



APPROVED
by Decision No. 1.1 of the extraordinary electronic
meeting of the Tallinn Health University of Applied Sciences
on 4 June 2024

ASSISTANT PHARMACIST

1477

Educational institution	TALLINN HEALTH UNIVERSITY OF APPLIED SCIENCES
Code of educational institution	70003980
Title of the curriculum	<i>FARMATSEUT</i>
Title of the curriculum in English	ASSISTANT PHARMACIST
Higher education level	Professional higher education
Curriculum code in the Estonian Education Info-System (EHIS)	1477
Data about the right for conducting studies in the curriculum	The curriculum belongs to the “Medicine” study programme group in which there is a right to conduct studies by regulation No 62 “Standard of Higher Education” issued by the Government of Estonia on 11 July 2019.
Primary registration of the curriculum	05.09.2002
Approval date of the version of the curriculum in the educational institution	The curriculum has been approved by the Council of Pharmacy Curriculum on 27 March 2024. The curriculum has been approved by the Tallinn Health Care College Council by Decision No 1.1. on 4 June 2024.

Study area	Health and well-being
Field of studies	Health
Curriculum group	Medicine
Main field of study (or studies) of the curriculum and their volume (ECTS)	Assistant Pharmacist 180 ECTS
Minor field (or fields) of study and other possible specializations in the curriculum and their volume (ECTS)	The curriculum has no minor fields and specializations
Forms of study	Full-time study
Nominal length of studies	3 years
Volume of the curriculum in European credit point system (ECTS)	180
Volume of compulsory subjects (ECTS)	175
Volume of elective subjects (ECTS)	5

Study language	Estonian
Other languages needed for achieving the learning outcomes	English
Admission requirements	Secondary school diploma, vocational secondary education diploma, or an equivalent qualification.
Aim of the curriculum The aim of the Assistant Pharmacist curriculum is to train professionals with an applied higher education degree – assistant pharmacists who are knowledgeable about medicines, their preparation, and other medical goods and health products. Their knowledge and skills will enable them to work in pharmacies, pharmaceutical wholesale companies, and other enterprises involved in handling medicines, medical goods, and health products	

Learning outcomes of the curriculum

1. Understands medicines, their composition, and the technologies of extemporaneous preparation; is able to assess the quality of medicines organoleptically and by means of routine physical and chemical methods.
2. Is able to explain to clients the effects and side effects of medicines and medicinal plants, as well as their use in the treatment and prevention of illnesses.
3. Is competent to manage the ordering, receipt, preparation, and dispensing of medicines in a pharmacy and is well-versed in pharmaceutical legislation.
4. Is familiar with key professional issues and trends in the field of pharmacy and is capable of proposing solutions to address them.
5. Is able to apply interdisciplinary knowledge within the limits of their competence and consults with professionals from other fields when necessary.
6. Is capable of articulating pharmacy-related issues in both spoken and written form in Estonian and English, across different cultural contexts; uses professional IT tools and communication methods; is able to plan data collection and analyse the results.
7. Values intercultural differences, demonstrates tolerance and equality towards individual differences, adheres to the principles of professional ethics, and promotes environmentally sustainable behaviour.
8. Can competently use professional information sources and auxiliary materials to solve problems that arise at work, understands the need for lifelong learning, values physical and mental health, and keeps up to date with professional developments.
9. Has the teamwork skills necessary for professional work, applies innovation and entrepreneurial spirit to solve pharmacy-related problems.

Conditions of fulfilling the curriculum

Curriculum contains:

8 modules (180 ECTS)

Chemistry	25 ECTS
Herbal Treatment	14 ECTS
Effect of Medicines on Human Body	36 ECTS
Preparation and Dispensing of Medicines	47 ECTS
Professional Development	6 ECTS
Research Methodology	20 ECTS

Basics of Health Care	27 ECTS
Elective Subjects	5 ECTS
Volume of Practical Training	30 ECTS
Volume of Final Thesis/Final Examination	5 ECTS
Volume of Elective Subjects	5 ECTS
Options for passing the curriculum	The curriculum includes 5 ECTS of elective courses, which support the achievement of the curriculum objectives and allow students to realise their individual needs and intellectual interests within the field of study. In addition, in the third year, students may choose between completing the final examination or a final thesis to graduate
Graduation requirements	Completion of the curriculum in full and passing the final examination with a positive grade or defending the final thesis.
Type of diploma issued upon graduation	College graduate is awarded the Diploma of Professional Higher Education and <i>Meditiiniteaduse bakalaureus</i> Bachelor of Medicines (BSc).
Documents issued upon graduation	Diploma of Professional Higher Education with academic transcript and Diploma Supplement in English.
Possibilities for continuing studies	Master's studies
Access to labour market	Has acquired the learning outcomes for working as an assistant pharmacist.
Additional information	https://www.ttk.ee/et/kontaktileht

LETTER OF EXPLANATION FOR THE CURRICULUM OF ASSISTANT PHARMACIST

From the 2024/2025 academic year, the pharmacy curriculum has been updated, and the learning outcomes have been enhanced. The learning outcomes, scope, and placement of courses within the curriculum have also been revised, resulting in changes to the extent of the modules. Across Europe, pharmacy is moving towards a more in-depth focus on clinical disciplines, as the pharmacist's duties have evolved and increasingly include counselling on health conditions, side effects of medicines, and disease prevention.

The following changes have been introduced:

1. Pharmacotherapy I – the volume has been increased by 2 ECTS and the content enhanced – under the title *Clinical Pharmacology and Therapy I*; and Pharmacotherapy II, improved and renamed *Clinical Pharmacology and Therapy II*. These changes are related to the need to provide more essential clinical knowledge. The total volume of Clinical Pharmacology and Therapy will be 10 ECTS:
2. The volume of the course Phytotherapy is reduced by 1 ECTS (from 4 to 3 ECTS), as its topics overlap with those of Pharmacognosy – in parallel, all material can be covered. Conducting specialty subjects Pharmacology I and II, Pharmacotherapy I and II are moved forward by one semester, in order to provide students with the opportunity to understand whether their choice of profession is justified.
3. A new course Counselling in Pharmacy II will be added with a volume of 4 ECTS (currently *Counselling in Pharmacy* is 3 ECTS, in future 3 + 4 = 7 ECTS), as pharmacists are among the most accessible healthcare professionals worldwide at the first stage of service provision..
4. Pharmacy Organisation II will include a hospital pharmacy component, increasing the course volume by 1 ECTS (to 3 ECTS in future). To conclude, new solutions enhance securing students' professional choice as well as the reinforcement of knowledge in students integrating working at the pharmacy with studying.
5. A new course Immunology will be added, worth 2 ECTS, to provide in-depth knowledge of the functioning of the immune system and immunisation.
6. Nutrition Studies, worth 5 ECTS, will be included among compulsory courses, as pharmacists are expected to have knowledge of the basics of healthy nutrition and the ability to apply this knowledge for the benefit of pharmacy visitors' health.
7. The course Management and Entrepreneurship has been moved to electives, as the pharmacist's qualification does not allow working as a pharmacy manager or deputy manager, nor owning a pharmacy. The compulsory course *Pharmacy Organisation II* covers entrepreneurship, pharmacy operations, and the principles of organisational management.
8. The Pharmacy Practice II outcomes and volume have been adjusted (from 25 to 20 ECTS by reducing the share of defectari work and over-the-counter sales). This change arises from shifts in pharmacy work and feedback from practice supervisors. Defectari work is no longer necessary, as ordering and receiving goods is automated. With the decline in the number of extemporaneous prescriptions, the volume of medicines prepared has also decreased. The total volume of pharmacy practice in the curriculum is 30 ECTS, making up 16.7% of the total curriculum.
9. The learning outcomes of the courses Pharmaceutical Product Knowledge I and II are covered within *Counselling in Pharmacy I and II*. More in-depth knowledge of pharmaceutical product topics can be acquired as electives.
10. Updating and addition of electives.

In the Curriculum of Assistant Pharmacist, the name of the curriculum, conditions of commencement of the studies, the nominal duration and volume of the studies, study language, specialization possibilities and the curriculum classification have not been changed.

THE EXPECTED FIELD OF ACTIVITY OF THE GRADUATES

According to the orientation of the curriculum, the training of assistant pharmacists is primarily directed towards pharmacy work. The professional knowledge and skills acquired through the curriculum enable assistant pharmacists to work not only in community and hospital pharmacies but also in wholesale and manufacturing companies dealing with medicines, in pharmaceutical research and educational institutions, in laboratories engaged in pharmaceutical analysis, and in other applied areas of pharmacy. Due to their educational preparation, assistant pharmacists are also competitive in labour market areas adjacent to pharmacy.

In professional practice, an assistant pharmacist is expected to demonstrate precision, accuracy, dedication to their field, adherence to professional ethics, stress tolerance, decision-making capacity, a strong sense of responsibility, and good communication skills.

Graduates also have the possibility to continue their studies in Master's programmes

BASES OF THE CURRICULUM AND ORGANISATION OF PRACTICAL TRAINING

Curriculum is based on the following legal acts and basic reference documents of the field:

- Republic of Estonia Education Act (01.08.2022)
- Higher Education Act (01.08.2023)
- Standard of Higher Education (10.10.2022)
- Pharmacist VI Professional Standard (21.10.2021)
- Medicines Act (01.04.2023)
- Universities Act, the Private Schools Act and Institutions of Professional Higher Education Act and the Related Legislation Amendment Act (19.06.2008)
- Medicines policy 2030 (02.02.2023)
- Pharmacy 2030 – PGEU (19.04.2019)
- Tallinn Health University of Applied Sciences development plan 2022-2026 (24.05.2022)
- Statute of Tallinn Health Care College (01.09.2019)
- The Statute of the Outcome Based Curriculum of the Tallinn Health Care College (22.05.2018).

The current Assistant Pharmacist curriculum was established in 1998 and has since been revised in 2002, 2003, 2017, 2020, and 2023. It was approved by the Minister of Education on 5 September 2002 by directive no. 975. The curriculum's study volume is calculated in ECTS credits, where one credit corresponds to 26 hours of student work. An academic year comprises 60 ECTS credits, equal to 1560 hours of different forms of study. The curriculum consists of contact learning (lectures, seminars, practical training in the study environment), independent work, and practice in the work environment. Contact learning (including e-learning) amounts to up to 1950 hours, independent work to at least 1950 hours (including 130 hours for the final exam or thesis), and practical training in the work environment (pharmacy practice) to 780 hours.

The main teaching methods used are lectures, seminars, e-learning, panel discussions, lecture-discussions, group work, role play, case analysis, practical situational tasks, and problem-based learning. The subjects in the Assistant Pharmacist curriculum are selected considering the needs and

specifics of the profession. To improve integration and achieve curriculum objectives and learning outcomes, courses are grouped into 8 modules.

Modules extend across study years, covering the entire study cycle. In addition to theoretical instruction, practical training in a work environment plays a crucial role in the curriculum. Based on the primary training focus, practical training is carried out entirely in pharmacies (30 ECTS).

Practical training is a goal-directed activity aimed at applying acquired knowledge and skills in a work environment under supervision. Its organisation is based on the Study Regulations approved by the University Council and published on the University website. If necessary, students may complete practical training according to an individual schedule. Students may choose from practice placements approved by the department, which are updated annually. Practice placements include hospital and community pharmacies, where students acquire the learning outcomes related to dispensing medicines. Learning outcomes for medicine preparation are acquired in pharmacies that prepare medicines daily according to prescriptions. Practical training is supervised by both university lecturers (academic supervisors) and qualified field specialists from practice placements who have completed mentor training (practice supervisors). Collaboration among students, lecturers, and mentors regulates learning opportunities during practice and supports assessment and feedback processes both individually and in groups. After each practical training period, lecturers analyse its organisation, students' performance, and learning opportunities in the work environment. The outcomes of these analyses are considered when planning the next academic year.

Research-related objectives are achieved through course papers and the final thesis. Independent study is supported through tasks, which are assessed as part of final grades or exam requirements. The organisation of the study process is regulated by the Study Regulations of Tallinn Health University of Applied Sciences. The timetable regulates the distribution of contact learning and students' workload across study weeks and academic years in accordance with the curriculum. The volume and timing of studies ensure maximum rationality, efficiency, and learner-centredness. The ongoing development of the study process is ensured by adopting and consistently applying modern teaching and learning methods.

REQUIREMENTS SET FOR THE CURRICULUM QUALITY

The Curriculum of Assistant Pharmacist is in accordance with the strategic directions of Tallinn Health University of Applied Science.

The curriculum objectives and outcomes comply with the general requirements of professional higher education as well as the requirements necessary for professional activities of an assistant pharmacist (Assistant Pharmacist Professional Standard). The content and development of the curriculum are guided by the Curriculum Council, which includes representatives of pharmacy lecturers, pharmacy students, alumni, employers, and external experts. The Council monitors and analyses contemporary trends in the field of pharmacy and, where necessary, makes proposals for supplementing and amending the curriculum, as well as for the development of the learning environment. Conducting studies upon completion of the curriculum is fully covered with teaching staff with higher education.

The required quality of teaching and the professional competency of the graduates are ensured by:

- curriculum design and compliance with professional standards;
- continuous development of the content of the curriculum in line with the changes in the nature of drug handling and pharmacy work;

- improving the teaching methods in accordance with the emergence of new opportunities for the use of information technology;
- Increasing the professional and pedagogical competence of lecturers through continuing education, internships, and exchange teaching opportunities;
- Systematic collection and analysis of feedback from students, alumni, and employers;
- Ensuring the internationalisation of the curriculum through mobility of students and lecturers and cooperation between universities.

The development trends and the further development strategy of the Curriculum of Assistant Pharmacist are related to the factors that directly or indirectly affect pharmacy as a profession and a specific healthcare area. The most significant of these factors are:

- Changes in the professional directions of assistant pharmacists, arising from developments in pharmaceutical trade; Ensuring the internationalisation of the curriculum through mobility of students and lecturers and cooperation between universities.
- Amendments in the Assistant Pharmacist Professional Standard;
- Changes in healthcare system legislation;
- Changes in educational system legislation;
- Healthcare reforms;
- Technological changes in healthcare;
- Demographic changes in society.

Financial resources to ensure the functioning of the curriculum are provided from the College's budget.

MODULES AND SUBJECTS OF THE CURRICULUM, AIMS AND LEARNING OUTCOMES

Module title: Chemistry		Volume: 25 ECTS
Aim	To develop a knowledge base in chemistry necessary for professional practice, provide an overview of chemical processes in the human body and their connections with physiological functions, and explain links between the chemical structure of active substances and their pharmacological action. To raise awareness of the environmental risks associated with pharmaceutical residues.	
Learning outcomes	1. Knows the basic concepts of inorganic, organic, analytical, pharmaceutical and biochemistry. 2. Understands the structure, classes, reactions and biological roles of inorganic and organic compounds, and their applications in medicine. 3. Is able to use key methods of analysis applied in analytical and pharmaceutical chemistry. 4. Can explain the chemical structure, physical and chemical properties, and analytical principles of major groups of active substances, as well as requirements for purity and storage. 5. Explains the reasons and risks for environmental contamination with pharmaceutical waste and methods to mitigate it.	
Evaluation of module: subject-based method		
Subjects		
Code	Subject title	Volume
1KE17/AOK	Inorganic Chemistry	4 ECTS
Aim	To acquire basic knowledge of the structure of inorganic compounds, their physical and chemical properties and their mutual relationships.	
Learning outcome	1. Knows the basic concepts of inorganic chemistry. 2. Recognises classes of substances. 3. Is able to explain the nature of the hydrolysis process. 4. Possesses basic knowledge of redox processes. 5. Possesses basic knowledge of the most important compounds of metals and non-metals.	
Code	Subject title	Volume
1KE17/OK	Organic Chemistry	5 ECTS
Aim	To acquire the basic knowledge of the structure of organic compounds, their physical and chemical properties and mutual relationships.	
Learning outcomes	1. Knows the basic concepts of organic chemistry. 2. Is able to characterize the most important organic compounds (hydrocarbons, oxygen, and nitrogen-containing compounds, aromatic compounds, heterocyclic compounds) and their use in medicine. 3. Knows the principles of synthesis of organic compounds.	

	4. Is able to explain the properties of chemical compounds and inter-relationships between compounds.	
Code	Subject title	Volume
1KE20/AK	Analytical Chemistry	6 ECTS
Aim	To provide students with practical skills for analysis of various compounds, including medicine.	
Learning outcomes	1. Knows the basic concepts of analytical chemistry. 2. Is able to determine a variety of compounds using the main qualitative and quantitative methods of analytical chemistry. 3. Knows and is able to use some devices to perform instrumental analysis (gas chromatography-mass spectrometry, UV liquid chromatography, atomic absorption spectroscopy, infrared spectroscopy).	
Code	Subject title	Volume
1KE20/BK	Biochemistry	3 ECTS
Aim	To acquire basic knowledge of biomolecules in the human body and their role in metabolism. To provide introductory knowledge of biochemistry that enables the student to form a comprehensive scientific worldview from the perspective and needs of their speciality. The aim of the biochemistry course is to acquire knowledge at a level that allows understanding of human structure, vital functions, and development, and provides the fundamental basis for studying professional subjects.	
Learning outcomes	1. Has knowledge of basic concepts of biochemistry, is able to explain the relationship between the structure and the properties of the substance, understands the relationships between the micro-structure and macro-structure and the biochemical nature of the processes taking place in the body's cells and organs. 2. Has knowledge of the body as a whole, its individual parts and the relationship and the cooperation between the parts. 3. Is able to express the acquired knowledge in a written form as well as orally, is able to use the acquired terminology. 4. Is able to read and understand basic biochemistry related texts in foreign languages.	
Code	Subject title	Volume
1KE17/FK1	Pharmaceutical Chemistry I	3 ECTS
Aim	To acquire foundational knowledge of the analysis of medicinal substances, the chemical structure of key inorganic medicinal agents, their physical and chemical properties, and pharmaceutical analysis.	
Learning outcomes	1. Knows the basic concepts of pharmaceutical chemistry. 2. Knows the requirements for the chemical purity of medicinal substances and their storage. 3. Is able to explain the basic structure of inorganic and acyclic organic drug groups, as well as the chemical structure and properties of the medicinal substances within them.	

	4. Is familiar with the principles of identification and quantitative determination of key inorganic and acyclic organic medicinal substances.	
Code	Subject title	Volume
1KE24/FK2	Pharmaceutical Chemistry II	4 ECTS
Aim	To acquire basic knowledge of the chemical structure of the main organic medicinal substances, their physical and chemical properties, and pharmaceutical analysis. To explain the risks associated with pharmaceutical residues entering the environment.	
Learning outcomes	1. Is able to explain the basic structure of organic drug groups and the chemical structure and properties of the medicinal substances within them. 2. Relates the effects of organic medicinal substances to the functional groups they contain. 3. Is familiar with the principles of identification and quantitative determination of key organic medicinal substances. 4. Explains the causes and risks of pharmaceutical residues entering the environment, as well as the possibilities for reducing them.	

Module title: Herbal Treatment		Volume: 14 ECTS
Aim	To acquire the knowledge of the fundamentals of herbal medicine necessary for practical pharmacy work and the ability to use medicinal plants and preparations derived from them to strengthen the body, treat diseases, and for disease prevention.	
Learning outcomes	1. Is able to explain the anatomical and morphological structure and the most important physiological functions of plants. 2. Is familiar with plant systematics and knows the most important plants in the main plant groups. 3. Knows medicinal plants, the drugs derived thereof and their active substances. 4. Knows the principles of modern phytotherapy. 5. Knows the use of medicinal plants and herbal remedies for the treatment of diseases. 6. Is familiar with the nomenclature of natural preparations affecting the body functions and is able to make recommendations for their use.	
Module evaluation: subject-based method		
Subjects		
Code	Subject title	Volume
1TR20/BOT1	Botany I	4 ECTS
Aim	To acquire the basic knowledge on the structure of plants and their functions in order to pass specialty subjects related to medicinal plants (pharmacognosy, phytotherapy) and to understand the importance of plants in nature and human life.	
Learning outcomes	1. Has knowledge of the structure of plant cells, plant tissues and plant organs and of their function in plants. 2. Is able to classify vegetative organs and has an overview of the most important physiological processes in plants (photosynthesis, transpiration, mineral nutrition). 3. Is able to classify generative organs and explain the characteristics of plant reproduction and its course of the life cycle. 4. Knows the principles of plant classification and the most species-rich plant families, and is able to classify the most important plant species belonging to them, including cultivated and medicinal plants.	
Code	Subject title	Volume
1TR17/BOT2	Botany II	2 ECTS
Aim	To acquire the skills to identify plant species occurring in nature using plant identification keys and to compile herbarium collections.	
Learning outcomes	1. Is able to use plant identification keys to identify unknown plants. 2. Is able to collect, preserve, and store plant specimens from nature for research purposes.	

	3. Is able to properly prepare and document collected plant specimens for the compilation or supplementation of botanical collections.	
Code	Subject title	Volume
1TR17/FGN	Pharmacognosy	5 ECTS
Aim	To acquire basic knowledge of medicines, herbal drugs, medicinal plants, their main active substances and the biosynthesis of active substances.	
Learning outcomes	1. Knows the medicinal plants and the drugs derived thereof. 2. Knows the most important groups of active substances in medicinal plants, the chemical structure and biosynthesis mechanisms of these substances. 3. Is familiar with the substances on which the therapeutic effect of the most important medicinal plants and herbal drugs depends on. 4. Knows the principles of collection, drying and storage of medicinal plants.	
Code	Subject title	Volume
1TR24/FÜT	Phytotherapy	3 ECTS
Aim	To acquire knowledge of the basics of herbal treatment and of the use of plants for treatment of the disorders and pathological abnormalities occurring in the body.	
Learning outcomes	1. Understands the principles and methods of the medicinal use of plants. 2. Knows the pharmacological effects of medicinal plants used in pharmacy products and their application in the treatment of specific diseases.	

Module title: Effect of Medicines on Human Body		Volume: 36 ECTS
Aim	To acquire fundamental knowledge of the effects and mechanisms of action of medicines in the human body, their use in the treatment and prevention of diseases, drug interactions, as well as the potential toxic effects of medicines and other potent substances on the functions of the body.	
Learning outcomes	1. Knows the drug groups that affect different organs and their active substances. 2. Understands the mechanisms of action of different drug groups, as well as their pharmacokinetics and pharmacodynamics. 3. Is familiar with the factors that modify drug effects and drug interactions, as well as the mechanisms of absorption and metabolism of medicinal substances in the body. 4. Is familiar with modern medicines and their use in the treatment of diseases. 5. Knows toxic substances and their effects on the body. 6. Is familiar with medicines used to treat companion and farm animals.	
Module evaluation: subject-based method		
Subjects		
Code	Subject title	Volume
UF17	General Pharmacology	2 ECTS
Aim	To acquire knowledge about concepts of general pharmacology, groups and different forms of medications, and routes of administration.	
Learning outcomes	1. Knows concepts of general pharmacology and can use them. 2. Describes effects of the medication groups on a human body and factors influencing them. 3. Names different forms and routes of administration of medications, and dependence of a form or route of administration on the effect of medication.	
Code	Subject title	Volume
1RTO20/FL1	Pharmacology I	5 ECTS
Aim	To study pharmacodynamics: the mechanisms of action of medicines, their side and adverse effects, clinical use, contraindications, and interactions with other medicines.	
Learning outcomes	1. Understands and is able to describe the pharmacodynamics of medicines. 2. Has knowledge and is able to describe the effect of medicines on the organism and the factors affecting the effect. 3. Knows and is able to describe the mechanisms of action, side effects, contraindications, and medical use of hormones, analgesics and anti-inflammatory medicines, respiratory and digestive system medicines, and biological medicines.	
Code	Subject title	Volume

1RTO20/FL2	Pharmacology II	5 ECTS
Aim	To acquire knowledge of action mechanisms of medicines, their side effects and adverse effects, clinical usage, contraindications and interaction with other medicines. Passing Pharmacology is a prerequisite to the studies of Pharmacotherapy.	
Learning outcomes	1. Understands and is able to describe the pharmacodynamics of medicines. 2. Knows and is able to describe the effect of medicines on an organism and factors affecting them. 3. Knows and is able to describe the action mechanisms, usage, side-effects and contraindications of cardiovascular medicines, chemotherapeutics and central nervous system medicines. 4. Is able to use evidence-based pharmacological reference books, handbooks, and online sources.	
Code	Subject title	Volume
1RTO24/KFT1	Clinical Pharmacy and Pharmacotherapy I	5 ECTS
Aim	To acquire knowledge of medicines used for infectious, haematological, and gastrointestinal diseases, allergies, dermatological conditions, pain, and inflammation, as well as relevant treatment guidelines.	
Learning outcomes	1. Has knowledge of the indications, contraindications, side effects, and interactions of vaccines and medicines used for infectious, haematological, and gastrointestinal diseases, allergies, dermatological conditions, pain, and inflammation. 2. Is able to find and use treatment guidelines in both Estonian and English. 3. Has knowledge of the diseases for which the substances in these drug groups are used.	
Code	Subject title	Volume
1RTO24/KFT2	Clinical Pharmacy and Pharmacotherapy II	5 ECTS
Aim	To acquire knowledge of the medicines and treatment guidelines used in the treatment of cardiovascular, central nervous system, and metabolic diseases, asthma and COPD, autoimmune diseases, cancer, as well as in andrology and gynaecology.	
Learning outcomes	1. Has knowledge of the indications, contraindications, side effects, and interactions of medicines used in the treatment of cardiovascular, central nervous system, and metabolic diseases, asthma and COPD, autoimmune diseases, cancer, and in andrology and gynaecology. 2. Is able to find and use treatment guidelines in both Estonian and English. 3. Has knowledge of the diseases for which the substances in these drug groups are used.	
Code	Subject title	Volume
1RTO20/VF	Veterinary Pharmacy	2 ECTS

Aim	To acquire knowledge of the mechanisms of action, side effects and clinical use of veterinary drugs.	
Learning outcomes	1. Understands the differences between humans and animals and knows the nuances in determining the doses of medication. 2. Is able to give adequate advice to animal owners within the competences of an assistant pharmacist. 3. Knows the legislation concerning animals.	
Code	Subject title	Volume
1RTO20/BF	Biopharmacy	3 ECTS
Aim	To acquire knowledge on the pharmacokinetics and biopharmaceutical meaning of medicines, of the relationship between pharmaceutical technology and pharmacology.	
Learning outcomes	1. Knows the kinetics of release of active substances from medicines and the possibilities of investigating it. 2. Is able to explain the principles of passive and active transportation in the organism. 3. Knows and is able to explain the processes of bioavailability and bioequivalence. 4. Knows the biopharmaceutical meaning of different medicinal forms.	
Code	Subject title	Volume
1RTO16/TO	Toxicology	2 ECTS
Aim	To give an overview of the toxic effects of potent substances, including drugs, of the function on the organism and of the prevention of poisonings and treatment principles. To create appropriate links between everyday life and professional practice.	
Learning outcomes	1. Has an overview of the effects of most common poisons on the body. 2. Knows the basic antidotes and is able to provide first aid in case of poisonings. 3. Knows the signs and treatment principles of chronic poisonings.	
Code	Subject title	Volume
1RTO24/NA1	Counselling in a Pharmacy I	3 ECTS
Aim	To provide counselling skills by guiding students to understand and practically apply techniques for the professional service of pharmacy clients in relation to medicines for infectious, haematological, and gastrointestinal diseases, allergies, dermatological conditions, pain, and inflammation.	
Learning outcomes	1. Understands the nature and causes of an individual's social behaviour. 2. Is able to gather information by actively listening to and guiding the client/patient through questions during medicinal consultations and then provide effective counselling. 3. Is able to apply various communication techniques (including motivational interviewing) and principles of teamwork. 4. Uses evidence-based information sources and knows where to find them.	
Code	Subject title	Volume
1RTO24/NA2	Counselling in a Pharmacy II	4 ECTS

Aim	To deepen students' knowledge of pharmaceutical counselling by guiding them to understand and practically apply techniques for the professional service of pharmacy clients regarding medicines used in the treatment of cardiovascular, central nervous system, and metabolic diseases, asthma and COPD, autoimmune diseases, cancer, as well as in andrology and gynaecology.
Learning outcomes	1. Understands the nature and causes of an individual's social behaviour. 2. Is able to gather information by actively listening to and guiding the client/patient through questions during medicinal consultations and then provide effective counselling. 3. Is able to apply various communication techniques (including motivational interviewing) and principles of teamwork. 4. Is familiar with pharmacy-related entrepreneurship, work organisation in Estonia, relevant legislation, and the medicinal product handling system. 5. 5. Is able to process both digital and paper prescriptions.

Module title: Preparation and Dispensing of Medicines		Volume: 47 ECTS
Aims	1. To acquire specific professional expertise in pharmacy drugs, the real pharmacy work and the organization of the pharmaceutical industry in Estonia. 2. To provide students with skills to prepare prescription drugs, process prescriptions and interpersonal skills for serving the customers of the pharmacy.	
Learning outcomes	1. Knows the drug manufacturing technologies and is able to prepare on the basis of prescription's magistral formulae, taking into account the physiochemical properties of the active substances. 2. Has an overview of the drugs, other medical use goods and health products sold in Estonian pharmacies and is familiar with the active substances of pharmaceutical drugs. 3. Knows the main principles of client service and is able to implement them in the service process. 4. Knows the nomenclature of the drugs containing the main active substances and is able to comparatively evaluate pharmaceutical preparations provided by different manufacturers. 5. Is familiar with pharmacy-related entrepreneurship, work organisation in Estonia, relevant legislation, and the medicinal product handling system..	
Module evaluation: subject-based method		
Subjects:		
Code	Subject title	Volume
1RVV24/FTH1	Pharmaceutical Technology I	4 ECTS
Aim	To acquire knowledge of the technologies used in the preparation of solid and liquid dosage forms, and the ability to prepare extemporaneous medicines, taking into account the physicochemical properties of the active substances.	
Learning outcomes	1. Is able to rationally use the devices of weight and volume measuring. 2. Is able to correctly prepare solid dosage forms (powders, tablets, capsules) and liquid medicines (solutions, mixtures, suspensions, emulsions) in accordance with proper technological procedures, with an understanding of the physicochemical properties of the active substances. 3. Is able to properly label and store the prepared medicine for dispensing.	
Code	Subject title	Volume
1RVV24/FTH2	Pharmaceutical Technology II	4 ECTS
Aim	To acquire knowledge of the technologies for preparing semi-solid dosage forms and antiseptic medicines, and the ability to prepare extemporaneous medicines, taking into account the physicochemical properties of active substances as well as asepsis and antisepsis requirements.	
Learning outcomes	1. Knows the principles of asepsis and antisepsis, as well as the physical, mechanical, and chemical sterilisation methods used for sterilisation.	

	2. Is able to correctly prepare powders, solutions, mixtures, suspensions, emulsions, ointments, suppositories, and injectable medicines in accordance with proper technological procedures, with an understanding of the physicochemical properties of the active substances. 3. Is able to correctly label and store the prepared medicine for dispensing.	
Code	Subject title	Volume
1RVV24/PrA1	Pharmacy Practical Training I	10 ECTS
Aim	To consolidate the knowledge acquired through theoretical and practical studies regarding the preparation of solid dosage forms and liquid medicines, as well as over-the-counter preparations. To understand the processes related to the receipt and handling of pharmacy goods.	
Learning outcomes	1. Is able to prepare solid and liquid extemporaneous medicines based on prescriptions. 2. Has an overview of over-the-counter medicines, other medical products, and health products sold in Estonian pharmacies. 3. Knows the nomenclature of over-the-counter medicines containing active substances and is able to comparatively evaluate medicinal products offered by different manufacturers. 4. Is familiar with the organisation of pharmacy work and the medicines handling system. 5. Is able to describe and evaluate the work process and the final result in terms of technological, supervisory, and organisational components.	
Code	Subject title	Volume
1RVV24/PrA2	Pharmacy Practical Training II	20 ECTS
Aim	To consolidate the knowledge acquired through theoretical and practical training in the preparation of extemporaneous medicines, as well as in relation to prescription medicines and other pharmacy goods. To reinforce counselling skills in the pharmacy setting.	
Learning outcomes	1. Is able to prepare extemporaneous medicines. 2. Has an overview of over-the-counter and prescription medicines, other medical products, and health products sold in Estonian pharmacies. 3. Is familiar with the nomenclature of over-the-counter and prescription medicines containing active substances and is able to comparatively evaluate medicinal products offered by different manufacturers. 4. Is able to counsel clients/patients according to their needs. 5. Analyses the work process and the final result in terms of technological, supervisory, and organisational components, and is able to provide an assessment.	
Code	Subject title	Volume

Code	Subject title	Volume
1RVV20/FKR1	Pharmacy Organisation I	3 ECTS
Aim	To acquire and consolidate knowledge of pharmacy entrepreneurship and work organisation, applicable legislation, and the quality guidelines for pharmacy services. To understand ethical standards and their application in the provision of pharmacy services.	
Learning outcomes	1. Has an overview of the history of pharmacy. 2. Knows the requirements for prescribing and dispensing medicines from pharmacies, as well as the conditions for providing pharmacy services and the organisation of pharmacy work across different authorities. 3. Is familiar with the organisation of work in pharmacies and related legislation, including in hospital pharmacies. 4. Understands the principles of entrepreneurship and is able to assess and develop business opportunities in the healthcare sector. 5. Is able to analyse information materials needed in pharmacy practice and use them to provide counselling to both patients and healthcare professionals.	
Code	Subject title	Volume
1RVV24/FKR2	Pharmacy Organisation II	3 ECTS
Aim	To acquire and reinforce knowledge on pharmacy works, current legislation and quality guidelines of pharmacy services. To understand and comply with ethical norms in providing pharmacy services.	
Learning outcomes	1. Has an overview of Good Pharmacy Practice. 2. Knows the requirements for prescribing and dispensing medicines in pharmacies. 3. Knows the conditions for the provision of pharmacy services and the organisation of work in community and hospital pharmacies. 4. Is able to analyse the information material needed in pharmacy practice and use it for counselling both patients and healthcare professionals.	
Code	Subject title	Volume
KL17	Client Service	3 ECTS
Aim	To acquire knowledge about client service foundations and provide readiness for understanding and fulfilling clients' needs in service process.	
Learning outcomes	1. Knows foundations and ethical aspects of client service. 2. Knows the nature of service process and can participate properly in this. 3. Knows types of products/service and is able to plan and carry out (sales) conversation. 4. Uses appropriate communication techniques in client service.	

Module title: Professional Development		Volume: 10 ECTS
Aim	To acquire necessary skills and knowledge to ensure learning-related professional development and lifelong learning.	
Learning outcomes	1. Knows the specialty terminology in Latin, abbreviations and expressions used in prescriptions. 2. Is familiar with healthcare technology terminology, health telematics, and e-solutions, and understands the importance of data protection and cybersecurity requirements. 3. Is able to plan and manage one’s studies in Tallinn Health University of Applied Sciences. 4. Is able to implement the principles of teamwork.	
Module evaluation: subject-based method		
Subjects:		
Code	Subject title	Volume
SO17	Introduction to Learning	2 ECTS
Aim	To create possibilities for managing successfully in study process in Tallinn Health University of Applied Sciences.	
Learning outcomes	1. Has an overview of Estonian higher education system and possibilities for international cooperation. 2. Knows organization of studies and practical training, and study counselling system in Tallinn Health University of Applied Sciences. 3. Is able to draft and format letters and study-related documents. 4. Knows the basics of learning, teamwork, stress and time management, and career planning.	
Code	Subject title	Volume
TTE20	Health Care Technology and e-Health	2 ECTS
Aim	To develop knowledge about electronic health information systems and the principles of technologies used in healthcare.	
Learning outcomes	1. Knows and uses health care technology terminology and the developed e-solutions, understands the importance of data transfer. 2. Has an overview of health telematics implication possibilities. 3. Understands data protection requirements and the importance of cyber security requirements.	
Code	Subject title	Volume
1PA20/LK	Latin	2 ECTS
Aim	To acquire Latin skills needed for the profession of assistant pharmacist.	
Learning outcomes	1. Is able to correctly pronounce Latin. 2. Knows how to form necessary expressions and how to correctly use them.	

	3. Is able to translate expressions based on nouns and adjectives from Latin to Estonian. 4. Is able to correctly use specialty terminology, including expressions and abbreviations used in prescriptions.
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Module title: Research Methodology		Volume: 20 ECTS
Aim	To develop readiness for collecting and analysing evidence-based information	
Learning outcomes	1. Is able to find and use reliable evidence-based scientific information sources in professional research. 2. Is able to analyse and summarise information from different sources. 3. Knows the basics of statistics, is able to collect data methodologically and analyse it correctly. 4. Knows the ethical aspects of research and is able to follow them. 5. Is able to formulate professional problems and provide recommendations for their solution based on research.	
Evaluation of module: subject-based method		
Subjects		
Code	Subject title	Volume
UTM1-17	Foundations of Research I	5 ECTS
Aim	To create readiness for collecting and analysing evidence-based information.	
Learning outcomes	1. Is able to use the principles of systematic literature search and document the search results. 2. Is able to independently use scientific databases and analyse relevant evidence-based material. 3. Is able to summarise professional scientific literature in both English and Estonian. 4. Knows the basics of statistics and is able to find and interpret statistical data. 5. Is able to prepare and format independent assignments and use scientific language.	
Code	Subject title	Volume
UTM2-17	Foundations of Research II	5 ECTS
Aim	To develop skills for conducting research.	
Learning outcomes	1. Understands the key concepts and principles of scientific research and recognises the differences between types of research. 2. Knows the various methodologies used in research and is able to choose the most appropriate method for data collection and analysis when planning a study. 3. Is able to collect or find statistical data and relevant evidence-based source material, analyse it in their work, and correctly summarise and reference it.	

	4. Understands the principles of research and medical ethics and is able to address ethical aspects in the preparation of research work.	
Code	Subject title	Volume
LP2-23	Graduation thesis	5 ECTS
Aim	To demonstrate the student's ability to apply the knowledge acquired during the curriculum, to show the acquisition of practical skills in conducting research using various research methods	
Learning outcomes	1. Understands the principles of research ethics and reliability and applies them in the preparation of research. 2. Is able to review and analyse scientific literature related to the research problem. 3. Masters the method of data collection and analysis used in the research. 4. Is able to explain the research results and their significance to the field. 5. Is able to critically analyse and defend the viewpoints presented in the research and discuss the researched topic.	
Code	Subject title	Volume
LE17	Final Examination	5 ECTS
Aim	To demonstrate the student's ability to integrate professional knowledge and skills, and readiness to enter professional employment	
Learning outcomes	1. Has a systematic overview of the profession and its competencies. 2. Possesses the knowledge, skills, and readiness to independently enter professional employment. 3. Is able to connect professional theory with practice and apply this knowledge without compromising the interests of the patient/client.	

Module title: Basics of Health Care		Volume: 27 ECTS
Aims	1. To acquire the basic knowledge of the structure of the human body, organ systems, and their normal and pathological functioning, necessary for understanding the effects of medicines and for professional practice. 2. To provide knowledge of the foundations of pharmaceutical care, health maintenance, development of coping strategies, and prevention of work-related diseases	
Learning outcomes	1. Knows the structure and functioning of human organism, the biological basics of functioning. Is able to measure and interpret primary health care indicators. 2. Knows the nature of pathological and genetic processes and their action mechanisms. 3. Knows the principles and ways of application of a-and antiseptics. 4. Knows the organisational problems accompanying the use of medicines, their manufacturing, inspection and information. 5. Knows the main principles of legislation, public health and legislation of work health care as well as the criteria of assessing and improving the health condition of the population.	
Module evaluation: subject-based method		
Subjects		
Code	Subject title	Volume
AnF17	Anatomy and Physiology	6 ECTS
Aim	To acquire basic knowledge in anatomy and physiology.	
Learning outcomes	1. Uses appropriate anatomy and physiology related terminology. 2. Knows and is able to explain the structure of the human body and the mechanisms regulating its functioning and development. 3. Knows the shape, structure and location of organs in human body by body systems.	
Code	Subject title	Volume
HaOp17	Pathology	5 ECTS
Aim	To acquire foundational knowledge about the causes and development of diseases, related phenomena, and the changes occurring in the human body.	
Learning outcomes	1. Knows fundamental processes and concepts of general pathology. 2. Knows etiopathogenesis and pathogenesis of most prevalent diseases, and ways to prevent the diseases treating each organ system separately. 3. Has basic knowledge about microbiology and function of the immune system, most common micro-organisms and diseases caused by them affecting human functioning. 4. Knows the basics of genetics, understands the nature of heredity and variability, possesses fundamental knowledge of the most common chromosomal and genetic diseases, and is aware of the possibilities of	

	applying genetics in medicine.	
Code	Subject title	Volume
TO17	Occupational Safety	3 ECTS
Aim	To acquire first aid skills, ability to act safely in the work environment and in case of fire hazard.	
Learning outcomes	1. Knows the principles of quality and risk management in health care organization. 2. Is able to assess risk factors in the work environment and develop a risk analysis. 3. Knows, how to use ergonomic job methods and promote health at workplace. 4. Is able to give first aid without any medical devices. 5. Is able to act in case of fire hazard.	
Code	Subject title	Volume
RaTer17	Public Health	2 ECTS
Aim	To form knowledge about theoretical foundations and functions of public health, public health policy principles, and give an overview of the situation and organizational arrangement of public health in Estonia.	
Learning outcomes	1. Understands the nature of public health field, tasks, public health policy principles, and is able to interact health factors having effect on an individual and the community. 2. Knows most common health problems of population in Estonia and activities within the frames of the National Health Development Plan to prevent diseases and promote health. 3. Has an overview of the organizational arrangement of public health in Estonia and creates connections between activities of different institutional sectors and levels.	
Code	Subject title	Volume
1TA17/FH	Pharmaceutical Care	2 ECTS
Aim	To give an overview of responsible and proper usage of medicines, including other health care professionals and clients/patients.	
Learning outcomes	1. Knows the principles of pharmaceutical care, has an overview of pharmaceutical production and marketing. 2. Knows the factors influencing the use of medicines. 3. Has an overview of the process of manufacturing new medicines. 4. Applies their professional knowledge for the benefit of the client/patient and consults with other healthcare professionals when necessary.	
Code	Subject title	Volume
1TA20/TMT	Measuring and Interpreting of Vital Signs of the Body	2 ECTS

Aim	To provide knowledge of a pharmacist's role in primary level health care and in measuring the primary health markers theoretically as well as practically in terms of interpreting the results.	
Learning outcomes	1. Knows the main principles of primary health counselling and patient education. 2. Complies with the requirements of a- and antiseptics. 3. Knows how to measure blood sugar, cholesterol, level of haemoglobin and vitamin D as well as body composition and blood pressure and document the results. 4. Knows how to give primary recommendations in case of results differing from the norm.	
Code	Subject title	Volume
VA17/TÖ	Nutrition Studies	5 ECTS
Aim	To provide knowledge of macro- and micronutrients, the basics of nutrition, and nutritional terminology, as well as the application of this knowledge.	
Learning outcomes	1. Has knowledge of the body's micro- and macronutrients, their functions, and their interrelations within the body. 2. Is familiar with nutritional terminology. 3. Has knowledge of the principles of healthy eating and is able to apply them both in personal dietary choices and in future professional practice.	
Code	Subject title	Volume
Imm24	Immunology	2 EAP
Aim	To acquire foundational knowledge of the functioning of the immune system, the mechanisms of innate and acquired immune responses, and immunisation.	
Outcomes	1. Understands the basic principles of the functioning of the immune system. 2. Understands the mechanisms of development of innate and acquired immune responses. 3. Has fundamental knowledge of immunisation, is familiar with different types of vaccines and their mechanisms of action.	

Module title: Elective Subjects		Volume: 5 ECTS
Module evaluation: subject-based method		
Subjects		
Code	Subject title	Volume
JuEt17	Management and Entrepreneurship	4 ECTS
VA17/HN	Healthy Nutrition	5 ECTS
VAVF15	Veterinary Pharmacy	2 ECTS
VA24/PM	Pharmacy Organisation	3 ECTS
VA24/Im	Immunisation	2 ECTS
VA24/BF2	Biopharmacy II	2 ECTS
IRVV17/FKT1	Pharmaceutical Product Knowledge I	2 ECTS
1RVV20/FKT2	Pharmaceutical Product Knowledge II	2 ECTS
VAEA12	Entrepreneurship Development 1	1 ECTS