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nature?
The Faculty's mission is to offer higher professional education, undergraduate and postgraduate university study programs, as well as research and professional and advisory services in the areas of living nature (biology, microbiology), agriculture, forestry and fishery (forestry, animal science, agronomy) and in closely related production technologies (wood science, food science, biotechnology).

All the educational and research disciplines provided at the Biotechnical Faculty incorporate the issues of management of natural resources (soil, space, flora and fauna, water). The Biotechnical Faculty, with its research into environmental resources and its sustainable management orientation, is an institution needed by every nation in its efforts to define and preserve its identity. Research and education in the area of life and nature obliges the Biotechnical Faculty to provide the professional and scientific foundations and an appropriate atmosphere in society that will enable the creation and development of a sustainable symbiotic existence between man and nature.

Environmental renovation and protection, preservation of the natural heritage, ecological and sustainable use of natural resources, production and processing of high quality food and the use of modern biotechnology, are global challenges demanding a constant and strenuous search for the new and better and for furthering expertise that will be widely accessible and utilized in everyday life.

Scientific research at the Biotechnical Faculty comprises basic, applied and developmental work. It enables research findings and accomplishments to be widely accessible in life. Professional and advisory services, as part of the research activities, keep the staff of the Faculty informed about emerging needs and issues of practice, facilitates their participation in resolving problems and thus becoming familiar with new ideas that can be successfully applied in teaching and research. A circle is created: basic research – applied research – education – professional work and development. Such an approach requires close linkage with production in order to meet the practical needs of individual professions and those responsible for social development.

With a variety of educational and research programs, the Biotechnical Faculty encourages inter-disciplinary and multi-disciplinary approaches to education and integral research into developmental issues that are becoming more and more complex and influenced by the interests of various professions. In addition, it tries to promote and advance the highest quality, internationally recognized scientific and professional cooperation, openness, and a reputation for excellence. The international competitiveness of the Faculty guarantees the quality of its educational, research and developmental activities.
The Biotechnical Faculty is part of the University of Ljubljana, which was established in 1919 on the foundations of a long pedagogic tradition. The University of Ljubljana is the central and largest educational institution in Slovenia. With over 50,000 undergraduate and postgraduate students participating in more than 300 different undergraduate and postgraduate study programs, it is also among the largest universities on a world scale. It employs approximately 6,000 higher education teachers, researchers, assistants and administrative staff in 23 faculties and 3 academies of art. The Biotechnical Faculty had 620 employees in December 2009.

According to European University Association (EUA) reviews, the University enjoys an excellent academic reputation; it has qualified teachers and motivated students. It has the support of its external partners and well developed international cooperation in the spheres of student exchange and research.

The University of Ljubljana is ranked among the top 500 universities in the world according to ARWU Shanghai, Times THES-QS and WEBOMETRICS.
The Faculty of Agronomy was founded in the City of Ljubljana in 1947. When the Department of Forestry was established in 1949, the institution changed its name to the Faculty of Agronomy and Forestry. With the introduction of the Veterinary Medicine Study Program, the former Faculty of Agronomy and Forestry became the Faculty of Agronomy, Forestry and Veterinary Medicine.

In 1960, a new program was initiated at the Department of Agronomy, the study of animal science, today known as the Study Program of Agriculture – Animal Production, conducted at the Department of Animal Science. In the year after the Faculty of Natural Science and Mathematics was re-organized, the Study Program of Biology became part of studies at the Faculty of Agronomy, Forestry and Veterinary Medicine and, in 1961, the Faculty obtained its present name. In the autumn of 1961, the Study Program of Food Science and Technology was introduced as a discipline at the Department of Agronomy and in 1965 it became an independent program at the Department of Food Science and Technology.

The Study Program of Agronomy has included landscape management since 1950 but the Postgraduate Program Study in Landscape Architecture only began in 1972. In 1976, the Undergraduate Study Program of Landscape Architecture also started.

The Forestry Study Program was divided in the third academic year into a Wood Science and Technology Course and a Forestry Course. In 1968, an independent Wood Science and Technology Program began, so a Department of Forestry and Wood Science was established. Two independent departments were formed in 1975 – the Department of Forestry and the Department of Wood Science and Technology.

In 1990, the Study Program of Veterinary Medicine went its own way at the independent Faculty of Veterinary Medicine.

The youngest fields of study are the Study Program of Microbiology, which has been on the curriculum of the Biotechnical Faculty since 1993 and Biotechnology, which started in the academic year 2004/2005.

Study programs adapted to the Bologna process were introduced in the 2007/2008 academic year. In addition to academic study
programs, the Faculty organizes professional study programs. There are altogether nine academic study programs and four professional study programs provided by the Faculty.

The Biotechnical Faculty offers fifteen master study programs: Agronomy, Biotechnology, Ecology and Biodiversity, Economics of Natural Resources, Forestry and Managing Forest Ecosystems, Horticulture, Landscape Architecture, Wood Science, Microbiology, Molecular Biology, Nutrition, Structural and Functional Biology, Protection of the Natural Heritage, Animal Science, Food Science.

The Biotechnical Faculty offers an Interdisciplinary Doctoral Program in Biosciences in the following areas: Agronomy, Bioinformatics, Biology, Biotechnology, Economics of Natural Resources, Horticulture, Landscape Architecture, Wood and Biocomposites, Nanosciences, Nutrition, Technical Systems in Biotechniques, Managing Forest Ecosystems, Protection of the Natural Heritage, Animal Science, Cell Sciences, and Food Sciences. The interdisciplinary doctoral study program is a joint project of four faculties of the University of Ljubljana. It started in the academic year 2009/2010.

In partnership with other faculties of the University of Ljubljana, the Biotechnical Faculty provides an Interdisciplinary Doctoral Study Program in Biomedicine, an Interdisciplinary Doctoral Study Program in Environmental Protection and an Interdisciplinary Doctoral Study Program in Statistics.
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Biotechnical Faculty is organized into Departments, Chairs, and Special Units.
UNDERGRADUATE STUDY PROGRAMS

FIRST CYCLE
The Biotechnical Faculty organizes undergraduate study programs in the fields of Biology, Biotechnology, Forestry and Renewable Forest Resources, Agriculture-Agronomy, Agriculture-Animal Production, Landscape Architecture, Wood Science, Microbiology, and Food Science and Nutrition.

The programs are evaluated according to the European Credit Transfer System – ECTS, with 30 ECTS credits for a semester. The study programs are provided as lectures, laboratory practicals, seminars and field work.

The majority of programs provide electives, particularly in the second and third year of study. A student completes the study after he/she has fulfilled all the requirements determined by the program.

Assessment of a student’s performance is carried out in compliance with the Faculty’s Exam Regulations.

**Grading System:**

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<th>Percentage Range</th>
<th>Grade</th>
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<tr>
<td>91 % – 100 %</td>
<td>10 = excellent</td>
</tr>
<tr>
<td>81 % – 90 %</td>
<td>9 = very good</td>
</tr>
<tr>
<td>71 % – 80 %</td>
<td>8 = very good</td>
</tr>
<tr>
<td>61 % – 70 %</td>
<td>7 = good</td>
</tr>
<tr>
<td>51 % – 60 %</td>
<td>6 = satisfactory</td>
</tr>
<tr>
<td>less than 51 %</td>
<td>1 – 5 = fail</td>
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**Academic Study Programs** last three years (6 semesters), encompass the following fields: biology, biotechnology, forestry and renewable forest resources, agriculture – agronomy, agriculture – animal production, landscape architecture, wood science, microbiology, and food science and nutrition.

**Professional Study Programs** last three years (6 semesters), one semester is for practical education experience. These programs cover the following fields: forestry, agriculture – agronomy and horticulture, agriculture – animal husbandry, and technologies of wood and fibre composites.

All study programs are described in more detail on the Faculty’s web site: [www.bf.uni-lj.si](http://www.bf.uni-lj.si)

**Academic calendar**

- **Semester One**
  - beginning of October – middle of January
- **Semester Two**
  - middle of February – end of May
- **Winter holidays**
  - middle of January – middle of February
- **Winter examination period**
  - middle of January – beginning of February
- **Summer holidays**
  - beginning of July – end of August
- **Summer examination period**
  - beginning of June – end of June
- **Autumn examination period**
  - end of August – middle of September

The number of students enrolled at the Biotechnical Faculty in the 2009/2010 academic year was 2322 (1741 in academic study programs and 581 in professional study programs). The total number of graduates in 2009 was 445 (292 in academic study programs and 153 in professional study programs).
Slovenia needs highly qualified professionals in the field of agriculture, capable of interdisciplinary linkage of natural science, technical, economic and social subjects for work in the field of sustainable development, sustainable management of the agricultural space and production of safe and functional food. The basic aim of the Academic Study Program in Agriculture - Agronomy is to educate professionals who understand the interdisciplinary nature of the profession, who master the basic research methods of natural science, technology, economics and social science and are able to apply them in sustainable agricultural development, with an emphasis on plant production. The knowledge, qualifications and skills acquired enable both a continuation of study in a second cycle master's study program and employment. Graduates are qualified for basic planning, organization, management and implementation of technological processes and maintenance services in plant production. The full-time study program is provided as contact methods of work, individual consultations with a professor or an assistant and independent student work. Additional help for students will be provided by mentors and tutors. Most courses are provided in blocks not exceeding one term. Extensive main courses will also include regular tests. The goal of the various pedagogical methods and active participation of students is fluent transition from year to year. Students must therefore participate in all contact methods of work and complete all the study requirements. The Academic Study Program in Agriculture - Agronomy lasts for three years and has a workload of 180 credits. After successful completion of the study requirements, students obtain a university academic degree in agronomy. Graduates can be employed in agricultural plant production (manager of production line, organizer, supervisor), in the field of marketing and services (marketing fresh fruit and vegetables, ornamental plants and other agricultural plants and production materials), in the public sector (chamber of agriculture, supervisory organizations, administration, etc) or as independent producers and advisors.
Agriculture, of which animal production is an integral part, is an economically and socially important activity that today faces several challenges. Animal production entails various interactions, among which links between humans and animals play an essential role. Modern methods in animal production are based on the principles of efficient and sustainable management and the multipurpose role of agriculture. The importance of animal production is not only in food production, entertainment and other benefits but also in its environmental, and social aspects. The aim of the program is to educate and train highly qualified professionals in agriculture with a wide profile, with special emphasis on knowledge of animal science. On the basis of natural, technological, environmental and economic subjects, graduates will gain a complete understanding of sustainable agriculture, with explicit emphasis on issues related to the rearing of different species of domestic animals. Graduates will be qualified for independent, interdisciplinary and practical issue-oriented work and for a project and team based approach. The study program, which lasts for 3 years (six terms), is provided as a full-time or part-time study, and is comparable to many programs at other European universities. Students will be taught by modern teaching approaches such as problem-based learning and project development in smaller groups and solving practical problems and cases with an emphasis on individual work. This will enable students to comprehend the essence of biological laws and rules of animal management in the context of close-to-nature, efficient management of space and animals. After successful completion of all study requirements, a student obtains a university academic degree in animal science. Students acquire knowledge and skills that enable them to continue their studies in second cycle master’s study program in animal science, or other programs related to agriculture and applied life sciences that are provided in Slovenia or abroad. They can be employed in the field of agricultural production, particularly in the area of animal production and in the production and processing of food of animal origin, marketing and services, the public sector and in the sphere of rural development, animal protection and protection of the environment.
Academic Study Program in Biology

In the first year, the program provides basic natural science subjects that are essential in understanding all areas of biology. Thereafter, students master the basics of biological disciplines: biochemistry, genetics, microbiology, systematics, developmental biology, physiology, ecology, neuroethology and evolution. In addition to classical pedagogical approaches, the program also includes several additional methods of study that will orient a student towards studying regularly, and emphasise the need for lifelong learning, interdisciplinary and practical issues, project work and group work. On completion of the program, a student gains a university academic degree in biology. Students are required to obtain 60 credits each year. The total workload is 180 credits, of which 21 credits are provided by elective subjects.

Due to the broad scheme of the first cycle academic study program in biology, graduates will have employment opportunities in various areas – research laboratories, administrative institutions (ministries, inspectorates, various institutes and municipalities), national and landscape parks, botanical and zoological gardens, museums, and national and international non-governmental organizations.
In its wider sense, biotechnology is the integrated application of the achievements of molecular biology and molecular engineering, on organisms, their parts and products. Biotechnology is a professionally diverse economic activity, which markets its knowledge in the form of patents and products. Biotechnology is characterized by close links between the economy and science, the rapid development of innovations, multi-disciplinarity and the possibility of development in a small business environment. For Slovenia, a country with few natural resources, biotechnology, together with its associated activities, is a very suitable field for economic development with high added value. The main aim of the program is to provide complete undergraduate education in the field of biotechnology. Basic knowledge of natural science, together with its application in specialized biotechnological contexts, will provide the education required to meet the demands of the most up-to-date technologies and the skills needed in various professions, and will enable a student to continue his/her studies in second cycle master’s study programs. Biotechnologists who have completed the first cycle academic study program will be qualified for critical judgement of relevant biotechnological topics and will have the knowledge and skills needed independently to carry out both traditional and modern biotechnological procedures in agriculture, food science, pharmacy, health care and environmental protection. The program is provided as a full-time three-year study program, which includes lectures, seminars, laboratory practicals, seminar practice, fieldwork and project work. Additional specialization within the framework of individual biotechnological fields is achieved by elective subjects from biotechnology or other study programs. It is also possible to do part of the study program at other universities. After successful completion of all course requirements, a student receives a university academic degree in biotechnology. Graduates are qualified for work in scientific research and educational institutions, governmental services, developmental programs in agriculture and animal breeding, chemical and food industries, pharmaceutical industry and for application of the technologies in the preservation, protection and sanitation of the environment, in medical programs, in the manufacture of products for general use and in all companies that use modern biotechnological processes.
Academic Study Program in Food Science and Nutrition

Food science is an economically important and fast-developing branch with a strong interdisciplinary emphasis or vertical connection between producers of safe and high quality raw materials and food processing factories which, on the basis of contemporary achievements, principles and technologies, assure people a quality food supply. Nutrition is an applied science in relation to food and its impact on the human organism, its normal development and functions, and the appearance of diseases and metabolic disorders. Nutritionists are important mediators in the transfer of the achievements of nutritional science to the general public in order to maintain or improve their health, which also means implementing the guidelines of the National Nutritional Strategy. The main aim of the Academic Study Program in Food Science and Nutrition is to qualify a professional who is capable of wide comprehension of food science and nutrition, with an emphasis on knowledge connected to food science, production, processing, quality and food marketing and nutrition as a natural continuation of food science for balanced, safe nutrition and the normal development and maintenance of human health. The program is full-time and lasts for three years. After the completion of all study requirements, a student obtains a university academic degree in food science and nutrition. Graduates can be employed in large and small food processing plants, microbiological, physical, chemical and sensory laboratories for the food industry and in laboratories for food quality control, in consumer education, food quality and safety inspection services, in institutional nutrition in factories, health resorts with specific nutrition programs, services connected to nutrition in public health institutions, centres for the promotion of healthy nutrition, in distributional centres, shops selling food and/or nutritional additives for preservation of health. Graduates can continue studies in second cycle master’s study programs.
Academic Study Program in Forestry and Renewable Forest Resources

Forests are a specific living environment. They help create ecological balance and, at the same time, provide the human population with a basic renewable resource, as well as numerous non-material benefits. Sustainable development is not possible without professional foresters. Almost two thirds of Slovenian territory is covered by forests, which gives the country a special position in Europe and it provides an excellent opportunity for development, since natural resources are scarce and Slovenia has a rich tradition of sustainable, close-to-nature forest management. The study program qualifies students for complete ecosystem forest work in accordance with modern principles of close-to-nature, multipurpose and sustainable management. Such a scheme requires linkage among ecological, economic and technical sciences. It requires knowledge of forest ecosystems, social aspects of forest management, the various techniques and technologies used in forest management and familiarity with modern methodological tools. An advantage of the study program is the emphasis on individual and seminar practica, which are partially carried out in the forest. The study program lasts for three academic years (180 credits) and is provided as full-time, and occasionally as part-time, study. Students obtain a university academic degree in forestry. Graduates can obtain employment in public forestry services, organizations for wildlife management and nature conservation, economic organizations and schools (upper secondary and higher education). More and more opportunities are provided by self-employment - independent entrepreneurs (primary wood processing, forest construction, wood trade, arboriculture, ornamental tree production, ecotourism, private advisory agencies in forestry, biological engineering, spatial planning, mountain area management and sanitation of ecological points). There are also increased employment possibilities in (non) forestry secondary schools and in the sphere of extracurricular activities. The spheres of waste and communal management are also promising. Due to the abundance of forests and their importance in Slovenia, there is increasing demand for forestry professionals in administration and in nature conservation governmental and non-governmental organizations. The tradition of close-to-nature forest management in Slovenia also provides employment possibilities abroad.
Landscape architecture is the study of landscape design, environmental planning, protection of the environment, nature conservation and spatial planning. The study of landscape architecture provides education that will enable students analytically to define and creatively to solve issues on all levels of spatial planning and landscape design. The study program is interdisciplinary in its nature, which means that a student acquires knowledge from numerous fields. A landscape architect is educated in disciplines that provide the knowledge required for spatial management, nature conservation and landscape design; natural-ecological, socio-economic, humanistic and cultural, technical, design and planning knowledge; and he/she masters skills such as drawing and three-dimensional design. The first cycle study program is unified in terms of subjects and leads to students acquiring the basic knowledge and skills that a landscape architect needs. Each year contains compulsory and elective courses. Students can also choose courses from other study programs at the Biotechnical Faculty, other members of the University of Ljubljana and universities in Slovenia and abroad. The international aspect of studies is ensured by the possibility of enrolling in courses or even two terms abroad within the framework of exchange programs among European universities. The main aim of the program is to qualify graduates for landscape planning and design, with an emphasis on specific competences. Students should acquire the ability to elaborate planting and landscape schemes and plan construction work, elaborate inventories and estimate costs, skills in computer programming, preparation and maintenance of spatial data, management of administrative procedures for less complex spatial interventions and similar. The study program lasts for three years. After successful completion of the study requirements (180 credits), students obtain a university academic degree in landscape architecture. Landscape architecture graduates can be employed in project and planning offices, municipal communal services, tree nurseries, and other operational and construction companies.
Microbiology is a basic natural and applied science that has experienced rapid development in the last 20 years. The study of microbiology enables an understanding of the living world, microbial processes and organisms invisible to the human eye and essential for life on our planet. The program offers basic natural science knowledge (mathematics, chemistry, statistics, biophysics, biochemistry, molecular and cellular biology, bioinformatics) and specialized knowledge of microbial physiology, genetics, taxonomy, biotechnology, ecology, virology, immunology and the role of microbes in medicine. The basic aims of the study program are to ensure complete undergraduate education in the field of microbiology, which will enable a student to use classical and modern methods in microbiology and to make independent decisions in microbiology related themes, and successfully participate and communicate with other profiles in natural science. The program is provided as full-time study, which incorporates in addition to lectures and laboratory practice also modern educational approaches: seminars, project work and individual research projects. A student chooses elective subjects within the framework of the program in microbiology or other programs within the Biotechnical Faculty, other members of the University of Ljubljana, and other universities. It is also possible to complete courses at foreign universities. The program lasts three years. After successful completion of the study requirements, students obtain a university academic degree in microbiology. Graduates gain wide knowledge of natural science and can be employed in numerous professions: medicine, agro-food industry, pharmaceutical industry, environmental conservation, education and other governmental services dealing with research. Microbiology graduates acquire an excellent basis for the continuation of studies in second cycle master’s study programs in microbiology and related fields in Slovenia and abroad.
Academic Study Program in Wood Science

More than 60% of Slovenia is covered by forests and timber is the most important renewable raw material resource in the country. Wood is linked to several economic branches, which provide an important share in the national product and are export oriented. Wood is becoming more and more important in energetics and as a material in chemical production. It is a quality and ecological material for the living environment and is still an indispensable construction material. Wood is of high importance in the natural and cultural heritage of the nation. The main aim of the First Cycle Academic Study Program in Wood Science is to educate experts who are able to provide an interdisciplinary link among natural science, technical, economic and social subjects, with the aim of the sustainable development of the profession - wood science. Students acquire knowledge of wood, timber production and processing technologies, production of wood composites, and skills in organization, economics, construction and design. In line with the challenges of the modern world, graduates are qualified to evaluate wood correctly as a sustainable resource, to find methods for its optimal use, to manage and plan wood processing and wood working technologies applied to wood and wood composites, the manufacture of wood products, to organize and manage companies concerned with wood and wood products. They are qualified to participate in interdisciplinary managerial and research development groups. The full-time program is provided in the form of lectures, seminars, seminar projects, practice and consultations with professors and assistants and a student's independent work. Students also receive help from mentors and tutors. The First Cycle Academic Study Program in Wood Science lasts for 3 years (6 terms) and has a workload of 180 credits. A student obtains a university academic degree in wood science. The acquired knowledge enables students to continue their studies in a second cycle master’s study program or to find employment in organizations dealing with production, including wood and fibre composites processing and woodworking, in organizations in which the main activity is the sale of wood and wood products, in the area of services that involve wood and wood products, in the public sector (chambers, supervision and certifying organizations, museums, restoration centres), education (secondary schools, colleges, universities). Graduates can also work as independent entrepreneurs or advisors.
The Professional Study Program in Agriculture - Agronomy and Horticulture is adapted to the needs of Slovenia in the field of food production, especially the production of healthy and safe food, while preserving the agricultural space and cultural landscape, population and jobs in rural areas. The main aim of the program is to train and qualify professionals who are able to link basic achievements in natural sciences, technology and the economy to the circumstances of a market economy and use them for the sustainable production of quality and healthy food, while preserving the cultural landscape. The program is organized in such a way as to familiarize students with natural science subjects and basic technologies and then to offer specialization in agronomic and horticultural fields. The great majority of elective subjects provide further specialization or prepare a student for second cycle master’s study programs. Full-time study is conducted by means of contact forms of work, as individual consultations with professors or assistants, and through a student’s individual work. Additional help is provided by mentors and tutors. Part-time study is based on extensive individual work, so the number of contact hours compared to full-time study is limited to 30% of lectures and seminars and 50% of laboratory and seminar work, while the number of hours for fieldwork remains about the same. The course is constructed in blocks of one term at most. Main courses also include regular tests of knowledge gained. The Professional Study Program in Agriculture - Agronomy and Horticulture lasts for three years and comprises 180 credits. The program consists of two modules: Horticulture and Agronomy. Graduates obtain a professional degree in agronomy and horticulture. Graduates can work in the production of field crops, turfs, tree nurseries, vegetables, fruit, vines, wine, herbs, ornamental plants etc. They can be employed in public communal services, botanical gardens, landscape parks and economic organizations (agricultural production, processing, trade in agricultural repro-material and products), independent businesses or as specialized farmers who market their own products and try to adapt to globalization processes.
Professional Study Program Agriculture - Animal Husbandry

Animal husbandry is the prevailing activity in Slovenian agriculture, which is today facing great changes and new challenges. For economically efficient and sustainable management of agricultural holdings and areas in practice, graduates need theoretical as well as applied knowledge and skills covering both food production and environmental, natural and social aspects. The main aim of the program is to train agricultural professionals in many practical skills in various fields of animal husbandry. The emphasis is on knowledge and skills in the areas of production technologies, animal feeding, nutrition, animal breeding and farm management needed in animal husbandry activities on family farms, in agricultural industry and institutions dealing with breeding pets. Graduates achieve a significant level of knowledge, they can make decisions in various business spheres, including technical, production and marketing fields. These decisions are made on the basis of economic calculations and analyses and by comparing alternatives in both predictable and unpredictable circumstances. The study program lasts for 3 years (six terms) and is provided as either a full-time or part-time program. It is comparable to European study programs and offers a range of skills needed in agriculture, with an emphasis on animal husbandry. Students will be qualified for economically efficient and sustainable management of agricultural holdings and associated areas of practice. Graduates obtain a professional degree in agriculture - animal husbandry, and can be employed in agriculture, especially farms and organizations oriented to animal husbandry. They can also work in a wide range of activities connected to agricultural production and breeding, processing and sale, and other services in the private and public sectors. Students can continue their education immediately in a second cycle master’s study program.
Forestry in Slovenia is an important economic and environmental activity. Forests cover more than 60 percent of Slovenia and are potential natural vegetation for more than 90 percent of the territory. Foresters are mostly employed outside urban centres and they thus help solve the problems of demographically endangered areas. The Professional Study Program in Forestry has a long tradition and it links natural science, social and technical subjects needed for close-to-nature, sustainable and multipurpose forest management. The main aims of the program are to qualify a student for complete forest and forest space management. Full-time and part-time studies are provided at the Department of Forestry and Renewable Forest Resources of the Biotechnical Faculty and in the field. Twenty-five percent of contact hours are devoted to fieldwork, which is carried out at different locations in Slovenia. The study program lasts for six terms, during which a student obtains 180 credits. After the completion of all the prescribed study requirements, a student obtains a professional degree in forestry. Graduates can be employed in the public forestry service, organizations for game management and nature conservation, or in business enterprises. More and more opportunities are provided by independent business (primary wood processing, forest construction, wood trade, arboriculture, ornamental tree production, energy supply from renewable sources). Higher demands for forestry professionals are expected in administrative agencies for nature conservation, forestry business and in independent entrepreneurship.
In Slovenia, a state rich in forests and with a long tradition in wood processing, we need professionals with wide and applied knowledge in the field of woodworking and processing of wood and fibre composites. Graduates with a wide range of practical knowledge, supported by in-depth theoretical knowledge, will be able effectively to follow the changing challenges that appear in practice. The Professional Study Program in Technologies of Wood and Fibre Composites is an applied study program oriented to technology and natural sciences. The emphasis is on students' practical work. Students acquire knowledge of wood and supplement it with applied knowledge of woodworking and wood processing technologies of wood and fibre composites. They gain basic construction knowledge and practice important organizational and economic skills. A graduate's knowledge is based on an understanding of the structure and properties of wood as a renewable engineering material, knowledge of the development and use of technologies in wood production, product development, business legislation and marketing within organizations. Graduates are able to evaluate wood correctly as a sustainable resource, to find methods for its optimal use, to manage and plan wood processing and wood working technologies applied to wood and wood composites, to construct wooden products, to organize and manage small companies and organisations concerned with wood and wood products. Students gain skills in solving practical issues and a project based approach. Particular emphasis is given to the development of independent critical thinking based on thorough professional knowledge. The main aim is thus to educate professionals in the field of wood science with excellent applied knowledge in the sphere of technologies of wood and fibre composites. The full-time and part-time study programs are made up of lectures, seminars, seminar projects, practice work and consultation with professors and assistants, and an individual student's work. Students receive help from mentors and tutors. The part-time program comprises 50% of the full-time study program lectures. The other 50% is provided to students in the form of consultations and additional study literature. The First Cycle Professional Study Program in Technologies of Wood and Fibre Composites lasts for 3 years (6 terms), one semester of which is devoted to practical work. A student's workload is 180 credits. Graduates obtain a professional degree in wood science. The acquired knowledge enables students to be employed in organizations dealing with production activities, including wood and fibre composites processing, in organizations in which the main activity is the sale of wood and wood products, in the area of service activities involving wood and wood products, and in the public sector (chambers, supervision and certifying organizations). The single education space means that graduates can also be employed in other EU states.
Second cycle master programs last two years and comprise 120 credit points. The master study programs take the form of lectures, laboratory practicals, seminars and field work.
1. Brief presentation of the discipline

In recent decades, the role of agriculture has broadened, since in addition to the production of healthy food, it is increasingly important for ensuring sustainable development, which is directly linked to environmental protection.

The Agronomy Program reflects such a role of agriculture, which links in-depth knowledge in the field of classical agronomy disciplines, field crops, pasturing and forage crops, with naturalistic and environmentally based agriculture.

2. Basic aims of the study program

The basic aim of the study program is to deepen knowledge and methods from the area of the natural foundations and technological procedures of crop production, inseparably linked with integral management of the agricultural space and environmental conservation.

Masters obtain in depth knowledge of natural sciences, which is the basis of modern technologies of agricultural production and environmental conservation, professional competences in the sphere of field and forage crops, and professional and methodological knowledge for managing the agricultural space and protection of the environment. They are also qualified for research work in these fields.

3. Employment opportunities for graduates

Masters of Agronomy can be employed on regional, national and international levels in public and private foundations and companies involved in agricultural production, the production and sale of agricultural products or with spatial planning and environmental questions connected with agriculture, with environmental protection, with research, education and advisory work in the sphere of agriculture and the environment, as well as in administration, politics and non-governmental organisations.
ANIMAL SCIENCE

1. Brief presentation of the discipline

Agriculture, together with animal breeding, is in the middle of important changes and challenges. In order to develop new procedures of increasing healthy food and animal breeding, and for the sake of other social benefits as well as for sustainable and efficient balanced activities, it is necessary to educate graduates with wide knowledge, capable of specialisation but also understanding wider and connected aspects of agriculture in society. The Master Program in Animal Science thus links in-depth knowledge in the sphere of classical and modern animal science (breeding, selection, nutrition, biotechnology, genomics) and associated aspects of the environment and safety and quality of food.

2. Basic aims of the study program

The master program is intended to deepen and broaden knowledge in the animal science. This is mainly knowledge required for efficient and sustainable balancing of production systems of breeding animals for the production of food and other benefits in their environmental, natural science and social science aspects. It is therefore planned in an interdisciplinary and multi-disciplinary manner, which is essential for the profile of animal science professionals, who must be capable of understanding general natural science and scientific-research aspects, as well as the most demanding professional tasks. The program therefore has two basic aims:

- to develop specific knowledge and skills that will enable students
- to be employed in leading positions in animal breeding production and processing and other fields connected with agriculture, as well as in the sphere of education, to develop in depth basic knowledge required for continuing studies at doctoral level.

3. Employment opportunities for graduates

The professional and methodological knowledge and the associated competences enable graduates to be employed in a wide field of professional possibilities connected with agricultural production and breeding, processing and sale, food safety and quality, animal protection, environmental conservation, monitoring, associated service activities, rural development, representation of interest groups, agricultural state administration and agricultural politics, non-governmental organisations, education and research.
1. Brief presentation of the discipline

The Master Study Program in Biotechnology is required for extending knowledge already obtained and for mastering additional scientific knowledge essential for the development of the field of biotechnology. Biotechnology, with its broad range of activities has become a very extensive, professionally demanding and varied business economic activity, which markets top knowledge in the form of patents and products, because of which it has been the most propulsive economic activity in the last ten years. For Slovenia, as a country with modest natural resources, biotechnology with its associated activities is a very suitable field for the development of economic activities with high added value.

2. Basic aims of the study program

The main aim of the second cycle study program is to satisfy the need for the most up-to-date technologies and knowledge for various fields of biotechnology. In addition to classical pedagogical approaches, the program devotes great attention to work in project groups, in which students are confronted with solving problems in both theoretical and practical senses, which leads to the capacity for critical judgement of themes, self-innovation and team work.

3. Employment possibilities for graduates

Masters of Biotechnology will be able to continue their studies in doctoral programs and, because of their broad education, will have various employment possibilities in the fields of education, research and development (universities, institutes), in the field of marketing and service activities (large, medium and small biotechnology companies, commodity markets, economic interest associations, insurance companies etc.), in the public sector (EU administration, ministries, agencies, funds, chambers, control and certification organisations, consumer protection organisations etc.) and self-employment (independent businessperson, advisor, independent assessor)
ECOLOGY AND BIODIVERSITY

1. Brief presentation of the discipline

Ecology is a scientific biology discipline that enables understanding of processes and changes in nature and the importance of diversity of life systems. The results of ecology are the basis for the considered use of resources and sustainable management, which is particularly important because of over-settlement and the changeability and burdens on all spheres of our planet, which is changing globally.

2. Basic aims of the study program

To educate masters with fundamental knowledge of ecological science, which is the basis for recognising the role of organisms on various levels of an ecosystem, for understanding processes and recognising changes in nature and in our immediate environment and for preventing and alleviating these changes.

3. Employment possibilities for graduates

- in factories and production facilities whose activities are a burden on nature and the environment and must therefore be controlled and the negative effects alleviated,
- in administrative institutions (ministries, inspection services, various institutes, municipalities), which prepare management plans for individual regions or ecosystems, decide on interventions and are responsible for monitoring the state of nature and the environment,
- in parks as advisors, preparers of professional assessments and wardens,
- researchers in research institutions, researchers and curators in museums,
- collaborants of institutions for environmental consultancy and independent researchers,
- collaborators in national and international non-governmental organisations.
1. Brief presentation of the discipline

In agriculture, forestry, food sciences, wood sciences and other fields of life sciences, efficient and sustainable management of human, production and natural resources is the key challenge and question of future development. So, together with technical and natural needs, they are increasingly adapted to economic knowledge. Understanding the principles of economics, law, business and sustainable management is a condition for anyone who wishes to operate effectively in the public or private sector. The Biotechnical Faculty, in line with international examples, is offering a new program and professional profile: economist of natural resources. The program is intended for graduates of first cycle programs in live sciences and other sciences, who wish to combine natural and social sciences, in order to obtain a wide profile of education for new challenges and employment opportunities.

2. Basic aims of the study program

The master program is intended to provide general and specific economic knowledge in the wide field of managing natural resources. Students are qualified for understanding the economic and legal-political aspects on the level of farms, companies, non-governmental groups and state administration. They also obtain basic skills for management and administration in agriculture and related sciences. Candidates are directed through the choice of subjects into business and/or state administration aspects of operation. The study is planned to be multidisciplinary, project based and builds new development profiles of graduates who will take key responsible positions in the bussines and state administration in the sphere of management of natural resources. The study also provides the basic knowledge required for further doctoral study in the field of the economics of natural resources.

3. Employment opportunities for graduates

Graduates have very wide employment opportunities in public services and in the business, in governmental and non-governmental sectors connected with the leadership, management, organisational and administrative work in the field of agriculture, forestry, food sciences, woodworking, environmental protection, European integrations and other fields.
FOOD SCIENCE

1. Brief presentation of the discipline

Food science is an important and fast developing branch in Slovenia, with a strong interdisciplinary stress, or vertical links between producers of high quality and safe raw materials and food processing plants which, on the basis of contemporary knowledge, principles and technologies, produce and ensure supply of the population with high quality food. Extensive knowledge and mastering additional scientific understandings are required for the development of food science and technology. The needs of the market for professional and scientific staff, who can ensure with their work the development of technology in a segment that is particularly important for the overall economic development of Slovenia, are ever greater in both public and private sectors.

2. Basic aims of the study program

The basic aim of the Study Program in Food Science is to communicate in-depth theoretical knowledge from basic natural science, food science and analysis of food, food safety, nutritional engineering and methods of development and research. Masters will be qualified for the most demanding and most responsible work in planning, organising, control and leading the production of food, for creating and developing new technological processes and new products, for work in control and analytical laboratories and inspection services and for research work.

3. Employment opportunities for graduates

Masters of food science will find positions in scientific and pedagogic institutions, in research and development laboratories and institutions, in large food processing plants, in small private enterprises, inspection services, advisory services, the pharmaceutical industry for the production of dietary foods, in the ecological production of food, project planning organisations and as managers in the most responsible positions in food companies.
1. **Brief presentation of the discipline**

The multi-purpose role of forests is growing. Because of environmental questions and the greater awareness and changing interests of the public and forest owners, their social and environmental importance and their importance for supplies of drinking water is increasing, and wood is becoming an increasingly important renewable natural resource.

2. **Basic aims of the study program**

The basic aim of the study program is to provide students with integral knowledge about forests and to train them for management in accordance with three contemporary principles of forest management – co-natural, multi-purpose and sustainable. This requires knowledge of forest ecosystems, social science aspects of forest management, technologies that can be used in dealing with forests and familiarity with contemporary methodological tools. The program follows contemporary European trends and places to the fore integral eco-system forest management. Students deepen basic knowledge about forests and their management and, depending on their particular interests, also obtain wider knowledge from special or fringe fields of forestry and managing forest ecosystems.

3. **Employment opportunities for graduates**

A number of employment opportunities exist for graduates of the master study: in public forestry services, economic enterprises, education and science and, in the future, also in fields of independent enterprise (e.g., ecotourism, private bureaus in the sphere of forestry consultancy, biological engineering, planning the sanation of ecological hotspots, managing high mountain regions). Opportunities will also increase for managing the most demanding tasks in administrative bodies for nature protection and in organisations for nature conservation, and the fields of journalism, public relations, forestry politics, public utilities and ecological treatment of waste.
1. Brief presentation of the discipline

Because of a change in dietary habits, which is increasing the use of fruit and vegetables and, at the same time, the greater awareness of the importance of the quality of the living environment, horticulture has become an ever more important discipline in recent decades. In Slovenia, because of natural and other limitations, horticulture is a very promising branch of agriculture, which is also extremely important for the development of the Slovene rural areas.

2. Basic aims of the study program

The basic aim of the program is, by linking various knowledge from the areas of the natural sciences and technology, to train students for the cultivation of horticultural plants, while simultaneously respecting the co-natural development of the agricultural space. The obtained knowledge enables interdisciplinary understanding of the cultivation and use of quality horticultural plants, both for the needs of safe food and preserving the cultural landscape or the human living environment. Masters understand the specifics of horticultural plants in terms of growth and development, their composition and functional value and methods of cultivation, which enable a nature conservation approach and responsible exploitation of renewable resources.

3. Employment opportunities for graduates

Masters of Horticulture can be employed in the area of research and development, in the area of marketing and service activities (marketing of fresh fruit and vegetables, organization of production, commodities market, economic interest associations, insurance companies etc.), in the public sector (EU administration, ministries, agencies, funds, chambers, control and certification organisations, consumer protection organisations, etc.), in orchard-vineyard-nursery production (head of production, technologist), and the obtained knowledge will also qualify them for self-employment (freelance businessperson, advisor, independent assessor).
LANDSCAPE ARCHITECTURE

1. Brief presentation of the discipline

Second cycle study of landscape architecture is a direct continuation of first cycle study and retains the characteristic interdisciplinarity of the profession, with a range of obtained knowledge from landscape or environmental planning to landscape design. The main contents of the program are focused around project seminars – i.e., studios, planning or design, which supplement with their content other compulsory and especially elective subjects.

2. Basic aims of the program

Students are qualified for the most demanding planning and project work in the landscape sphere, for applied research work in the field of the development and protection of the cultural and natural landscape, for environmental (protection) planning during interventions in space and in protected areas and for project planning of both urban and non-urban landscapes. The obtained knowledge covers a selected environmental content and spatial development planning oriented subjects, in particular tourism and recreation, the countryside, green systems in the city and outside the city context and protected regions, renovation of historical parks and gardens. A characteristic of planning subjects is dealing with real spatial problems. The work takes place in the field, with the cooperation of commissioning agents and the public. A lot of time is devoted to intensive workshops and seminars, which generally conclude with a public presentation of results (exhibitions, catalogues, brochures).

3. Employment opportunities for graduates

Employment of graduates is possible in administrative state services (Ministry of the Environment and Spatial Planning, Ministry of Agriculture, Forestry and Food, administrative units), in municipal professional services, in professional services in the field of protection of the natural and cultural heritage. In compliance with legislation that regulates membership of landscape architects in the branch chamber (ZAPS), landscape architects who wish to elaborate landscape architecture plans must obtain a landscape architects’ licence, and planners a planners’ licence. These licenses enable them to be employed in project or planning working organisations, to found their own limited liability companies or be self-employed as self-employed businesspersons or freelance cultural workers.
1. Brief presentation of the discipline

Microbiology is a basic natural science and applied science which has experienced extremely fast development in recent decades. The study of microbiology enables understanding of the living world and organisms that are crucial for life on our planet and provides qualification for meeting professional demands in medicine, industry, environmental conservation, in the research sphere and in education. Because of the allround dissemination of microorganisms in the environment, the profile of a microbiologist is often an integral part of interdisciplinary linkage, in which microbiological knowledge is becoming an essential element of development. Second Cycle Study of Microbiology (MSc) is planned in such a way that it enables continuation of BSc study of natural and biotechnical science. The study offers basic knowledge from genetics, molecular biology and the biochemistry of microorganisms and a range of applicative microbiological knowledge, which a student can deepen in the context of sanitary medical microbiology, microbial biotechnology and microbial ecology.

2. Basic aims of the study program

The basic aims are to educate professionals with second cycle education (MSc), who have in-depth knowledge about the influence and functioning of microorganisms in the environment, biotechnological production and people. Within the framework of studies, they obtain knowledge and skills for work with microbes and master all elements of safe work in a microbiological laboratory. Similarly, they obtain suitable skills of written and oral reporting on the results of their work and obtaining information through contemporary information sources. Within the framework of a master project, they are confronted with independent research work. Graduates of the Second Cycle Study Program in Microbiology have the possibility of continuing research in doctor of science studies.

3. Employment opportunities for graduates

The practical and theoretical knowledge that they obtain within the framework of the Second Cycle Program of Microbiology provides a good basis for work in developmental and control laboratories. They can be included in operational work in scientific research institutions, in universities and in the development departments of clinical laboratories. They have a suitable body of knowledge for independent work in small biotechnical companies that require microbiological knowledge.
**MOLECULAR BIOLOGY**

1. **Brief presentation of the discipline**

Molecular biology is a science that provides answers to the question of what enables life and how an organism functions on the molecular level. It is one of the most modern life sciences, which is important as a foundation for many other disciplines. The questions that molecular biology answers are topical and modern and the results of molecular biology carry within themselves great applicative value for the fields of medicine and pharmacy, as well as biotechnology.

2. **Basic aims of the study program**

Graduates of the program obtain theoretical and practical knowledge about organisms and life processes on a molecular level, as well as insight into new up-to-date approaches to solving biological problems. In an up-to-date manner, they are familiarised with the universitalities of life processes, their molecular and structural bases, with genetic diversity, genetic modifications on the evolutionary scale, as well as with the fact that the success of an individual organism, as well as life as a whole on Earth, depends on the interaction of organisms and the environment.

3. **Employment opportunities for graduates**

- tertiary education institutions,
- medical, pharmaceutical, diagnostic, forensic and other laboratories,
- biotechnological and pharmaceutical companies (Bia Separations, Acies Bio, Educell, Krka, Lek, etc.),
- agriculture and forestry,
- state and other institutions operating in the fields of protection of nature and the environment and the health of people, animals and plants,
- continuing studies at the doctoral level.
1. Brief presentation of the discipline

Food science or nutrition is an applicative natural science about food and its effects on the human organism. Research in the field of nutrition has been of decisive importance in recent years in understanding many processes connected with nutrition and the appearance of diseases or nutritional disturbances. Nutritionists, therefore, have an ever more important role today, not just as researchers but also experts that transfer scientific discoveries and understandings to the general and target populations, in order to maintain health and improve existing conditions. In addition to these new understandings, they can also create novel food and other food products.

2. Basic aims of the study program

The basic aim of the Study Program in Nutrition is to communicate in depth theoretical knowledge from basic natural science subjects, from specific contents of nutritional science, contamination, toxicology, or food safety, nutritional planning, nutritional education, nutritional engineering, analysis of food, development, scientific communication and research.

3. Employment opportunities for graduates

Masters of Food Engineering will be qualified for the most demanding and most responsible work for planning, organisation, control and leading nutrition, dietetics and clinical nutrition, alternative and special forms of nutrition, nutritional education and advisory services, special tasks in the food and pharmaceutical industries, food analysis and work in control, analytical, inspection, developmental and research laboritories and for research work in the nutrition fields.
PROTECTION OF THE NATURAL HERITAGE

1. Brief presentation of the discipline

The Master Program in Protection of the Natural Heritage is an interdisciplinary second cycle study of the Biotechnical Faculty, in which staff from other members of the Universities of Ljubljana and Maribor cooperate. The study builds on various three-year programs at BSc level, primarily agronomy, biology, forestry, wood sciences, landscape architecture, microbiology and zootechnics, but it also envisages a wider input of students from other BSc programs of Ljubljana University, other universities in Slovenia and abroad. The program Protection of the Natural Heritage is continued in independent scientific fields, with the interdisciplinary study of third cycle Biosciences.

2. Basic aims of the study program

The study program is intended to mastering an understanding of open space and the wider environment and protection of the natural heritage. Such an orientation corresponds to the ever more important new role of nature protection disciplines, in which, in addition to the production of healthy food and raw materials, ensuring sustainable development with nature conservation is to the fore. The program contents, and cooperation with partner universities, meet these expectations. The proposed study program is designed with the intention of exploiting the potentials of knowledge available at the Biotechnical Faculty and to enable students to form new employment capacities in the field of preserving nature, in particular in the field of preserving natural values. The program Protection of the Natural Heritage is devoted in entirety to education in the field of management and preservation of valuable natural features, with a stress on those fields of protection that are traditionally associated with biotechnology: ecosystem protection, nature conservation, soil protection, protection of natural resources, management of nature and the landscape and environmental (protection) planning. There are ever greater employment opportunities in these fields and they will continue to increase in the future.

3. Employment opportunities for graduates

Graduates of the program Protection of the Natural Heritage will be able to be employed on regional, national and international levels in public and private organisations that deal with spatial and environmental problems; nature conservation; protection of the natural heritage; research, education and advisory services in the sphere of management of renewable resources and protection of the environment and natural heritage, as well as in administration, politics and in non-governmental organisations.
1. Brief presentation of the discipline

This field includes a wide spectrum of scientific disciplines, such as physiology of organisms, neurobiology, embryology or developmental biology, cell biology, anthropology and evolution. It also includes research in the fields of biomedicine and other branches that use cytology, biochemistry, molecular genetics or microbiological knowledge. Masters will be able to perform demanding professional tasks in biomedicine and veterinary medicine, the pharmaceutical and food industries, agriculture and forestry, engineering professions and in the field of forensics. The questions that structural and functional biology answers are topical and modern, and the results of a wide spectrum of scientific disciplines carry within themselves great applicative value both for the fields of biomedicine, pharmacy, veterinary medicine, as well as biotechnology and in the sphere of forensics.

2. Basic aims of the study program

The aim of the Master Program in Structural and Functional Biology is to educate top professionals and scientists who are qualified to research the construction and early development of living beings, using contemporary microscopic, histological, cytological and molecular biological techniques, and research into functions also for the use of contemporary physiological methods in research into the nervous system and sensory organs of animals.

3. Employment opportunities for graduates

Completion of the program Structural and Functional Biology provides masters with employment opportunities:

- in medical and veterinary laboratories,
- in laboratories for developmental biology and artificial insemination,
- in the pharmaceutical industry for carrying out physiological and behavioural experiments,
- in anthropological laboratories, in biomedical marketing of research equipment,
- in leadership and in the development of zoos and national parks,
- in natural history museums,
- in forensic laboratories.
1. Brief presentation of the discipline

The Second Cycle Master Study Program in Wood Science has been created because analysis of the present state of the profession showed that such a study program is needed in Slovenia. We have our own high quality raw material base and the associated economic activity, which is well developed, competitive, export oriented, has a relatively long tradition and is capable of adapting to new trends and harsher international competition. Graduates of various programs of the Department of Wood Science after graduation have to date almost without exception obtained employment and taken important leading roles in companies. The need for the staff that this program will train still exists and is increasing. Already today, the profession needs at least 10% more employees with higher education. All analyses show that wood is gaining in importance and that we can expect a need for experts, who will be employed in Slovenia, the EU and outside the EU.

2. Basic aims of the study program

Masters will obtain the knowledge and ability for independently solving contemporary challenges, whereby we strive that wood raw material will be suitably valued, processed and exploited, so that products will be of high quality with the maximum possible investment of innovativeness and development, and produced in an environmentally friendly manner and with environmentally friendly materials and with high quality design. Suitable marketing is also crucial to their success. The basic aim of the master study program is to educate experts capable of solving the most demanding research, development, technological and organisational tasks, to perform independent development and research work and, in accordance with contemporary challenges, to ensure the all-round development of the profession in the field of the sustainable use of wood.

3. Employment opportunities for graduates

The obtained knowledge, after conclusion of studies, will enable employment in companies involved in production activities that include the production and processing of wood and wood composites, in companies involved in marketing wood and wood products, in the field of service activities that involve wood and wood products, in the public sector (chambers, control and certification organisations, museums, institutes for protection of the cultural heritage, institutes for the rehabilitation of the disabled etc.), in education (secondary schools, colleges, universities), in research and development institutions. Masters will be qualified for cooperation in interdisciplinary teams, e.g., in the development departments of companies (head of development departments, product heads), can be employed in project bureaus as project planners for furniture and as project heads (engineering). There is also the possibility of self-employment (independent businessperson, advisor, researcher). Masters can also continue their studies at doctoral level.
1. Brief presentation of the discipline

Fruit science is an important part of horticulture with a long tradition in the central European region. Because of beneficial components and large quantities of substances beneficial to health, fruit is gaining increasing importance as an essential part in people’s healthy diet. Consumers demand fruit of high quality, produced in a manner that causes the least burden on the environment. The complexity of the branch appears in the capability to adapt to the requirements of plants, environmental conditions, dynamic decision making, difficulties of storage and handling. With suitable marketing methods, fruit growing is a profitable agricultural branch.

2. Basic aims of the study program

The basic aim of the program of International Master of Fruit Science is the linkage of various disciplines within fruit growing in order to produce high quality fruit for human needs, while simultaneously taking into account the co-natural development of the agricultural space. The study enables students to be well acquainted with the particularities of fruit production in the wider Central European region, its composition, use value and marketing. The stress is also on production methods that enable responsible exploitation of renewable resources. Participating universities (in addition to the University of Ljubljana, Biotechnical Faculty, the Free University of Bozen/Bolzano, Italy and Mendel University Brno, Czech Republic are also taking part) are offering within the course contents (compulsory and elective subjects) that are designed to cover the entire field of fruit growing. Each institution provides a speciality in the field of fruit growing, in which it achieves the best research results. Graduates of this study program will be familiarised with technologies of fruit production in the wider Central European region, which will enable them to obtain competences in this field and good employment opportunities in Slovenia and in the wider European space.

3. Employment opportunities for graduates

The obtained knowledge at this level and the experience gained at three different universities, enables them to continue studies in a doctoral program or employment in the field.
[ DOCTORAL STUDY PROGRAM ]

THIRD CYCLE
The Interdisciplinary Doctoral Study Program in Biosciences is a joint project of four faculties of the University of Ljubljana: the Biotechnical Faculty in the role of coordinator of the program and the Faculty of Computer and Information Science, the Faculty of Engineering and the Faculty of Electrical Engineering as co-implementers of the program.

The Interdisciplinary Doctoral Program in Biosciences, as well as applying the Bologna guidelines on quality, combines science and experience from the following scientific fields:

- Agronomy
- Bioinformatics
- Biology
- Biotechnology
- Economics of Natural Resources
- Horticulture
- Landscape Architecture
- Wood and Biocomposites
- Nanosciences
- Nutrition
- Technical Systems in Biotechniques
- Managing Forest Ecosystems
- Protection of the Natural Heritage
- Animal Science
- Cell Sciences
- Food Sciences

The need for high quality and up-to-date doctoral study programs for obtaining suitable knowledge in the scientific spheres developed within various members of the University of Ljubljana, is also dictated by the fast and extensive development of these fields and their impact on the quality of life.

The essential element of the program is connecting contents from the field of Biosciences on the level of the University of Ljubljana with special attention to new, ground-breaking fields of research, often overlooked by the wider public, and which are not suitably represented in first and second cycle study programs. The doctoral study program in Biosciences is the response of the Biotechnical Faculty and associated partners to the challenges of the time and it represents the most up-to-date knowledge in this field that we can offer in Slovenia, combining the commitment of domestic experts and visiting professors from abroad.

The main stress of the doctoral studies is on research work, on interdisciplinary study and on the cooperation of internationally established domestic and foreign experts. Following the recommendations of the European University Association (EUA), the program envisages the international exchange of students and, as a condition for ensuring the international comparability of high quality doctoral work, the publication of at least one scientific article in an internationally recognised scientific journal is required, which is an important part of candidates' research work. Particular stress is devoted to close cooperation between doctoral students and mentors, which gives the program special tenor and enables candidates, in agreement with their mentors, to design a personal program of education, which best suits their ambitions.

The interdisciplinary doctoral study program of Biosciences lasts three years and covers 180 points or 4500 hours. One credit point is equivalent to 25 hours of a student's work. The study program is composed of an organised educational part, amounting to 60 credit points, while the remaining 120 credit points are devoted to individual research work for the doctoral thesis.

The aim of the program is to train doctoral students for scientific work in fields of basic and applied life sciences, so that they will be able to develop new knowledge within the framework of a scientific research career or transfer knowledge to everyday practice.

In 2009, 47 students were awarded a doctoral degree.
The distinguished professors and researchers at the Biotechnical Faculty perform extensive fundamental, applied, and developmental research work. Research work is organised in 49 research teams. The Faculty is involved in approximately 220 research projects, of which 120 are national and 100 international projects.

The Biotechnical Faculty has about 100 young researchers financed by the Slovenian Research Agency and 20 young researchers from business, financed by the Slovenian Technology Agency.

Since 2009, the Biotechnical Faculty has participated as a partner in three Centres of Excellence financed by the EU Structural Fund and the Ministry of Higher Education, Science and Technology and which will last until 2013.

Research work at the Biotechnical Faculty is organized and implemented in such a way as to enable students to achieve the following goals:

**in the field of agronomy**
- to become familiar with the structure and function of agroecosystems in the pedoclimatic conditions of Slovenia, closely linked with traditional soil utilization and socio-economic relations
- to study the soil from the point of its composition, properties, fertility, water regime, and pollution, in order successfully to facilitate agricultural production and sustainable management of agricultural land
- to advance knowledge in the field of botany, zoology, microbiology, genetics, plant breeding, phytomedicine, agrometeorology, and agrotechnology and apply it in sustainable agricultural production
- to develop and improve agricultural technologies applied in the sustainable production of healthy food
- to preserve the population of rural areas and activities such as crop production, grassland and pasture management, fruit production, viticulture, and vegetable production
- to study the agricultural economy, policy, and social processes

**in the field of animal science**
- to research genetic factors in animal production and to develop selection methods, advanced animal production technologies, sustainable agriculture and high quality animal products
- to study the properties of Slovene autochthonous animal species
- to study the physiological principles of nutrition in the chain system: feed – nutritious substances – animal – functional food – environment, and to include probiotic and phytobiotic substances in the system
- to develop and apply molecular tools in order to study biotic diversity, properties of ribosomal genes and operons, and the function of microbial ecosystems in the intestinal tract and in the environment
- to investigate the chemistry, enzymatic activities and microbiology of milk and dairy products
- to study the economics and legislation of Slovene agro-food production in European integration processes
in the field of biology

• to study the anatomy and physiology of plants and animals and understand the fundamentals of life
• to study animal and plant species from taxonomic and phylogenetic points of view and thus contribute to understanding the biodiversity in Slovenia and the wider area
• to identify particular ecological issues, environmental laws and to solve emerging ecological problems, taking into account the protection of the environmental and natural heritage
• to learn about the fundamentals of active membrane components and toxins of marine organisms and identify their functions
• to study the principles of bacterial resistance
• to determine the role of fungi and their symbiotic relationship with higher plants
• to study the basic physiology of sensory perception in insects and fish and their behavioural responses
• to study the physical development and anthropometric characteristics of Slovene youth
• to transfer advanced biological findings into the curriculum of primary and secondary schools and develop didactics in biology

in the field of biotechnology

• to learn about the basic properties and characteristics of living organisms and to assess their potential application in biotechnology
• to be able to use the most up-to-date research tools of genomics, transcriptomics, proteomics and metagenomics
• to study the genetics and physiology of living organisms and understand the basic principles of life
• to become familiar with the basic principles of plant and cell tissue cultures
• to become familiar with the basic principles of different biotechnologies (plant, microbial, animal, environmental, industrial, pharmaceutical and medical)
• to acquire knowledge on intellectual property rights
• to become aware of ethical issues in life sciences

in the field of food science

• to advance research methods for efficient identification of pathogenic bacteria
• to create national food labels for functional food products
• to study microbial clusters of nitrifiers and their activities
• to become familiar with post-harvest processes and influence of volatile metabolites and antioxidants on the stability of fruit and vegetables
• to research the bioaccumulation of metal ions in yeasts in order to develop natural bioactive sources of minerals
• to research genetic, nutritional and technological impacts on meat quality
• to investigate the role of phenolic compounds as antioxidants for preventing oxidative stress on wine

in the field of forestry

• to study the structure, properties and function of forest ecosystems and to become familiar with the diversity and stability of forests
• efficiently to relate and connect natural, environmental, technological and economic factors in the protection, development and improvement of forests
• to research hazards and disturbances in the forest due to the emerging needs of man and society, the impact on forest soils, water resources and forest production, as well as the response of forests to such stress

• to advance forest management technologies in order to preserve forests and their functions

• to gain an in-depth insight into the role of forests in rural development

in the field of landscape architecture

• to attain knowledge of the Slovene landscape heritage and its cultural and natural origins

• to research the typological characteristics of the Slovene regions; including the advancement of methodological approaches to solutions

• to become aware of the rapid changes in the world, especially in relation to issues of national identity and globalisation

• to gain an in-depth insight into the landscape architecture profession

in the field of design

• to study the transformation of two-dimensional abstract patterns into three-dimensional landscape features

• critically to evaluate modern trends in landscape design

• to follow basic principles – attitude to nature and the natural, social viewpoints of landscaping and environmental psychology of landscape planning and management

• to develop methodological solutions in the area of evaluation and analysis of the landscape and landscape planning

in the field of wood science and technology

• to research the properties and quality of wood, including the study of biological, chemical, physiological and mechanical characteristics relevant for the processing, machining, wood surface finishing and final utilization of wood

• to learn about the hardness of wood; i.e., resistance to indentation, to study the surface properties, dimensional stability, internal strength and wood density of wood-based materials, to investigate the ecological properties of glue and to perform wood quality evaluation

• to increase raw material potential by utilizing less marketable tree species, and extracting chemicals from wood and bark for further processing

• to study wood pests, the biology of wood deterioration, and to develop and apply environmentally friendly chemical substances and wood protection processes

• to study the drying processes of sawn wood, veneers, splinters and fibres

• to become familiar with mechanical woodworking, woodworking machinery and learn about the impact of interactions between machine – tool – material (wood)

• to introduce environmentally friendly surface coatings and new methods of their application

• to improve the production and design of wooden products (innovations in furniture construction, including dimensional rationalisation)

• to provide in-depth study of wood processing and production technology systems, by applying modern qualitative methods for business decisions and data analysis

• to understand organization, economics, management and marketing issues, as well as the production and utilization of wood in relation to environmental protection
The Biotechnical Faculty promotes international cooperation. It is currently very well developed and promotes the faculty's reputation in the world. International partnership is based on cooperation between individual professors and researchers, the exchange of students and professors, and the exchange of scientific publications. In collaboration with international research units, both teaching and research staff are active in international scientific and professional organizations. Bilateral collaboration on the basis of interstate agreements and within the framework of European Union programs is also very extensive.

Researchers from our faculty are partners or coordinators in 18 COST projects, 44 bilateral projects and in 15 other international projects. We are partners in 7 projects of the 6th Framework Program and in 15 projects of the 7th Framework Program.

Participation in the Erasmus Program, which is part of the European Union Lifelong Learning Program, is primarily of high importance for students. Through participation in the Erasmus Program, an undergraduate or postgraduate student can complete some of his/her academic obligations at one of the universities in the European Union with which the Biotechnical Faculty has an agreement. A student spends a period of three months to one year at a chosen faculty, attends study courses there and fulfils certain academic requirements, including exams. The courses that a student is obliged to attend are determined by the professors of the two faculties. The host institution, i.e., the receiving institution, issues a certificate on the obligations fulfilled, and the home institution, i.e., the sending institution, recognises the certificate. Approximately 40 students from the Biotechnical Faculty study abroad each year within the framework of the Erasmus Program. More and more foreign students participate in study programs at the Biotechnical Faculty each year.
Researchers at the faculty present the results of their research work in scientific articles published in international and national research magazines, and by presentations at national and international scientific symposia. They annually publish or present at international scientific conferences approximately 390 research articles, 160 professional articles, 10 scientific monographs and 250 reports.

The faculty publishes the following scientific periodicals which encompass scientific reports by Slovene and foreign authors written in Slovene and English languages.

- Acta Agriculturae Slovenica (Agronomy and Zootechnics) (formerly Research Reports)
- Acta Biologica Slovenica
- Research Reports of Forestry and Wood Science and Technology
There are seven libraries at the Biotechnical Faculty: the Central Biotechnical Library and six departmental libraries (agronomy, animal science, biology, forestry, food technology and wood technology).

All libraries are part of the national library network and shared bibliographic information system and service COBISS. The Central Biotechnical Library is also a member of the Slovene National AGRIS Centre, AGLINET (Agricultural Libraries Network) and IAALD (International Association of Agricultural Information Specialists).


**Monographs:** approximately 300,000 library units of library holdings (including in departmental libraries).

**Current serials:** 1,200 titles (including in departmental libraries).

**Special collections:** Slovenian agricultural doctoral theses, Slovenian agricultural Master of Science theses, Slovenian agricultural grey literature, agricultural research reports, all of the Slovene AGRIS input documents, agriculture-related CD-ROM databases, official journal of Slovenian legislation.

**Services:** loans, inter-library loans, updating personal bibliographies for faculty researchers and some other research institutes, reference and information services.

**Digital library:** we provide access to bibliographic databases (AGRIS, CAB, FSTA and others), Digital Library UL (DIKUL; access to e-journals, databases, e-dictionaries, etc.), Digital Library BF (access to faculty theses). Most of our e-resources are accessible by remote access from outside the University of Ljubljana local networks.

**Library members:** over 5,000 (students, lecturers, researches and other professionals).
What else if not