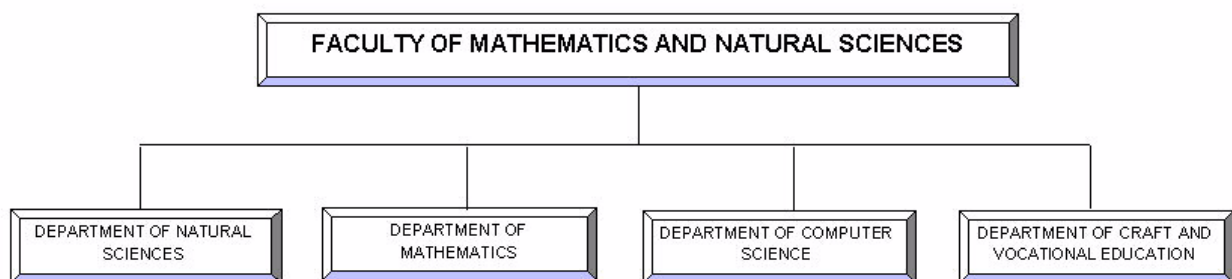


Figure 3. Structure of the Faculty of Mathematics and Natural Sciences.

The TPU Faculty of Mathematics and Natural Sciences is the only higher education establishment in Tallinn to work on complex development of natural sciences (physics, chemistry, biology, geocology) and mathematics and to offer post-graduate studies in them. For decades the faculty has been the only institution in Estonia to train craft and vocational education teachers. The demand for the graduates of the Faculty of Mathematics and Natural Sciences is ever growing; it is especially big regarding computer technicians, teachers of natural sciences, physics, mathematics, and craft, as well as specialists (meteorology, environmental management, geocology, etc). **The objectives of the Faculty lie in improving and modernising academic and research activities, placing importance on Estonia’s partner relationships as a member state of the European Union. The goal is to**

make modern higher education available both on the bachelor studies' level, and on the master's and doctoral studies level, as well as conduct high level research.

TPU has been very successful in training teachers in mathematics and natural sciences. A major amount of school text- and work-books in Estonia after the Second World War have been written by the university teachers of the Faculty of Mathematics and Natural Sciences (e. g. A. Telgmaa, O. Nilson, E. Prikk, K. Kärk, R. Kolde, T. Tönso, H. Karik, V. Ratassepp, Ü. Ugaste, T. Elvisto, E. Lind, K. Pappel, *etc.*).

Proceeding from the missions of Tallinn Pedagogical University as a whole, the objectives, tasks and the responsibility of the Faculty of Mathematics and Natural Sciences are fixed in the resolutions of the TPU.

6. Department of Natural Sciences

The number of BA/BSc, MA/MSc and PhD students in the Department as of January 2005: 338.

The number of curricula: 5 BA, 11 MA and 1 PhD curriculum.

There are 13 PhD students.

In the last three years 30 MA/MSc theses and 7 PhD dissertations have been defended in the Department.

The number of the teaching staff: there are 29 full-time members of the teaching staff.

The mission of the Department of Natural Sciences of TPU is to support the sustainable development of the Estonian society and state through preparing intellectuals in the field of natural sciences, their research work and application of results, and academic partnership.

The Department of Natural Sciences in the frame of the Faculty of Mathematics and Natural Sciences of the Tallinn Pedagogical University (TPU) was founded in 1993. Teaching natural sciences in connection with teacher training has been carried out under different structural units during the whole existence of TPU. The Department of Natural Sciences prepares teachers of natural sciences and specialists on environment. It consists of the Chair of Biology, the Chair of Geo-Ecology, the Chair of Chemistry, the Chair of Applied Physics, the Chair of Theoretical Physics, and the Lectureship of Environmental Management (see Figure 4). The research of the department focuses on the following themes: dynamics of associations in technogenetic ecological systems; describing and modelling the processes of substance circulation in coastal sea and different lake types of Estonia; stochastic processes and their interdisciplinary applications, including diffusion processes in complex systems; structural research and biotechnology of algal polysaccharides etc.

The first specialists in the field of biology-chemistry (a joint speciality) got their schooling at Tallinn Pedagogical Institute right after the Faculty of Mathematics and Natural Sciences had been founded in 1952. The 1960ies and 70ies in Estonia were characterized by several educational reforms, which were carried out by the spirit of socialist centralization. On request of the Communist Party of the Estonian Soviet Socialist Republic, the teaching of natural sciences, continued only in University of Tartu. On Nov 24, 1997 M. Klaassen (the former Minister of Education of Estonia) and M. Arvisto (the former rector of TPU) signed an agreement according to which the Institute of Ecology became an autonomous research institution of TPU. On May 9, 1997 TPU signed a cooperation agreement with the Estonian

Marine Institute (University of Tartu). These two documents laid the modern foundation for the study and research work in the Chairs of Biology and Ecology.

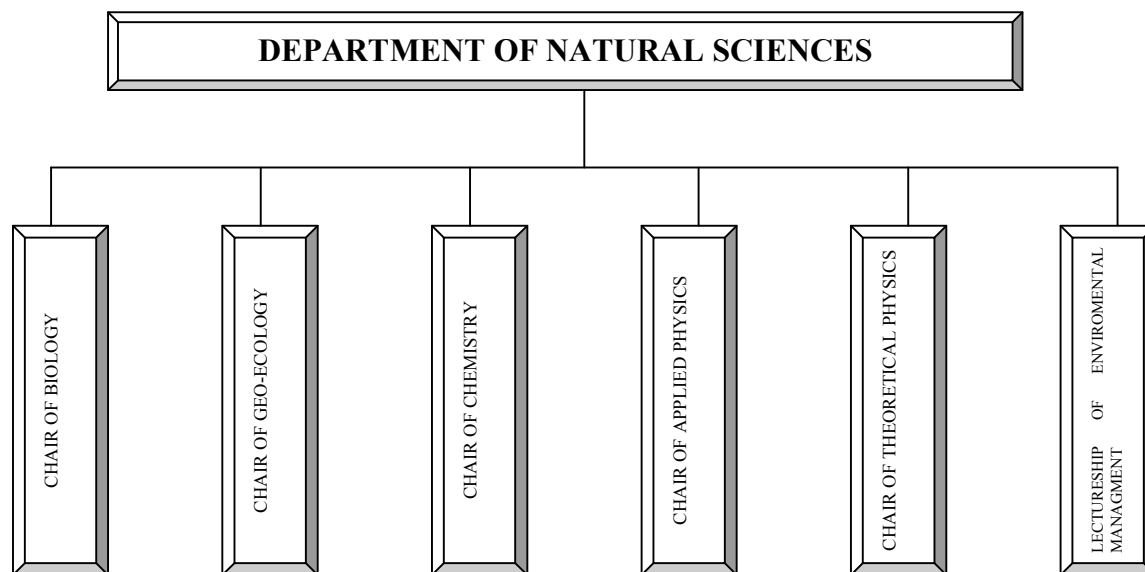


Figure 4. Structure of the Department of Natural Sciences.

Scientific activities of the Department covers research in biology, geocology, environment management and environmental situation assessment, chemistry, physics and didactics. The main fields are: natural and man-generated factors of the development of landscapes and ecosystems, transportation of substance and energy and its regulation in coastal sea at various production levels, preparation and application of didactic aids for teaching natural sciences in comprehensive school, and application of stochastic processes in research of open systems (Appendix G5). The number of topics and sub-topics being worked on in the department was 19 in 2004. The department's teaching staff participated in the completion of two international research projects, six grants of the Estonian Science Foundation, three topics with targeted financing and three topics on a contractual basis.

The teaching staff worked in the following international research projects in 2001-2004: Prof. Ü. Ugaste – INCO-Copernicus, contract No ER BIC 15cT980811 and International Atomic Energy Agency, contract No. 12062/R0/PBF; Ass. Prof. T. Elvisto, Prof. H. Kukk – A Sustainable Baltic Region, The Baltic University Programme – A Regional University Network and Environmental Science for the Baltic Sea Basin, The Baltic University Programme – A Regional University Network; Ass. Prof. M. Harak – an international project Sustainable Water Management, The Baltic University Programme, A Regional University Network; Ass. Prof. E. Karofeld – European Commission 5th Framework Project ACCROTELM Abrupt Climate Changes, Recorded Over the European Land Mass: Multi Proxy Records of Late-Holocene Climate Variability in Europe. European Commission Contract No EVK2-2002-00166; Ass. Prof. A. Lõoke – project Lipoprotein Lipase Binding to Vascular Endothelium; assistant lecturer T. Ploompuu – international project Quantification of Alkaline and Acidifying Deposition Loads from Estonian Industry; senior research fellow P. Reiska – research project Physiklernen und Handeln of Kiel University.

Beside the above-mentioned projects research of teachers and students is financed from various research and study foundations of the university (TPU Science Foundation, TPU Study Foundation, *etc.*) and academic departments.

All the chairs cooperate with Estonian or foreign universities. The most successful in terms of contracts is the Chair of Geo-Ecology which has bilateral contracts with London University, Ioannina University, Umea University and Uppsala University within the Erasmus Programme. The department has research and study contacts with Helsinki University, Turku University, Kiel University, Institute of Biophysics of the Free University of Berlin, Armstrong Atlantic University (USA), Eindhoven Technical University, Savannah University, Krakow University of Mining and Metallurgy, Gdansk Technical University, Moscow Institute of Material Sciences, Institute of Organic Chemistry of Russian Academy of Sciences, Warsaw Institute of Plasma Physics, and many others. There are plans to strengthen these relations in the near future, especially by our own stronger contribution to make the relationships more efficient.

The following staff have worked and delivered lectures abroad: Prof. J.-M. Punning (Ioannina University, Greece), Prof. Ü. Ugaste (Warsaw Institute of Plasma Physics and Laser Microfusion, Poland), Ass. Prof. A. Lõoke (Umea University, Sweden), Ass. Prof. T. Elvisto (Turku Polytechnic, Finland), P. Reiska (Kiel University, Germany), A. Metsis (Laboratory of Parasitology, Statens Serum Institut, Copenhagen, Denmark and Karolinska Institute, Sweden), and Ass. Prof. M. Harak (Free University of Berlin, Germany).

Prof. J.-M. Punning is a member of the General Assembly of the International Geography Union; Prof. H. Kukk is a member of the Committee of the Baltic Marine Biologists; Prof. Ü. Ugaste is a member of the Pre-University Section of European Physical Society Education Division; Ass. Prof. T. Elvisto is a member of the EUROBIO Council. Five teachers of the curriculum of natural sciences are members of subject committees of the Ministry of Education and Research. Ass. Prof. K. Truus, Prof. T. Laas and Ass. Prof. E. Karofeldt are advisers in the expert committee of acquisitions of the TPU Academic Library, the TPU Library (a study library) and the National Library of Estonia.

In 2000-2004 the teaching staff published 169 papers, 74 of them in international journals with wide-spread distribution; 66 conference abstracts, including 55 international ones as well as two collections and numerous other publications. The number of publications has increased from year to year.

The staff have participated in writing 25 textbooks for comprehensive school and six for higher education, and numerous other study materials including those published on the Internet and university intranet. The list of publications in the last five years is in Appendix G6.

Several research topics in the Department of Natural Sciences have been internationally evaluated. In 2000 those of the curriculum of ecology were evaluated. The research group of paleoecology led by Prof. J.-M. Punning was graded as “excellent” and the research group of wetlands led by Ass. Prof. E. Karofeldt as “good”.

Two research topics in the curriculum of physics were evaluated in the spring of 2001: “Stochastic Processes in Open Systems” (project manager R. Mankin) was graded as “good”; “Didactical Issues of Teaching Physics in the Conditions of Estonian Educational Reform” (project manager Ü. Ugaste) was also graded “good”.

Evaluation of educational sciences at TPU incl. didactics of natural sciences was carried out in the autumn of 2002 and was assessed as “good”.

Bachelor and Master Students are largely involved in the research carried out in the Department.

High standards of the staff are characterised by the results of student papers they supervise at the TPU competition of research papers. In 2002 ten students of the Department received awards in this competition, 11 in 2003. The student Liisa Puusepp won the first prize at the competition in 2002. Students who are supervised by the staff of the Department have successfully participated in national competitions. For instance, in 2003 these students were awarded prizes: Alar Mägi's research article (with co-authors) – the winner of the Swiss Baltic Net Graduate Awards; Hele Kiimann – 2nd prize in the competition of student papers of the Estonian Academy of Sciences; Tiit Vaasma – a diploma in the student research competition of the Estonian Ministry of Education and Research in the field of biology and geology; Tambet Lember – 2nd prize in technical sciences and Astrid Haljas – 1st prize in exact sciences.

The staff of the Department have been active in education policy-making. Five of them have been long-term members of subject committees of the Ministry of Education and Research (T.Elviso, Ü.Ugaste, A.Saar, P.Reiska, M.Harak). The teaching staff are involved in working out and development of the new national curriculum of basic and upper secondary schools, and of vocational schools, and in reviewing and approval of textbooks for primary, basic, upper secondary and vocational schools, etc.

Several teachers (Ass. Prof. T. Elvisto, lecturer S. Siska, Prof. Ü.Ugaste *etc.*) have been actively participating in the committees of the State Examination and Qualification Centre of the Ministry of Education and Research, which organise and conduct state examinations in physics, biology and geography.

The department secures teaching of natural sciences in the curricula of class teacher and recreation management.

Funding. The total budget of the Department of Natural Sciences for the year 2004 was 6,198,750 EEK, which was divided as follows:

salaries 81%

library 1%

information technology 2,5%

equipment 10,1%

student allowances 2%

other purposes 3,4%

In the Department both state commissioned students and non-state commissioned students study. The average cost of a credit point is 650 EEK. The Department is allocated funds for carrying out studies according to the volume of the BA/BSc and MA/MSc studies during a financial year, the number of state commissioned student places and the total amount paid for non-state commissioned studies. The basis for calculating the volume of studies is the prognosis of student credit points coordinated with Study Department, which is multiplied by the coefficient of the study field approved by University Board and the cost of a credit point. The resulting sum is allocated to the budget of the Department. For each state commissioned student the Department has to pay 10 per cent of the basic cost of a state commissioned student place to the budget of the faculty, from the tuition fee received from non-state commissioned students, 20 per cent has to be paid to the budget of the faculty.

Head of the department is responsible for budget management.

A provisional budget for the year 2005 is still in development. As the number of state-financed study places will be presented only in May, it is not easy to draw up the budget.

The vision of future development of the department until 2012 is presented in the Development Plan of the Department of Natural Sciences (see Appendix G7).

A short comparative overview of development plans of teaching activities are listed in the table below:

Table 1. Comparative overview of development plans

Tallinn Pedagogical University, 2001-2005	Faculty of Mathematics and Natural Sciences 2002-2005	Department of Natural Sciences 2002-2005
In 2002 introduces 3+2 system	Gradually transforms curricula into 3+2 system	Elaborates postgraduate programmes further, including full accreditation of all curricula; Opens a new PhD curriculum
Implements a quality assurance system	Implements a modern system for updating of curricula, engaging employers, representations and alumni. All curricula own accreditation by 2005	Guarantees permanent updating process of courses. Regularly evaluates subjects, takes students, evaluation records into account in remuneration of teaching staff
Introduces a model of lifelong learning, based on holistic approach to the pre-service and in-service training	Provides up-to-date university education at bachelor, master and doctoral levels and develops in-service training	Compiles the curricula with the need for later in-service training in mind
Updates learning process by using ICT and active learning, increases role of session-based learning, creates joint curricula, increases role of individual work, creates and disseminates modern study materials	Implements ICT for education, especially for distance learning; Compiles and translates study materials and textbooks	Supports the development of various teaching methods, more attention is paid to web-based learning (electronic study materials); Complies study materials and textbooks

Tallinn Pedagogical University, 2001-2005	Faculty of Mathematics and Natural Sciences 2002-2005	Department of Natural Sciences 2002-2005
Expands significantly enrolment in and graduation from MA programmes	Facilitates graduating within nominal study period	Makes efforts to increase the number of BA and MA/MSc students graduating within nominal study period
Increases the share of foreign students and visiting professors	Facilitates international mobility, incl. Erasmus exchange	Seeks possibilities to take PhD and MA/MSc studies partly abroad, develops international student exchange and networking
Elaborates an information system for study purposes	Elaborates a information system for study purposes	External and internal communication is linked to the ICT solutions and department's website
Involves TPU research institutes more intensively into teaching, especially at MA and Doctoral levels	Facilitates cooperation with TPU research institutes in research and teaching	Organizes regular research seminars jointly with the Institute of Ecology to enhance communication between teachers, researchers and graduate students
Facilitates admission of Russian-speaking school leavers into curricula with Estonian language of instruction	Facilitates university studies of Russian-speakers	
	Develop the laboratory bases necessary for studies	Modernisation of the existing study and science laboratories and planning new laboratories

Location on contact of Tallinn Pedagogical University

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Lectureship of Environmental Management	Tõnis Põder	P-221	Phone (+372) 6409 466 tonisp@tpu.ee

Location of Tallinn Pedagogical University buildings

Most of TPU buildings are located in the centre of the city. The central campus on Narva Road includes the main building, the language building and the students' residence building in Karu Street among others. In addition to that there are buildings in Pirita, Lasnamäe, and the old town.

The following abbreviations are used to denote the principal buildings:

The main building (peamaja) - P (Narva Road 25)

The language building (keeltemaja) - K (Narva Road 29)

The sports building (spordimaja) - S (Narva Road 25)

The craft department workshops (töökodade maja) - T (Narva Road 25)

The art department building (kunstiosakonna õppehoone) - J (Narva Road 25)

The administration building (haldusmaja) - H (Narva Road 27)

The faculty of fine arts (kultuuriteaduskonna õppehoone) - L (Lai Street 13)

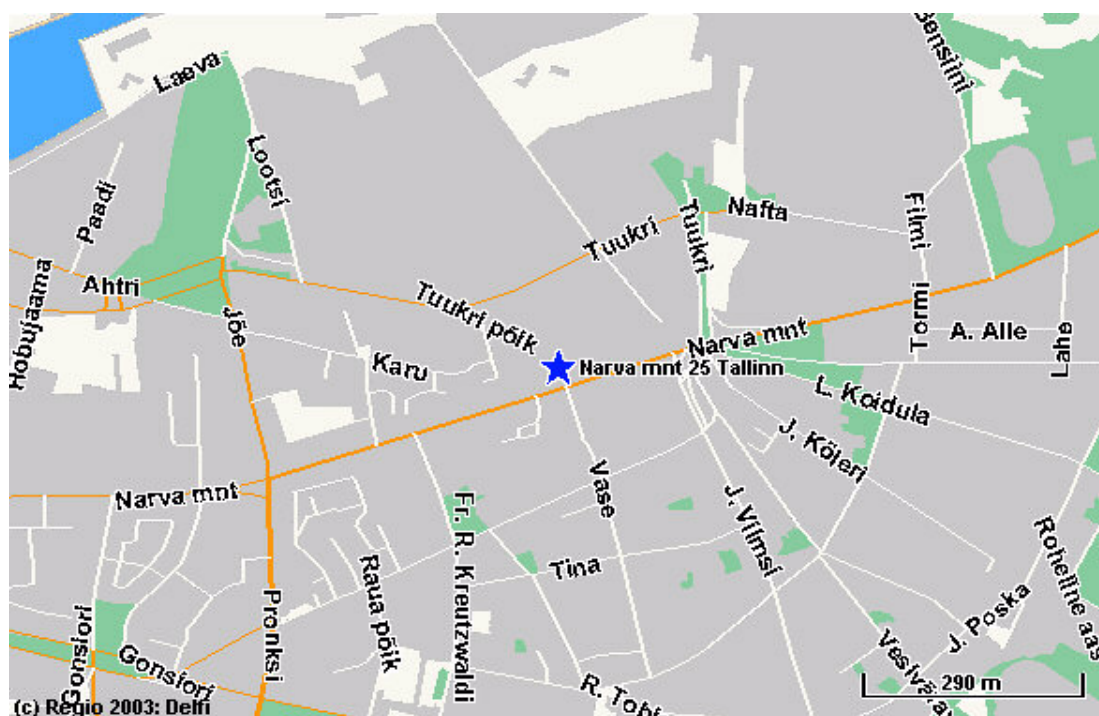
The faculty of educational sciences (kasvatusteaduste teaduskonna õppehoone) - Vi (Viru Square 2)

The faculty of physical education (kehakultuuriteaduskonna õppehoone) - Pi (Regati avenue 1)

The department of professional development (täienduskoolituseosakonna maja) – Raadiku tn 8 and Valge nt 10. The adult education centre (täiskasvanute hariduse keskuse maja) - La (Lasnamäe 52)

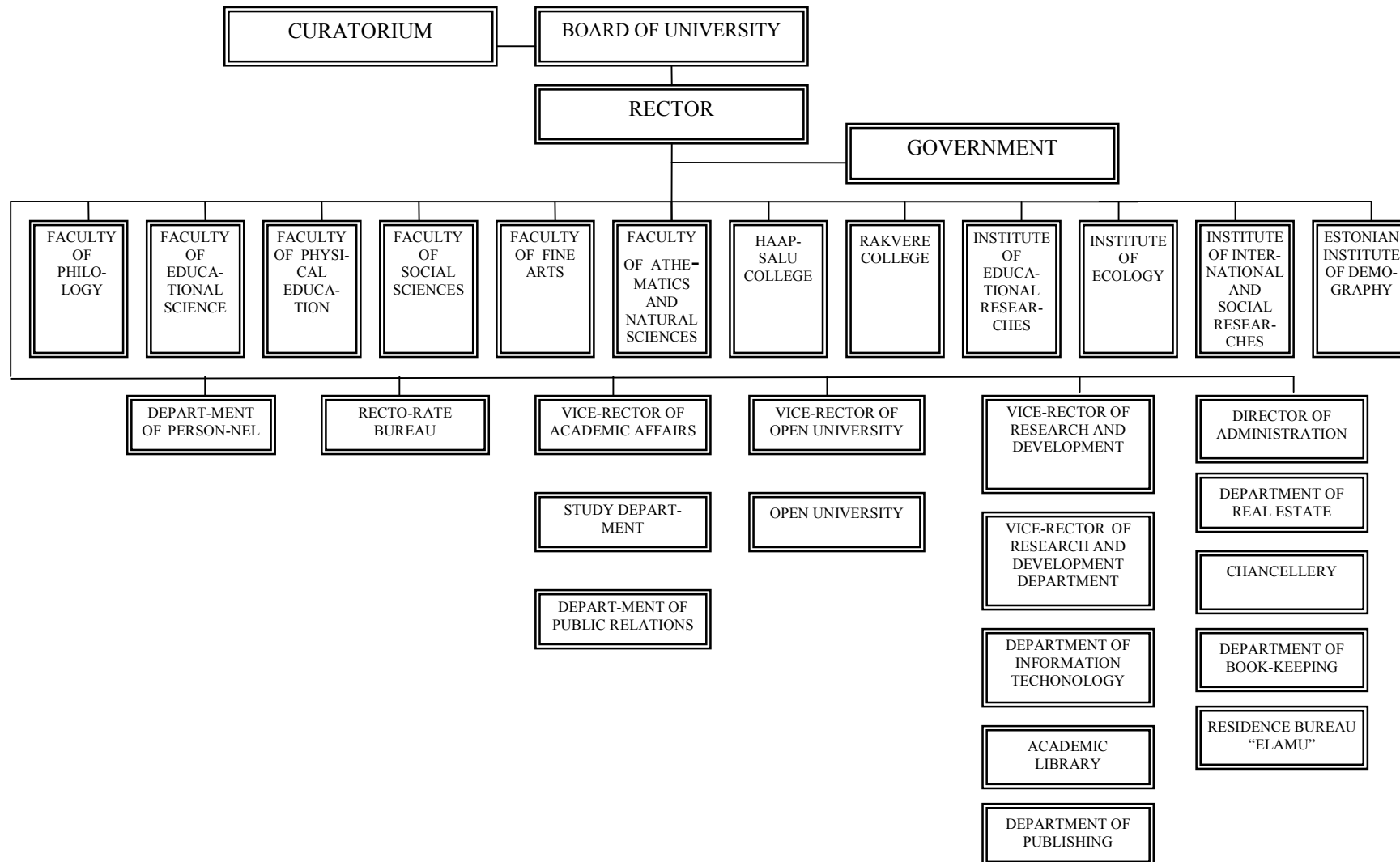
The rooms of the university are labelled in university publications according to the building, floor, letter and number of the room.

For example, P-233, main building, 2nd floor, room 223.

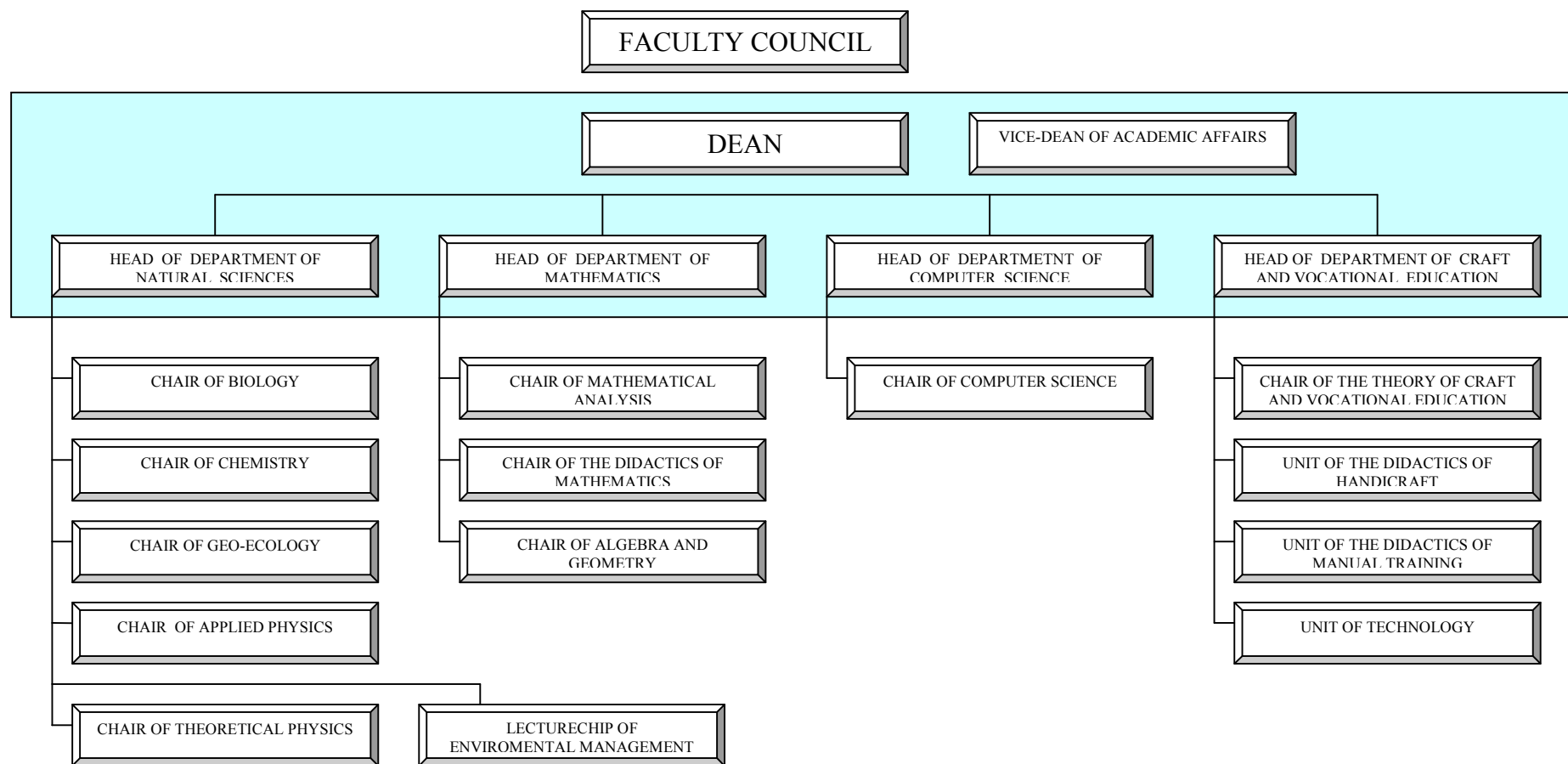


Location of Main Building (peamaja) of Tallinn Pedagogical University (Narva Road 25)

Structure of Tallinn Pedagogical University



Structure of Department of Natural Sciences and Faculty of Mathematics and Natural Sciences of Tallinn Pedagogical University



Research and development in chairs of Department of Natural Sciences

Chairs of physics

Principal research topics in the chairs of physics are wave processes in curved space-time, application of stochastic processes in the research of open systems, and diffusion processes in binary and multi-component systems. Research in didactics: issues in training teachers of physics under the conditions of comprehensive school curriculum reform, implementation of the new physics curriculum in school: issues and perspectives and use of Concept Mapping (CM) in teaching physics and other sciences. An optimum use of CM dependent on criteria of concept map compilation and pupils' age. Physics and physics didactics are being developed into an inter-related system in the teaching process to overcome earlier relative separation in the chairs of physics.

Two themes "Stochastic processes in open systems" (theme leader Romi Mankin) and "Didactics problems of teaching physics in the conditions of educational reforms in Estonia" (theme leader Ülo Ugaste) were evaluated by international expert team in 2001.

Our staff have made presentations in many international conferences. Methodologically these have been based on fundamental research (in stochastic processes, incl. diffusion processes, field theory) conducted by the teachers and researchers as well as on student papers they have supervised. More than 30 publications have appeared in peer-reviewed international journals in the last five years as an output of fundamental research. Two Estonian Science Foundation grants are under way and one project co-ordinated by International Atomic Energy Agency (Contract EST-12060/R0).

A number of master's papers have been successfully defended (6 papers in the last 3 years), Associate Professor Tõnu Lass defended his PhD at the University of Tartu, assistant teacher A. Haljas is studying in the doctorate programme at the University of Tartu. The teaching staff have extensive international connections – Estonian cooperation partners are Tallinn Technical University, the University of Tartu, the Estonian Maritime Academy, Kiel University in Germany, Helsinki University in Finland, Eindhoven Technical University in Holland, the Institute of Material Sciences of Russian Academy of Sciences, Warsaw Institute of Plasma Physics and Laser Microfusion and single contacts elsewhere.

Chair of Biology

The fields of fundamental research are transportation of substance and energy in marine ecosystems (with the Estonian Marine Institute/), physiology of insects (with Estonian Agricultural University), anthropogenic changes in ecosystems, taxonomy, floristics and faunistics. The teaching staff participates in international programmes and projects: Prof H. Kukk and Associate Professor T. Elvisto teach the courses *Baltic Sea Environment* and *Sustainable Baltic Region* at Tallinn Pedagogical University, which are developed by an international network Baltic University (the secretariat is located by Uppsala University, Sweden).

The master students of the chair can choose between five master's programmes: 1) biology (ecology) wherein they specialise in one of three areas – plant ecology, animal ecology or marine biology; 2) master of educational sciences (didactics of biology); 3) master of

educational sciences (didactics of natural science) 4) master of pedagogics (didactics of biology); 5) master of pedagogics (didactics of natural science). In 2001-2003 Professor H. Kukk, Associate Professors T. Elvisto and M. Harak supervised the defended papers as follows: 9 master's degrees in biology (ecology), 2 master's degrees in educational sciences of didactics of natural science, 1 master of pedagogics of didactics of biology, 2 master's degrees in pedagogics of didactics of natural science, 14 students altogether.

Associate Professor T. Elvisto is member of the Biology Subject Board at the Ministry of Education and Research, she participate in compiling the new state curricula for comprehensive school, approved in 2002.

The teaching staff of the chair have co-authored four textbooks published for schools in 2001-2004, and one textbook for higher education which was published by the international network *The Baltic University Programme*, as well as other study materials for comprehensive schools, three titles in total.

T. Elvisto was a visiting teacher at the Centre of Sustainable Development, Turku Polytechnic conducting studies worth 1 CP in October 2002; she has taken part in teachers' in-service training-conferences organised by the Baltic University in Uppsala, Sweden 15-19 June 2001, and in Bialowieza, Poland 5-9 February 2003. T. Elvisto is a representative of Estonia in the EURO BIO Council (*The European Association of University Departments and Faculties of Biology*), its headquarters are in Free University Brussels, Belgium.

Chair of Geo-ecology

The main field of research is the study of long-term development tendencies of landscapes and ecosystems. Research is closely integrated with the Institute of Ecology and studies are carried out within two research issues with targeted financing, three grants of the Estonian Science Foundation and three international cooperation agreements. In the last five years 75 articles have been published, 30 of them in peer-reviewed journals. The chair has cooperation agreements with Uppsala University (responsible Prof J.-M. Punning), London University College and Ioannina University, Greece within the Erasmus Programme. Master and doctoral students are involved in doing research. 17 master's students (100%) and 4 doctoral students have defended their theses. Currently the chair has 7 master's and 6 doctoral students. Both master and doctoral students participate in the supervision of students' bachelor's papers.

Research in didactics is related to geography textbooks for comprehensive school. The teaching staff are involved in working out the new national curriculum of basic and upper secondary school, and participate in drafting the study topics of a principal theme *Environment* of the national curriculum. They are members of the Geography Subject Board and the board responsible for writing tasks and compiling the final examination papers for basic school of the Ministry of Education and Research. They have also participated in writing two geography textbooks for comprehensive schools and in in-service training of teachers of natural sciences.

They give lectures to teachers of natural sciences in physical geography (general geography, Estonian geography, soil science, climatology) and economic geography (human geography, world economy and political geography). They supervise term papers and diploma papers in didactics. Students have a course in didactics of geography followed by professional placement in school under teaching staff's guidance.

Chair of Chemistry

The fields of research are: the study of brown algae – “structure-property” dependences of polysaccharides (Ass. Prof K. Truus, in cooperation with the Institute of Chemistry and Institute of Chemical and Biological Physics of Tallinn Technical University), biochemistry-lipoprotein lipase binding to vascular endothelium (Ass. Prof A. Lõokene) and analytical chemistry of environment (instrumental analysis of heavy metals in natural objects, lecturer H. Hõdrejärv). Other fields are didactics of chemistry (Prof Emeritus H. Karik, teacher V. Sillaste, lecturer H. Hõdrejärv) and compilation and introduction of didactical materials in nutrition (Ass. Prof K. Pappel).

The teaching staff are active in writing textbooks for comprehensive schools and higher education. Recently the focus has been on chemistry lexicons and other reference materials. Prof H. Karik coordinated work on publication of a bulky “English-Estonian-Russian Dictionary of Chemistry” (1998, 703 pages) and Chemistry Nomenclature” (2000). H. Karik, K. Truus and K. Kuiv have compiled a chemistry reference book for upper secondary school (2001, 327 pages) and a university textbook on anorganic chemistry (H. Karik, K. Truus, 2003, 607 pages).

The chair cooperates with the Institute of Chemistry, the Department of Food Processing and the Institute of Chemical and Biological Physics of Tallinn Technical University, the staff participate in the Federation of European Biochemical Societies, Division of Analytical Chemistry (FEBS DAC). The chair maintains contacts with Turku University, Helsinki University, Armstrong Atlantic University, USA, and others. K. Truus is a member of the Chemistry Subject Board.

Publications (2001-2004) of Teaching Staff from Department of Natural Sciences, Tallinn Pedagogical University

I SCIENTIFIC PUBLICATIONS

IA – WITH WIDE-SPREAD INTERNATIONAL DISTRIBUTION

2004

1. Charman, D.J., Brown, A.D., Hendon, D. & **Karofeld, E.** 2004. Testing the relationship between Holocene peatland palaeoclimate reconstructions and instrumental data. *Quaternary Science Reviews*, 23, 137-143.
2. **Haljas A., Mankin R., Sauga A.,** Reiter E. 2004. Anomalous mobility of Brownian particles in a titled symmetric sawtooth potential. *Physical Review E*, 70, 041107, 1-12.
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4. Kropman D., Kärner T., Abru U., **Ugaste Ü.** & Mellikov E. 2004. Interaction between Point Defects, Extended Defects and Impurities in the Si - SiO₂ System during the Process of its Formation. *Thin Solid Films*, 459 (1-2), 53-57.
5. Kropman D., Kärner T., Abru U., **Ugaste Ü.,** Mellikov E., & Kauk, M. 2004. Interaction between Point Defects, Extended Defects and Impurities in the Si - SiO₂ System during the Process of its Formation. *Material Science and Engineering B* (114-115), 295-298.
6. **Lõokene, A.,** Zhang, L., Hultin, M. & Olivecrona, G. 2004. Rapid subunit exchange in dimeric lipoprotein lipase and properties of the inactive monomer. *J Biol Chem.* Nov 26; 279 (48): 49964-72.
7. **Mankin R., Sauga A., Ainsaar A., Haljas A. & Paunel K.** 2004 *Colored-noise-induced discontinuous transitions in symbiotic ecosystems.* *Phys. Rev. E*, 69, 1, 061106, 1-8.
8. **Metsis, A.,** Andersson, U., Bauren, G., Ernfors, P., Lönnerberg, P., Montelius, A., Oldin, M., Pihlak, A. & Linnarsson, S. 2004. Whole-genome expression profiling through fragment display and combinatorial gene identification. *Nucleic Acids Research*, 32 (16).
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11. **Punning, J.-M.,** Koff, T., Sakson, M. & Terasmaa, J. 2004. Human impact on the ecosystem of Lake Ruusmäe (Southern Estonia) traced in the sediments. *Polish Journal of Ecology*, 52, 3, 285-299.
12. Puurmann, E., **Ratas, U., Rivis, R.** 2004. Diversity of Estonian Coastal Landscapes: Past and Future. In: Palang, H.; Sooväli, H.; Antrop, M.; Setten, G. (Eds.) *European Rural Landscapes: Persistence and Change in a Globalising Environment.* Springer, 411-424.
13. **Põllumäe, A.,** 2004. Does Invasive *Cercopagis pengoi* correlate in the late summer zooplankton community in the Gulf of Finland (Baltic Sea)? *Biol. Mar. Medit.*, 11(3), 43.
14. Tammelo R., **Laas T., Mankin R.** 2004. On electromagnetic wave tails in curved spacetimes. *Comm. Phys.-Math. Soc. Sci. Fennica*, 166, 201-208.
15. Torn, K., Martin, G., **Kukk, H.,** Trei, T. 2004. Distribution of charophyte species in Estonian coastal water (NE Baltic Sea). *Scientia Marina*, 68, 129-136.

16. **Truus, K.**, Vaher, M., Koel, M., **Mähar, A.** & Taure, I. 2004. Analysis of bioactive ingredients in the brown alga *Fucus vesiculosus* by capillary electrophoresis and neutron activation analysis. *Analytical and Bioanalytical Chemistry*, 379, 849-852.
17. **Ugaste Yu.E.**, Kodentsov A.A., van Loo F. 2004. Interdiffusion and Kirkendall effect in the Co-Ni-Fe system. I. Redistribution of component concentrations in the diffusion zone and shift of inert markers. - *Phys. Met. Metallography*, 97 (3) 298-306.
18. **Ugaste Yu.E.**, Kodentsov A.A., van Loo F. 2004. Interdiffusion and Kirkendall effect in the Co-Ni-Fe system. II. Effective and partial coefficients of interdiffusion.- *Phys. Met. Metallography*, 97 (5), 495-501.
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Development plan of the department of natural sciences for 2004-2012

*Approved by Council of
Department of Natural Sciences
Ordinance No 2 of 07.01.2004*

Mission, strategic and tactical goals and aims.

The Department of Natural Sciences consists of five chairs and one lectureship:

The Chair of Geo-Ecology, Chair of Biology, Chair of Chemistry, Chair of Applied Physics, Chair of Theoretical Physics and the Lectureship of Environmental Management. The department conducts studies in 18 curricula, of which there are 2 diploma programmes, 8 bachelor's programmes, 7 master's programmes, and 1 doctorate programme in ecology. Twelve of these programmes follow the old 4+2 system (4-year bachelor and 2-year master's programme) and six the new educational system (Bologna Declaration providing for 3+2 system). In 2001 the last students were enrolled in 4+2 bachelor's programme.

One more bachelor's programme and nine master's programmes are registered in the Estonian Ministry of Education and Research with regard to transition to the 3+2 system (Appendix 1). Peculiarity of the programmes as compared to other curricula in the field of natural sciences lies in the large proportion of integrative subjects allowing preparation of specialists and teachers with high environmental knowledge and integrated skills in natural sciences. The department organises in-service training for active teachers and also teaches subjects of natural sciences to the students in other areas of specialisation (informatics, mathematics, handicraft and domestic economics, class teacher, etc). The department participates in the work of the Open University.

The mission of the department is to support sustainable development of the Estonian society and state in the field of natural sciences through teaching of specialists, research and its applications, and academic partnership.

Strategic goals:

- Promote Estonian spiritual independence with high-level education and research in natural sciences; participate in viewpoints expressed by the European and worldwide academic communities.
- Make connection between studies and research and applications considering development needs of Estonia.
- Support academic communication both in and outside Estonia, create opportunities of study and research for non-Estonians either from Estonia or abroad.
- Develop research in natural sciences and become a research centre of natural sciences in Tallinn, concentrate young researchers and degree students in the doctoral school of natural sciences.

The department sets the following aims:

- *Strengthen integration with other structural units of research and study of Tallinn University, create common curricula, plan common research programmes, and actively participate to implement the mission of Tallinn University. The specific nature of the*

department considered, work out courses and curricula necessary to develop scientific view of the world of our students and to understand principles of sustainable development of the society.

- *Integrate into the pan-European study and research work in natural sciences. Therefore, design a schedule to prepare curricula in English; activate student exchange in all branches to be developed; begin to actively introduce curricula of all academic levels in the EU as well as other countries; foster involvement of foreign students (especially doctoral) and researchers in research work.*
- *Prepare highly qualified teachers and specialists in geography, physics, biology, chemistry and environment management. The aim is to provide modern, research-based university education for bachelor, master and doctoral students, thus enhance intellectual capital of the Estonian society.*
- *Strengthen both fundamental and applied research, develop larger and more competitive research groups, and connect them to international programmes and networks. Involve researchers more intensively in studies, especially in doctorate programmes, and emphasise the role of research in the work of the teaching staff.*

The department sees the great and growing deficit of teachers of natural sciences in Estonian schools as a guarantee of its aims. The demand for teachers able to teach several subjects in comprehensive schools is enormous, especially in smaller schools where the amount of classes in one particular subject is not enough for teachers to work full-time. There is an acute need for teachers of physics (in 2000/2001 academic year 6% of teachers were under 30, and 31% of pension age). The situation in chemistry and biology is equally bad. Alleviation of such a situation is an aim of the department. Another aim is to educate the new generation of university teachers and researchers. The department has to take research and teaching to such a level where a sufficient number of graduates of master's programmes continue in doctorate programmes and further work as teachers or researchers in universities.

The goals of the department are connected with improvement and modernisation of the academic study process and research at a high level with an aim to practise natural sciences at an international level at Tallinn University. The department needs to find an opportunity to realise its interdisciplinary intellectual potential at an international level in one research field as a minimum.

New planned areas of specialisation and related activities

The department considers its main task to create new doctorate programmes which are approved and accredited. Currently there is one accredited doctorate programme in the department: Ecology, code 842027. In the near future the doctorate programme in physics must be prepared and submitted for registration (2004-2005). Thereafter make preparations for introduction of doctorate studies in chemistry and environmental management. Chemistry and physics should be better promoted among school leavers to ensure study groups are opened in bachelor and master's curricula: *Chemistry (With Second Subject)*, code 6421252; *Teacher of Chemistry*, code 7141045 and *Chemistry*, code 7421251, and also their accreditation at a later stage. To that aim the department must develop research and study laboratories, involve young researchers and teaching staff and intensify cooperation with other universities and research institutions.

Institutional planning. Development of structures

The department intends to introduce the following structural changes to achieve its aims.

Form an integrative research laboratory in natural sciences in the near future, at the first stage use the present resources. Partly based on the cooperation agreement between Warsaw Institute of Plasma Physics and Tallinn Pedagogical University (22 December 2003) and the project of IAEA EST-12062 establish the plasma physics research laboratory. Establish a research laboratory of stochastic processes on the basis of existing resources (at the first stage does not require separate facilities or large investment).

Establish the Chair of Zoology and Hydrobiology and the Chair of Botany and Ecology on the basis of the present Chair of Biology. Establish the Chair of Nature Geography and the Chair of Urban Geography on the basis of the Chair of Geo-Ecology. The Lectureship of Environmental Management should be developed into the Chair of Environmental Management. The present Chair of Chemistry should form the basis for the Chair of Anorganic and Analytical Chemistry and the Chair of Organic Chemistry.

Development of fields of research.

Major fields of activities:

- *Establish prioritised research fields and form larger inter-institutional research groups. Create favourable conditions for development of interdisciplinary research.*
- *Increase the ratio of researchers to 20% of the academic staff by 2006; involve additional means, mostly from implementation of research.*
- *Establish an inter-university centre of excellence in natural sciences.*
- *Support participation in international cooperation projects (primarily in the EU research and development programmes) and extension of funding science from outside Estonia.*
- *Introduce a system to motivate research done by the teaching staff and researchers. Support international publication of research results and implementation thereof.*
- *Create opportunities for doctoral students to work in research groups.*
- *Establish a system of research quality monitoring and support.*

The department sees as its principal task the development of new research courses to prepare an interdisciplinary common project of the chairs which is competitive to apply for targeted financing. That project, while based on the planned integrative research laboratory of natural sciences is expected to ensure continuous development of the laboratory's infrastructure.

The new Chair of Urban Geography will focus on research in human geography: regularities of urban environment, cultural and social development. Currently such research is nonexistent in Estonia.

Under conditions of growing competition between universities and low numbers of student admission, we cannot rely on fast growing numbers of the teaching staff and researchers. Planning of research fields should consider the present, more successful research topics and concentrate both intellectual and material resources to increase their level. The Chair of Natural Geography will specialise in the research of regularities of carbon cycle, further introduction of GIS, and issues related to soil development. Research is carried out closely with the Institute of Ecology of TPU. To ensure continuous development of the research field and related studies it is necessary to establish a study and research laboratory of organic geochemistry (2005-2006).

Research in the chairs of physics focuses on stochastic processes in open systems. Therefore a laboratory of stochastic processes will be established which coordinates activities of teaching staff and researchers involved in these issues. The research laboratory of plasma physics will be established to satisfy the needs of experimental research and study (2005-2006).

The priority of research in the chairs of biology is given to marine biology: processes that regulate benthic communities in the conditions of the species-poor Baltic Sea. There are plans to establish a research and study laboratory of microbiology to support this particular research field (2005-2008).

A principal field of research for the chairs of chemistry is bioanalytical chemistry. In order to create prerequisites for quality experimental research and studies the department plans to complete a research and study laboratory of bioanalytical chemistry and a research and study laboratory of analytical and electrochemistry (2006-2010).

Personnel. Personnel policy

Principal trends:

- *Establish a support system to ensure the new generation of teaching staff and researchers, incl. in cooperation with foreign partners of Tallinn University.*
- *Create joint professorships with other universities.*
- *Involve more foreign teaching staff in the teaching process; introduce the system of visiting fellows.*

The department has pursued a personnel policy to raise the ratio of qualified and full-time employees. We still cannot be satisfied with the situation. A negative indicator is a high average age of the teaching staff (about 50 years of age) and a large proportion of part-time teaching staff (currently 41%). An increase in the number of full-time teaching staff is limited by the small volume of some subjects in the curricula. Personnel's qualifications correspond fairly well to the curricula and prioritised research topics, however, developments are possible. Out of 29 regular teaching staff of the department 20 have a doctorate or candidate's degree, 7 have a master's degree. The geo-ecology field has been most successful in raising the new teaching staff over the last five years; positive tendencies are observed in physics as well. Considerably more efforts should be made to prepare more academic teaching staff. More opportunities must be found to send capable degree students to foreign universities for a minimum of one semester. Stronger laboratory basis should help to increase the number of young teachers and researchers. Most importantly, positions of researchers (senior researchers) will be established in the chairs – a most vital prerequisite for the development of the department. On average we need two researcher positions in each chair. Realisation of the plan depends on: how fast the laboratory basis is constructed in the department, and if a breakthrough in the formation of competitive research groups is made in the near future.

Students

An increase in the quality of studies and research is inhibited by the small size of study groups and accompanying underfunding. To improve the situation it is necessary to promote and apply for an increased state commission at all levels (comprehensive school, professional unions, Tallinn University (Tallinn Pedagogical University) and ministries) in each area of specialisation to a minimum of 20-25 students. We should particularly emphasize the real deficit of teachers of natural sciences in schools, which in the longer perspective may considerably decelerate the development of Estonia.

There are internal resources of development, however. Academic progress leaves to be desired, the number of exmatriculated students is high. This is partly due to low attractiveness of a curriculum (physics, teacher of natural sciences in basic school). The situation must be rapidly improved (wider use of IT, more flexible curricula, modernisation of study aids, etc). Opportunities for self-development and extracurricular activities in student organisations have been expanding and are continuing. The chairs of biology and geo-ecology have very good opportunities thanks to their expeditions and fieldwork.

Interpersonal relationships

The relationships between the members of the academic staff are good. The relationships between the academic staff and students are also good, especially with the students of more advanced courses. The relations should be developing on the basis of more extensive research, in degree courses particularly. Decision-making should become even more democratic; mechanisms of problem-solving should become more flexible.

Organisation of studies

Principal trends:

- *Introduce a quality assurance system of curricula.*
- *Regulate and develop curricula on the basis of a common feedback system.*
- *Develop the laboratory basis necessary for studies.*
- *Elaborate curricula in English at all academic study levels and promote them abroad.*
- *Create an exchange system of students, teachers and researchers with foreign universities, foster participation in international professional networks.*
- *Increase students' opportunities to choose subjects from other universities.*
- *Participate actively in the Open University.*

The proportion and quality of laboratory work and fieldwork is to be increased, especially in relation to degree studies. The development plan provides for the following new study laboratories: a study laboratory of cartography and geographical information systems (2005), a study and research laboratory of organic geo-chemistry (2007), a laboratory of school test equipment (2005), a study and research laboratory of microbiology (2007), a study and research laboratory of plasma physics (2005-2007), a study and research laboratory of bioanalytical chemistry (2008-2009), a study and research laboratory of analytical and electrochemistry (2010-2011).

Quality of fieldwork can be enhanced by finding a possibility to complete a stationary base. The department must make a greater contribution to conduct practical teaching in geo-ecology. Until now it has heavily relied upon on assistance of the Institute of Ecology.

Modernisation of studies requires a computer class (20 PCs) in the nearest future (2005).

Up-to-date foreign study literature must be made available in our libraries i.e. more copies. More books to meet the needs of degree studies must already be bought in 2004.

Both the department and the university should specify their requirements to students (compulsory attendance of lectures, timely completion of tasks, etc).

Quality assurance in the curriculum development has been fragmentary until now. There is ample space for the development in quality assurance of studies as well (improvement of

teaching methods and materials, organisation of independent work, etc). Quality assurance (in its European meaning) is still in the primary phase of development in the department as well as Estonian universities in general. The counselling system and work of tutors should be developed and improved. In-service training should be enhanced and studies in foreign languages developed.

Infrastructure

Rooms

The department needs twice as large a space for normal work as it has. Firstly, for research and studies 18 additional rooms with a total area of about 470 m² (Appendix 3, Room programme). We expect the situation to improve in 2005-2006 when the main building of Tallinn University will be completed.

Equipment

The department needs equipment for a total of 4 million kroons in its present and new rooms in 2004-2006, about the same amount is required in the next three years as well. The primary task is to develop the present study laboratories of biology and chemistry (P-210, P-211) and the planned integrative research laboratory of natural sciences.

The source of financing: allocation from study costs (both from and outside of the state budget), participation in international and Estonian research projects with targeted financing, possible support of Tallinn University to develop infrastructure, a.o.) It must be taken into account that acquisition of allocations from outside the state budget will become possible when preconditions have been created with the state budget funds.

Cooperation

All the chairs cooperate with Estonian and foreign universities. The Chair of Geo-Ecology has been the most successful concerning contracts. It has bilateral contracts within the Erasmus Programme with London University, Ioannina University (Greece), Umea University and Uppsala University. The department also has relations with Kiel University, Helsinki University, Institute of Biophysics of the Free University of Berlin, Armstrong Atlantic University (USA), Eindhoven Technical University, Krakow University of Mining and Metallurgy, Gdansk Technical University, Moscow Institute of Material Sciences, Institute of Organic Chemistry of Russian Academy of Sciences, Warsaw Institute of Plasma Physics, and many others. There are plans to strengthen these relations in the near future, especially by our own stronger contribution to make the relations more efficient.

Timetable of institutional development

- Establish an integrative research laboratory of natural sciences (2004)
- Establish the Chair of Zoology and Hydrology and the Chair of Botany and Ecology on the basis of the present Chair of Biology (2005)
- Establish the Chair of Urban Geography and the Chair of Natural Geography on the basis of the present Chair of Geo-ecology (2006)
- Develop the Lectureship of Environment Management into a chair (2004-2007)
- Establish a plasma physics research laboratory (2005-2006)

- Form a laboratory of stochastic processes (does not initially require separate rooms) (2005-2007)
- Establish the Chair of Anorganic and Analytical Chemistry, and the Chair of Organic and Biochemistry on the basis of the present Chair of Chemistry (2010-2012)

Room programme of the department

In order to implement the aims of the development plan, the department will need additional rooms (total area about 470 m²):

- Laboratory of school test equipment (20-30 m²)
- Study and research laboratory of plasma physics (20-30 m²)
- Computer class (20 workstations, 40 m²)
- Study laboratory of cartography and geographic information systems (30 m²)
- Study and research laboratory of geo-chemistry (30 m²)
- Office for the Chair of Environment Management (15-20 m²)
- Lecture theatre for natural sciences with a room for demonstration tests (total of 60 m²)
- Study and research laboratory of microbiology (30 m²)
- Office for the Chair of Zoology and Hydrology (15-20 m²)
- Storeroom of reactants (ca 15 m²)
- Freezing room (ca 10 m²)
- Study and research laboratory of bioanalytical chemistry (30 m²)
- Study and research laboratory of analytical and electrochemistry (20 m²)
- Staff room of the Chair of Natural Geography (15-20 m²)
- Laboratory of integrative research (3 rooms, 25 m² each)

Development Plans of the Integrated Laboratory of the Department of Natural Sciences for years 2005-2010

By the decision of the board of the Department of Natural Sciences (Nr. 1, 23.01.2004), the integrated Science Laboratory of the Department of Natural Sciences was formed on the basis of the existing Laboratory of organic chemistry and biochemistry (room P-211) and the Laboratory of molecular and cell biology (room P-210).

The main subject of the research conducted at the laboratory is the **Biogeochemical matter cycling in the terrestrial and aquatic ecosystems.**

The following are the subtopics during the first stage of the project:

- The composition and structure of the lacustrine sediments (prof. J.-M. Punning).
- Applications of bioanalytical chemistry in biological and ecological sciences (dots K. Truus, MSc R. Tuvikene).
- Using fast neutrons to identify different species of algae (starting from 2007).(prof Ü. Ugaste, associate prof. T. Laas, MSc Alar Mägi).
- The role of accumulation and decomposition of drifting macroalgal mats in nutrient dynamics in water column and sediments of the coastal sea areas (prof H. Kukk, doctoral student T. Paalme, master's students)
- Linking models of ecosystems and theoretical models describing the process of sedimentation, based on the theory of stochastic processes, with observational data (prof R. Mankin, MSc A. Rekker, doctoral student A. Sauga).

Aims:

1. To develop interdisciplinary research in natural sciences.
2. Conducting scientific research of students involved in graduate studies as an integrated part of interdisciplinary research topics of the Department of Natural Sciences.
3. To ensure the increase in quality and in the proportion of research work by members of the teaching staff, enabling them to periodically work as researchers and vice versa.
4. To establish larger and more competitive research groups, first and foremost in order to develop interdisciplinary research.
5. Creating additional opportunities for applying for grants from the Estonian Science Foundation, for grants for projects target-financed by the Ministry of Education, and for grants for international scientific projects, as well as for fulfilling these grants, ensuring future development of the laboratory.
6. Developing and implementing new international master's and doctoral curricula (for example, in cooperation with Warsaw Institute of Plasma Physics).

Calendar Plan for the Development of the Laboratory:

2004 – 2005 (fulfilled)

1. Creating the laboratory (decision of the board of the Department of Natural Sciences Nr. 1, 23.01.2004)
2. Staff members
Head of laboratory/researcher (1,0), MSc R. Tuvikene
3. Rooms: P-211, P-210; total area 127 m².
4. Main equipment of the laboratory:
Perkin-Elmer Series 200 HPLC system, UV-1601 Shimadzu spectrophotometer, Incubator GFL-3032, Laminar Telstar Bio-II-A, Microscope Zeiss Axioskope 40 FL, laboratory thermostats, Cooler Fuge Heraeus, Minifuges Tomy (400552, 400542), , Refractometer REFRACTO 30P Mettler, Vacuum pump Kit22 Kit23, Freeze-drying System Drywinner 1-60, pH meter Mettler, Balances Mettler PB602, Rotary evaporator R-114 and a number of smaller additional equipment.
5. Drafting a detailed plan of a plasma physics laboratory in cooperation with Warsaw Institute of Plasma Physics.

2006 – 2007 (planned)

1. Increasing the number of staff members by two researchers and 0.5 lab technicians.
2. In conjunction with the construction of the new main building of TPU, an additional room (~ 50 m²), mainly for analytic research of biochemical and geochemical objects.
 - a) Furniture for the laboratory (projected cost 80 thousand kroons)
 - b) Primary equipment together with accessories: infrared spectrophotometer IRPrestige-21 Shimadzu FTIR spectrophotometer (440 thousand EEK), quadruple mass spectrometer (projected cost together with accessories 2.5 million EEK); electron microscope JEOL scanning electron microscope JSM 840 A (supplied with the support from Eindhoven University of Technology, projected cost of main accessories 100 000 EEK).
- 3) Equipping and opening the plasma physics laboratory (~50 m²) planned to be built in the new main building of TPU.
 - a) Tests with the source of fast neutrons will be conducted there in the framework of the integrated science laboratory.
 - b) Warsaw Institute of Plasma Physics and Microfusion will obtain and help install the primary equipment Plasma Focus PF-6 and the essential accessories together with

computers and the necessary software (total cost ~ 1, 4 million EEK), in the framework of the international research project I AEA No 12062 (the corresponding contract between TPU and The Institute of Plasma Physics and Microfusion, Warsaw was signed on 22.12.2003).

- c) Obtaining a CNS element analyzer (for analysing the genesis of the organic matter formed in the sediment).
- d) LI-192 Underwater Quantum Sensor (projected cost 50 000 EEK).

2008 – 2010

1. Upgrading the existing material and technical base of the laboratories.
2. Increasing the number of laboratory staff to 4.0 full-time staff members. Implementing rotation of members of the teaching staff and researchers.

Curricula Vitae of the teaching staff of the Department of Natural Sciences

Chair of Biology

Name: **Henn Kukk**
Date of birth: March 18, 1942
Place of Birth: Lõhavere Village, Viljandi County, Estonia
Nationality: Estonian
Present address: 35 Sihi St, Tallinn 11622,
Ph: +372 56620695.
Email: henn@tpu.ee

Present status and working address:

Professor of the Tallinn Pedagogical University, Dean of the Faculty of Mathematics and Natural Sciences
Narva 25 Narva Road, 10120 Tallinn, Estonia
Phone and fax: +372 6409400

Education:

1970 - graduation from the Department of Biology and Geography of Tartu University with the diploma of biologist-botanist,
1980 - the degree of Candidate of Biology, defended at Tartu University,
1989 - the academic rank of Senior Researcher in Botany, awarded by the Higher Attestation Commission.

Research and professional experience:

1970 - junior researcher in the Tallinn Department of the Baltic Fisheries Research Institute
1987 - senior researcher
1984 - head of the Department of Hydrobiology
1991 - head of the Marine Biology Department of the Institute of Ecology and Marine Research
1992 - head of the Department of Marine Biology of the Estonian Marine Institute
1997 - head of the Chair of Biology at the Tallinn Pedagogical University
1998 – dean of the Faculty of Mathematics and Natural Sciences at the Tallinn Pedagogical University

Awards:

Soros diploma and scholarship for the studies in 1993-1994 in the field of the diversity of species composition

Representation in international organisations:

Estonian representative in the HELCOM Biology Working Group, member of the BMB Committee and Estonian Marine Committee

Supervision of Mag. dissertations: 16 persons

Supervision of Doctoral dissertations:

Georg Martin. Phytobenthic communities of the Gulf of Riga and the Inner Sea of the West-Estonian Archipelago. Tartu 2000

Ain Lankov. Feeding Ecology of the Pelagic Fishes in the North-eastern Baltic Sea in 1908-1990-s. Tallinn 2002

Ilmar Kotta. Population Ecology of Mysids in the Gulf of Riga. Tallinn 2003

Courses taught at Tallinn Pedagogical University:

Hydrobiology, General ecology, Algology, the Baltic Sea Environment, Conservation biology, Biodiversity and Conservation Biology.

Languages:

Estonian excellent speaking, reading and writing

Russian good speaking, reading and writing

Finnish good reading, fair speaking and writing

English fair speaking, reading and writing

Total number of **published papers**: 135

Name: **Tiina Elvisto** (Ksenofontova)
Date of birth: 02.02.1957
Place of Birth: Ambla, Estonia
Nationality: Estonian
Present address: Nõmme-Kase 31-1, Tallinn, 11620.
Phone: +372 67 00 783.
Email: elvisto@tpu.ee

Present status and working address:

Associate professor at Tallinn Pedagogical University
25 Narva Road, 10120 Tallinn, Estonia. Phone: +372 6409416, fax: +372 6409418

Education:

Graduated in 1980 from Chair of Botany, Faculty of Biology and Geography, University of Tartu. Diploma thesis title: *Matsalu Wetland's Reedbeds Communities and Their Phytoproducton Rate*. Graduated *Can. Biol* degree in ecology in 1987 from University of Tartu & Institute of Zoology and Botany, Tartu. Master thesis title: *Productivity of the Helophytes' Communities and Their Role in the Mineral Cycle of the Waterbodies*.

Research and professional experience:

1980 - 1983 Department of Botany, Institute of Zoology and Botany, Tartu, post-graduated student
1983 - 1992 Department of Botany, Institute of Zoology and Botany, Tartu, researcher
1992-1994 Tallinn 8th Secondary School & Tallinn Pelgulinna Secondary School, teacher of biology, natural studies and health care
1993- Chair of Biology, Tallinn Pedagogical University, Associated Professor

Courses taught at Tallinn Pedagogical University: Introduction to Botany; Man and Environment; Environmental Sciences and Education; A Sustainable Baltic Region; Environmental Science; Didactics of Natural Studies; Field Works in Plant and Animal Ecology etc.

Current scientific research projects where involved:

Aims of Teaching Natural Studies at Estonian Primary School.

Languages:

Estonian excellent speaking, reading and writing
Russian good reading and speaking, fair writing
English good reading, fair speaking and writing
German good reading, fair speaking and poor writing

Has published 30 scientific works, nine popular science publications, 18 items of teaching material (textbooks, workbooks, teacher's books); has written articles for the scientific publications *Ökoloogialeksikon* and *Eesti Entsüklopeedia*, and has been the editor of seven scientific collections and collections of popular science and one textbook for higher education establishments.

Name: **Toomas Veidebaum**
Date of birth: 21.10.1946
Place of Birth: Tallinn, Estonia
Nationality: Estonian
Present address: Süda 9-4, Tallinn, 10116.
Phone: +372 5020544.
Email: toomas.veidebaum@tai.ee

Present status and working address:

Associate professor at Tallinn Pedagogical University
Narva 25 Narva Road
10120 Tallinn, Estonia. Phone: +372 6409419, fax: +372 6409418
Director of Research Centre, National Institute for Health Development
Hiiu 42, 11619 Tallinn, Estonia, Phone: +372-6593903, fax: +372-6593901

Education:

Graduated in 1970 from Chair of Cell Biology, Faculty of Biology and Geography, University of Tartu.
Graduated *Cand. Sci.* degree in 1976 from Institute of General and Molecular Pathology, Faculty of Medicine, Tartu University.

Research and professional experience:

1974-1976 Laboratory of Cell Biology, Institute of Experimental Biology, Estonian Academy of Sciences, Junior Researcher
1977-1981 Laboratory of Mechanisms of Carcinogenesis, Institute of Experimental and Clinical Medicine, Tallinn, Junior Researcher
1982-1990 Laboratory of Mechanisms of Carcinogenesis, Institute of Experimental and Clinical Medicine, Tallinn, Senior Researcher
Since 1991, Institute of Experimental and Clinical Medicine, Tallinn, Director General
1993-1997 Faculty of Medicine, Tartu University, Professor of Experimental Oncology
Since 1998 Chair of Biology, Tallinn Pedagogical University, Associate Professor
1993 visiting scientist in Health Canada (assessment and modelling of cancer risk)
1995 Visiting researcher in National Cancer Institute (USA) and Oak Ridge State Laboratory
1997 Visiting researcher, National Cancer Institute (USA) and University of New Mexico and Los Alamos State Laboratory

Courses taught at Tallinn Pedagogical University: Genetics, Evolution Theory

Main area of research:

Molecular and Genetic Epidemiology, Radiation epidemiology and biodosimetry and biomarkers in cancer risk assessment

Languages:

Estonian, English, Russian - excellent speaking, reading and writing
French - fair speaking, reading and writing

Altogether 172 papers including 1 monograph, 97 papers in international scientific magazines, 63 local or All-Union scientific magazines and books
21 conference abstracts within the last 5 years

Name: **Ats Metsis**
Date of Birth: 21.05.1961
Place of Birth: Tallinn, Estonia
Nationality: Estonian
Present address: Astangu 66-9, 13519 Tallinn, Estonia

Present status and working address:

Associate professor at the chair of Biology, Tallinn Pedagogical University, 25 Narva Road, 10120 Tallinn, Estonia.

Education:

Graduated St. Petersburg University, Russia, in 1984, Department of Invertebrate Zoology, biologist;

Candidate of Biological Sciences in cytology (Ph.D.) in, 1988, Institute of Cytology, St. Petersburg, Russia, "Cytological studies of the cyst stages of *Sarcocystis bovicanis* from bovine heart".

Research and professional experience:

1987 till May 1991 research scientist, Institute of Experimental Biology, Department of Animal Genetics, Harku, Estonia.

May 1991 till May 1992 head of the Department of Protozoology, Institute of Experimental Biology, Harku, Estonia.

May 1992 till July 1995 research scientist, Institute of Experimental Biology, Department of Animal Genetics, Harku, Estonia.

July 1995 till Sept. 1996 research scientist, Institute of Chemical- and Biophysics, Laboratory of Molecular Genetics, Tallinn, Estonia

Since Sept. 1996 till January 2001 senior scientist, Institute of Chemical- and Biophysics, Laboratory of Molecular Genetics, Tallinn, Estonia

Sept. 1997 till March 1998 senior scientist at the Centre for Gene Technology, Tallinn Technical University, Estonia

Sept. 1998 till end 2000 docent at the Centre for Gene Technology, Tallinn Technical University, Estonia

Since Sept. 1999 docent at the Chair of Biology, Tallinn Pedagogical University, Estonia

Professional training:

Six months in 1990-1991, practice in molecular biology in the Institute of Chemical- and Biophysics, Laboratory of Molecular Genetics, Tallinn, Estonia

Two months in 1991-1992, Institute of Zoology of the University of Bonn, Laboratory of Protozoology, Germany.

May 1993 II Nordic Training Course in Parasitic Zoonoses (NORFA II): Epidemiology of Parasitic zoonoses, Copenhagen, Denmark.

May 1993 - April 1995 postdoc in the Statens Serum Institut, Division of Biotechnology, Laboratory of Parasitology, Copenhagen, Denmark.

Applied Project Management course by Wenell AB, Gothenburgh Dec.2003

Language knowledge: English, Russian, Estonian

Number of publications: 9.

Patents:

WO2003064691-A; WO2003064691-A2; US2003175908-A1; Producing a population of double-stranded product DNA molecules, useful for mRNA profiling, comprises amplification by nested polymerase chain reaction

Inventor Name(s):

LINNARSSON S, ERNFORS P, BAUREN G, METSIS A, PIHLAK A, MONTELIUS A

Name: **Tõnu Ploompuu**
Date of birth: 17.01.1960
Place of Birth: Tallinn, Estonia
Nationality: Estonian
Present address: Vabaduse 43, Tallinn, 11212.
Phone: +372 6 586260.
Email: toenu@tpu.ee

Present status and working address:

Assistant at Chair of Biology, Tallinn Pedagogical University
25 Narva Road, 10120 Tallinn, Estonia, Phone: +372 6409416, fax: +372 6409418

Education:

Graduated in 1983, Faculty of Biology and Geography, University of Tartu. Biologist (plant physiology), teacher of biology and chemistry.

Post-graduate studentship at Tallinn Botanical Garden (plant ecophysiology) 1985-1988.

Graduated MSc degree in 2002 from Institute of Botany and Ecology, University of Tartu.

Master thesis title: Tallinna krundid võõrliikide kasvukohana /The grounds of Tallinn as a habitat of alien species/

Research and professional experience:

1983-1984 (-1991) Tallinn Youth Naturalists House, teacher.

1988-1992 Tallinn Botanical Gardens, engineer (= junior researcher).

1990-1991 Tallinn Communications School, teacher (botany).

1992- Tallinn Pedagogical University, senior teacher

1992-1993 Tallinn Pedagogical University, lecturer (since 1993 assistant)

Courses taught at Tallinn Pedagogical University: Introduction to Botany, General Biology, Development Study, Plant and Animal Physiology, Estonian Living Communities, Mycology, Ethnobotany, Field Works in Plant & Animal Ecology & Mycology, Field Works in Floristics and Faunistics, Field Works I and II, Biodiversity, Estonian Flora and Vegetation etc.

Courses taught at Tallinn Technical University: Botany

Current **scientific research projects** where involved:

1. Anthropogenous ecosystems: a) Alkali polluted bogs in NE Estonia, especially plant and mushroom communities; b) Plant communities of urban areas, especially urban forests herb layer and private areas flora.
2. Bog and fen ecosystems.
3. Taxonomy and systematics: *Cotoneaster*, *Amomixis* of *Cotoneaster*.
4. Theoretical biology: Early evolution. Evolution of flower.

Languages:

Estonian excellent speaking, reading and writing

English and Russian good reading, fair speaking and writing

Number of publications:

Scientific papers 36, popular scientific papers 60 and 36 articles in encyclopaedia,

Teaching materials 1

Name: **Toomas Põld**
Date of birth: 21.12. 1961
Place of birth: Kohtla-Järve, Estonia
Nationality: Estonian
Present address: Karu 15-55, Tallinn, 10120
Ph. 372 5159163

Present status and working address:

Lecturer at Tallinn Pedagogical University
Lecturer at Estonian Maritime Academy, Refresh Courses

Education:

Graduated 1992 from Faculty of Medicine, University of Tartu, Estonia, Medical Doctor and Psychologist
1992-1993 post-graduate student in Helsinki University, Medical Faculty, Finland
1994 Summer School, University of California, Santa Cruse, USA, Medical Faculty
1995-1996 post graduate student in Bergen University, Faculty of Psychology, Norway
2000-2003 Occupation Health Centre, Estonia, Occupational Health Resident

Research and professional experience:

1993- lecturer in Chair of Biology Tallinn Pedagogical University
1997- Head Doctor in Tallink
1997/98 research of knowledge and health attitude 5-th and 10-th grade pupils in Estonia
2001- lecturer in Estonian Maritime Academy

Courses taught at Tallinn Pedagogical University: Human Biology, Animal Physiology, Microbiology.

Languages:

Estonian excellent speaking, reading and writing
English good reading, fair speaking and writing
Russian good speaking, reading and writing
Finnish good speaking, reading and writing

Name: **Arno Põllumäe**
Date of birth: 17.07.1972
Place of Birth: Kohtla-Järve, Estonia
Nationality: Estonian
Present address: Võiisluse 4-29, Tallinn, 10132.
Phone: +372 5212 535.
Email: arno@sea.ee

Present status and working address:

Lecturer at Tallinn Pedagogical University
Scientist at Department of Marine Biology, Estonian Marine Institute, University of Tartu
Mäealuse 10a, 12618, Tallinn, Estonia
Phone: +372 6718974, fax: +372 6718972
Email: arno@sea.ee

Education:

Graduated in 1995 from Institute of Zoology and Hydrobiology, Faculty of Biology and Geography, University of Tartu.
Master of Science degree since 1998.
Master thesis title: Mesozooplanktoni sesoonne dünaamika Võrtsjärves 1995. aastal. (Mesozooplankton seasonal dynamic in Lake Võrtsjärv in 1995).
Since 1999 PhD student in Institute of Zoology and Hydrobiology, Faculty of Biology and Geography, University of Tartu.

Research and professional experience:

2001- present time, scientist in Estonian Marine Institute
2001- present time, lecturer at Tallinn Pedagogical University
1996-2000 - assistant in Estonian Marine Institute
1995-1996 - junior scientist in Estonian Marine Institute
1.02.-31.12.1995 - lab assistant Limnological Station of Lake Võrtsjärv, Institute of Zoology and Botany
Responsible for zooplankton measurements in Estonian national marine monitoring programme and administrator of monitoring database (incl. HELCOM BMP).
Courses taught at Tallinn Pedagogical University: "Zoology" and "Biomonitoring of coastal ecosystems"

Current **scientific research projects** where involved:

The dynamics of ecological subsystems of North-East Baltic Sea, Gulf of Finland and Gulf of Riga.

Languages:

Estonian excellent speaking, reading and writing
Finnish good speaking, reading and writing
English good reading, fair speaking and writing
Russian fair speaking, reading and writing
German poor speaking, reading and writing

Publications: 12 scientific papers published so far.

Chair of Chemistry

Name: **Kalle Truus**
Date of birth: 09.11.1949
Place of Birth: Tallinn, Estonia
Nationality: Estonian
Present address: Leegi 6, 10919 Tallinn
Phone: +372 6724828 (home)
Email: truus@tpu.ee

Present status and working address:

Holder of the Chair of Chemistry, associate professor of Chair of Chemistry, Dept. of Natural Sciences, Tallinn Pedagogical University
25 Narva Road, 10120 Tallinn, Estonia

Education:

1976 graduated from Tartu University, Faculty of Chemistry and Physics
1994 PhD in organic chemistry from Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia
Doctoral thesis title: Structure and Modification of Agarose Matrix from Far-East Red Alga *Ahnfeltia tobuchiensis*

Research and professional experience:

1979-1984 engineer Laboratory of Algal Polysaccharides, Institute of Chemistry, Estonian Academy of Sciences
1984-1991 research scientist Laboratory of Algal Polysaccharides, Institute of Chemistry, Estonian Academy of Sciences
1991-1999 group leader and senior research scientist Laboratory of Algal Polysaccharides, Institute of Chemistry, Estonian Academy of Sciences
1999-2004 professor Chair of Chemistry, Tallinn Pedagogical University
2004- associate professor Chair of Chemistry, Tallinn Pedagogical University

Teaching experiences

1974 –1979 Teacher of chemistry in secondary schools of Tallinn
1997 – 1999 Supervisor of Merike Vaher (MSc student)
1999 – Tallinn Pedagogical University: lectures in General Chemistry and Inorganic Chemistry

Research projects

Bioactive ingredients in red and brown algae
Structure and modification of carrageenan and agar matrices

Languages: Estonian, English, Russian

Number of publications (last 5 years): 6

Name: **Kaie Pappel**
Date of birth: 02.10.1942
Place of birth: Tallinn, Estonia
Nationality: Estonian
Present address: Mustamäe tee 100- 63, 12917, Tallinn
Ph: +372 6535663
E-mail: kpappel@tpu.ee

Present status and working address:

Associate Professor of Chair of Chemistry,
Department of Natural Sciences, Tallinn Pedagogical University,
Narva Road 25, 10120, Tallinn, Estonia

Education:

1984- Professional Certificate of Senior Researcher
1979- Candidate of Technical Science (PhD), Degree in Biotechnology from Moscow Institute of Foodstuffs Technology
1965- Technologist of Foodstuffs, graduated from Faculty of Chemistry, Tallinn Technical University

Research and professional experience:

Since 1992 – Tallinn Pedagogical University, Department of Natural Sciences, Chair of Chemistry, Associated Professor
1990- 92 - Tallinn Pedagogical University, Department of Technology, Associated Professor
1986- 90 - Tallinn Technical University, Laboratory of Biotechnology, Head of Research Group
1978-86 - Tallinn Technical University, Laboratory of Biotechnology, Senior Researcher
1974-78 - Tallinn Technical University, Laboratory of Biotechnology, Researcher
1966-74 - Tallinn Technical University, Laboratory of Biotechnology, Senior Engineer

Courses taught at Tallinn Pedagogical University:

Food Chemistry, Fundamentals of Nutrition, Food Safety, Fundamentals of Food Technology, Home Economics in Modern Society, Food Habits Today

Current scientific research projects:

Nutrition Behaviour of Pupils, Didactics of Nutrition

Languages:

Estonian excellent speaking, reading and writing
Russian good speaking, reading and writing
German good reading, fair speaking and writing
English fair reading

Number of publications in the last 5 years: 5 scientific papers, 5 teaching materials, 4 other papers.

Name: **Andres Mähar**
Date of birth: 06.06.1957
Place of Birth: Põlva, Estonia
Nationality: Estonian
Post address: POB 624, Tallinn, 12602
Phone: +372 5032351
Email: amahar@tpu.ee, andres@tft.ee

Present status and working address:

Lecturer (part-time) at Tallinn Pedagogical University, Chair of Chemistry
Narva Road 25, 10120 Tallinn, Estonia
tel: +372 6409415
Chemist, Tallinn Pharmaceutical Plant, Development and Regulatory Affairs Department
Tondi 33, 11316 Tallinn, Estonia
tel: +372 6120309, fax: +372 6120330

Education:

Graduated in 1980 from Department of Chemistry, Faculty of Physics and Chemistry, University of Tartu. Diploma thesis title: Modification of active site of Butyrylcholinesterase.

Research and professional experience:

1980-1988 Laboratory of Bioorganic Chemistry, Institute of Chemical Physics and Biophysics, Estonian Academy of Sciences, Engineer and Junior Researcher (since 1982)
1988-1990 Chair of Organic Chemistry and Biochemistry, Tallinn Technical University, Assistant Lecturer
1990-1991 Department of Prostanoid Biosynthesis, Pilot Production Plant of the Institute of Chemistry, Senior Chemist
1991-1992 Laboratory of Biotechnology, Tallinn Technical University, Research Chemist
1993-1997 Sales representative for a Swedish company Diazo AB, specialty chemicals and dyestuffs
1998-2000 Genaftoni Toorainevarustuse OÜ, Product Manager for Chemicals
Since 2000 Development and Regulatory Affairs Department, Tallinn Pharmaceutical Plant, Chemist
Since 2000 Chair of Chemistry, Tallinn Pedagogical University, Lecturer (part-time)

Courses taught at Tallinn Pedagogical University: Environmental Chemistry, Physical and Colloid Chemistry.

Languages:

Estonian (excellent speaking, reading and writing),
English and Russian (good speaking, reading and writing),
German (fair speaking and reading, poor writing).

Number of scientific papers in the last 5 years: 1

Name: **Kristi Paas**
Date of birth: 28.11.1976
Nationality: Estonian
Email: pasha@tpu.ee

Present status and working address:

Assistant at Tallinn Pedagogical University, Chair of Chemistry
Narva Road 25, 10120 Tallinn, Estonia, phone: +372 6409415

Education:

2000-2002 Tallinn Pedagogical University, *magister artium* degree in Educational Sciences (theory of craft and vocational education)

1995-1999 Tallinn Pedagogical University, *cum laude*, diploma in Handicraft and Home Economics

1984-1995 Tallinn Secondary School No 21.

Research and professional experience:

2002- : Tallinn Pedagogical University, Department of Natural Sciences, Assistant

2000-2002 Tallinn Pedagogical University, Department of Natural Sciences, Nutrition teacher

2000-2001 Tallinn Pedagogical University, Department of Natural Sciences, secretary

1999- 2000 Tallinn Open Air School of K. Päts, teacher of hand work club

1998-2000 Tallinn Pedagogical University, Chair of Chemistry, laboratory assistant

1997-1999 Tallinn Open Air School of K. Päts, teacher of Handicraft and Home Economics

Courses taught at Tallinn Pedagogical University:

Languages: Estonian, English, Russian.

Chair of Geo-Ecology

Name: **Jaan-Mati Punning**
Date of birth: 13.03.1940
Place of birth: Tartu district, Estonia
Nationality: Estonian
Present address: Trummi 40/3, Tallinn
Phone: 525 1095
e-mail: mati@eco.edu.ee

Present status:

Professor at Tallinn Pedagogical University, head of Chair of Geocology; Director of Institute of Ecology at Tallinn Pedagogical University. Kevade 2, 10137 Tallinn

Education: Graduated as diploma chemist from Department of Natural Sci, University of Tartu.

Academic degrees: Cand of geol.-min. sci (Tallinn) 1968; Dr of Science in Geography (Moscow, Inst of Geography) 1981; Senior researcher (VAK, Moscow) 1975; Professor: VAK, Moscow, 1986, Tartu University, 1986, Tallinn Pedagogical University, 1993.

Research and professional experience:

Technician, engineer, senior engineer in the Geological Survey (1963-1970);
head of laboratory at the Institute of Geology(1970-1987);
deputy Director of the Institute of Thermophysics and Electrophysics Acad of Sci Estonian SSR (1987-1989);
Director of the Institute of Ecology and Marine Sciences, Estonian Acad. of Sci. (1989-1991);
Director of the Institute of Ecology (since1991).
Professor in the Tartu University (1986-1992) and Tallinn Pedagogical University (since1993).
Visiting scolar at various universities and laboratories in Moscow, Helsinki, Oslo, Stockholm, London.

Current research programme:

Paleogeographical and palaeoecological reconstructions and modelling, global change, impact of natural and man-made processes on the state, structure and development of landscapes and ecosystems.

Leader of many research and applied projects. At present time:

ESF grant

Target-financed project of the Ministry of education and research

UNESCO project

Compiler of Estonian National Climate Report to the UN

Awards:

Medal of the Helsinki University, 1976

Medal of N. Vavilov, 1988

Medal of K.E.v. Baer, 1990

The Science Award of the Estonian Republic in Bio-, Geo-, and Agricultural Sciences, 1994,

Medal of Merits Estonian Acad of Sci, 1992

Medal of Merits Tallinn Pedagogical Univ, 2001,

4th class White Star orden, 2001

Medal of Merits of Ida Virumaa County, 2003.

Research- administrative experiences:

President of Estonian Geographical Society. Member of Academic Council for the President of the Estonian Republic, Member of the Editorial Board of journals "Publ of Acad Sci of Estonia, Biology*Ecology" and "Oil Shale", Head of the Master Sciences and PhD councils at TPU, Member of Scientific Council of TPU and head of Scientific Council of Institute of Ecology at TPU, Vice Member of Estonian Climate Commission

Courses taught at Tallinn Pedagogical University: Landscape geochemistry, Paleogeography, Paleoecology, Environmental studies, Modern ideas in natural geography, Development of Estonian territory and human settlement during the Holocene.

Supervised PhD dissertations:

2 cand. of sci. (R. Rajamäe, R. Vaikmäe)

4 PhD (K. Künis, T. Alliksaar, S. Jevrejeva, A. Kratovits), 16 MSc.

Languages:

Estonian - excellent speaking, reading and writing

English - good speaking, reading, and writing

Russian - good speaking, reading and writing

Publications: Author of 6 monographs and more than 450 scientific papers.

Name: **Jaan Jõgi**
Date of birth: 20.07.1949
Place of Birth: Tallinn, Estonia
Nationality: Estonian
Present address: Sakala 18-16, Tallinn, 10141
Phone: +3725076421
E-mail:

Present status and working address: Associate professor at Tallinn Pedagogical University Narva road 25, Tallinn 10120 Estonia. Phone +372 6409417, fax +3726409418

Education: Graduated in 1972 from the Chair of Physical Geography, Faculty of Biology and Geography, University of Tartu.
Diploma thesis title “Mikrokliima kaardistamine küsimusi”.

Academic degrees Candidate of science degree in 1983 from chair of meteorology and climatology, Faculty of geography. Leningrad State University. Thesis title: Физико-угодий (на примере Эстонский ССР).

Research and professional experience

1972 – 1991 Estonian Agrometeorological Laboratory

1972 – 1974 engineer

1974 – 1983 researcher

1983 – 1991 senior researcher

1992 – 2002 Estonian Meteorological and Hydrological Institute, Department of Climatology, Chair of Department.

1993-1998 Chair of geocology, Tallinn Pedagogical University; assistant, since 1998 docent.

Courses taught at Tallinn Pedagogical University: Meteorology and Climatology, General and agrometeorology of Estonia, General physical geography Cartography, Environmental Monitoring of Estonia.

Current scientific research projects: Regional and agroclimate of Estonia, Genesis of microclimate, the effect of human activities on microclimate.

Languages:

Estonian excellent speaking, reading and writing

English reading, speaking and writing

Russian good speaking, reading and writing

Publications: over 50 scientific papers, 4 schoolbooks..

Name: **Edgar Karofeld**
Date of birth: 21. IX 1959.
Place of Birth: Kohtla-Järve, Estonia
Nationality: Estonian
Present address: Raadiku 14-33 Tallinn 13817
Phone +372 6622187
Email: edgar@eco.edu.ee

Present status and working address: Associate professor at Tallinn Pedagogical University Narva road 25, Tallinn 10120 Estonia. Phone +372 6409417, fax +3726409418. Senior researcher Institute of Ecology at TPU, Kevade St. 2, Tallinn 10137. Phone +372 6622187, Fax + 372 6622283.

Education: Graduated from Tartu State University, 1983, Dipl. Biologist (Botany) + teacher of biology and chemistry;
1997 - 1999, PhD student at Tallinn Pedagogical University.

Research and professional experiences:

1983-1987 Institute of Geology, Academy of Sciences of ESSR; engineer and junior researcher.
1987-1990 Institute of Thermo- and Electrophysics, Estonian Acad of Sci.; jr. researcher.
1990-1992 Institute of Ecology and Marine Research, Estonian Acad. of Sci.; scientific secretary.
1992-2000 Institute of Ecology at Tallinn Pedagogical University; scientific secretary.
2000-2002 Institute of Ecology, researcher, since 2002 senior researcher.
1993-1998 Chair of geocology, Tallinn Pedagogical University; assistant, since 1998 docent.

Academic degrees: MSc degree in geocology in 1994 at Tallinn Pedagogical University "*On the influence of atmospheric influx upon bogs in North-Eastern Estonia*".

PhD in ecology in 1999 at TPU "*Formation and development of microtopography on Estonian raised bogs*".

Courses taught at Tallinn Pedagogical University: Environmental problems and nature conservation in Estonia, Methods in geocology, Field practicum, Field excursion I, Wetlands ecology.

Scientific interest: development of bogs and their role in nature, formation and development of bog microtopography and its role in bog ecosystem, human impact on bogs.

Honours/awards: Award of the Republic of Estonia in bio-, geo- and agricultural sciences in 1995 as the co-author of the monograph "The influence of natural and anthropogenic factors on the development of landscapes". Best scientific paper of TPU in bio-geo sciences and chemistry in 2001.

Participation in professional societies and boards: 1990-1992 scientific secretary of the Inst. of Ecology and Marine Research, 1992-2000 scientific secretary of the Inst. of Ecology at TPU and secretary of Scientific Council, 1998-2000 member of the TPU council, 1999-2000 member of the TPU Scientific Commission. International Peat Society - member of the V Committee. Advisers in the expert committee of acquisitions of the TPU Academic Library.

Recent grant funding:

ESF grant 4713 *Degeneration of Sphagnum mosses and formation of mud-bottoms — development dynamics and role in raised bog ecosystem*, 2000-2003. - principal investigator.

Target financed project funded by the Estonian Ministry of Education No 0282121s02 *Climate change impact on wetlands, their structure and functioning*, 2002-2005. - project leader.

EU 5th Framework project *Abrupt climate changes recorded over the European land mass: multi-proxy records of Late-Holocene climate variability in Europe, and N Atlantic teleconnections*, 2003-2006, - Estonian sub-project leader.

Languages:

Estonian - excellent speaking, reading and writing

English - good speaking, reading, and writing

Russian - good speaking, reading and writing

Publications: over 50 scientific papers, 4 of them in CC journals.

Name: **Andres Kratovits**
Date of birth: 10. X 1966
Place of Birth: Tallinn, Estonia
Nationality: Estonian
Present address: Lätte 9-5, Tallinn
Ph: +372 6262 841
Email: andres.kratovits@ekm.envir.ee

Present status and working address:

Assistant at Tallinn Pedagogical University
Narva 25 Narva Road, 10120 Tallinn, Estonia

Education:

Graduated in 1991 from Tartu University, diploma in biology. Graduated in 1992 from Estonian School of Diplomacy.

Graduated *MA* degree in 1999 from Tartu University, political sciences/international relations, *MA* thesis title: "Non-hierarchical arrangements in international environmental cooperation – the case of Baltic cooperation".

Graduated *PhD* degree in ecology in 2003 from Tallinn Pedagogical University. Doctoral thesis title: "Driving Forces of the Formation of Estonia's International Environmental Cooperation in the 1990s".

Research and professional experience:

2002 - ... Chair of Geocology, Tallinn Pedagogical University, Assistant

Courses taught at Tallinn Pedagogical University: Introduction to Human Geography; World Economic and Political Geography; Estonian Natural and Economic Geography.

Languages:

Estonian excellent speaking, reading and writing

English very good reading, good speaking and writing

Russian good speaking, reading and writing

French fair speaking, reading and poor writing

Publications: 12 papers in the last 5 years.

Awards:

November 2001, Award by Rein Taagepera fund for the article "Role of International Regimes in the Formation and Maintenance of the Baltic Environmental Cooperation" *Journal of Baltic Studies* (Vol. XXIII, Fall 2001, pp. 289-307);

The best article in natural sciences at Tallinn Pedagogical University in 2001 for the article "The Driving Forces of the Formation of Environmental Policy of the Baltic Countries" *AMBIO* (Vol. 30, No. 7, Nov. 2001, pp. 443-449)

Name: **Reimo Rivis**
Date of birth: 17.10.1974
Place of Birth: Tallinn, Estonia
Nationality: Estonian
Present address: Nõmme-Kase 5-1, Tallinn.
Phone: +372 5115987
E-mail: rrreimo@tpu.ee

Present status and working address:

Lecturer at TPU, Department of Natural Sciences; Researcher at TPU Institute of Ecology
Kevade St. 2., 10137 Tallinn, Estonia
tel: +372 6622187, fax: +372 6622283

Education:

Graduated in **1998** from Chair of Geoecology, Department of Natural Sciences, Tallinn Pedagogical University. BSc thesis title: "Changes of land cover pattern in Harilaid and in Rammu Island".

Graduated **MSc degree in 2000** from Chair of Geoecology, Department of Natural Sciences, Tallinn Pedagogical University. Master thesis title: Formation of landscape diversity of small islands exemplified by Abruka and Vilsandi.

Graduated **PhD degree in 2005** from Chair of Geoecology, Department of Natural Sciences, Tallinn Pedagogical University. Thesis title: Shoreline dynamics in Estonia associated with climate change.

Research and professional experience:

1997 Institute of Ecology, Tallinn Pedagogical University, technician

1998-2000 Institute of Ecology, Tallinn Pedagogical University, assistant

1998-2004 hourly waged assistant lecturer, Tallinn Pedagogical University

Since 2001 Institute of Ecology, Tallinn Pedagogical University, researcher

Since 2004 Tallinn Pedagogical University, Department of Natural Sciences, lecturer

Courses taught at Tallinn Pedagogical University:

Cartography, Geographical Information Systems, Data analyse and fieldwork methodology, Field trip II, Introduction to landscape studies, Estonian landscapes.

Scientific interest:

Shore processes and shoreline changes, changes of coastal landscapes, cartographic and graphical methods of data analyse.

Languages:

Estonian excellent speaking, reading and writing

English fair reading, speaking and writing

Publications: 9 scientific papers in the last 5 years, 1 schoolbook.

Name: **Sirje Siska**
Date of birth: 19.09.1957
Place of Birth: Antsla, Estonia
Nationality: Estonian
Present address: Linnamäe 11-174, Tallinn, 10120.
Ph: +5165731
Email: sirje@tpu.ee

Present status and working address: Lecturer at Tallinn Pedagogical University. Narva 25
Narva Road, 10120 Tallinn, Estonia
Phone: +372 6409417, fax: +372 6409418

Education: Graduated in 1983 from Chair of Geography, Faculty of Biology and Geography, University of Tartu. Diploma thesis title: "Karula upland protected area and landscape structure".

Academic degrees: *MA* degree in 2002 from Tallinn Pedagogical University Faculty of Educational Sciences. Master thesis title: "The topic of landscape zones in school Geography".

Research and professional experience:

1983 teacher of geography Tallinn 16th Secondary School

1997-2002 Chair of Geocology, Tallinn Pedagogical University, Teacher

Since 2002 Chair of Geocology, Tallinn Pedagogical University, Lecturer

Courses taught at Tallinn Pedagogical University: Estonian Geography, Physical Geography of the continents, History of geographical discoveries, Didactics of Geography, Physical Geography of the continents and history of geographical discoveries, Estonian Landscapes

Languages:

Estonian excellent speaking, reading and writing

English good reading, poor speaking and writing

Russian good speaking, reading and writing

Lectureship of Environmental Management

Name: **Tõnis Põder**
Date of birth: 28. 09. 1948
Place of Birth: Estonia
Nationality: Estonian
Email: tpoder@tpu.ee

Present status and working address:

Head of the Lectureship of Environmental Management, associate Professor in Tallinn Pedagogical University
25 Narva Road, 10120 Tallinn, Estonia
Phone: +372 64 09 466, fax: +372 64 09 418

Education:

Graduated in 1972 from Tartu State University, Faculty of Biology and Geography (Dipl. Hydrologist)

Academic Degree:

Cand. sci. of Biology (ecology) (PhD), 1981, Tartu State University

Research and professional experience:

1973-1989 Academy of Sciences, Dept. of the Baltic Sea, research scientist
1989-1992 Institute of Ecology and Marine Research, research scientist
1992-2001 Estonian Marine Institute, senior scientist, contractual consultant
1997- GR-Skoop Ltd., contractual environmental auditor, ISO 14001 consultant, EIA expert
2000- Associate Professor in Tallinn Pedagogical University

Courses taught in TPU: Environmental Impact Assessment, Strategic Environmental Assessment, Environmental Risk Assessment, Corporate Environmental Management

Membership of professional bodies:

Chamber of Environmental Auditors of Estonia
Registered environmental auditor
Licensed EIA expert
Member of EIA Trainers Network at the EIA Centre, University of Manchester
Head of the Lectureship of Environmental Management
Member of the Faculty Council

Language:

Estonian excellent speaking, reading and writing
English fair speaking, very good reading and fair writing
Russian fair speaking, very good reading, fair writing
German poor speaking, very good reading and fair writing
Finnish poor speaking, good reading, poor writing

Publications: about 25 scientific papers, 4 of them in CC journals

Name: **Ljubov Gornaja**
Date of birth: 23. 02. 1949
Place of Birth: Kohtla-Järve, Estonia
Nationality: Estonian
Present address: Vilde tee 79-38, Tallinn, 12912.
Phone: +372 65 46 489.
Email: gornaja@online.ee

Present status and working address:

Associate Professor at Tallinn Pedagogical University
25 Narva Road, 10120 Tallinn, Estonia
Phone: +372 64 09 466, fax: +372 6409418

Education:

Graduated in 1971 from Faculty of Engineering Economics, Technical University of Saint-Petersburg.

Graduated *Can. Econ* degree in 1986 from Central Institute for Economy and Mathematics, USSR Academy of Sciences, Moscow.

Research and professional experience:

1971 – 1975 Geological Department of Estonia, Tallinn, Economist

1975 –1978 Central Institute for Economy and Mathematics, USSR Academy of Sciences, Moscow, post-graduated student

1979 – 1980 Geological Department of Estonia, Tallinn, Senior Economist

1980 – 1988 Estonian Research Institute for Forestry and Nature Protection, Tallinn, Senior Research Associate

1988 – 1989 Scientific Information Centre for Nature Management, Ministry of Environment of Republic of Estonia, Tallinn, Senior Research Associate

1989 – 1992 Institute for Problem of Market Economy, Russian Academy of Sciences, Moscow, second post-graduate student

1993 – 1998 Environment Information Centre for the Ministry of Environment of Estonia, Tallinn; Environment Economics Adviser

1998 – 2003 Environmental Economics and Financing Consultant, freelancer

2003- Chair of Environmental Management, Tallinn Pedagogical University, Associate Professor

Courses taught at Tallinn Pedagogical University: Environmental Economics; An Introduction to Corporate Environmental Management.

Language skills:

Estonian excellent speaking, reading and writing

Russian excellent speaking, reading and writing

English good speaking, reading and writing

German good reading, fair speaking and writing

Number of publications: 14.

Name: **Kai Künnis**
Date of birth: 28. 06. 1961
Place of Birth: Estonia
Nationality: Estonian

Present status and working address:

Associate Professor at Tallinn Pedagogical University
25 Narva Road, 10120 Tallinn, Estonia
Phone: +372 64 09 466, fax: +372 6409418

Education:

1996-1999 PhD student at Tallinn Pedagogical University, Department of Natural Sciences; PhD of ecology degree, thesis: "Spatio-temporal regulation of bacterioplankton distribution and composition in marine habits."
1995-1996 MSc student at Tallinn Pedagogical University, Department of Natural Sciences; MSc of geoecology degree, thesis: "Microbiological transformation of nitrogen compounds in the Matsalu Wetland ecosystems."
1979-1984 student in Tartu State University, Faculty of Biology and Geography, Department of Biology; certified biologist-microbiologist, teaching qualification on biology and chemistry.

Training courses and other professional activities

2003 European Commission Joint Research Centre in Ispra (Italy), Inland and Marine Waters Unit, Inst. for Environment and Sustainability; Work group of Drinking Water (9 months).
2002 Assessor training course for laboratory accreditation (SWEDAK and EAK)
1999 Training course of the Environmental Management Systems (EMS) ISO 14000 Series (AJA Environmental, Quality and Safety Certification Services Ltd)
1997 FITA3 programme practical course on Toxkit Microbiotests at the RECETOX Centre of the Masaryk University, Czech Republic.
1997 Course: Environmental impact assessment. Environmental legislation in Estonia (Estonian Ministry of Environment).
1997 Training course of Due Diligence Auditing (Carl Bro as, Denmark).
1996 Training Course of Environmental Auditing (Det Norske Veritas).
1995 University of Lund, course "Restoration of lake and river ecosystems. River as an ecological unit".
1992-1993 EC Project TEMPUS courses: "Environmental Protection Training for Estonia".
1992: University of Sunderland, MSc. course of Waste Management, 2 modules.
1993: University of Rennes, Surface, ground and coastal waters management.
1992 Kiel Marine Institute, University of Kiel; DAAD grant (4 months): Modern microbiological methods for marine microbiology and Baltic Sea microbiological monitoring.
1990 Kalmar Technical University (Sweden), SI grant (3 months): Coastal environment biology, microbiological monitoring of south-east coastal waters of Sweden.

Research and professional experience:

2004 - Tallinn Pedagogical University, associate professor
2001-2004 Institute of Ecology, Tallinn Pedagogical University, Estonia; research scientist
1996-2001 Tallinn Water Ltd, Microbiological Laboratory, Estonia; head of the laboratory
1995-1996 Estonian Hydrometeorological Institute, Tallinn, Estonia; research scientist

1984-1995 Institute of Environmental Technologies, Tallinn Technical University, Estonia;
research scientist on Marine surface waters microbial monitoring

Membership in professional bodies: Estonian Water Association, Estonian Society of Microbiology, Estonian Society of Toxicology, Estonian Chamber of Environmental Auditors.

Languages:

Estonian: excellent written, read and spoken

English: good to very good written, read and spoken

Italian: good read, written and spoken with dictionary

Finish: good read, written and spoken with dictionary

Russian: good read and spoken, moderate with writing

Number of publications: 16.

Name: **Aadu Võsu**
Date of birth: 07.01.1942
Place of Birth: Valga, Estonia
Nationality: Estonian
Present address: Lootuse 10, Vasalemma, Harjumaa, 76101.

Present status and working address:

Lecturer at Tallinn Pedagogical University
25 Narva Road, 10120 Tallinn, Estonia
Phone: +372 64 09 466, fax: +372 6409418

Education:

1961-1966 Tallinn Polytechnical Institute, as civil engineer (sanitary engineering), PhD.

Further training

1992 Waste management practice in Canada, province of Ontario
1993 Waste management training in Denmark
1990-1993 Waste management practice in England, Finland, and Sweden
1994 Treatment and handling of sewage sludge. Practice in sewage treatment centre in Canada, Burlington.

Research and professional experience:

2004- Lecturer at Tallinn Pedagogical University

2004- AS Entec, project manager

2003-2004 Tallinna Prügila AS, production manager

2001-2003 Ing.-Büro DALI & Partner GmbH, Office Manager

Compiling waste treatment projects:

A. Environmental and economical assessment of EU directives “Order for old oil treatment”, “Order for managing cars removed from usage” and “Order for treatment of electronic waste”. Customer Ministry of Environment. 2001

B. Expertise of usage and closing project of Viljandi landfill. Customer Viljandi city government. 2002

C. Determination of optimal treatment and transportation means for waste produced, deposited and recycled in Raplamaa. Customer Rapla commune administration. 2002

D. Possibilities of hauling and treatment of waste in Pärnu county. Customer AS Entec. 2002.

E. Profitability study for waste reloading station to be established in Harjumaa. Customer AS Krissan. 2002.

1994-2001 Ragn-Sells AS, Manager of Environmental Affairs

1971-1994 Tallinn Technical University, Scientist, lecturer of solid waste management

1966-1971 Tallinn City Government, engineer, department manager.

Languages: Estonian, Russian, English.

Publications: scientific papers – 14, 7 of them are published in Current Contents journals.

Chair of Applied Physics

First Name	Ülo
Surname	Ugaste
Institution	Tallinn Pedagogical University
Position	Professor of Applied Physics
Date of birth	17.04.1939
Education	1957-63 Moscow University, physicist 1963-66 Moscow University, post-graduate student
Research and professional experience	1966-67 junior researcher (Institute of Thermal Physics, Acad. Sciences, Tallinn) 1967-73 junior researcher (Institute of Metallurgy, Acad. Sciences, Moscow) 1973-80 docent (All-Union Institute for Mashinebuilding, Moscow) 1980-87 docent (Norilsk Industrial Institute, Russia) 1987- docent, professor (Tallinn Pedagogical University)
Academic degree	Doctor Phys.Math.Sc. (1989, Institute for Metal Physics, Acad. Sci. Ukraine, Kiev - "Interdiffusion near phase transition points in binary metal systems") Cand.Phys.Math.Sc. (1968, A.A.Bardin Institute of Metallurgy, Moscow , " Development of methods for interdiffusion experiments in binary metal systems")
Professional training	Moscow University, advanced training courses (4 months) 1979 Moscow University, advanced training courses (2 months) 1986 Institute for Metal Physics, Kiev, research training (4 months) 1989 Eindhoven University of Technology, research training (3 months) 1997
Honours/awards	Medal of merits of Tallinn Pedagogical University 2003.
Research-administrative experience	1973-76 Head of Dept. for Scientific Research at All-Union Institute for Mashinebuilding, Moscow) 1980-87 Head of Dept. of Mathematics at Norilsk Industrial Institute 2003- Member of Expert Commission of the Estonian Science Foundation.
Supervised dissertations	2 Doctoral degree 5 Master degree
Current research programme	Interdiffusion in metal systems, phase transitions, interaction between dense plasma focus and wall materials, diffusion of hydrogen and its isotopes, interaction between point defects in Si-SiO ₂ system, didactics of physics
Current grant funding	Interdiffusion in ternary metal systems: optimum methodology for experimental investigations, ESF No. 5080, 2002-2004; (Principal Investigator). Stochastic processes at dense plasma beams interaction with constructions materials. International Atomic Energy Agency Project No 302-FI-EST12062, 2002-2005 (Chief Scientific Investigator).
Courses taught at	General Course of Physics (Mechanics, Molecular Physics,

Tallinn Pedagogical University	Electricity and Magnetism, Atomic and Nuclear Physics, Physics of Radiation), Solid State Physics, Metal Physics, Crucial Experiments in Physics, Thermodynamics of Irreversible Processes etc.
Publications	The number of scientific publications - 298 (Current Contents publications 46).; Monographs –3; University Text-books .- 4 , Text-books for secondary schools – 6.

First Name	Tõnu
Surname	Laas
Institution	Tallinn Pedagogical University
Position	Associate professor of applied and general physics
Date of birth	05.02.1969
Education	1986-1991 Tallinn Pedagogical Institute, diploma of teacher of physics and mathematics 1991-1992 Tallinn Pedagogical University, diploma in university teacher speciality 1993-1996 Post-graduate studies at Tallinn Pedagogical University in the field of theoretical physics, MSc in theoretical physics 1998. Master thesis title “Higher order fundamental solutions of the scalar wave equation on the curved space-time” 1998-2002 Doctoral degree study in Tartu University in the field of theoretical physics. Doctoral thesis title “Propagation of waves in curves spacetimes”
Research and professional experience	1992-1993 Järva County Council , computer system engineer, 1995-2002 Tallinn Pedagogical University, assistant in chair of applied physics, 2002-2003 Tallinn Pedagogical University, lecturer in chair of applied physics, 2003-Tallinn Pedagogical University, associate professor in chair of applied and general physics
Academic degree	PhD in theoretical physics
Dates and sites of earning the degrees	2002, Tartu University
Research-administrative experience	2004-... Member of the board of Estonian Physics Society
Current grant funding	Colored-noise-induced phase transitions and transport phenomena in nonlinear systems, ESF No. 5943, 2004-2007; (executer). Stochastic processes at dense plasma beams interaction with constructions materials. International Atomic Energy Agency Porject No 302-FI-EST12062, 2002-2005 (executer).
Courses taught at Tallinn Pedagogical University	Mathematical Methods in Natural Sciences, Introduction to the Area of Specialisation, Heat and Molecular Structure, Cosmology, Application of Computers in Physics, Preparation and Data Processing of Experiment, Methods of Mathematical Physics, Mechanics, Modern Physics, Structure of Matter
Number of publications: 10, 6 of them are published in Current Contents journals.	

First Name	Astrid
Surname	Rekker
Institution	Tallinn Pedagogical University
Position	Assistant of applied and general physics
Date of birth	25.07.1972
Education	Graduated <i>MSc</i> degree in theoretical physics in 2000 from Chair of Theoretical Physics, Faculty of Mathematics and Natural Sciences, Tallinn Pedagogical University. Master thesis title: "Trichotomous noise-induced phase transitions for the Malthus-Verhulst and Hongler models." Since 2001 PhD student, Chair of Theoretical Physics, Faculty of Physics and Chemistry, University of Tartu.
Research and professional experience	2002-2003 Tallinn Pedagogical University, researcher in chair of applied physics Since 2003 Tallinn Pedagogical University, assistant in chair of applied physics
Academic degree	<i>MSc</i> degree in theoretical physics
Dates and sites of earning the degrees	2000, Tallinn Pedagogical University
Current grant funding	Estonian Science Foundation grant nr 5943, senior personnel
Courses taught at Tallinn Pedagogical University	Mathematical Methods in Natural Sciences, Mechanics, Optics, Structure of Matter.
Number of most important publications:	8

First Name	Marko
Surname	Reedik
Institution	Tallinn Pedagogical University / Tallinn University of Technology
Position	Assistant of Appliance Physics
Date of birth	06.06.1978
Education	2001 - Tallinn Pedagogical University post-graduate 1996 – 2001 Tallinn Pedagogical University Physics Teacher of Gymnasium part 1985 – 1996 Pärnu VI Grammar School
Research and professional experience	10/1997 - 08/2001 Tallinna Kesklinna Koolidevaheline Õppekeskus teacher of informatics / basics of PC 09/2000 - 08/2001 Audru Grammar School teacher (base school and gymnasium school) / teaching of physics 09/2001 - Tallinn University of Technology engineer 09/2001 - 01/2002 Tallinna Vanalinna Hariduskolleegium teacher (base school and gymnasium school) / teaching of physics 09/2003 - Tallinn Pedagogical University assistant
Academic degree	BSc in Physics, teacher of physics of Gymnasium
Dates and sites of earning the degrees	2001, Tallinn Pedagogical University
Courses taught at Tallinn Pedagogical University	Mechanics, Heat and Molecular Structure, Elementary Physics I, Elementary Physics II.
Research work	Characteristics Of Turbulence and its analysis based on Baltic Sea.

First Name	Anneli
Surname	Roode
Institution	Tallinn Pedagogical University
Position	Teacher of physics' didactics
Date of birth	04.03.1968
Education	1991 graduated from faculty of mathematics and physics, Tallinn Pedagogical University as dipl. teacher of physics and mathematics; 2002- master degree study in TPU, physics didactics specialty
Research and professional experience	1991-1992 Tallinn Music High School, teacher of physics and mathematics; 1991-1997 Tallinn Special High School of Extramural Studies, teacher of physics and mathematics in school of children with specific needs; 1997- Old Town Educational College; 1994-1997 Tallinn Pedagogical University, teacher of physics; 1997- Tallinn Pedagogical University, Chief of Physics Laboratories, teacher of physics' didactics, head supervisor of Department of Natural Sciences.
Academic degree	Dipl. teacher of physics and mathematics
Dates and sites of earning the degrees	Tallinn Pedagogical Institute (Tallinn Pedagogical University), 1991.
Research-administrative experience	1993-1994 Project "School with Distinction", Transformation School Leaders Group 1994-1996 Project manager of the project "Resultative Small School" 1996 "Progresses of Special Education in East and West Europe" in Sonnenberg, Germany 2000 Participation in work of Curricula Development of Estonian Forum of Education 2000 "Progresses of Special Education in East and West Europe" in Sonnenberg, Germany 2000-2001 Participation in projects of Developmental Centre of Curricula, Tartu University, expert 2001 Project of Estonian Ministry of Education and Research "Physics' Study Aids"
Courses taught at Tallinn Pedagogical University	Structure of Matter, History of Physics, Didactics of Physics, Methodology in Physics' Teaching, Didactics of Physics I, II, Solution of Problems in School Physics, Experimental Equipment in School
Current research programme	Concept Mapping and use of computer simulations in practicums of physics
The number of scientific publications:	1

Chair of Theoretical Physics

First Name	Romi
Surname	Mankin
Institution	Tallinn Pedagogical University
Position	Professor of the chair of Theoretical Physics
Date of birth	07.11.1947
Education	1970 Tartu State University; diploma in theoretical physics; 1971-74 Tartu State University; post graduate course
Research and professional experience	1974-86 Tallinn Technical Institute, Physics chair: assistant, senior teacher, associated professor. 1978 Leningrad Technical Institute: refresher course (4 months) 1981 Leipzig University, Institute of Mathematics: refresher course (10 months). 1986-92 Tallinn Pedagogical Institute: Chairman of Physics Chair. 1992-93 Tallinn Pedagogical University: associated professor of theoretical physics. 1993- ... Tallinn Pedagogical University: professor of theoretical physics.
Academic degree	Cand. Phys. Mat. Sci. of theoretical and mathematical physics. Tartu State University, 1974.
Dates and sites of earning the degrees	Tartu State University, 1974. Cand. Phys. Mat. Sci.
Honours/awards	Medal of merits of Tallinn Pedagogical University 2000. Medal of Estonian Physicaln Society 2002.
Research-administrative experience	1993-2004 Head of the Department of Natural Sciences 1998-2004 Chairman of the Scientific Commission at the Council of Tallinn Pedagogical University 1996-2001 Deputy speaker of the Council of Tallinn Pedagogical University. 2004- Member of Estonian Higher Education Accreditation Council.
Supervised dissertations	1 Doctoral degree 5 Master degree

Current research programme	Field theory and general relativity. Statistical physics, stochastic processes. Didactics of physics in high school.
Current grant funding	Colored-noise-induced phase transitions and transport phenomena in nonlinear systems, ESF No. 5943, 2004-2007; Principal investigator. Stochastic processes at dense plasma beams interaction with constructions materials. International Atomic Energy Agency Project No 302-FI-EST12062, 2002-2005 (executer).
Courses taught at Tallinn Pedagogical University	Depth Course in Physics II, Methods of Mathematical Physics, Statistical Thermodynamics, Cosmology, Theory of General Relativity, Astronomy, Thermodynamics and Statistical Physics, Stochastic Processes.
The number of scientific publications	86; University Text – books 9. Current Contents publications 18.

First Name	Ain
Surname	Ainsaar
Institution	Tallinn Pedagogical University
Position	Associated professor
Date of birth	24.03.1938
Education	1955-1961 Tartu State University, Dept. of Physics - physicist, gymnasium teacher of Physics
Research and professional experience	1961 post-graduate practice in Joint Institute of Nuclear Physics, Dubna, Russia (2 months), 1961-1964 Institute of Physics and Astronomy, Tartu, post-graduate course, 1964-1968 Institute of Physics and Astronomy, Tartu, junior researcher, 1968-1988 Institute of Physics and Astronomy, Tartu, senior researcher, 1988-1994 Institute of Chemical and Biological Physics, Tallinn, senior researcher, 1994- Tallinn Pedagogical University, Chair of theoretical physics, associated professor
Academic degree	Candidate of physics and mathematics (PhD)
Dates and sites of earning the degrees	Tartu State University, 1968
Research-administrative experience	1987- Member of the Estonian Physical Society, also as a member of the Board
Supervised dissertations	1989 PhD (kandidat fiz-mat. nauk) K.Kiiranen
Current research programme	Theory of elementary fields. Evolution of systems under stochastic processes
Courses taught at Tallinn Pedagogical University	Introduction to Theoretical Physics, Methods of Mathematical Physics, Practical Works of General Physics, Equations of Mathematical Physics, Electrodynamics and Special Theory of Relativity, General Relativity, Astronomy, Astrophysics, Analytical Mechanics, Fourier Series and Fourier Analysis, Variational Calculation, Nuclear Physics, Theory of Elementary Particles, Thermodynamics, Quantum Mechanics, Problems of Modern Physics.
Current grant funding	Colored-noise-induced phase transitions and transport phenomena in nonlinear systems, ESF No. 5943, 2004-2007 (executer). Stochastic processes at dense plasma beams interaction with constructions materials. International Atomic Energy Agency Project No 302-FI-EST12062, 2002-2005 (executer).
Publications: 45 scientific papers, 13 of them CC papers.	

1. First Name	Tiit
2. Surname	Lukki
3. Institution	Tallinn Pedagogical University
4. Position	Assistant
5. Date of birth	09. 04.1948
6. Education	Graduated in 1972 from Faculty of Chemistry and Physics, University of Tartu as physicist.
7. Research and professional experience	09.03.71 – 01.01.72 High school schoolbooks editor for Publishing house “Valgus”, Tallinn. 01.08.72 – 31.08.75 Engineer in Mariner Investigating Department of Institute of Thermo and Electrophysics, Tallinn 01.09.75 - 12.08.83 Constructor engineer in Laboratory of Agrochemical Research, Tallinn. 01.06.85 – 15.01.91 Directing engineer for Tallinn Botanical Garden. 16.01.91 - ... Teacher (assistant at the moment) at Tallinn Pedagogical University Tallinn.
8. Academic degree	<i>MSc</i> degree
9. Dates and sites of earning the degrees	Graduated 1993 from Tallinn Pedagogical University Tallinn
10. Courses taught at Tallinn Pedagogical University	Physical Picture of the World, Physical Methods in Sciences, Electromagnetism, Astronomy, Methods of Mathematical Physics, Stochastic Processes in Biology, Mechanics, Mathematical Methods in the Natural Sciences.
11. The number of scientific publications:	15

The Regulation for the Organisation of Studies at Tallinn Pedagogical University

*Established by the Board of
Tallinn Pedagogical University
Ordinance No 6 of 27.10.2003*

1. General provisions
2. General regulations for the organisation of studies
 - 2.1 Students, full-time and part-time studies
 - 2.1.1 Students
 - 2.1.2 External students
 - 2.1.3 Open University students
 - 2.2 Academic levels
 - 2.2.1 Bachelor's studies
 - 2.2.2 Master's studies
 - 2.2.3 Study based on integrated curricula of bachelor and master's studies
 - 2.2.4 Doctorate studies
 - 2.3 Curricula
 - 2.3.1 Definition of curricula and modules
 - 2.3.2 Structure of curricula
 - 2.3.3 Preparation and acceptance of curricula
 - 2.3.4 Amendment and closure of curricula
 - 2.3.5 Accreditation of curricula
 - 2.4 Subjects
 - 2.4.1 Course descriptions
 - 2.4.2 Syllabi
 - 2.4.3 Study resources and reference literature
 - 2.5 Student places formed on the basis of state funding and funding outside the state budget
 - 2.5.1 Formation of student places
 - 2.5.2 Filling student places
 - 2.5.2.1 Admission, initial filling of student places
 - 2.5.2.2 Filling vacated student places
 - 2.5.3 Payment of study costs
 - 2.5.3.1 Payment of study costs during the standard period of study
 - 2.5.3.2 Payment of study costs after the standard period of study
3. Organisation of studies
 - 3.1 Academic calendar
 - 3.2 Forms of study
 - 3.2.1 Class work
 - 3.2.2 Professional placement
 - 3.2.3 Independent work
 - 3.3 Standard division of the curriculum and time-table
 - 3.4 Planning studies, registering for a course
 - 3.4.1 Planning compulsory and optional studies
 - 3.4.2 Planning foreign language and computer studies
 - 3.4.3 Planning studies in Estonian (or other mother tongue)
 - 3.4.4 Registering for subjects
 - 3.4.4.1 Registering for subjects within the standard curriculum
 - 3.4.4.2 Registering for subjects outside the standard curriculum
 - 3.5 Student performance
 - 3.5.1 Assessment scale
 - 3.5.2 Examinations and assessments

- 3.5.2.1 Prerequisites for sitting examinations and assessments
- 3.5.2.2 Procedures for taking examinations and assessments
- 3.5.2.3 Procedures for administering examinations and assessments
- 3.5.2.4 Procedures for reporting and registering the results of examinations and assessments
- 3.6 Visiting students
 - 3.6.1 Conditions for studying as a visiting student
 - 3.6.2 Students of Tallinn Pedagogical University as visiting students
 - 3.6.3 Visiting students from partner universities studying at TPU
- 3.7 Studying abroad
- 3.8 Recognition of prior studies and work experience
 - 3.8.1 Recognition of prior studies and work experience when entering master's and doctorate studies
 - 3.8.2 Recognition of prior studies and work experience in the completion of a curriculum
 - 3.8.3 Procedures for credit transfer
 - 3.8.4 Individual study plans
- 3.9 Academic leave
- 3.10 Student status
 - 3.10.1 Status on the basis of study load
 - 3.10.2 Status on the basis of the academic year
- 3.11 Exmatriculation
- 3.12 Rematriculation
- 3.13 Graduation from the university
 - 3.13.1 Conditions and procedures for defending final papers and taking final examinations
 - 3.13.2 Assessment of graduation examinations and theses
 - 3.13.3 Issuing of graduation documents
- 4. Student rights and obligations
 - 4.1 Student counselling
 - 4.2 Grants and allowances
 - 4.2.1 Study allowances
 - 4.2.1.1 Basic and supplementary allowances
 - 4.2.1.1.1 Applications for basic and supplementary allowances
 - 4.2.1.1.2 Nomination for basic and supplementary allowances
 - 4.2.1.2 Economic allowances
 - 4.2.1.2.1 Applications for economic allowances
 - 4.2.1.2.2 Nomination for economic allowances
 - 4.2.1.3 Doctoral allowances
 - 4.2.1.3.1 Applications for doctoral allowances
 - 4.2.1.3.2 Nomination for doctoral allowances
 - 4.2.1.4 Payment of allowances
 - 4.2.2 Faculty grants
 - 4.2.3 University grants
 - 4.2.3.1 Grants for developmental activity at the university
 - 4.2.3.2 Grants for students studying abroad
 - 4.2.4 Grant termination
 - 4.3 Disregard for academic practices
 - 4.4 Contesting decisions associated with the regulations for studies
- 5. Administrative provisions

1. GENERAL PROVISIONS

- 1) The Regulations for the Organisation of Studies at Tallinn Pedagogical University (hereinafter “the university”) is a document which provides for the organisation of studies and study-related relationships at all academic levels and in all forms of study.
- 2) The organisation of studies is based on the Universities Act, the Higher Education Standard, the Framework for Teacher Education, the Statutes of Tallinn Pedagogical University, legal acts of Tallinn Pedagogical University and these regulations together with supplemented guidelines.
- 3) The Regulations for the Organisation of Studies and the amendments to it shall be approved by the board of the university. The guidelines within the regulations shall be prepared and amended by the Study Department. The guidelines and their amendments shall be approved by the order of the Vice Rector for Academic Affairs.
- 4) Boards of faculties and colleges have the right to establish their own regulations concerning study organisation in their respective institutions. Directors of colleges exercise the rights and duties of the dean in accordance with the regulations.

2. GENERAL REGULATIONS FOR THE ORGANISATION OF STUDIES

- 5) The language of instruction at the university is Estonian. The use of other languages for instruction shall be decided by the board of the university. The use of the language of foreign teaching staff shall be decided by the appropriate academic department.
- 6) Teaching, lectures and instruction shall be conducted by academic departments/centres, institutes, doctorate schools and colleges. Student performance shall be documented by the dean's offices in departments and by colleges. The requirements for student performance shall not depend on the mode of study.
- 7) Studies shall be conducted within a system of subjects. Within this system the students select subjects according to self-designed study plans, which they formulate on the basis of subject pre-requisites.
- 8) The study load is calculated in credit points. A credit point (hereinafter CP) is a calculated unit of study for determining study load. One credit point is 40 hours, which is one week of study including the student's class and independent work.
- 9) A standard period of study is the time necessary for completing the curriculum. The calculated study load per standard academic year is 40 CP.

2.1 Students, full-time and part-time studies

- 10) The university offers programmes for students, visiting students, external students and Open University students. Programmes are delivered in full and part-time formats as well as via external and Open University courses.

2.1.1 Students

- 11) A student is a person who is matriculated in full or part-time bachelor, master and doctorate study, or study based on the integrated curricula of bachelor and master's study.
- 12) Full-time study is a form of study in which the pursuit of studies is the main activity of the student. The student shall cumulatively complete at least 30 CP of the study load according to the curriculum by the end of every academic year.
- 13) In part-time study, where higher education is acquired alongside work or other duties, the student cumulatively completes less than 30 CP of the study load according to the curriculum but not less than 20 CP per academic year.

- 14) Students are admitted to the university for full-time and part-time studies. For curricula offered both in full-time and part-time study, a special competition shall be organised for admission. In the following academic years the students shall be considered for full-time or part-time studies on the basis of the cumulative total sum of their credit points according to the curriculum.

2.1.2 External students

- 15) An external student is a person who is allowed to take examinations and assessments without participating in regular classes and without having the status of a student.
- 16) Bachelor and master's programmes allow for the admission of external students who have in the course of prior studies completed at least 75% of the subjects of the curriculum of bachelor and master's studies.
- 17) Doctorate programmes allow the completion of the doctorate curriculum and the defence of the doctoral thesis as an external student.

2.1.3 Open University students

- 18) An Open University student is a person who attends degree courses, in-service training courses, curriculum modules or single subject programmes. Open University students are not deemed to be students of the university.
- 19) Degree programmes offer unified studies for Open University students and regular students. The university students as well as students of other universities and persons without the status of student are allowed, with the consent of the teaching staff, to participate in degree programmes.
- 20) In-service training shall, in principle, be provided for university graduates to upgrade their professional knowledge and skills. These studies shall be conducted in study groups following the curricula for in-service training.
- 21) The organisation of studies in the Open University shall be embodied in "The Regulations for the Open University".

2.2 Academic levels

- 22) Degree studies at the university refer to bachelor's studies, studies based on the integrated curricula of bachelor and master's studies, master's studies or doctorate studies.

2.2.1 Bachelor's studies

- 23) Bachelor's studies involve courses at the first level of higher education during which students improve their general educational knowledge, acquire the basic knowledge and skills of an area of specialisation and the knowledge and skills necessary for master's studies and/or to commence work. Bachelor's studies are worth 120 CP (standard period of study is three years).
- 24) Bachelor's studies end with the taking of the bachelor's degree examination or the defence of a bachelor's thesis. A person who has completed bachelor's studies shall be awarded a diploma certifying the bachelor's degree together with an academic report. The university shall also issue, free of charge, a diploma supplement in English if the person so requests.

2.2.2 Master's studies

- 25) Master's studies involve courses at the second level of higher education during which students improve their professional knowledge and acquire skills for independent work and doctorate studies. Master's studies are worth 40 to 80 CP (standard period of study is one to two years).
- 26) Master's studies end with the defence of a master's thesis or the taking of a master's degree examination. A person who has completed master's studies shall be awarded a diploma certifying the master's degree together with an academic report. The university shall also issue, free of charge, a diploma supplement in English.

2.2.3 Study based on integrated curricula of bachelor's and master's studies

- 27) Training to be a schoolteacher with a study load of 200 CP (standard period of study is five years) is based on integrated curricula of bachelor and master's studies. A person who has completed the class teacher's curriculum shall be awarded a diploma certifying the master's degree together with an academic report. The university shall also issue, free of charge, a diploma supplement in English.

2.2.4 Doctorate studies

- 28) Doctorate studies involve study at the highest level of higher education during which a student acquires knowledge and skills for developmental and/or professional creative activity and/or independent research. Doctorate studies are worth 120 to 160 CP (the standard period of study is three to four years).
- 29) Doctorate studies end with the defence of a doctoral thesis. A person who has completed doctorate studies shall be awarded a research degree – a doctorate degree with a diploma certifying the doctorate degree together with an academic report; the university shall also issue, free of charge, a diploma supplement in English.
- 30) Authority to award a doctorate degree and the procedures for the defence of a doctoral thesis and awarding the doctorate degree are embodied in “The Regulations for Doctorate Studies and the Defence of Doctoral Theses at Tallinn Pedagogical University“.

2.3 Curricula

2.3.1 Definition of curricula and modules

- 31) A curriculum is a source document for study, which sets out the objectives of the studies to be undertaken, the standard period and the volume of studies, the conditions for the commencement of the studies, the extent of the list of subjects, short descriptions of subjects, the opportunities and conditions for choosing the subjects, the opportunities for specialisation and the conditions for the completion of studies.
- 32) A broad group of studies are unified introductory subjects in one broad field of study, which provide students with a basic knowledge of this particular field. The fields of study are humanities, natural sciences, social sciences and teacher training. The list of subjects in a broad group of studies and the changes to this list shall be determined by the field committee and approved by the board of the faculty.
- 33) Interdisciplinary electives are subjects, which provide for social competencies necessary for coping in today's labour market. They shall be included in all curricula. Interdisciplinary electives belong to the module of the broad group of studies and all academic units may be considered as candidates to teach these subjects. Selection shall be made by the academic commission on the basis of submitted syllabi.
- 34) Focus subjects are unified across at least two curricula in one broad group of studies. The focus subjects from each particular department shall be determined by a departmental academic commission and approved by the board of the faculty. Joint focus subjects from different departments shall be determined by the field committee and approved by the boards of the corresponding faculties.
- 35) A major is a subject, which provides a basic systematic knowledge of the theories, research methods and objects of a particular field of study; of the developments and main issues in the field along with the ability to put the acquired knowledge into practice. A major may include a professional placement.
- 36) Core subjects (subject-specific studies in the curricula of teacher education) provide, at master and doctorate level, a deep understanding of contemporary research methods and trends along with the competence for independent research work and innovation in a particular specialisation.

- 37) A minor (worth 30 CP) is a subject in the curricula of bachelor's studies, which provides for the education of teachers of two or three subjects at master's level. Minors provide the status of qualified teacher for teaching the minor subjects (mainly at basic school level). The choice of a minor may be restricted according to the objectives of the curriculum (compulsory or recommended minors). A minor, in principle, can belong to the module of core studies in some other teacher education curricula.
- 38) A minor (worth 15 CP) is a subject in the curricula of bachelor's studies, which together with the major subjects provide necessary complementary skills for coping in the labour market. A minor is a specially designed group of subjects with the aim of providing universal social competencies.
- 39) Teacher's professional studies belong to teacher education curricula and involve general educational and psychological studies, didactics of the major and the minor along with a professional placement in the major and the minor. Teacher education is coordinated by the teacher training department of the Faculty of Educational Sciences and by the teacher training council (which belongs to the teacher training department). Teacher education may be undertaken in bachelor, master and doctorate studies, or studies based on integrated curricula of bachelor and master's studies.
- 40) Open electives are subjects, which may be chosen by the students from among all subjects taught at Tallinn Pedagogical University or at other universities.
- 41) At all academic levels a final examination or defence of a thesis is required. A thesis involves research of a developmental or creative nature in a field determined by the curriculum. A final examination is a combination examination in the area of specialisation.

2.3.2 Structure of curricula

- 42) The structure of the curriculum shall determine the modules to be included in the curriculum and their volumes.
- 43) The principles of the structure and composition of the curriculum are embodied in "The Statutes of the Curriculum at Tallinn Pedagogical University" and supplemented by "The General Principles for the Organisation of Studies at the Future Tallinn University".
- 44) Joint curricula, which are delivered by different partner universities, may provide requirements for completion of the curriculum and organisation of studies, which differ from what these regulations set out; in this case the requirements established in the joint curricula by the boards of the partner universities shall take effect.

2.3.3 Preparation and acceptance of curricula

- 45) A prerequisite for the acceptance of a curriculum is the approval of the draft curriculum by the boards of the faculty and the university. For preparing a draft curriculum, the dean shall nominate a curriculum coordinator whose responsibilities shall be:
 - to determine the objective of the curriculum and its detailed requirements taking into account suggestions from alumni, students and representatives of employers;
 - to organise the process of preparing the documents necessary for the acceptance of the curriculum;
 - to take responsibility that the content and the format of the curriculum conforms with the standard of higher education, The Universities Act and other state and university legislation;
 - to submit the draft curriculum to the board of the university for approval.
- 46) A draft curriculum shall include:
 - title page of the curriculum;
 - list of subjects arranged by modules where possible choices are shown;
 - course descriptions with study loads, subject codes, subject outlines, performance requirements and lists of pre-requisites (for details of course descriptions, see § 69);
 - appendices.

- 47) The title page of a curriculum shall include:
- name of the university and faculty;
 - code of the curriculum and its name in Estonian and English;
 - dates of approval by the boards of the university and faculty;
 - level of study;
 - accreditation of the curriculum;
 - study load of the curriculum in credit points and standard period of study;
 - admission requirements and entrance examination(s);
 - objectives of the curriculum;
 - course outline and organisation of studies along with the conditions for completing the studies;
 - documents issued at graduation;
 - degrees and qualifications to be awarded.
- 48) New curricula to be introduced in the coming academic year shall be approved by the board of the faculty during the first two weeks of November and by the board of the university during December. The curriculum shall be submitted to the board of the university subsequent to its analysis and evaluation by the academic committee of the board of the university. Teacher education curricula shall first be reviewed by the teacher-training department, before submission to the academic committee.
- 49) When evaluating a curriculum the academic commission shall:
- analyse the conformity of the content and the format of the curriculum with the standard of higher education and other legal documents;
 - make suggestions to the curriculum coordinator concerning amendments and improvements to the curriculum;
 - make one of the following proposals:
 - (1) to the board of the university – to accept the curriculum;
 - (2) to the curriculum coordinator – to amend and improve the curriculum;
 - (3) not to accept the curriculum.
- 50) The curricula with appendices as approved by the board of the university, the resolution of the board to accept the curricula and the application for registration of the curricula shall be submitted to the Ministry of Education and Research. The issue of graduation documents (diplomas) certifying a particular education shall be based on the registered curricula.
- 51) The registering of curricula, amendments to curricula, accreditation and closure of curricula shall be documented by the Study Department.

2.3.4 Amendment and closure of curricula

- 52) Changes to the title of the curriculum/area of specialisation shall be approved by the board of the university. The amended curriculum with replaced, closed or additional subjects shall be approved by the board of the faculty and submitted to the Study Department.
- 53) Amendments to the approved curricula, which apply to the next academic year, shall be approved by the board of the faculty not later than during the first two weeks of March. In case the amendments concern the curricula of several faculties, the proposal for approval shall be submitted also to the boards of these faculties.
- 54) In case the amendments to the curriculum exceed one third of the volume of compulsory subjects, a new curriculum shall be initiated.
- 55) The closure of a curriculum shall be approved after the proposal of the board of the faculty by order of the board of the university.

2.3.5 Accreditation of curricula

- 56) In the course of the accreditation of a curriculum, an expert evaluation of the university or the curriculum shall be given; the accreditation decision may be positive or negative. The

accreditation requirements for universities and curricula shall be established by the regulation of the Government of the Republic.

- 57) In the course of the accreditation of a curriculum, the following shall be evaluated: the conformity of the programme to legislative acts and standards on the basis of the curriculum, the level of corresponding theoretical and practical instruction and the research and pedagogical qualifications of the teaching and research staff. In addition to the above, the sufficiency of the resources for the provision of instruction on the basis of the given curriculum shall also be evaluated.
- 58) A curriculum may be accredited for the first time when students have completed two thirds of the study determined in the curriculum. A curriculum of doctorate studies may be accredited for the first time after the first students have graduated from the doctorate programme. In order to get accreditation the academic department shall submit a request to the Vice Rector for Academic Affairs who shall forward the request to the Higher Education Evaluation Council.
- 59) In order to organise the accreditation process self-evaluation task group of at least four members together with the group leader shall be nominated by the dean of the department on the proposal of the department. The group leader shall be responsible for preparing and presenting a self-evaluation report in English according to the guidelines and for the reception of the expert panel to the university.
- 60) In order to ensure a timely completion of the self-evaluation report, the task group leader shall prepare a schedule for drafting and submitting the report. The schedule shall be submitted to the dean and to the Study Department not later than one week after the formation of the task group.
- 61) Subsequent to a discussion in the Study Department, but no later than two months before the arrival of the visiting experts, the self-evaluation report (either in Estonian or English) shall be submitted to the dean and the Study Department by the task group leader. During one week the dean and the Study Department have the right to make suggestions for amendments and improvements to the report.
- 62) The improved accreditation report shall be submitted for discussion to the academic commission of the board of the university by the task group leader.
- 63) The university shall submit the self-evaluation report in English signed by the head of the academic department and the dean of the faculty, and supplemented by a covering letter from the Vice Rector for Academic Affairs, to the evaluation council a month and a half before the arrival of the visiting experts.
- 64) The Higher Education Evaluation Council shall make, taking into account the evaluation of the expert panel, one of the following decisions:
 - positive accreditation;
 - conditional accreditation;
 - negative accreditation.
- 65) The decision shall enter into force subsequent to the directive of the Minister of Education and Research. The period of the validity of a positive accreditation decision is seven years. Conditional accreditation is a positive decision and its period of validity is three years.
- 66) In case of a negative accreditation of the curriculum, the university shall terminate admission and studies in the corresponding field of study; the university shall ensure students the opportunity to continue their studies in the same or a similar field.

2.4 Subjects

- 67) A subject is a systematised body of knowledge and skills dealing with a field of scholarship or inquiry or a part thereof. A subject is taught through lectures, seminars, practical classes, reports, readings from literature and other forms of class and independent work. Studies end with an examination or assessment.

- 68) Subjects shall be divided into:
- compulsory subjects: to acquire a certain integral part of the curriculum;
 - electives: available for selection from the list of subjects determined in the curriculum.

2.4.1 Course descriptions

- 69) A subject shall be outlined in a course description, which is produced in Estonian and English and includes:
- code and name of the subject in Estonian and English;
 - study load in credit points/ECTS system;
 - proportions of lectures and seminars/practical classes in class work;
 - methods and forms of assessment: the proportion of the examination grade that is made up of results from continuous assessment;
 - particular semester for the course and the language of instruction;
 - objectives of the course and the module of the curriculum (general, major, core subject, etc);
 - course outline and methods of study, including description of independent studies and forms of assessment;
 - teaching staff by name and position;
 - codes of pre-requisites; to ensure a logical progression of subjects, up to two pre-requisites may be determined for each subject;
 - list of required (or recommended) reading.
- 70) Course descriptions of the subjects to be taught in the next academic year shall be presented electronically not later than during the first week of April and published in the study guide and on the website. The course descriptions for the following year shall be made known on the website during the third week of April.

2.4.2 Syllabi

- 71) Teaching staff shall prepare student-oriented subject programmes or syllabi in the subjects they teach.
- 72) Besides course descriptions the syllabi shall outline:
- content and timetable by lectures and/or seminars;
 - rules for attendance;
 - a user name and password for access to study resources on the website.
- 73) A syllabus shall be structured according to a standard format. The syllabi shall be reviewed and approved by the coordinating academic department and authorised by the teaching staff who prepared the syllabus and the head of the department. If the subject belongs to a major of the curriculum of some other department, the syllabus shall be agreed upon with the coordinator of the corresponding curriculum.
- 74) The syllabi shall be made available for the students at the beginning of the semester on the website or delivered to the students at the first lecture.

2.4.3 Study resources and reference literature

- 75) A subject shall have study resources and reference literature to the extent that enables students to acquire the theoretical part independently.
- 76) The teaching staff shall compile written course abstracts to accompany the lectures covering the main topics and key terms.
- 77) The study resources compiled by the teaching staff shall be available for students at the beginning of each lecture on paper or two working days before each lecture on the university website under the link Subject Catalogue. Students who have registered for the subject have access to study resources on the basis of a user name and password provided in the course description.

2.5 Student places formed on the basis of state funding and funding outside the state budget

- 78) A student place is a unit for the scheduling and financial planning of studies.
- 79) Student places are divided, according to the sources of study costs in the following manner:
- state commissioned education (RE in Estonian), that is, student places formed on the basis of state funding;
 - student places formed on the basis of funding outside the state budget (REV in Estonian), that is, student places formed on the basis of contracts between natural or legal persons paying for the student places and the university.

2.5.1 Formation of student places

- 80) The reference figures and costs for student places formed on the basis of the state budget and outside the state budget per curriculum shall be approved by the board of the university on the proposal of the deans of the faculties during the first two weeks of December.
- 81) A finalised division of student places per curriculum shall be approved by the board of the university on the basis of state commissioned education in a particular broad group of studies and proposals from the faculties.

2.5.2 Filling student places

2.5.2.1 Admission, initial filling of student places

- 82) Admission to all academic levels at the university shall be carried out once a year by way of open competition on the basis of the "Admission Requirements and Procedures at Tallinn Pedagogical University". Admission to the Open University shall occur twice a year, at the beginning of every semester.
- 83) The initial filling of student places for a particular curriculum shall be carried out according to the ranked order of the results from entrance examinations. Matriculation shall be based on the decision of the admission committee and carried out by order of the Vice Rector for Academic Affairs during the week before the autumn semester.
- 84) The students admitted to the university who fail to register for study during the first two weeks of semester without valid explanation shall be exmatriculated. The vacated place shall be filled on the dean's proposal by the next person in order on the ranked list of the same year.
- 85) Students transferring from other universities shall be matriculated at the beginning of the semester by order of the Vice Rector for Academic Affairs on the basis of the personal application of the student and the consent of both universities. The application shall be authorised by the dean/head of the department/chair of the university.
- 86) A student studying at or having graduated from the university in a student place formed on the basis of state funding shall not commence studies for a second time at the same academic level in a student place formed on the basis of state commissioned education during a period of time equalling three times the standard period of study of the curriculum.

2.5.2.2 Filling vacated student places

- 87) Student places formed on the basis of state funding or outside the state budget become vacant in the event of exmatriculation or the transfer of a student, to part-time study, who did not fulfil the requirements of full-time study in the previous year.
- 88) Filling student places, which have become vacant due to exmatriculation, shall be carried out during the first month of study in every semester; filling full-time student places shall be carried out at the beginning of the academic year on a date set in the academic calendar.
- 89) Only the students who have fulfilled the requirements for full-time study in the previous year may apply to continue in full-time student places formed on the basis of state funding or outside the state budget.

- 90) The following persons may apply for vacant student places formed on the basis of state commissioned education:
- students studying in student places formed on the basis of state funding and students who apply for a curriculum transfer;
 - applicants for rematriculation;
 - students of the Open University who have taken entrance examinations;
 - students transferring from other universities.
- 91) A student who has been transferred from full-time state funded studies to part-time studies funded from outside the state budget may apply for a state funded student place, in the event of a vacancy and on an equal basis with other applicants.
- 92) Student places formed on the basis of state funding may not be applied for by persons who have, in the same broad group of studies, in state commissioned education, exceeded the standard period of study set for the curriculum.
- 93) A list ranking applicants for student places formed on the basis of state funding shall be established by the dean's office according to the total number of credit points collected during studies, the total number of credit points from the previous year and the cumulative index. In the event of equal results, a student with higher academic performance in a major/specialisation shall be preferred.
- 94) The list ranking applicants for student places formed on the basis of state funding shall be made public on the notice boards of the dean's office and academic unit or on the website of the university on the closing date for registrations and admissions.
- 95) Vacated student places shall be filled by way of matriculation/rematriculation on the basis of the competition results and personal applications. The dean's proposal for filling student places shall be made public on the notice boards of the dean's office and academic unit. On the basis of this proposal an order from the Vice Rector for Academic Affairs shall be drawn up.

2.5.3 Payment of study costs

- 96) Study costs refer to the expenses incurred by the university in order to finance a student place during the given academic year.

2.5.3.1 Payment of study costs during the standard period of study

- 97) State funded education is free of charge for a student during the standard period of study of a particular curriculum.

The standard period of study may be extended:

- according to the duration of academic leave;
 - by one year, if a student whose Estonian language proficiency is lower than intermediate level (the result of their state examination is less than 60 points) undertakes advanced state language studies during the first academic year under the conditions and in accordance with the procedures established by the Minister of Education and Research.
- 98) Student places formed on the basis of funding from outside the state budget require the payment of study costs by students during the standard period of study on the basis of the semester tuition fee, which shall be approved by the board of the university and reviewed as necessary every academic year by the board of the faculty.
- 99) The board of the faculty may raise the tuition fee by up to 10 per cent from one academic year to the next. Decisions concerning tuition fees for the next year shall be made by the board of the faculty not later than during the first two weeks of March.
- 100) Upon commencing studies in student places formed on the basis of funding from outside the state budget, the student, or the one financing the student place and the Vice Rector for Academic Affairs shall enter into a contract for the payment of the study costs. The contract

shall be signed by the student, the head of the department, the dean of the faculty and the Vice Rector for Academic Affairs of the university.

- 101) Part-time students may pay study costs on the basis of credit point costs in the Open University. A corresponding amendment to the tuition contract shall be made on the basis of the student's application and his or her individual study plan for the semester not later than by the closing date for registrations and admissions.
- 102) Students may be granted allowances for the payment of study costs, reducing the tuition fee by up to half. The following circumstances shall be taken into account if the student has excellent academic performance:
 - the student is a person with a moderate, severe or profound disability;
 - the student is a parent or guardian of a child under seven years of age or of a disabled child;
 - the student is an orphan;
 - the student has made a remarkable contribution to research and developmental activities at the university.
- 103) The above mentioned allowances shall be decided upon by the dean of the faculty in each individual case on the basis of the proposal of the head of the department. If the student applies for an allowance under different circumstances, the decision to grant the allowance shall be made by the board of the faculty on the basis of the proposal of the head of the department. The student's application or the proposal of the head of the department shall be submitted in the dean's office by the date set in the academic calendar.
- 104) During academic leave, students in places formed outside the state budget shall pay administrative costs on the basis of the rates established by the government of the university.

2.5.3.2 Payment of study costs after the standard period of study

- 105) A student who has studied in a student place formed on the basis of state funding shall be transferred to a student place formed on the basis of funding from outside the state budget and required to pay his or her study costs if:
 - the student has exceeded the standard period of study according to the curriculum by one year;
 - the student has failed to fulfil the requirements of full-time study and has been transferred to part-time study.

The Study Department shall notify the student about his or her transfer to a student place formed outside the state budget in writing (on paper or by e-mail) by the closing date of registrations and admissions.

- 106) An exemption from the payment of study costs shall be given to a student who is studying in a student place formed on the basis of state commissioned education and who has exceeded the standard period of study by one year, if:
 - the student is a person with a moderate, severe or profound disability;
 - the student is a parent or guardian of a child under seven years of age or of a disabled child;
 - the student is studying in a field of study or following a curriculum agreed upon in the contract for state commissioned education on the basis of which the university has created student places for part-time study.
- 107) Students studying in student places formed on the basis of funding from outside the state budget and the students who have studied in student places formed on the basis of state funding, but who have exceeded the standard period of study by one year shall pay their study costs:
 - in accordance with the contractual semester tuition fee;
 - on the basis of the cost of credit points at the Open University for the subjects selected for the particular semester;

- on the basis of the cost of the defence of the final thesis or examination, if the student has failed only to defend the final thesis or take the final examination.

The cost of Open University credit points shall be established for each academic year by the government of the university during May. Defence fees and tuition fees for the next academic year shall be established by the government of the university on the basis of proposals from faculties.

3. ORGANISATION OF STUDIES

3.1 Academic calendar

- 108) The academic calendar shall set out the duration of the academic year by date; it shall provide for the beginning and end of studies, examination sessions and closing dates for registrations and admissions. The academic calendar shall be approved every year by the university government and published on the website and in the study guide.
- 109) The curriculum shall be completed according to academic years and semesters. The academic year shall begin on the Monday closest to 1 September and last for 40 weeks of study. The academic year shall be divided into autumn and spring semesters with 20 weeks of study in each. The semester shall begin with a preceding week, which is followed by 15 weeks of class work and an examination session of three weeks. In the middle of the semester there is one week of independent study without class work.
- 110) In distance studies, the studies, examinations and assessments shall be organised in study sessions. The sessions for the academic year shall be approved by the Study Department on the basis of proposals from the departments.

3.2 Forms of study

- 111) Studies shall be delivered in the form of class work, practical classes and independent work. The total study load of a student per credit point is 40 hours. All detailed requirements and conditions shall be determined by the teaching staff in their syllabi.

3.2.1 Class work

- 112) Class work involves achieving the objective of the programme via lectures, seminars, practical classes or some other form according to the curriculum. Lectures provide theoretical knowledge. Seminars and practical classes allow for application of the acquired knowledge and/or development of practical skills. In principle, class work shall not exceed 15 academic hours per credit point and in subjects of a practical nature – 20 academic hours.
- 113) In subjects with a volume of class work greater or smaller than 15 CP, modular study by half semester may be allowed. Examinations and assessments in subjects taught in the first half of the semester shall be taken during the week of independent study.
- 114) The volume of class work in distance studies shall, in principle, depending on the subject, comprise up to 30 per cent and in exceptional circumstances up to 50 per cent of the calculated class work volume.

3.2.2 Professional placement

- 115) Professional placement is practical work carried out in a professional environment (partner organisation) under the guidance of a supervisor. The curricula include placements in areas of specialisation; the teacher training curricula include professional placements in a pedagogical context.
- 116) The aim of the professional placement in the student's area of specialisation is the application of the acquired knowledge and skills in a professional environment. The content and organisation

of professional placement shall be set out by academic departments in the professional placement guide.

- 117) Professional placement in a pedagogical context is a practical form of acquiring subject-related and professional knowledge with the aim of raising the awareness of the role(s) of the teacher and of the specific nature of an actual school environment. The volume and the requirements for professional pedagogical placement have been established in the professional pedagogical placement guide prepared by the Teacher Education Department and approved by the board of the Faculty of Educational Sciences.

3.2.3 Independent work

- 118) Independent work involves independent acquisition and application of knowledge, discussion of issues, preparing reports, reading literature in the student's area of specialisation, preparing written work (reports, essays, research papers), etc.
- 119) In distance studies the requirements and conditions for independent work and the forms of assessment shall be specified in the syllabus.
- 120) The requirements for written work (report, essay) according to the curriculum shall be established by the teaching staff in the syllabi; formats for research papers (seminar papers, bachelor, master and doctoral theses) shall be established by the board of the faculty.

3.3 Standard division of the curriculum and timetable

- 121) The standard division of the curriculum refers to the division of the subjects of the curriculum into semesters, which shall allow for completion of the curriculum in its entirety during the standard period of study (one academic year is 40 CP, 20 CP per semester on average).
- 122) On the basis of the standard division of the curriculum, a request specifying the subjects to be taught in the next academic year shall be submitted by the head of the department/chair coordinating the given curriculum to the corresponding academic department; the request shall include the subjects requested, their codes, study loads, semesters of study and the estimated number of participants.
- 123) The head of the department coordinating the studies of the given subject shall give a positive or negative response in writing to the head of the department requesting the subject; an explanation shall be added in case of a negative response.
- 124) The timetable is a basic document for the organisation of studies, which shall be prepared on the basis of the standard division of the curriculum in an academic department/college and approved by the head of the department.
- 125) The timetable shall include:
- name of subject, code of subject, study load;
 - names of the teaching staff;
 - time and place of study and study weeks;
 - explanations for abbreviations used;
 - names and signatures of the persons who prepared and approved the timetable.
- 126) Not later than two months before the beginning of the semester the draft timetable for the next semester with the scheduled general and focus subjects shall be forwarded by the Study Department to academic departments/chairs for the preparation of the final timetable.
- 127) Departments/chairs shall specify in the timetable the core subjects/majors and, proceeding from the standard division of the curriculum, the recommended volumes of electives and open electives.

- 128) The times and venues for minors (worth 15 CP and 30 CP) shall be coordinated by the Study Department and the teaching units. The standard division of the curriculum and the timetable for minor subjects shall be prepared by the teaching unit and made public along with the timetable of the area of specialisation on the notice board of the department.
- 129) The person preparing the timetable shall be responsible for its correctness and conformity with the standard division of the curriculum; the timetable shall be approved by the head of the department/chair.
- 130) The timetable for the semester shall be made known to the students by the academic department not later than two weeks before the beginning of the semester on the notice board of the department and on the website. One copy of the approved timetable shall be submitted by the academic department to the Study Department.
- 131) The timetable for sessions of study in distance studies and the standard division of the curriculum shall be sent to the students by the academic department not later than two weeks before the beginning of the first session. The timetables for study sessions shall be made public on the notice board of the academic department and on the website not later than two weeks before the beginning of the study session.

3.4 Planning studies, registering for a course

3.4.1 Planning compulsory and optional studies

- 132) A student shall plan his or her studies proceeding from the standard division of the curriculum, the timetable and his or her options. Completion of the curriculum in the standard period of study requires a student's study load of 20 CP per semester and 40 CP per academic year on average.
- 133) The students, when planning their studies, need to take into account that not all electives of the major/specialisation module offered by the curriculum are taught every year.
- 134) The students, when planning their electives and open electives, shall proceed from the study load determined by the curriculum and from the sufficiency/insufficiency of their computer skills and foreign language proficiency.

3.4.2 Planning foreign language and computer studies

- 135) In bachelor's studies the required level established by the university is:
- in foreign languages – upper intermediate level (B2 Council of Europe Level) or a minimum state examination result of 80 points;
 - computer skills – level requirements prepared by the Department of Computer Studies, approved by the academic commission of the board of the university and authorised by Vice Rector for Academic Affairs.
- 136) Students whose foreign language proficiency and computer skills do not meet the established requirements need to take into account that for them foreign language and computer studies shall be compulsory subjects according to the curriculum.
- 137) Foreign language and computer studies shall be undertaken by the students in the module of interdisciplinary electives or in open electives. Upon request, the students may take foreign language and computer courses outside the university and then take the foreign language and computer skills levels examinations as external students.
- 138) The language centre and the Department of Computer Studies shall prepare tests for measuring foreign language and computer proficiency to the required levels established by the university.
- 139) Based on student performance at entrance the Study Department shall, by the 1 October, prepare a list of students for whom the tests are compulsory and submit it to the language centre and Department of Computer Studies.

- 140) Testing is compulsory for the first year students who have no certificate of meeting the requirements and whose curriculum includes no foreign language and/or computer studies as compulsory subjects.
- 141) The students shall take the tests during the first semester at the dates established by the department/centre administering the tests. The results of the tests shall be reported to the dean's office of the home faculty of the student by the department/centre who administered the tests.
- 142) Testing is not compulsory for those students who have, by the date of administering the tests, registered for foreign language and computer studies or have started taking courses outside the university.
- 143) Those students who did not participate in the testing and do not meet the required level shall take foreign language and computer studies as compulsory subjects according to the curriculum. These studies shall be completed not later than by the end of the second year.

3.4.3 Planning studies in Estonian (or other mother tongue)

- 144) Students who have graduated from secondary schools with Russian as the language of instruction and have not taken the state language examination or whose result at the state examination was lower than 60 points, shall undertake state language studies during the first academic year under the conditions and in accordance with the procedure established by the Minister of Education and Research.
- 145) Based on student performance at admission to the university the Study Department shall, during the month of September, prepare a list of students for whom Estonian language studies are compulsory and submit it to the language centre and the dean's office of the home faculty.
- 146) Studies in the Estonian language by students in student places formed on the basis of state funding shall be financed by the Ministry of Education and Research; students studying in student places formed on the basis of funding from outside the state budget shall be financed by the student or person financing the student place.

3.4.4 Registering for subjects

3.4.4.1 Registering for subjects within the standard curriculum

- 147) The students, in order to undertake their planned studies, shall register for participation in particular subjects. Registering for participation means an obligation for a student to take an examination or (graded) assessment in the subject.
- 148) The students shall register for subjects with no pre-requisites or subjects with pre-requisites the students have completed.
- 149) Registering for participation shall be carried out by the department/chair/lectorate or centre teaching the subject. Two deadlines for registering shall be set:
 - pre-registration at the end of the previous semester by the date set in the academic calendar;
 - registration at the beginning of the semester until the closing date for registrations and admissions.
- 150) Pre-registration shall be carried out by the academic unit to find out the number of participants in minors and electives in order to decide whether to proceed or not proceed with the corresponding programmes.
- 151) A minor may be withdrawn if the number of participants registered for it is under the minimum established by the department. If the number of participants exceeds the teaching capacity the students shall undergo a selection procedure under the conditions and in accordance with the procedure (e.g. the registration order) established by the academic unit teaching the given minor. Students for whom the given minor is compulsory or recommended shall be given preference.

3.4.4.2 Registering for subjects outside the standard curriculum

- 152) In order to take subjects from outside the curriculum the students need to register as a student of the Open University by the closing date for registrations and admissions.
- 153) The Open University programme coordinator shall issue, to those who request, application forms and study sheets where the students indicate the subjects they wish to attend in the given semester. An Open University student shall obtain in writing, from the teaching staff, on their academic transcripts, proof of their registration for participation in the given subject. They then register themselves for participation in the given subject at the department/chair teaching the subject or in the list of the participants at the first lecture; they shall write 'OU' for 'study group' in the registration sheet.
- 154) The OU students shall submit their academic transcripts, approved by the teaching staff, to the Open University programme coordinator not later than in the third week of the semester and obtain an invoice.
- 155) The tuition fee for OU students shall be calculated on the basis of the price-list established by the university government. The head of the academic department has the right, with the consent of the dean, to establish a reduced tuition fee, which may not be lower than the cost of one credit point in a student place formed on the basis of funding from outside the state budget in the given department.
- 156) To apply for a reduced fee, Open University students shall submit an application to the head of the department teaching the subject; in their applications they shall specify the amount of money and give justification for the application.
- 157) Payment on invoice shall be made by bank transfer not later than 15 October in the autumn semester and 25 February in the spring semester. The payments once made shall be non-refundable. The Open University programme coordinator shall confirm the payments made with his or her signature on the academic transcript of the student. The accounts to academic departments shall be balanced by the programme coordinator by 15 November and 15 April.

3.5 Student performance

- 158) Assessment shall be carried out via tests, seminars and practical classes; grades are awarded at examinations, graded assessments and at the defence of graduation theses. The forms of assessment shall be set out in the curricula and syllabi, they serve the aim of recording the level of the students' knowledge and skills.

3.5.1 Assessment scale

- 159) The differentiated assessment of student performance in subjects or in parts of subjects shall be carried out by means of a six-point scale system (together with corresponding wording and description) as follows:
 - Positive grades Knowledge of the subject
 - "A" – excellent 91-100%
 - "B" – very good 81- 90 %
 - "C" – good 71- 80 %
 - "D" – satisfactory 61-70 %
 - "E" – sufficient 51- 60 %
 - Negative grade
 - "F" - fail
- 160) "A" - excellent – outstanding and remarkably thorough knowledge of the theory and practice of the subject, original and creative ability to apply the acquired knowledge, extensive independent work, in-depth orientation in specialist literature; 91 to 100 per cent of the volume of the subject acquired.

- 161) "B" - very good – very good knowledge of the theory and practice of the subject according to the curriculum and study material, very good ability to apply the acquired knowledge; minor slips (not conceptual, not fundamental) may occur in the examination; 81 to 90 percent of the volume of the subject acquired.
- 162) "C" - good – good knowledge of the theory and practice of the subject, good ability to apply the acquired knowledge; occasional hesitation and inaccuracies in the examination may occur on more profound and finer points; 71 to 80 per cent of the volume of the subject acquired.
- 163) "D" - satisfactory – knowledge of basic theoretical and practical principles, facts and methods of the subject; ability to apply the acquired knowledge in typical situations, but at the examination significant shortcomings and hesitation may occur; 61 to 70 per cent of the volume of the subject acquired.
- 164) "E" - sufficient – minimum level of knowledge of the subject, significant shortcomings in putting the acquired knowledge into practice which may disturb further study of subjects based on the given subject; acquired 51 to 60 per cent of the volume of the subject.
- 165) "F" - fail – lack of minimum knowledge of the subject; up to 50 per cent of the volume of the subject acquired.
- 166) For calculating average grades and cumulative indices, the letters shall be transferred to numerical values as follows: A = 5, B = 4, C = 3, D = 2, E = 1, F = 0.
- 167) Undifferentiated assessment shall have a positive result "pass" (P) and a negative result "fail" (F).
- 168) The subject is deemed to have been acquired after having passed the examination or assessment.

3.5.2 Examinations and assessments

- 169) An examination is a method for evaluating knowledge. All subjects of a theoretical nature end with an examination. Examinations shall, in general, be taken during the examination session, which follows the study of the given subject.
- 170) The aim of an assessment is to evaluate knowledge and skills of a practical nature acquired in the course of study. Assessments shall be based on course work and, as a rule, they are graded assessments (GA) or, in exceptional circumstances depending on the subject profile, pass-fail assessments (PFA). Assessments shall be taken or entered during the last lecture/seminar.
- 171) In distance studies, examinations and assessments shall be carried out during the examination session or on dates agreed upon with the teaching staff. The examinations and assessments of the next examination session shall be made known to the students during the previous session.

3.5.2.1 Prerequisites for sitting examinations and assessments

- 172) The teaching staff may establish requirements, which have to be met before sitting an examination or assessment. The prerequisites for sitting examinations/assessments shall be set out in the syllabi made known to the students at the first lecture/seminar.
- 173) A student, who has not fulfilled the requirements set out in the syllabus, may be barred by the teaching staff from taking an examination/assessment. Any student who has not fulfilled these requirements shall receive an "F" note in their assessment sheet; to be accepted for re-examination the student must fulfil certain requirements. Attendance shall not be considered a prerequisite for taking the examination/assessment.

3.5.2.2 Procedures for taking examinations and assessments

- 174) Students shall retain the right to take an examination/assessment in a particular subject during one year from the last day of the examination session immediately following the study of the given subject. The student who fails to pass such subjects by the given date has to repeat the subjects in the full volume. If the student fails to pass the examination/assessment by the given dates, the note "withdrawn" in the assessment sheet shall be replaced by "failed" (F).

- 175) Two dates during the examination session for taking an examination shall be suggested by the teaching staff and agreed upon with the participants. The first examination date for general, focus and major/core subjects shall be specified in the examination plan of the study group of a particular specialisation not later than one month before the beginning of the examination session. An interval of at least three days shall be ensured between the examinations in the same subject during the examination session.
- 176) Besides two examination dates during the examination session, one more date during the week before the next semester or another date during the week of independent work in mid-semester shall be suggested by the teaching staff.
- 177) The completed examination plan shall be submitted to the dean's office for revision by the representative of the study group one month before the beginning of the examination session. The dean's assistant shall forward the examination plan to the Study Department for preparing a room plan.
- 178) Timetable and rooms for the study of minor subjects shall be coordinated with the Study Department by the technical assistant of the department teaching the given subjects.
- 179) Examination plans shall be made public on notice boards.
- 180) All participants of the subject shall be deemed registered for the first examination administered during the examination session and their names shall be entered in the assessment sheet. If a student withdraws from an examination, a note –"withdrawn" – shall be made in the examination sheet after his or her name.
- 181) Students shall register at the department/chair or lectorate for the next date of the examination/assessment. They may cancel the registration up to one working day before the date of the examination. If a student withdraws on the second date of the examination/assessment, a note "failed" (F) shall be made in their assessment sheet.
- 182) In case of a negative result, the examination/assessment may be re-taken twice. A positive grade may be improved, by agreement with the teaching staff; the result of the last performance shall count.
- 183) For the last re-examination (the third performance) the students may request for an opportunity to take the examination/assessment before a board. On the written application of the student an examination board of at least three members shall be formed by order of the dean.
- 184) Any student, who fails to pass an examination/assessment on all three occasions, shall be exmatriculated. The student may refuse to take the examination/assessment for the third time and in order to improve on the given subject repeat the subject. After repeating the programme the student has the right to take the corresponding examination/assessment up to three times.
- 185) The students shall repeat the subject through the Open University and pay for it. The cost shall be calculated on the basis of the study load of the subject and the cost of one credit point in the OU of the given subject or area of specialisation.

3.5.2.3 Procedures for administering examinations and assessments

- 186) Procedures for examinations/assessments and methods of assessment shall be set out by teaching staff in the syllabus. The assessment shall, in general, be carried out by the teaching staff who taught the subject.
- 187) At the examination/assessment the students shall identify themselves by means of their transcript booklet or other form of ID.
- 188) Teaching staff shall have the right to dismiss any student who is cheating or using external help from the examination/assessment. The dismissal shall count as a fail and an "F" note shall be entered in the assessment sheet for the given student. Recurring violation of examination/assessment procedures may lead to exmatriculation. Refusal to answer at the examination/assessment shall equally result in a fail.

3.5.2.4 Procedures for reporting and registering the results of examinations and assessments

- 189) The grades for oral examinations/assessments shall be made known to students on the day of administering the examination/assessment; grades for written examinations/assessments shall be made known within ten workdays.
- 190) The chair shall make the examination/assessment results public on the notice board and/or website, the student's name shall be replaced by the student's transcript booklet number.
- 191) Students shall have the right to review their examination/assessment work during the seven days from the date of the release of the examination/assessment results.
- 192) Examination/assessment results shall be entered into pro forma assessment sheets; positive grades shall also be entered into the student's transcript booklet. The original copy of the assessment sheet shall be submitted to the dean's office of the student's specialisation by the department staff not later than 10 working days after administering the examination/assessment.
- 193) Teaching staff shall enter examination/assessment results of students of the Open University into an assessment sheet provided by the technical assistant of the department/chair and into the student's academic transcript. The technical assistant of the department/chair shall complete the transcript only if the student's tuition fee has been paid.
- 194) The students of the Open University shall keep their completed academic transcripts; the technical assistant of the department/chair shall submit the academic transcripts to the programme coordinator of the Open University; the programme coordinator of the Open University shall take the academic transcripts to the offices of the dean of the student's home faculty.
- 195) The academic transcript is the sole document, which serves as the basis for documenting a student's academic performance. The academic transcripts shall be retained in the dean's office of the faculty for not less than twice the standard period of study according to the curriculum.

3.6 Visiting students

3.6.1 Conditions for studying as a visiting student

- 196) A visiting student is a student who has matriculated to an institution of higher education in Estonia and who has the right to study in partner institutions of higher education according to their curricula.
- 197) Visiting students may, in accordance with an agreement between Estonian public universities, be admitted to Tartu University, Tallinn Technical University, Tallinn Pedagogical University (TPU), Estonian Art Academy, Estonian Agricultural University and Estonian Music Academy. Study in private institutions of higher education and the admission of visiting students shall be provided for via an agreement between Tallinn Pedagogical University and the partner institution of higher education.
- 198) During the first two weeks of the academic year the Study Department shall negotiate with the partner universities concerning the cost of credit points to be used for balancing the accounts concerning the studies of visiting students; on the basis of these costs a price list shall be prepared by the Study Department and distributed to the departments.
- 199) The balancing of accounts between universities shall proceed from the arithmetic mean of the cost of the credit point used in inter-faculty balancing of accounts and the cost of credit points in the partner universities. If the arithmetic mean is greater than the cost of the credit point used in the inter-faculty balancing of accounts, the student shall, on the request of the academic department, cover the difference. The cost of credit points for balancing the accounts shall be approved by the university government on proposals from faculties during the first two weeks of May.

200) Visiting students shall have:

- the right to participate in studies on an equal basis with the students of the hosting university;
- the right to membership of the library;
- the right to apply for vacant places in student hostels;
- the obligation to follow the regulations for study and the home rules of the hosting university.

201) The university shall have:

- the right, in case of limited admission, to give preference to home students over the visiting students;
- the right to terminate the study of a visiting student if he or she fails to follow the regulations for study and the home rules of the hosting university;
- an obligation to grant the visiting students the opportunity to study the subjects they have determined in their applications.

3.6.2 Students of Tallinn Pedagogical University as visiting students

202) Students who wish to study as visiting students in some other institution of higher education, shall obtain a letter of referral from the academic department of their area of specialisation, where they shall specify the subjects they wish to study at the partner university. The students shall obtain approval for the selected subjects from the curriculum coordinator and the head of the academic department and register the letter of referral at the Study Department at Tallinn Pedagogical University.

203) Students shall register for study in the hosting university and obtain the confirmation of the hosting university for their letter of referral.

204) On the basis of the confirmed letter of referral, the academic department of the area of specialisation shall issue visiting students an assessment sheet. Upon the request of the academic department; students shall, before they receive the assessment sheet, pay the difference between the cost of a credit point on the approved price list and the cost of each credit point on the inter-faculty settlement on the basis of an invoice issued by the department.

205) After taking the subject, visiting students shall present a single copy of the visiting student assessment sheet to the teaching staff carrying out the examination/assessment for admission to the examination/assessment. The student shall submit the completed assessment sheet for confirmation to the Study Department at the hosting university.

206) The students shall then present the assessment sheet, which has been confirmed by the Study Department at the hosting university, at the dean's office of the home faculty.

3.6.3 Visiting students from partner universities studying at TPU

207) Visiting students who wish to study at TPU shall take a letter of referral, issued by the home university, to the Study Department where the existence of an agreement between the universities and consent of the student's home university are checked, and the letter of referral is signed.

208) The student takes the signed letter of referral from the Study Department to the academic department whose subjects the student wishes to attend. The department briefs the student on the procedures for registering for study and the student registers for the subject/s, with the department's consent, by the deadline set in the academic calendar.

209) The student takes a single copy of the visiting student's assessment sheet, allowing admission to examinations/assessments, from the home university and presents it for the teaching staff who administers the examination/assessment to enter their results.

- 210) The student shall submit a completed assessment sheet for approval to the Study Department at TPU, and thereafter take the certified original copy of the assessment sheet to the home university.

3.7 Studying abroad

- 211) Students of TPU have the following opportunities to study abroad:
- as scholarship holders from international organisations and programmes, governments, foundations and universities;
 - in the course of a student exchange on the basis of agreements between universities or governments, which also establish scholarship exchanges;
 - personal initiative, providing themselves with the necessary funding.
- 212) The dean shall decide the validity and relevance of studying abroad (except when a competition is organised by the university). Students who wish to study abroad must submit the following to the dean's office:
- an application to the dean of the faculty which specifies the name of the hosting institution of higher education, the period of study and reasons for studying there;
 - the curriculum regarding studying abroad, which is approved in the department; if a final paper is to be written, the supervisor's recommendation as well?
- 213) In order to apply for a competition organised by the university it is necessary to submit the following items to the International Student Office:
- an application to the Vice Rector for Academic Affairs, indicating reasons for studying abroad, signed by the dean;
 - a certificate of foreign language proficiency;
 - the curriculum for the studies to be undertaken abroad, approved by the department;
 - a copy of the academic transcript;
 - a letter of recommendation by the head of the department;
 - any other documents as established in the agreement.
- 214) The Vice Rector for Academic Affairs convenes a commission to examine student applications and select candidates. The working procedures of the commission and criteria for selecting candidates are established by order of the Vice Rector for Academic Affairs.
- 215) Those students who have satisfied at least the minimum requirement for passing their studies in the previous academic year shall be allowed to study abroad.
- 216) An order from the dean shall be issued listing those students allowed to study abroad. The order shall specify the corresponding university and length of study. The order shall be sent to the department of the area of specialisation, the Study Department, the International Student Office and the students concerned.
- 217) Examinations and assessments taken in foreign universities shall be considered in the completion of the curriculum in accordance with the previously confirmed agreement with the head of the department and the dean. It will be deemed that any student who has left to study abroad has not interrupted his or her studies in the university. The extent of the completion of the current curriculum in the university is taken into account when considering the status of students who have studied in foreign universities.
- 218) The approval sheet certifying subjects taken in the foreign university and the student's academic record from the foreign university shall be submitted to the dean's office by the date set in the academic calendar for establishing the student's status.

3.8 Recognition of prior studies and work experience

- 219) Tallinn Pedagogical University recognises prior studies and studies completed elsewhere and work experience as part of the completion of a curriculum and the satisfaction of the required level of education for admission.

3.8.1 Recognition of prior studies and work experience when entering master's and doctorate studies

- 220) A person who has a diploma or applied higher education, vocational higher education, a bachelor's degree, a specialist diploma, or whose education through prior studies and work experience corresponds to the bachelor's level, has the right to apply for a master's programme.
- 221) A person who has a master's degree, five years of university education (200 credit points), a diploma as a specialist of the Soviet Union or whose education through prior studies and work experience corresponds to master's level, has the right apply for a doctorate programme.
- 222) Recognition of prior studies and work experience when entering the university is carried out according to individual assessment. A person whose educational level does not correspond to the requirements set for entering master or doctorate programmes, submits documents certifying his or her prior work experience and education to the academic department, which is in charge of his or her chosen area of specialisation, at least one month before the date for the submission of documents required for admission.
- 223) The head of the academic department forms a commission for reviewing the documents and considers the following criteria:
- prior studies in the preceding level of higher education constitute at least 75 per cent of the minimal volume required for applying for the given level of study;
 - the final thesis which was defended at a previous educational level or any other condition for graduation that corresponds to the educational level required for applying;
 - an applicant works in the relevant area of specialisation, has done research, has completed further training in the area of specialisation, etc.
- 224) The academic department issues the applicant with a written decision on whether the applicant's prior studies and work experience correspond/do not correspond to the required educational level for entering the university within one month at the latest from the submission of the application to the department.

3.8.2 Recognition of prior studies and work experience in the completion of the curriculum

- 225) In the completion of the curriculum any of the following, as long as they are suitable in content and correspond to the level of the university, may be recognised: prior studies in the university, subjects and curriculum modules taken at other institutions of higher education and work experience.
- 226) By way of recognition, studies taken elsewhere and work experience, as a rule, may contribute up to 50 per cent of the university curriculum. Results of prior study in the university may contribute more than 50 per cent.
- 227) A person's prior studies shall be taken into account by up to 50 per cent of the curriculum volume in a bachelor's programme. In master and doctorate programmes prior studies and work experience in the area of specialisation may account for 50 per cent of the curriculum volume. In a bachelor's programme a person's prior work experience as an active teacher may be recognised if the work experience is related to the area of specialisation being studied.
- 228) The following may be recognised from prior studies:
- interrupted studies in the same curriculum;
 - previously taken content-related subjects if the student has changed curriculum;
 - subjects taken in the Open University or in-service training; studies in in-service-training are taken into account, as a rule, if the conditions for completion involve a pass in an examination/assessment or the defence of a final thesis.
- 229) Studies in an accredited curriculum performed not more than twice the standard period of studies earlier are usually recognised.

- 230) Studies at a previous level of higher education may be recognised as a part of the completion of the curriculum if their level meets requirements set in the curriculum:
- studies based on a bachelor's programme, entered in the register before 1 June 2002, shall be recognised, if possible, as a part of studies in the completion of a master's programme, entered in the register of curricula after 1 June 2002;
 - studies completed on the basis of a master's programme, entered in the register of curricula before 1 June 2002, shall be taken into account as a part of doctorate study if possible.
- 231) Work experience, which is related to the area of specialisation, shall be recognised in the completion of the curriculum when completing subjects related to practical skills and professional placement.

3.8.3 Procedures for credit transfer

- 232) Recognition of prior studies shall be carried out according to individual assessment. A person applying for recognition of prior study results submits, upon commencement or continuation of studies, an application for subject transfer to the head of the curriculum or academic counsellor for confirmation, and to the head of the department/chair for approval.
- 233) An application for the transfer of subjects taken outside TPU shall be appended with an original document issued at the corresponding institution of higher education, which contains the name of the subject (in Estonian and/or English), volume in credit points, result, date of performance and name/s of teaching staff who delivered the course and an explanation of the assessment system. These results shall be entered in the student's academic report with a reference to the institution of higher education where the studies were performed.
- 234) When the student transfers from one curriculum within TPU to another at the same level of study, or prior studies are transferred to a curriculum of the same level, the curriculum leader/academic counsellor shall approve the subject transfer sheet compiled by the student. The original name of the subject taken by the student, subject code, volume, result, name of teaching staff carrying out the assessment and the date of performance shall be entered in the database. The student shall not be obliged to pay if the volume of the curriculum is exceeded due to subject transfer. A reduction in the number of credit points due to subject transfer may be compensated for by open electives or electives.
- 235) For the transfer of subjects taken at a previous level of study or in-service training the head of the academic department/chair in charge of the subject shall approve the transfer sheet compiled by the student. The transferred subject shall be given the name and code of the subject considered equal to it, its volume, the student's result and the name/s of teaching staff who carried out the assessment. The date of transfer will become the date of completion. The student shall not be obliged to pay if the volume of the curriculum is exceeded due to subject transfer. A reduction in the number of credit points due to subject transfer may be compensated for by open electives or electives.
- 236) The students shall submit a confirmed transfer application with original documents to the dean's office by the closing date for course registration and admissions in the academic calendar.

3.8.4 Individual study plans

- 237) Where necessary, the student draws up an individual study plan in order to declare his or her further studies to the head of the curriculum or the academic counsellor. The individual study plan specifies the subjects (replacement studies) which shall be taken into account in the completion of the student's curriculum.
- 238) The individual study plan shall be submitted with a transfer application to the dean's office by the closing date for course registration and admissions. The student shall retain a copy of their individual study plan and transfer application.

3.9 Academic leave

- 239) Academic leave is an exemption of the student from study and research on the basis of his or her application at any academic level, generally for up to one year, during the standard period of study. The shortest duration of academic leave is one semester.
- 240) People on academic leave are on the list of students at TPU. The students on academic leave shall not be transferred to the next year of study – their standard period of study is prolonged by the length of the academic leave.
- 241) Academic leave may be applied for in the following instances:
- health reasons (up to two years) on the basis of a certificate from a medical institution, which contains a physician's recommendation for the necessity of academic leave;
 - pregnancy for one semester on the basis of a certificate issued by a medical institution;
 - parental leave (until the child attains three years of age) on the basis of a copy of the child's birth certificate;
 - service in the Defence Forces (up to one year), on the basis of a call-up notice;
 - other reasons (up to one year), for instance economic hardship, family problems, working abroad and so on. Academic leave for other reasons may be applied for by the closing date for course registration and admissions of the coming term.
- 242) Students in their first semester are not eligible for academic leave on the basis of those instances given in § 241 (5).
- 243) Academic leave, its extension and/or termination shall be applied for by submitting an application in the name of the Vice Rector for Academic Affairs, which is signed by the head of the department and the dean. The required documents or their copies shall be appended to the application. The granting and termination of academic leave shall be formalised by order of the Vice Rector for Academic Affairs.
- 244) During academic leave students may attend subjects and take examinations and assessments. Students in state funded places submit an application, which specifies their declared subjects for the semester and their volume, to the head of the academic department. Students who are in study places outside the state budget shall be charged on the basis of the cost of OU subject points in the subjects declared and the current tuition fee valid during the academic leave.

3.10 Student status

- 245) A student's status shows his or her progress in their studies. This is considered when making decisions on exmatriculation and rematriculation and granting scholarships and allowances. Student status is determined on the basis of study load, volume of studies and academic progress on the date specified in the academic calendar.

3.10.1 Status on the basis of study load

- 246) A student's status is calculated according to study load at the beginning of the academic year on the basis of credit points collected in the previous academic year. On the basis of study load a student may be deemed a full-time or part-time student.
- 247) Full-time student status is maintained when the student completes cumulatively not less than 75 per cent or a minimum of 30 credit points of the volume of the programme, which is compulsory according to the curriculum by the end of each academic year. Full-time students in bachelor or master's studies shall cumulatively collect 40 CP in any given academic year in order to graduate within the standard period of study.
- 248) A part-time student must collect a minimum of 20 credit points of the curriculum by the end of each academic year.

3.10.2 Status on the basis of the academic year

- 249) On the basis of the academic year, students are divided into students of the first, second and third year in bachelor's study, first and second year in master's study, and first to fourth year in doctorate study.
- 250) Transfer of students to the next academic year is performed on the basis of the sum of credit points collected during studies. The student is considered:
- a first year student from matriculation until he or she has collected 34.5 credit points;
 - a second year student if he or she has 35 credit points;
 - a third year student if he or she has 75 credit points;
 - a fourth year student if he or she has 115 credit points.

3.11 Exmatriculation

- 251) Exmatriculation is the exclusion of a student from the list of students at TPU. Exmatriculation occurs by order of the Vice Rector for Academic Affairs.
- 252) A student is exmatriculated on the initiative of the university based on the proposal of the dean:
- upon graduation from the university;
 - due to non-attendance in the programme if the student has not registered himself or herself as an attendee of subjects worth a minimum of ten credit points during the preliminary week and two first weeks of the semester, except for students who have less than ten credit points to collect to fulfil the total volume of the curriculum;
 - due to an incomplete subject where the student has:
 - collected less than 20 CP from the subjects in the curriculum in the last academic year;
 - failed an examination/assessment in a compulsory subject three times;
 - failed to pass a compulsory subject after taking the course for the second time;
 - a cumulative index calculated on the basis of the grades of the previous academic year of less than "2";
 - not satisfied the requirements of full-time study in the previous academic year and has not concluded a tuition fee contract;
 - failure to pay a tuition fee by the deadline;
 - for misconduct:
 - within the scope of a violation of the academic code of conduct as described in Chapter 4.3 at the proposal of the dean where the case description is attached;
 - document forgery;
 - when a court conviction for a criminal offence, intentionally committed by a student, enters into force.
- 253) Exmatriculation initiated by the student is based on his or her application authorised by the head of the academic department and the dean:
- at his or her own request;
 - when commencing studies at another institution of higher education.
- 254) In situations outside the control of either party, the student is exmatriculated on the basis of a proposal by the dean when:
- the student is divested of legal capacity;
 - the student dies.

3.12 Rematriculation

- 255) Rematriculation (reinstatement) is the inclusion of a former student in the list of students.
- 256) Rematriculation in vacant state funded student places or student places formed on the basis of funding from outside the state budget is formalised on the basis of personal application and by order of the Vice Rector for Academic Affairs at the consent of the head of the department/chair and the dean during the preliminary week or first two weeks of the semester.
- 257) Rematriculation may, as a rule, be applied for one semester after exmatriculation. A student exmatriculated for misconduct cannot apply for reinstatement earlier than a minimum of one year after his or her name was deleted from the list of students.
- 258) Former students who have passed examinations/assessments worth a minimum volume of 10 credit points have the right to apply for reinstatement if these passes were completed not more than two standard periods of study before the application.
- 259) An exception is made regarding the reinstatement of students taking their final examination or attempting to defend their thesis, if the students have passed all examinations, assessments and professional placements as established in the curriculum. Such persons may apply for rematriculation a minimum of one month before the date of the defence of the final papers. The supervisor's written confirmation on the application that the final paper was completed within the time limit is a prerequisite for rematriculation.
- 260) Any person who studied in a state funded place, but has not graduated from university, may be reinstated in a state funded place in the same field of studies if vacancies are available and if the person has not exceeded the standard period of study.
- 261) The university has the right not to satisfy the student's application for rematriculation for certain reasons. Valid reasons for refusing rematriculation are:
- repeated (more than two times) exmatriculation for an incomplete subject;
 - the cumulative index of the student's prior study is less than "2" (satisfactory);
 - repeated failure to pay tuition fees;
 - repeated violation of the academic code of conduct;
 - the student is serving punishment for an intentionally committed criminal offence.
- 262) The academic department will send the person a written notice of the reasons of the refusal three weeks from the date of submitting the application.

3.13 Graduation from the university

3.13.1 Conditions and procedures for defending final papers and taking final examinations

- 263) Diploma, bachelor and master's theses, final papers of integrated bachelor and master's studies and doctoral theses shall be defended as final papers.
- 264) The defence of final papers or the taking of final examinations takes place at the end of the autumn or spring semester at a time established in the academic calendar (except for doctoral theses). A prerequisite for the defence of a thesis or taking an examination is the completion of all elements of the curriculum. The student is permitted to defend their thesis by order of the dean, prepared a minimum of two weeks before the date of the defence and submitted to the Study Department.
- 265) Defence commissions for theses and final examinations (except doctoral theses) are established for one academic year. The commission has at least three members, including the chairperson who, as a rule, has a doctoral degree or corresponding qualification.
- 266) Membership of defence commissions for theses or final examinations in the diploma and bachelor's study shall be approved by the dean of the faculty, and in the master's study by the Vice Rector for Academic Affairs on the basis of the dean's proposal.

- 267) The defence council for doctoral theses shall be established by order of the Vice Rector for Research and Development at the proposal of the board of the faculty for a period of three calendar years. The doctoral council has a minimum of five members, including the chairperson.
- 268) Topics for and supervisors of final papers (except doctoral theses) shall be authorised by the head of the chair coordinating the area of specialisation, and shall be approved by the head of the department in the semester preceding the defence by the date set in the academic calendar. The supervisor and topic of a doctoral thesis shall be approved by the dean of the faculty on the basis of a proposal by the head of the academic department in the first semester of study before 1 October. Requirements for and topics covered in the final examination shall be established by the chair/department and be approved by the head of the department. Requirements for the final examination shall be made public to the students within the first month of the final semester.
- 269) The requirements for the final paper shall be established by the board of the faculty. As a rule, the volume of final papers in the case of a 20-credit-point research paper is 40-60 pages of printed text (1 page = 2250 characters); for a paper worth 10-15 credit points, 30-50 pages and for a paper worth 4 credit points, 15-25 pages of printed text. Uniform requirements for final papers (including the referencing system), that conform to international standards, are used in the faculty.
- 270) The department/chair shall make public to the students and the dean's office the dates for the submission and defence of final papers two months before the date of the defence at the latest.
- 271) Students must submit their final paper to the department/chair a minimum of two weeks before the defence with the supervisor's signature on the title page proving that the final paper has been authorised for defence.
- 272) The department/chair must then present the names of the students, who have submitted final papers, along with the names of their supervisors and the titles of their final papers in Estonian and English to the dean's office of the faculty two weeks before the defence.
- 273) The head of the academic sub-unit nominates a reviewer for the final paper (except in the case of doctoral theses). A written review (minimum one page) must then be submitted to the department/chair a minimum of three days before the defence. The student has the right to examine the review of his or her final paper.

3.13.2 Assessment of graduation examinations and final papers

- 274) The defence of final papers and taking of final examinations is public and is performed before a defence commission in the room and in the order made public by the department. As a rule, the student's supervisor and the reviewer attend the defence procedure.
- 275) The perspective graduate provides a summary of his or her final paper at the defence and responds to the reviewer's comments in the form of a discussion. After the discussion the defender responds to questions put by those people attending the defence procedure.
- 276) The defence commission has a quorum if 2/3 of its members (including the chairperson) are present at the defence/examination. The results of the final paper (except doctoral theses) and the final examination shall be expressed using the words "excellent", "very good", "good", "satisfactory", "sufficient" and the grades "A" – "E", a negative result is "fail" (F). The final result is the mean of the assessments given by the members of the commission, and the chairperson's vote determines any rounding up or down.
- 277) Grades are entered in an established protocol form. The signed protocol shall be submitted to the dean's office of the faculty at the latest on the day after the grades have been made public.
- 278) The results of the defence of final papers and final oral examinations shall be made public to the students on the day of the defence immediately after protocols have been completed. The results of the final written examinations shall be made public within three working days after the examination day. The chairperson of the commission will inform the students of the venue and date that the results will be made public before the final examination is commenced.

- 279) Waiving the defence of the final paper/taking the final examination where no valid reason is given will be equal to a “fail” (F). The note “withdrawn” is entered in the protocol about any student who fails to appear without a valid reason. Illness, proven by a medical certificate and submitted to the chairperson of the commission, will be accepted as a valid reason. If the student fails to submit a medical certificate within three working days, the note “withdrawn” shall be repealed and a negative result entered in the protocol.
- 280) Any student who failed to appear for a valid reason has the right to defend their final paper or take their final examination on a day determined by the chairperson of the commission within the examination session. In the case of a negative result a repeated defence of the final paper or taking the final examination is possible in the following semester at a time established in the academic calendar.
- 281) The final examination may be taken up to two times. Any student who fails to pass the final examination the second time shall have to repeat the major/core subjects in the Open University to a volume determined by the department before the next examination (third performance).
- 282) The final paper may be defended one more time. For the next defence the commission requires improvement of the present paper or the choice of a new topic.
- 283) The defence commission may change its decision within three working days of the day of defence of the final paper if proven discrediting information becomes evident (plagiarism, presenting falsified information, etc.). Evidence that formed the basis of the changed decision shall be appended to the changed decision. In the case of proven plagiarism, the student shall lose the right to attempt a subsequent defence of the present final paper.
- 284) If the student does not accept the grade received at the defence or the defence procedure, he or she has the right to submit an appeal in writing to the dean within three working days after the results have been made public. The dean shall establish a three-member commission, which will hear the appeal and notify the dean of its decision within ten working days from the student submitting the appeal. The dean shall make the decision public in writing to all parties concerned including the defence commission.
- 285) The requirements for doctoral theses and the consequent defence procedure are established in the document “Rules for Doctorate Studies and Defence of a Doctoral Thesis at Tallinn Pedagogical University”.

3.13.3 Issuing of graduation documents

- 286) After completion of the curriculum and defence of the final paper or gaining a pass in the final examination, the graduate of the university shall be issued a diploma and academic report documenting the issuance of the degree and/or the completion of the curriculum. The statute and procedure for the issuing of diplomas and academic reports is enacted by the regulation of the Government of the Republic, “Statute and Forms for Diplomas and Academic Reports”.
- 287) The Study Department prepares diplomas and certificates, which prove the completion of the teacher training curriculum. The offices of the dean in each faculty prepare academic reports in Estonian and English for the graduates.
- 288) Graduation documents are issued to graduates twice a year (as a rule, in June and December) at graduation ceremonies. At other times the dean’s office of the faculty issues graduation documents after one month from the defence of the final paper or passing the final examination.
- 289) A diploma with distinction (*cum laude*) is issued to a person who completes the full volume of diploma study, bachelor’s study, study based on integrated curricula of bachelor and master’s study or master’s study, and who meets the following conditions:
- received grades “A”, “B” or “C” in all examinations/assessments;
 - defended the final paper and/or passed the bachelor’s examination with an “A”;

- the mean grade during studies was 4.60 or higher (on the basis of grades received before 24 March 1999 “4.75” or higher), where grades of all examinations, graded assessments, professional placements and final papers/final examinations shall be considered.

4. STUDENT RIGHTS AND OBLIGATIONS

4.1 Student counselling

- 290) Initially, counselling of a student is performed in the sub-unit teaching the area of specialisation – the chair or department. The student has the right to turn to the dean’s office, the Study Department and the Student Council to seek counselling or information on studies and to resolve problems. First-year students may also be counselled by a student tutor.
- 291) An academic counsellor consults students in matters related to a corresponding curriculum, choosing a minor and drawing up an individual study plan. The head of the department nominates an academic counsellor from the teaching staff or academic support staff.
- 292) The teaching staff consults in matters related to studying and passing a subject (study resources, syllabi and so on).
- 293) Academic support staff in the department/chair counsel students in matters related to organisational aspects of studies: the curriculum and its standard division into years of study; issues related to the timetable; lectures and teaching staff; the conclusion of contracts with students studying in student places formed outside the state budget; issues related to tuition fee invoices and so on. Immediate information concerning the chair/department (for instance cancellation of lectures, changes in timetables) are displayed on the notice board of the sub-unit and made public to study groups via mailing lists.
- 294) The office of the dean of the faculty informs students on matters related to the documentation of study results, student status (transfer to the next academic year, academic leave, exmatriculation, rematriculation) and the awarding of grants. The dean’s office issues, upon the student’s request and free of charge, an academic transcript, which displays the study results entered in the student database once a semester. A fee is charged for subsequent printouts. The university government establishes the fee.
- 295) The Study Department issues documents about the students’ studies at the university, provides information to the banks and the health insurance fund about the database and advises on general matters related to admission and regulations for the organisation of studies.
- 296) The International Student Council counsels international students, informs students about study opportunities abroad and consults on applications for grants.
- 297) International coordinators in the academic departments counsel international students in the department concerning the drawing up and following of individual study plans, the regulations for the organisation of studies and organise information events on study opportunities in foreign universities.
- 298) The Student Council counsels in academic, social and economic matters (travel fare concessions, one-off benefits), in matters related to student life and the issuing of student cards.
- 299) A tutor is a student who has completed the elective in student counselling to counsel first-year students in his or her area of specialisation. A tutor helps new students to adjust to the university system and student life by introducing them to the university at the beginning of an academic year, provides information on departments, offices and centres, essential for students, and their functions.

4.2 Grants and allowances

4.2.1 Study allowances

300) The types of allowances are:

- basic grant – a monetary allowance to cover costs accrued in the acquisition of education.
- economic allowance – a monetary allowance for those whose economic situation does not allow continuation of studies without financial assistance.
- supplementary allowance – a monetary allowance to cover the expense of accommodation and transportation.
- doctoral allowance – a monetary allowance to enable commitment to doctorate studies and research, and cover expenses accrued in the acquisition of education.

4.2.1.1 Basic and supplementary allowances

301) Students (except doctoral students) have the right to apply for a basic allowance if:

1. the student is an Estonian or resides in Estonia on the basis of a permanent or temporary residence permit;
2. is acquiring a higher educational curriculum which has student places formed on the basis of state funding and studies in a student place formed on the basis of state funding or a place formed on the basis of funding from outside the state budget;
3. studies in full-time or part-time;
4. has not exceeded the standard of study;
5. is not on academic leave.

302) Students (except doctoral students) who satisfy the requirements for submitting an application for a basic allowance and whose place of residence, according to the data in the population register, is outside the local government area where the educational institution is located or the adjacent local government areas, have the right to apply for a supplementary allowance.

Local governments adjacent to Tallinn include the rural municipalities of Harku, Jõelähtme, Kiili, Laagri, Rae, Saku, Saue, Viimsi, and the towns of Maardu and Saue.

The local government adjacent to Haapsalu is Ridala rural municipality.

The local governments adjacent to Rakvere are the rural municipalities of Rakvere, Sõmeru and Vinni.

303) Students have the right to apply for a basic allowance and supplementary allowance twice a year, in September for the autumn semester and in February for the spring semester by the date set in the academic calendar. First-year students have the right to apply for the allowance once a year for the spring semester.

304) Students who meet the requirements for receipt of the allowance submit a standard application form (Form 1) to the dean's office of their faculty. The application form is available on the university website under the link "Degree programmes". Students who apply for the supplementary allowance shall submit a certificate from the population register, acquired from the respective local municipality, as proof of their place of residence.

4.2.1.1. Nomination for basic and supplementary allowances

305) Basic and supplementary allowances are nominated by 10 October in the autumn semester and by 10 March in the spring semester of the respective year. The dean of the faculty shall set up a commission consisting of the dean, vice dean for academic affairs and a representative of the faculty authorised by the Student Council.

- 306) The allowance is nominated for five months in the autumn semester (September, October, November, December, January) and spring semester (February, March, April, May, June) respectively.
- 307) Nomination of the allowance is based on the ranked lists of students who have submitted applications and meet the requirements in each curriculum. Students of different years belong to a common ranked list.
- 308) Ranking lists are drawn up on the basis of the percentage of the student's completion of the study volume of the curriculum (cumulatively 20 CP a semester) and the cumulative index of the previous semester. Upon application for a basic allowance the cumulative index has to be a minimum of 3.50; upon application for a supplementary allowance a minimum cumulative index does not apply. Completed studies have to account for a minimum of 75 percent of the study volume of the curriculum. Students who have completed 100 percent or more of the curriculum are equal in the ranking system.

Students who study on the basis of master's programmes registered before 1 June 2002 are ranked on the basis of evaluation results.

- 309) If a number of applicants have equal results in the ranking, the student with a higher cumulative index in the semester preceding the application is preferred. If the student was on academic leave in the semester preceding the application, the cumulative index of the semester preceding academic leave is taken into account.
- 310) If students have completed an equal percentage of the study volume and have equal cumulative indices, the applicant who has achieved outstanding results in studies, is active in public activities or successful in competitions in their area of specialisation, is preferred.
- 311) If applicants are equal in their public activities or professional success, the applicant whose income was lower in the year preceding application, is preferred. The dean's office has the right to require the submission of documents proving income as the basis of the decision: a copy of the income tax return of the applicant, his or her partner or spouse, or a certificate issued by the Tax Board proving the applicant is not a taxable person or any other such documents which facilitates the respective decision.
- 312) The dean's office of the faculty formulates student rankings on the basis of the percentage of the study volume they have completed and the cumulative index made public in September or February on the date set in the academic calendar. The ranking displays the number of the student's transcript booklet instead of his or her name.
- 313) Students who apply for an allowance have the right and obligation to check the correctness of data that forms the basis of the ranking. If the data is incorrect they have to turn to the dean's office of the faculty with their transcript booklet before the closing date for the submission of applications (1 October in the autumn semester and 1 March in the spring semester). Appeals related to incomplete data on the database are not accepted after allowances have been nominated.
- 314) The commission has the right to check the correctness of the documents and data submitted in application for an allowance or present them for checking to competent agencies and/or persons.
- 315) Basic and supplementary allowances are nominated by order of the dean, which is sent to the Study Department and the Finance Department. The list of persons receiving the allowance shall be displayed on the notice board of the dean's office and academic department/chair. Applications for the allowance shall be retained in the dean's office for one calendar year.

4.2.1.2 Economic allowances

4.2.1.2.1 Applications for economic allowances

- 316) Students who study in state funded student places or student places outside the state budget and who study in full-time study (except for doctoral students) and whose economic situation does not allow continuation of studies, may apply for an economic allowance.

317) The standard application form (Form 2) is available on the website of the university under the link “Degree programmes”. The student shall submit the application to the Student Council in September for the autumn semester and in February for the spring semester. The applicant shall also submit a copy of their income tax return for the previous year and that of his or her parents/spouse or partner, or a certificate from the Tax Board which proves that the applicant is not a taxable person, and any other such documents proving data in the given application.

4.2.1.2.2 Nomination for economic allowances

318) Upon nomination of the economic allowance preference is given to the student who:

1. is a person with a moderate or profound disability;
2. is an orphan;
3. is a parent or guardian of a child under seven years of age or of a disabled child;
4. comes from a family with a maximum of four dependant children.

319) Nomination of the allowance shall be decided by a commission set up by the Vice Rector for Academic Affairs which consists of two members of the Student Council, a member of the commission for economic affairs of the board of the university, a member of the commission for studies, the Head of the Study Department and a lawyer.

320) Nomination of the economic allowance shall be decided by 10 October in the autumn semester and 10 March in the spring semester of the respective year.

321) The allowance shall be nominated by order of the Vice Rector for Academic Affairs, which is then sent to the Finance Department for delivery of the payments. A copy of the order shall be issued to the applicant.

322) Applications for an economic allowance shall be retained in the Student Council for one calendar year.

4.2.1.3 Doctoral allowances

4.2.1.3.1 Applications for doctoral allowances

323) The doctoral student has the right to apply for a doctoral allowance if the student:

1. is an Estonian citizen or resides in Estonia on the basis of a permanent or temporary residence permit;
2. studies in a curriculum which student places formed on the basis of state funding and studies in a student place formed on the basis state funding or a place formed on the basis of funding from outside the state budget
3. works only in the field of research or teaching (as a researcher, teacher in general or higher education);
4. is not on academic leave;
5. has not exceeded the standard of study.

324) Doctoral students have the right to apply for doctoral allowances in September for ten study months. A doctoral student of the first year has the right to apply for the allowance for five months (February, March, April, May, June), an evaluation report has also to be submitted with the application.

325) Doctoral students, who satisfy requirements set for receiving the allowance, submit a standard application form (Form 3), which is available on the university website under the link “Degree programmes”, to the dean’s office by the closing date set in the academic calendar. Doctoral students who work in the field of research or teaching shall append a certificate from their workplace, which states their position or main tasks.

4.2.1.3.2 Nomination for doctoral allowances

- 326) Doctoral allowances are nominated by 10 October in the respective year and for first-year doctoral students, by 10 March in the respective year.
- 327) The allowance is nominated on the basis of the ranked list of doctoral students who satisfy the requirements and have applied; study and research results of the previous academic year shall be taken into account. Study and research results are evaluated by an evaluation commission on the basis of evaluation reports. Upon nomination for the allowance to be awarded to first-year doctoral students the results of studies and research in the autumn semester shall be taken into account. Doctoral students of different years are ranked in a common list on the basis of the decision of the evaluation commission.
- 328) The dean of the faculty convenes a commission to nominate doctoral allowances. The dean, Vice Dean for Academic Affairs, the head of the doctorate school and a representative authorised by the Student Council shall be appointed to the commission.
- 329) The doctoral allowance shall be nominated by order of the dean, which is sent to the Study Department and Finance Department. The list of students receiving the allowance shall be made public on the notice board of the dean's office/doctorate school. Applications for the allowance shall be retained in the dean's office for one calendar year.

4.2.1.4 Payment of allowances

- 330) Allowances are paid by the Finance Department on the basis of the dean's directive; economic allowances are paid by order of the Vice Rector for Academic Affairs by the twentieth date of each month, except for September when payment is made in October, the December allowance is paid in January and the February allowance is paid in March.
- 331) The amount of the basic allowance, supplementary allowance and doctoral allowance paid to the student each study month is established in the state budget every year.
- 332) If some curricula do not have entitled applicants for allowances, the financial resources shall be transferred for the payment of allowances to students who study in the curricula of the same level in the same broad area of study.

4.2.2 Faculty grants

- 333) A grant from the faculty grant fund is paid to students successful in studies and research. In addition, participation in professional and public activities related to their area of specialisation is taken into account.
- 334) This grant is nominated on two occasions in each academic year by order of the dean and on the proposal of the head of the academic department. Deadlines for the submission of grant applications are 1 October and 1 March of the approaching semester. The grant is paid once a semester or each month of the semester.
- 335) Grant candidates are proposed by the head of the academic department on the recommendation of the chairs of the area of specialisation and on the basis of the ranked study result issued by the dean's office. The following documents are attached to the grant application:
- written substantiation from the head of the department/chair or supervising teaching staff;
 - a copy of the student's academic transcript;
 - the applicant's CV detailing the student's participation in professional and public activities related to their area of specialisation;
 - applicant's bank details.

4.2.3 University grants

- 336) A university grant is paid to:
- students who have achieved outstanding results in the development of the university and/or other extracurricular activities providing added value for the university;
 - students of TPU studying at foreign universities in order to support their studies.

337) Nomination for the grant is made by order of the Vice Rector for Academic Affairs on the basis of corresponding proposals from the Rector's office, the head of the academic department or the Head of the Department for Public Relations. The grant is paid once a semester or each month during the semester.

4.2.3.1 Grants for developmental activity at the university

338) For students who have achieved outstanding results in the development of the university or created added value for the university in other extracurricular activities, the head of the academic department or the Head of the Department for Public Relations may apply for a grant from the university grant fund.

339) The deadline for the submission of applications for the current semester is 1 October and 1 March. Applications for one-off grants may be submitted when necessary.

The application must be submitted with:

- the reason for the application;
- a copy of the applicant's academic transcript;
- the applicant's CV;
- the applicant's bank details.

4.2.3.2 Grants for students studying abroad

340) A grant for students commencing studies in a foreign university is issued according to his or her academic results, the living standard of the country, the cost of living and whether the country is among the countries prioritised by the European Commission.

341) The deadline for the submission of applications for the coming semester is 25 August or 25 January. The student must submit an application to the Head of the Department for Public Relations who examines the application and prepares a corresponding proposal to the Vice Rector for Academic Affairs.

342) The following is appended to the student's application:

- substantiation from the Head of the Department for Public Relations;
- recommendation/reference from the head of the academic department/chair;
- copy of the applicant's academic transcript;
- applicant's CV;
- applicant's bank details.

4.2.4 Grant termination

343) The payment of grants will be terminated before time if the grant holder:

- is exmatriculated;
- takes academic leave;
- terminates activities forming the basis of the nomination for the grant;
- waives the grant on the basis of a written application submitted to the Vice Rector for Academic Affairs;
- has violated the rules of behaviour or damaged the image of the university.

4.3 Disregard for academic practices

344) Any offence against the academic practices and generally recognised rules of behaviour constitute misconduct, including:

- performing in an examination of knowledge on behalf of other students;
- the use of such materials in an examination of knowledge which the teaching staff have explicitly forbidden;
- submission of someone else's written paper or parts thereof under one's own name without giving the required references (plagiarism);

- the unacceptable exchange of knowledge between students during an examination of knowledge.
- 345) If the student violates generally recognised rules of behaviour and academic practices, the dean has, depending on the gravity of the mistake, the right to:
- reprimand the student;
 - make a proposal to the Vice Rector for Academic Affairs to exmatriculate the student.

4.4 Contesting decisions associated with the regulations for studies

- 346) Any student who wishes to contest a decision related to the regulations for studies must submit a written application to the person who made the decision in order to contest it. If the person who made the decision does not satisfy the application of the student, the student may appeal in writing to the Head of the Study Department within two weeks from the date when the contested decision was made public or the problem occurred.
- 347) Where a decision made by the head of the department is being contested, an appeal in writing must be submitted to the dean of the faculty. If the dean's decision is being contested, an appeal must be submitted to the Vice Rector for Academic Affairs; if the decision of the Vice Rector for Academic Affairs is appealed, then to the Rector.
- 348) Grades of final papers or final examinations and issues related to defence procedures may be contested within three working days by submitting a corresponding application in writing to the dean of the faculty.
- 349) The dean and the Vice Rector for Academic Affairs may form a commission of three members to examine the appeal. The Vice Rector for Academic Affairs may consult the Commission for Studies and the Student Council in order to respond to the appeal.
- 350) The person whom the appeal was submitted to is obliged to notify the student about his or her decision in writing as to whether the appeal was resolved or not within ten working days of its submission.

5. ADMINISTRATIVE PROVISIONS

- 5.1 Full-time and part-time study forms are offered to students who were admitted to the university from the 2003-2004 academic year.
- 5.2 Admission in diploma programmes took place before the 2002-2003 academic year.
- 5.2.1 A diploma study is a professional higher educational programme with applied orientation, which consists of studies and the acquisition of vocational skills and professional knowledge.
- 5.2.2 The volume of diploma study is 120 to 160 credit points (3 to 4 years).
- 5.2.3 A diploma programme ends with the defence of a diploma paper. The person who has completed a diploma programme shall receive a diploma certifying the completion of the corresponding curriculum and an academic report, and upon the person's request, a diploma supplement in English, free of charge, will also be issued.
- 5.2.4 Graduates of a diploma programme have the right to continue their studies in the master's programme; where necessary, an applicant to a master's programme may be asked to take an examination in the area of specialisation.
- 5.2.5 A diploma programme may take place until 1 September 2007 for students matriculated before 30 June 2002.
- 5.3 Admission to a bachelor's programme before the 2002-2003 academic year has the following special considerations:
- 5.3.1 The objective of the bachelor's programme is to improve general educational knowledge, provide sufficient theoretical knowledge and skills for the commencement of work in the chosen field and for continuing studies.

- 5.3.2 The volume of the bachelor's programme is 160 to 200 credit points (4 to 5 years).
- 5.3.3 A bachelor's programme ends with the defence of the bachelor's thesis and in accordance with the curriculum either a *baccalaureus artium* or *baccalaureus scientiarum* degree shall be awarded.
- 5.3.4 Any person who has completed the corresponding curriculum shall be awarded a diploma certifying completion of the curriculum and an academic report, and upon the person's request a diploma supplement in English, will be issued free of charge.
- 5.4 The structure of bachelor and diploma curricula registered before 1 June 2002 is as follows:
- general subjects 20 CP;
 - the major in a bachelor's programme 75-95 CP;
 - the major in a diploma programme 40-50 CP;
 - a minor 30/15+15-40 CP;
 - electives (open) 5-10 CP;
 - teacher training 40 CP.
- In a bachelor's programme the major is divided into lower, middle and upper stages. The curricula of diploma and bachelor's programmes share subjects only within the middle stage of the major.
- 5.5 Any person matriculated in the full-time or distance learning form of study in the diploma programme before 30 June 2002 are deemed to be students. Any person admitted to student places formed on the basis of the teacher training curricula with a standard period of study consisting of one year following the bachelor's programme until 1 September 2005, are also deemed to be students.
- 5.6 Any person who has completed the curriculum in teacher training shall be awarded a corresponding certificate certifying the completion of the curriculum, displaying the stage of study and the subject (subjects) the person has the right to teach, and an academic report.
- 5.7 Study in a master's programme on the basis of curricula entered into the register of curricula at the Ministry of Education and Research before 1 June 2002 has the following exceptions:
- 5.7.1 The master's programme involves studies at the second level of academic education with the objective of creating opportunities for master's students to acquire an education with a more focused professional specialisation, to develop skills for planning, performing and applying the results of research, and to write and defend a master's thesis.
- 5.7.2 Master's degrees are divided into research and professional degrees.
- 5.7.3 Master's theses are graded as follows:
- with distinction (*cum laude*);
 - with credit (*optime approbatur*);
 - pass (*approbatur*);
 - unsatisfactory (*non sufficient*).
- 5.7.4 A master's programme ends with the defence of the master's thesis. According to the curriculum a *magister artium*, *magister scientiarum* or vocational master's degree shall be awarded.
- 5.8 The volume of one academic year will be 60 CP when the European Credit Transfer System is implemented.
- 5.9 The students who are obliged to pay five percent of the semester fee during their academic leave and whose fee on the basis of the contract is lower than the tuition fee during academic leave, shall pay as set out in the contract.
- 5.10 Payment for repeated attendance of a subject is effective as of the 2004-2005 academic year.

5.11 The procedure indicated in clause 174 according to which the note “withdrawn” in the assessment sheet shall be automatically replaced by “failed” in the database, shall take effect as of the 2004-2005 academic year.

TPU Academic Calendar for the 2004/05 academic year

*Approved by the Board of
Tallinn Pedagogical University
Ordinance No 14 of 19.04.2004*

June 28 – July 8, 2004	accepting applications from new perspective students
July 10 - July 19	entrance examinations
August 6	end of registration of accepted students for state-funded and non-state-funded studies
August 6 - August 16	submitting of additional applications to the vacated places
August 27	enrolment order is compiled
August 8	schedule for the autumn semester is displayed on the information board and on the website and is submitted to the Department of Academic Affairs
August 23 - August 27	PRELIMINARY WEEK OF THE AUTUMN SEMESTER
August 30, 2004	OPENNING CEREMONIES, an information day for the students accepted to regular form of studies in 2004 when organization of studies is explained
August 30	fixing of the students' status on the basis of academic results and the amount of academic studies completed (transfer to the next study year, exclusion of the students who have accumulated less than 20 CP during the previous academic year or whose cumulative grade point average is less than 2.0)
August 31	commencement of class work for the AUTUMN SEMESTER
September 6	deadline for submitting the attestation results of master's and doctoral students to the Dean's office, deadline for applying for concessions in tuition fees
September 13	end of academic movement (registration for courses and practice, applying for an academic vacation or reinstatement, filling the state-funded student places, transferring the students who were accepted for full-time studies in 2003 and who have not fulfilled the academic requirements to part-time studies)
September 13	deadline for submitting individual study plans to the Dean's office
September 20	exclusion of the students who have registered for autumn semester courses in the amount of less than 10 CP
September 20	Faculty Dean's offices publish lists of students sorted in the order of descent on the basis of their academic achievements for applying for study aid
September 25	deadline for receiving payment from non-state-funded students
September 27	academic departments submit the names of students registered for additional specialities/minors with these departments to the Dean's office of the student's major faculty
October 1	deadline for submitting applications for receiving study aid to the dean's office and student body; deadline for submitting applications for receiving faculty scholarship to the Academic Department
October 10	the last day of allocating study aid
October 15	allocating the faculty scholarship
October 18	85th ANNIVERSARY OF THE UNIVERSITY
October 25 - October 29	students' independent work week; examination/credit tests in the cyclic-study courses conducted in the first half of the semester

October 25 - November 5	defence of graduation theses
November 1	submitting suggestions on excluding the students who have not paid tuition fees by the prescribed deadline to the Dean's office
November 1 - November 5	approving of supervisors and topics of graduation theses of the students planning to graduate in the spring semester
November 15	approving of acceptance numbers and the amounts of tuition fees for non-state-funded students by the University Council
November 15	settlement of accounts with academic departments in the questions of Open University learners
November 15 - November 26	approving of new curricula by the Faculty Board, beginning of compilation of course curricula for the spring semester
November 29 – December 3	preliminary registration for elective courses and pedagogic practice for the spring semester at academic departments/chairs
December 13 - December 23	approving of new curricula by the University Council
December 13	submitting examination schedules to the Department of Academic Affairs
December 17	conclusion of class work for the spring semester, approving graduation theses/graduation examination defence commissions
December 24 – January 2	Christmas break
January 3 – January 23, 2005	examination session
January 17	schedule for the spring semester is displayed on the information board and on the website and is submitted to the Department of Academic Affairs
January 17 - January 28	defence of graduation theses
January 24 - January 28	PRELIMINARY WEEK OF THE SPRING SEMESTER
January 31, 2005	commencement of class work for the SPRING SEMESTER
January 31	fixing of the students' status on the basis of academic results and the amount of academic studies completed (for applying for study aid and faculty scholarship, exclusion of students who have accumulated less than 10 CP during the autumn semester)
February 7	deadline for submitting the attestation results of master's students to the Dean's office, deadline for applying for concessions in tuition fees
February 14	end of academic movement (registration for courses and practice, applying for an academic vacation or reinstatement, filling the state-funded student places)
February 14	deadline for submitting individual study plans for the semester to the Dean's office
February 16	Faculty Dean's offices publish lists of students sorted in the order of descent on the basis of their academic achievements for applying for study aid
February 21	exclusion of the students who have registered for courses in the amount of less than 10 CP
February 25	deadline for receiving payment from non-state-funded students
March 1	deadline for submitting applications for receiving study aid to the dean's office and student body; deadline for submitting applications for receiving faculty scholarship to the Academic Department

March 1 - March 18	approving of changes to the curricula, minors, and cross-curricular elective course programmes by the Faculty Board
March 7	submitting suggestions on excluding the students who have not paid tuition fees to the Dean's office
March 10	the last day of allocating study aid
March 15	allocating the faculty scholarship, deadline for applying for the students' ERASMUS scholarship
March 21 - March 8	submitting order forms for courses for the next academic year to the respective faculty
March 18	conclusion of class work for those graduating by taking or a defending a 10 CP examination/graduation thesis
March 21 - March 25	students' independent work week; examination/credit tests in the cyclic-study courses conducted in the first half of the semester
March 21 - March 29	compiling and producing course cards for the next academic year
March 21	beginning of compilation of course curricula for the autumn semester
April 15	conclusion of class work for those graduating by defending or taking a 4 CP bachelor thesis or bachelor examination
April 15	settlement of accounts with academic departments in the questions of Open University learners
April 18 - April 22	preliminary registration for elective courses and pedagogic practice for the autumn semester at academic departments/chairs
April 18 - April 22	approving of supervisors and topics of graduation theses of the students planning to graduate in the autumn semester
April 25	approving graduation theses/graduation examination defence commissions
May 2	submitting examination schedules to the Department of Academic Affairs
May 2 - May 13	approving of the cost of credit points at open university by the University board
May 20	conclusion of class work for the spring semester
May 23 – June 12	examination session
May 23 – June 5	defence of graduation theses
June 16 - June 19	graduation ceremonies
June 20 – August 19	SUMMER BREAK
August 22 - August 26	preliminary week of the autumn semester
August 29,2005	commencement of academic work in the AUTUMN SEMESTER of the 2005/06 academic year
August 29	fixing of the students' status on the basis of academic results and the amount of academic studies completed
September 12	deadline for submitting study plans for the autumn semester, end of academic movement

List of full-time teachers of Department of Natural Sciences

No	Name	Occupation	Load	Degree
Chair of Theoretical Physics				
1.	Mankin, Romi	Professor	1,000	Cand.Sci
2.	Ainsaar, Ain	Ass.Prof.	1,000	Cand.Sci
3.	Lukki, Tiit	assistant	1,000	MSc in Physics
Chair of Applied Physics				
1.	Ugaste, Ülo	Professor	1,000	D.Sci
2.	Laas, Tõnu	Ass.Prof.	1,000	PhD in Physics
3.	Rekker, Astrid	assistant	0,500	MSc in Physics
4.	Roode, Anneli	teacher	1,000	BSc in Physics (dipl. teacher of Physics)
5.	Reedik, Marko	assistant	0,500	BSc in Physics
Chair of Biology				
1.	Kukk, Henn	Professor	1,000	Cand. Sci
2.	Elvisto, Tiina	Ass.Prof	1,000	Cand. Sci
3.	Ploompuu, Tõnu	assistant	1,000	MSc in Biol.
4.	Metsis, Ats	Ass.Prof	0,250	Cand Sci
5.	Veidebaum, Toomas	Ass.Prof	0,250	Cand Sci
6.	Põld, Toomas	lecturer	0,500	Medical Doctor and Psychologist
7.	Põllumäe, Arno	lecturer	0,500	MSc in Biology
Chair of Chemistry				
1.	Truus, Kalle	Ass.Prof	1,000	PhD
2.	Pappel, Kaie	Ass.Prof	1,000	Cand.Sci
3.	Mähar, Andres	lecturer	0,250	Dipl. Chem.
4.	Paas, Kristi	assistant	1,000	MA in Educat. sciences
Lectorate of environmental protection				
1.	Pöder, Tõnis	Ass.Prof	1,000	Cand.Sci
2.	Gornaja, Ljubov	Ass.Prof	1,000	Cand.Econ
3.	Künnis, Kai		1,000	PhD in ecology
4.	Võsu, Aadu	lecturer	0,250	Cand.Sci

Chair of geo-ecology

1.	Punning, Jaan-Mati	Professor	0,500	Dr.Geogr.
2.	Jõgi, Jaan	Ass.Prof	1,000	Cand,Geogr.
3.	Karofeld, Edgar	Ass.Prof	0,500	PhD Ecol.
4.	Siska, Sirje	lecturer	1,000	MA
5.	Kratovitš, Andres	assistant	0,500	PhD Ecol
6.	Rivis, Reimo	lecturer	1,000	PhD Ecol

List of support personnel of Department of Natural Sciences

No	Name	Occupation	Load
1.	Telgmaa, Lotte-Triin	Assist. Chief of Dept., secretary	1,000
2.	Kõiv, Tiina	secretary	1,000
3.	Räim, Liisi	referent	1,000
4.	Korsen, Viljo	sen. engineer	1,000
5.	Soika, Erkki	sen. office assistant	1,000
6.	Timm, Anne	sen. office assistant	1,000
7.	Lausa, Ebe	sen. office assistant	1,000
8.	Part, Kristin	secretary	0,500
9.	Tamm, Jaana	teacing master	1,000
10.	Uibo, Merle	secretary	0,500
11.	Klimenko, Kaia	secretary	1,000

Requirements for term papers in the Department of Natural Sciences

*Approved by the Board of the
Department on November 11, 2003*

In addition to lectures and seminars, compiling of term papers and graduation theses forms an integral part of the academic process. A term paper is an academic report or research paper structured in accordance with the requirements of the Department of Natural Sciences for term papers and graduation theses.

Term Paper I 2.0 CP (deadlines for completion are set in accordance with the schedule distribution of the particular major) is first and foremost an academic report/research, the aim of which is to acquire skills for independent analytic work with various source materials.

Term Paper II 4.0 CP (deadlines for completion are set in accordance with the schedule distribution of the particular major) contains both academic report work and independent practical research work (gathering and analyzing data, making a test device, etc).

Educational Research Paper 5.0 CP is an independent pedagogical/methodological research paper. Depending on the curriculum, the Educational Research Paper is a research of pedagogical/methodological or development nature, founded on scientific grounds, the aim of which is to acquire skills for independent analytic work with various source materials and practical knowledge of means of didactic methodology.

Graduation thesis is an independent scientific/methodological research paper. Graduation theses on the subject of environmental management and didactics may independent methodical papers/theses of developmental (project) nature, founded on scientific grounds. Depending on the curriculum, the following are considered graduation theses:

- diploma thesis 10CP ;
- bachelor's thesis 4CP;
- bachelor's thesis 15AP.

1. Choosing and Registering the Topic of the Paper

By the end of the spring semester of each year the chair publicly announces the topics for term papers and graduation theses in the following form:

Topic
Short annotation of the topic
Supervisor: NN

The student chooses a topic, coordinates his/her choice with the supervisor on the corresponding topic, and registers the topic at the chair.

2. Parts of term papers and graduation theses are bound in the following order:

title page,
table of contents,
main part (overview of the literature, materials and methodology, results, discussion),
summary (conclusions),
summary in a foreign language,
works cited list, appendices.

2.1. Title Page

An example of the title page can be found in appendix 1.

2.2. Main Part

The paper/thesis must consist of the following chapters:

introduction,

theoretical background,

research methods or the characteristics of the model (term paper II and graduation thesis),

results and their analysis.

In the case of papers/theses of development nature:

establishing the problem,

planning – theoretical foundation of the solution to the problem on the basis of scientific literature and practical experience; developing the means of solving the problem, e.g. a curriculum, organisational means, study materials (textbook, workbook, collection of tests, laboratory experiments' guidelines, work sheets for educational field trips), etc;

evaluating the project – effectiveness of the project (strong and weak points); prospects and conditions of implementing the project.

The structure of the main part depends on the individual paper/thesis. Customarily, the main part is comprised of three major parts: 1) characteristics of the object of the research; 2) materials and methods; 3) analysis and synthesis.

The main parts of papers/theses of research nature are the existing research of the problem, research methods, additional research conducted, and the analysis and synthesis of the results, which should produce new information.

Papers/theses of applied nature (for those majoring in Environmental Management) must specify the primary task of the work, which contains a more detailed description of the problem than in the introduction, and, if necessary, must contain the client's wishes and special conditions. The client's terms and wishes presented in writing must be included as an appendix to the paper/thesis.

The content of the paper/thesis must demonstrate that the student has mastered the basic research methods and is capable of formulating the tasks and of fulfilling them.

2.2.1 Introduction

In the introduction, a short overview of the field of study and its relevance is given, the aims of the paper/thesis are established and the research tasks are set, and the predicted results are indicated. The aims/questions/hypotheses set in the introduction specify the problem introduced in the title. The reasons for choosing the topic are specified, the characteristics of the used data and the layout of the paper/thesis are given.

The author may choose whether to thank the supervisors and other people who have substantially contributed to the completion of the paper/thesis in the introduction, summary, or in a separate paragraph after the summary.

2.2.2 Theoretical Background

The theoretical background encompasses the coverage of the subject on the level of literature. The text must contain appropriate references to all the sources used (see section 3).

2.2.3 Research Methods or Characteristics of the Model

The chapter must contain the description of the object of study, model or test device, and that of the research methods employed. The description may be based either on processing existing data or on additional research, which resulted in acquiring new data.

The descriptions must be as specific as possible in order for the reader to be able to replicate the research at any time. A brief introduction of the method will be sufficient if the method employed is commonly used. In this case, however, an adequate reference must be provided. If an original (in this case, the differences from currently recognised methods must be explained and the author(s) must be credited) or a less widely used method is employed, the paper/thesis must contain its detailed description. Methods are listed in the order they have been utilised, complex methods are presented together.

In the case of paper/theses dealing with conducting experiments, a detailed description of the test device and of the methods of data processing must be given, as well as an evaluation of the trustworthiness of the data.

It is advisable to split the chapter dealing with materials and methods into subchapters, e.g.: Characteristics of the object of the research; area of research; fieldwork; work at the laboratory; data processing.

2.2.4 Results, Analysis of the Results, and Discussion

The achieved results and their analysis are presented; if necessary, the hypotheses that the results are based on are also presented. If the paper/thesis is of applied nature, the concept and the description of the solutions are presented.

When classifying the results, methodical classification is appropriate. The results must be presented in the style accepted for this type of literature (in an unemotional, laconic, and clear way) and their meaning must remain without comment. Tables, drawings, plans, photographs, and diagrams used in order to make the presentation of the results more graphic. All charts, diagrams, plans, and photos that are present in the paper/thesis are numbered as drawings and are marked Figure 1, Figure 2, etc. Each figure present in the paper/thesis must have references to it in the text. Example: *The results of the measurements of the birds' body length and mass are given in table 1.* Or: *A strong correlation between the birds' body length and mass has been discovered (figure 1).* The content of each figure must be unequivocal, and explanatory notes must be provided for abbreviations, markings, units, etc. The tables present in the paper/thesis are numbered (Table 1, Table 2, etc) and are given titles. Each table must have a reference to it and an explanation in the text. Numbered tables are placed in the order they have been referred to. Tables that give a more general overview are placed in the main part of the paper/thesis; tables with more specific content are usually placed in appendices.

2.2.5. Discussion

The results are discussed; they are compared with the results of similar research conducted by other authors; possible reasons for dissimilarities between them are analysed. Possible mistakes are discussed. Generalisations are made and conclusions are drawn on the basis of the results; new hypotheses, ones that could need to be tested in the future, are suggested.

2.3. Summary

A short (1-1.5 pages) overview of the most important results is given. When compiling the summary, it must be noted whether the problems raised in the introduction have been solved

or not. The reasons for the lack of the solution must be highlighted if it has not been found. It would be advisable to be able to point out in the summary the main topical problems of the given area of study. The summary must be comprehensible and must give the reader sufficient overview of the paper/thesis without reading the remaining parts of it.

No new problems are raised and no references to other sources are made in the summary. The summary must not contain new data, previously not presented in the text. If necessary, references can be made to drawings and text tables.

2.4. Summary in a Foreign Language

A short overview of the whole paper/thesis is given: the title of the paper/thesis, the aims, the methods employed, and the results. If the paper/thesis is in a foreign language, the summary must be written in Estonian.

2.5. Appendices

The materials that may be of interest only to the ones wishing to familiarise themselves with the topic in depth and the lack of which from the main part of the paper/thesis does not hinder its integrity (source data, tables, photographs, computer programmes, graphs) are presented as appendices. Appendices are numbered (Appendix 1, Appendix 2, etc) and are given titles. Every appendix must have references to it in the main part of the paper/thesis. The appendices are given in the order they are referred to in the text. Example: *The source data obtained using this method is given in appendix 1.*

3. Referencing, Works Cited List

It must be clearly stated in the paper/thesis, which results are a product of the author's work and which results are taken from other authors. For this purpose references to literature are used in the text of the paper/thesis. When inserting references and compiling the works cited list, the requirements given in the series of publications of the proceedings of The Academy of Sciences on respective subjects (*Biology; Ecology; Physics; Mathematics; Chemistry* — <http://www.kirj.ee>). The works cited list must include all the source materials used in the paper/thesis. It would be appropriate to list the publications, manuscripts, maps, plans, URLs, etc. separately.

If indirect referencing is employed (Newton, 1987; quoted in Rattiste, 1996), then the works cited list must contain full bibliographical entries of the sources indirectly referred to, together with a note showing which direct source has been used (in this case, Rattiste, 1996).

When quoting an entire paragraph, the reference in parenthesis is written after the full stop that ends the paragraph. When quoting just a single sentence, the reference must be placed before the full stop that ends the sentence.

Examples of Bibliographic Entries

Geocology, biology

The works cited list must be in alphabetical order. When citing a source in the paper, the last name of the author of the book or the author and the year of publication must be added in parenthesis in respective places.

All sources included in the works cited list need to have references in the text and vice versa. Works cited are to be presented in the following form:

books: Author(s). Publication year. *Title of the Book*. Publisher, city.

Lusztig, G. 1993. *Introduction to Quantum Groups*. Birkhauser, Boston.

Magazine articles: Author(s) of the Article. Year. Title of the Article. *Abbreviated Name of the Magazine*. **Volume Number**, magazine number, page numbers.

Milnor, J. 1964. On the Betti numbers of real algebraic varieties. *Proc. Am. Math. Soc.*, **15**, 275-281.

Karofeld, E. 1998. Effects of bombing and regeneration of plant cover in Kõnnu-Suursoo raised bog, North Estonia. *Wetl. Ecol. Manage*, **6**, 4, 253-260.

Articles from Collections of Articles: Author(s) of the Article. Year. Title of the Article. Rmt.,: *Title of the Collection* (editor(s) of the collection). Publisher, city, page numbers

Jones, W. B. 1977. Multiple-point Pade tables. Rmt.,: *Pade and Rational Approximation: Theory and Applications* (Saff, E. B. & Varga, R. S. toim.). Academic Press, New York, 57-65.

Materials in electronic form must be handled as texts. The specification of the electronic carrier must be included (e.g. CD_ROM, disk, etc). If the material is only available as an online version, then its exact URL and the date when the material was taken from the Internet must be provided.

Manning, G. *Internet: The WWW Virtual Library: Drosophila*. <http://ceolas.org/fly/index.html> (08.04.2002).

Articles in Cyrillic: if possible, the official title of the article in Estonian, English, German or French (taken, e.g. from summaries) must be included. If there is no official title in Estonian, English, German or French, then the title of the book and/or the article must be translated or transliterated into the Estonian or English language and the name of the magazine must be written in Latin letters. Publisher and publication data also must be written in Latin letters. A note must be included: (vene keeles/in Russian).

Shiyatov, S. G. 1986. *Dendrochronology of the Upper Timberline in the Urals*. Nauka, Moskva (vene keeles).

Physics and Chemistry

Number the works cited in the order they have been used and include the reference to it with the number in superior scrip in parenthesis in the respective place of the text (e.g. [1]). All sources included in the works cited list need to have references in the text and vice versa. Works cited are to be presented in the following form:

Books: Author(s). *Title of the Book*. Publisher, city, publication year.

Lusztig, G. *Introduction to Quantum Groups*. Birkhauser, Boston, 1993.

Magazine articles: Author(s) of the Article. Title of the Article. *Abbreviated Name of the Magazine*. Year. **Volume Number**, magazine number, page numbers.

Milnor, J. On the Betti numbers of real algebraic varieties. *Proc. Am. Math. Soc.*, 1964, **15**, 275-281.

Articles from Collections of Articles: Author(s) of the Article. Title of the Article. Rmt.,: *Title of the Collection* (editor). Publisher, city, Year. page numbers:

Ugi, I., Lohrberger, S. & Karl, R. The Passerini and Ugi reactions. Rmt.,: *Comprehensive Organic Chemistry: Selectivity for Synthesis Efficiency* (toim. Trost, B. M. & Heathcock, C. H.). Pergamon, Oxford, 1991, 1083-1109.

Jones, W. B. Multiple-point Pade tables. Rmt.,: *Pade and Rational Approximation: Theory and Applications* (toim. Saff, E. B. & Varga, R. S.). Academic Press, New York, 1977, 57-65.

Materials in electronic form must be handled as texts. The specification of the electronic carrier must be included (e.g. CD_ROM, disk, etc). If the material is only available as an

online version, then its exact URL and the date when the material was taken from the Internet must be provided.

Articles in Cyrillic: if possible, the official title of the article in Estonian, English, German or French (taken, e.g. from summaries) must be included. If there is no official title in Estonian, English, German or French, then the title of the book and/or the article must be translated or transliterated into the Estonian or English language and the name of the magazine must be written in Latin letters. Publisher and publication data also must be written in Latin letters. A note must be included: (vene keeles/in Russian).

Shiyatov, S. G. 1986. *Dendrochronology of the Upper Timberline in the Urals*. Nauka, Moskva (vene keeles).

Environmental Management

References must be provided to all the sources used, and only those sources that the author has used must be referred to. All references must be included in the works cited list. All the views belonging to other authors must be presented in the form of a quote (in original wording) or paraphrased (the idea restated in free form).

All the reference systems used in the cited magazines on environmental management may be used to provide references. Only one reference systems must be used throughout the paper. It is recommended that the name and year system is used, in which case the author's name and the publication year are included in parenthesis inside the text: (Dale 1998)

The name of the author who is being referred is not repeated if it is evident from the text: Dale (1998) claims that ...

In the book "Tools to Aid Environmental Decision Making" (1998) Dale claims that ...

If the cited work has up to three authors, the names of all the authors may be included in the reference:

... were refuted (Kask, Kuusk, Mänd 2000)

Kask, Kuusk, and Mänd (2000) found that ...

If there are more than three authors, the following is included in the text:

Kask, et al (2000) claimed that ...

... the presented arguments against (Kask *et al* 2000).

The order of the authors' names in the reference must be the same as in the publication. When referring to different works by the same author, the author's name is not repeated, the publication years of the works are separated by semicolons. The different publications that have appeared in the same year are differentiated by adding a small letter to the year: Kask (2001a; 2001b)

If it is not possible to use the original publication, one publication must be referred to through another publication, as follows:

Kask (2001, quoted in Kuusk 2002) found that ...

When referring to several sources at once the publications are separated by semicolons:

A variety of scholars (Kask 2000; Kuusk 2000; Mänd, 2000) have discovered that ...

If the authors have the same last name, initials are included in the reference:

(Kask, A., Kask, O. 2000)

The list of works cited is presented in the alphabetical order of the authors' last names, if there is no author – by the first word of the title. The works cited in the list are not numbered (except when the reference system with is used).

When referring to books, the following data, separated by full stops, is included in the list: author (last name together with initials, place of publication, publishing house (publisher), page numbers (if necessary).

Treweek, J. 1999. Ecological Impact Assessment. Blackwell Science.

In the case of a book with a compiler or editor, the following data, separated by full stops, is included in the list: title, publication year, name of the compiler, publishing house (publisher), (page numbers).

In the case of an article or a separate part by one author from a collection, the following data, separated by full stops, is included in the list: name of the other of the article of the part, (last name with initials), year of publication, title of the article or the part, name of the compiler of the collection (first name or its first letter together with the last name), title and number of the collection, place of publication, page numbers of the referred article.

La Point, T.W. 1995. Signs and measurements of ecotoxicology in the aquatic environment. In D.J. Hoffman (ed). Handbook of Ecotoxicology. CRC Press, Boca Raton, FL. 13 - 24

When making a reference to a magazine article, the following data, separated by full stops, is included in the list: author, year of publication, title, name of the publication, number of the publication, pages.

Johnson, A. R. 1988. Diagnostic variables as predictors of ecological risk. Environmental Management. 12. 515 – 523

In the case of a newspaper article, the following data, separated by full stops, is included in the list: author, year of publication, title, name of the newspaper, date of publication (without the year), and the number of the publication (if necessary).

The list of manuscripts is presented separately from published sources (for example, under the heading of “Manuscripts Cited” or “Manuscripts”). The type of the manuscript (for example, graduation thesis) and the location of the work (e.g. TPU Chair of Biology) must be included.

The list of legal acts is presented as a list under a separate heading (e.g. “Legal Acts”). In the entries for the acts that have appeared in the State Gazette or its appendixes, full titles of the acts followed by the data of the State Gazette are presented.

In the case of other acts, the full title of the act and the place of its official publication must be given.

In the case of sources in electronic form, the URL of the webpage where the document is available from and the date of accessing the webpage are indicated.

If oral data has been used in the paper, information about them must be given as a marginal note on the same page or added to the end of the works cited list.

Reference to reference books (e.g. dictionaries, lexicons, encyclopaedias) is not given in the text and they are not included in the works cited list.

4. Formulae, equations

Formulae that appear in the paper are parts of the sentence and are placed at the end of the sentence. Formulae that follow one another in the text are separated with commas or conjunctions. All the formulae found in the paper are numbered. The number is placed in parenthesis in the right margin on the same line as the corresponding formula.

5. Formatting Standards

Term papers and graduation theses are typed on one side of white sheets of paper (A4 format), 28-29 lines per page. All pages except the title page are numbered. The font to be used in the text is *Times New Roman* or *Arial*, size 12, with 1.5 lines line spacing. Subheadings may be typed in font size 14, paragraph headings in font size 16, chapter headings in font size 18 and the main heading in font size 20. Binding margins on the left-hand side are 3.5-4 cm, margins on the right-hand side – 1-2 cm, upper and lower margins – 2.5-3 cm. The recommended base lines are 1, guidelines are 0.4-0.5, and dimension lines are 0.2 ppt.

All footnotes or explanations of drawings are to be typed in font size 10; however, drawing footnotes and the titles of tables are to be typed in font size 12. The page must have lines on both sides for the length of the paragraph.

Hyphenation must be used if the biggest gap that is formed is bigger than three spaces (the so called “soft” Ctrl+hyphen hyphenation is recommended). Latin names and terms in a foreign language used for the first time must be italicized. Explanations of the terms must be provided.

No hyphenation is allowed in the title of the paper, and the last word in a line cannot be a conjunction. No full stops are used at the ends of sentences or words on the title page, and there is no comma between the place of publication and the year of publication. The title page, foreword, table of contents, and the first page of the introduction are counted but are not numbered.

The text is divided into parts (1.; 2.; 3.; ...), chapters (1.1.; 1.2.; 1.3.; ...), subchapters (1.1.1.; 1.1.2.; 1.2.1.; 1.2.2.; ...), and points. The titles of the biggest units of the paper (part or chapter) are written in capital letters at the beginning of a new page. Only initial letters of the titles of smaller subdivisions are capitalised and directly follow the preceding text (it is not allowed to end the page with the title of a new subdivision). The title and the text are separated by additional blank space.

The language of the students’ research papers is proper academic Estonian language. Slang, colloquial and belletristic expressions, as well as the conditional mood, are not used in the papers.

Papers and theses are written using impersonal forms. Abbreviations are not used in titles. The meaning of the abbreviation is explained when the abbreviation is used in the text for the first time.

When using less commonly-known terms, their explanation must be provided (for example, in an appendix); for the terms that do not have an accepted equivalent in Estonian the version in the original language must be included (for example, in parenthesis).

6. Defending and Grading the Papers and Theses

The term paper is submitted to the head of the chair in its final form in either spiral or quick binding not later than one week before the assigned date of the defence. The head of the chair allows the term paper to the defence, confirming this by his/her signature on the title page, and assigns a reviewer. The paper is presented to the reviewer by the chair not later than three days before the defence. The reviewer sends his/her written review to the head of the chair no later than the day before the defence.

The graduation thesis, adhesively bound, is submitted by the chair to the Department of Natural Sciences not later than one week before the defence. The head of the chair is responsible for the theses being submitted on time. Overdue theses are not allowed to the defence.

The student is allowed to defend his/her graduation thesis after he/she has completed a theoretical course by the dean's order. The head of the chair allows the term paper to the defence, confirming this by his/her signature on the title page, and assigns a reviewer. The paper is presented to the reviewer by the chair not later than five days before the defence. The reviewer sends his/her written review to the head of the chair no later than the day before the defence.

On the day of the defence the student must definitely have his/her record book with him/her.

The defence of term papers and graduation theses takes place at an open meeting, where the author is given up to ten minutes to introduce the main points and results of his/her paper/thesis. After that, the supervisor of the paper/thesis gives his/her opinion. Following the short introduction of the paper/thesis, the reviewer is given the floor. The reviewer presents his/her opinion of the paper or the thesis and engages, preferably in the form of questions and answers, in an academic discussion with the author. After the discussion, all present are allowed to present their questions, and the defence is concluded with the author of the thesis saying a few closing words.

The term paper defence commission is assigned by the head of the chair; the graduation theses defence commission is approved by the TPU rector.

When assessing term papers and graduation theses, the defence commission take into consideration the following:

- resolving the set objectives,
- command of the topic,
- articulating the results of the work,
- the student's performance at the defence.

The commission makes the results known the same day or on a previously agreed date.

7. Appealing

The student has the right to submit a written appeal within two work days of the defence date to the chairman of the defence commission, who must reply to it within seven days. The result may be changed for the better or left the same, but it cannot be changed for worse.

Example of the layout of the title page

TALLINN PEDAGOGICAL UNIVERSITY
Faculty of Mathematics and Natural Sciences
Chair of Geocology

Kalev Ilmarine

DISTRIBUTION OF
BENTHIC MACROFAUNA IN THE TOPU BAY, WEST-ESTONIA

Bachelor's thesis

Supervisors: doctor of biology prof. Siim Sõnajalg
PhD Valve Hani

Author: ”...”2003. a
Supervisor:..... “...”2003. a
Allowed to the defence ”...”2003. a
Head of Chair prof. J. Kuusk

Tallinn 2003