

“Rangers”

Pilot bachelor study programme in Europe

Nature protection and landscape Management

Specialisation:

Warden of nature - ranger



Park rangers have a big job with a lot of different responsibilities. Their work involves everything from law enforcement to education, from search and rescue missions to ensuring the safety of park visitors.

In 2006, the bachelor programme „Ranger“ was established at the Institute of High Mountain Biology for Slovak and foreign students. It was the first bachelor study programme of its kind in the European territory, where the nature protection has such a long and good tradition. Students - future rangers, learn how to apply the knowledge and principles of science to understanding and management of production, processing and marketing of animal products and to the management and conservation of our natural resources, including native and endangered species. Throughout the three years of study and the final project students have the opportunity to gain special research skills. The degree provides an excellent opportunity for students seeking a professional career working with flora and fauna.

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Courses of the “Ranger” study programme

Computer skills

- Hardware and software
- Windows
- MS Word and other text processors, databases
- MS Power Point and Excell



Social psychology and ranger’s code of ethics

- Process of social interaction, characteristics of social perception, communication, individual behaviour and acting.
- Communication typology, communication strategies and tools.
- Verbal and non-verbal communication..
- Conflicts and solutions.



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Mapping and topography

- Basic concepts and development of mapping.
- National border project.
- Creation of a basic large scale map. Technical city map. Measurement of altitude.
- Digital surface model. Middle scale maps. Map generalisation. Identification of natural reserves, protected areas, topography, compass, GPS.



Geology and pedology

- Earth as a space body, its properties and a structure of the Earth's crust.
- Rock-forming minerals. Magmatites, sediments and metamorphic rocks.
- Tectonic disruptions. Magmatism. Volcanism. Seismic movements in the Earth's crust.
- Main types and forms of relief. Geofactors of the environment - regional geology in Slovakia.
- Soil - definition, composition, profile, horizons. Basic characteristics of soil. Processes and conditions of soil formation.
- Living condition of the soil fauna, its description and function.
- Basic soil groups and types in Slovakia.

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Hydrology and climatology

- Principles of hydrogeology, its subject and classification. Hydrology of the oceans. Hydrology of the land.
- The subject of climatology, aims and organization of meteorological services.
- Chemical composition and vertical stratification of the atmosphere.
- Radiation types in the atmosphere. Radiation of the Earth's surface. Radiation balance.
- Air temperature. Heat convection in the air, water and soil. Evaporation. Air humidity.
- Water circulation on Earth. Condensation and sublimation. Adiabatic processes, vertical heat stratification, stability, temperature inversions. Pressure, density and circulation of air.
- Human impact on the climate.



Health care

- Variability in the health care system adopted in the recently approved legislative.
- Balneal treatments. Changes in the field of health insurance. Transportation of patients.
- History of the Red Cross foundation and its main tasks at present.
- Principles of first aid administration. First aid in injuries and life threatening conditions.
- Specific aspects of the first aid in summer and winter season and in hardly accessible terrain. Techniques of improvised victim transportation.



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Terrain navigation and orienteering

- Maps and map use.
- Determination of geographical directions. Determination of distance, time, altitude and altitude difference. Determination of location.
- Navigation in the field, GPS, orientation landmarks, orientation using natural landmarks. Navigation in emergency situations.
- Identification of the borders of the territory .
- Principles of orienteering. Orienteering maps.
- Organization and management of orienteering competition with maps.
- Organization and management of orienteering competition without maps.



Ranger training and reports

- Designation of the subject of protection.
- Reconnaissance of the terrain.
- Planning of protection methods.
- Guarding management .
- Material and technical support of a guarding service. Diary of a ranger.
- Cooperation with the police, Mountain rescue, local authorities and another organizations
- Public relations
- Ranger missions and written records.



English language

- Past tenses, time expressions.
- Conditional sentences, Mixed Conditionals.
- Comparison of adjectives.
- Relative clauses (who, which).
- Reported speech.
- Expression of a suggestion, advice and warning - should, ought to, could.
- Modal verbs. Phrasal verbs. Passive and active forms.
- Expression of skills. Causative. Verb „make”



Botany

- Evolution from the unicellular to vascular plants (stellar theory).
- Organology and physiology.
- Histology, anatomy and morphology.
- Protection of plant genetic heritage: protected plants, red lists and books, international agreements.
- Methods and techniques of taxonomical determination.
- Cultural plants. Determination and classification of cultural plants.
- Species recovery programs and projects in practice. Data recording in botany.



Basics of environmental science and environmental monitoring

- Introduction to environmental science. Natural resources - atmosphere, water, soil, biodiversity.
- General problems and stressors of natural environment. Pollution of the environment. Radiation pollution, risk factors, wastes, changes in biodiversity.
- Evaluation system for the natural environment characteristics. Large scale monitoring system, partial monitoring systems. Methods and measured parameters.
- Environmental politics, law, philosophy and ethics. Environmental movements, international organizations.



Environmental education and training

- Theory of lecturing, preparation and presentation of lectures.
- Publication activity and the use of different media - TV, radio, broadcast, press (preparation of mass-medial reports and information, professional articles, photo documentation, layout and presentation of posters, interviewing techniques, distribution).
- Communication with different age groups of visitors.

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Ecotoxicology

- Sources of environmental pollution, physiology of model organisms exposed to pollutant and heavy metals in the natural environment. Nitrates and nitrites. Diesel, crude oil and its products in the natural environment.
- Levels of toxicity - malformations, degradation of ecosystems.
- Aluminium in the nature as a side effect of acidification, its negative impact on the terrestrial and aquatic organisms.
- Dioxins, genetic modification of organisms, European and world ecotoxicological legislation.



General and ecosystem ecology

- Introduction to ecology. Population ecology.
- Abiotic components of the natural environments and their ecological importance.
- Biotic components of the natural environment.
- Populations in the ecosystem, ecology of plant and animal populations.
- Ecosystem, classification of natural ecosystems. Trophic chains and energy flows in ecosystems.
- Evolution of the living organisms and their interactions. Adaptation and geographical distribution of the organisms.
- Terrestrial, semiterrestrial and aquatic ecosystems.
- Direct human impact on the nature, changes in natural areas, human influence on the extinction of species.

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Field course in botany

- This field course is concerned with field identification of different plant species. Determination of common and protected plant species.
- Red lists and books, international agreements.



Environmental law and management

- Atmosphere, water, soil - their protection and legislation.
- Conservation of plant species and plant communities.
- Conservation of animal species and communities.
- Nature protection in towns, problems of urban communities, wastes.
- Land protection, nature protection laws.
- Organization and management of the environment.
- National environmental politics.
- Management projects in the environmental sector.
- Environmental audit.
- Environmental information (scientific, popular, media).
- Team work, evaluation of the project's quality.



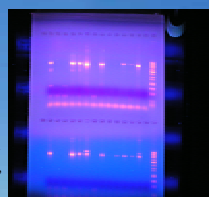
Assessment of human impact on the environment

- Development of environmental politics in Slovakia and foreign countries.
- Process of environmental impact assessment – EIA, mandatory assessment, investigative process.
- Aim of the law. Assessment of constructions, facilities and activities.
- Parties of the process: proponent, community, decisive authority, offended authority, offended community, public, professionally responsible persons, other parties.
- Basic rights and responsibilities of the involved parties. Process control, informing citizens, publicity.



Molecular ecology

- Basic subjects of molecular ecology, genetic information transfer processes, principles of genetic manipulation, genetically modified organisms (GMO).
- Methods of molecular diagnostics used in the research of bacterial and animal diversity (PCR, RFLP, FISH, SSCP, DGGE).
- Practical work : isolation of DNA and RNA, restriction analysis and polymerase chain reaction.



Ethology

- Basic concepts of ethology and animal psychology.
- Types and forms of animal behaviour.
- Hierarchy. Types of animal societies.
- Basic components of telemetry. Techniques of transmitter attachment on the animals.
- Use of telemetry (circadian rhythms monitoring, individual dispersion monitoring, in laboratory conditions).



Etnography

- Categories of material and spiritual folk culture.
- Slovak regions - basic characteristics, historical and geographical conditions.
- Human social and cultural adaptation to the natural environment.
- Types of buildings, garments, forms of alimentation, economic and social relationships in rural villages.



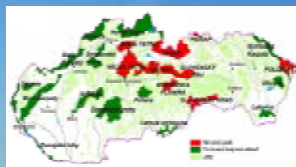
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Protection of nature and landscape - legislation, organization in EU

- Human attitude to the nature. Attitude of the land owners to the natural environment in the Slovak Republic.
- Disputes between the legislation and citizens over the protection of natural resources and territories.
- The legislative protection of particular territories and involved organizations.
- Nature and landscape protection - protected areas (categories and protection levels) and species protection.
- Global strategy of the nature protection and ecological education. Perspectives of current nature protection. International collaboration.

Environment of the Slovak Republic

- Abiotic compounds of the environment .
- Landscape territories. Biodiversity. Natural territories. Urban territories.
- Health of the human population. Population curve.
- Wastes. Noise and radiation pollution. Chemically and genetically modified organisms.
- Energetics. Industry. Agriculture. Forestry. Fishing and aquaculture. Transportation.
- Tourism and recreation.



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Global and landscape ecology

- Landscape definition. Landscape characteristics.
- Land forming processes, landscape complexes.
- Disturbance and stability changes.
- Landscape types in the Slovak Republic and foreign countries.
- Movement of animals and plants in the landscape.
- Earth life - natural catastrophies and anthropogenic activity.



Cynology and horse riding

- The role and status of cynology in the society
- Governmental and non-governmental organisation and management of cynology.
- Service dog training. Service dog assistance and usage.
- Origin, evolution, basic anatomy and physiology of horses. Horse movement.
- Selection of horses for different purposes. Equipment.
- Veterinary corps. Documentation.
- Basic training (saddling, mounting...).
- Field riding. Group training.
- Performance tuning - basic forms of movement.



Basics of climbing and ski traning

- Basics of climbing, equipment and material (movement techniques, climbing knots, securing, abseiling, ascending).
- Principles of safe movement in summer conditions in the alpine zone (rocks, snow fields...).
- Navigation in the climbing terrain.
- International classification of ski slopes and cross country ski tracks.
- Ski training (alpine and cross country skiing).
- Skiing in exposed terrain.
- The snow structure and avalanche danger.
- Prevention of skiing accidents.



Zoology

- Animals - general characteristics, taxonomy, ecophysiology, phylogeny morphology, anatomy.
- Protection, importance, domestic animals
- Determination of selected species living in Slovakia.



Hunting and fishing

- Nature protection and hunting. Hunting unions and legislation.
- Nature protection and fishing. Fishing unions and legislation.
- History of tracking. Methods of tracking. Tracking of small animals in different seasons.
- Poaching and its negative effects.



Biology of high mountains

- High mountains. Morphophysiological adaptations of organisms in the alpine, subnival and nival vegetation zone.
- Adaptation of organisms to water, snow, ice, high altitudes.
- Fauna and flora divergence in world mountains (Andes, Cordilleras, Himalayas, Alps...).
- Biodiversity and its difference in different mountains on the Earth.
- West Carpathians - geomorphology and its influence on the biota composition.
- Evolution and current state of human ethnics living in the high mountains.
- World and Slovak protection of high mountains.



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Field course in zoology

- Taxonomic determination of animal species. Small mammals, birds catching and trapping. Invertebrate field collection methods.
- Observation of anatomic and morphologic characters, measurements, weighing, etc.
- Signs of animal activity in the field.
- Fishery, freshwater fish determination.



Nature protection - park rangers

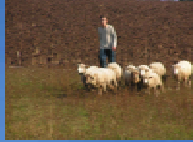
- Legislation of rangers, ranger associations.
- Documentation. Communication with visitors of protected areas.
- Management of negative impacts of agriculture, forestry and hunting.
- Management, animal and plant conservation. Conservation of the abiotic component of nature.
- Rangers and tourism.
- Communication with public (public education, publicity).
- Personal and practical skills.



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Pastoralism

- Breeding and grazing of domesticated animals in prehistorical and historical periods.
- Development and characteristic features of the Carpathian pastoralism in Slovakia since the beginning of the 15th century.
- Pastoral regions in Slovakia. Impact of pastoralism on material and spiritual culture of the Slovak nation.
- Traditional medicine, magic and its practical uses in the raising of sheep and cattle.
- Positive and negative effects of grazing and pastoral culture in Slovakia.
- Animals in extensive farming in contrast to free living animal species.



Rescue systems

- Integrated rescue system, its components and activities.
- Safety regulations of individual activities.
- Rescue mission organization and proceeding, collaboration with Integrated rescue system (triggering the IRS, alarm plan).
- Rescue techniques in search, ground and airborne rescue missions.
- Technical rescue equipment (summer and winter equipment, ways of transportation, signalisation equipment).
- Airborne rescue (search and rescue flights, flight conditions, signal points for helicopter navigation, movement around the helicopter, landing in the field).
- Management of rescue mission risks.

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Management of human resources

- Theory and practice in human resources management.
- Personal work analysis and working plan.
- Specific aspects of human resource management in crisis situations.
- Education and career development.
- Occupational relationships in an organisation, health care, safety and health protection.

Wireless technology, tele- and radio-communication

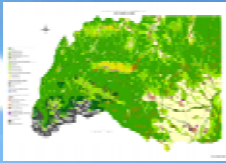
- Wireless system, basic characteristics.
- Radiocommunication rules. Electromagnetic wave propagation.
- Ground wave propagation. Fresnel zones. Atmospheric composition.
- Conductors of electromagnetic field. Theory of the symmetric dipole. Antenna.
- Transceiver of AM and FM. Telecommunication network.
- GSM network. UMTS system. Cellular phones. Satellite systems.



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Landscape studies and regional planning

- The landscape - definition, original and recent state.
- Physiogeographical classification. Monitoring, survey, modelling.
- Protection and formation of the landscape and the environment.
- Public awareness and education, legislation, strategy, agreements.
- Cultural landscape. Environmental load products, stresses.
- Ecological carrying capacity, non-conflicting management.
- Regional and landscape planning, settlement, regional and urbanistic potential.
- Architectural, administrative and project activities.



Microeconomy

- Subject and methods of microeconomy
- Benefit theory, preconditions of business, theory of the firm.
- Types of firms and their structure.
- Production function, factors of production.
- Firm property, property valuation
- Supplying, costs, yields, price creation, business financing.

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Management of natural disasters

- Identification and extent of natural catastrophic events.
- Management of crisis situations associated with floods, water dam failures, landslides and earthquakes, natural fires and avalanches.
- Meteorological phenomena leading to extreme weather conditions. Flood protection system.
- Prevention of natural catastrophes.
- Basic methodological and technological procedures in the management of natural disaster situations.



Individual field practice

- Documentation of rangers.
- Analyses of negative impacts
- Field communication with visitors.
- Field training - recognition of negative effects in the nature.



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Self-defence and handgun shooting

- Security system services.
- Basic techniques of self-defence.
- Law of firearms and ammunition.
- Basic rules of handgun shooting, activities on a shooting-range.
- Shooting methods in service-shooting a gun.
- Psychological aspect and stress situations in self-defence.



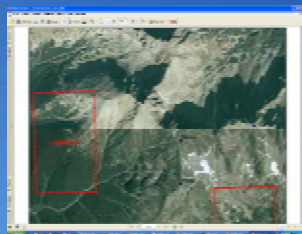
Criminal law, code of criminal procedure, infringement law

- The basic Constitution clauses and paragraphs, explanation.
- The position of the Constitution in the system of Slovak legislation
- Explanation of the Part 2. of the Constitution of the SR (Fundamental rights and freedoms).
- Informative explanation of the Part 3. and 4.
- Legislative tools of protection against criminality.
- Criminal law – general explanation.
- Generally-dangerous criminal acts including environmental hazards.

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Information systems - GIS

- Introduction to geographic information systems.
- Basics of computer graphics – computer graphics devices, raster and vector graphics.
- Mathematic fundamentals of computer graphics – system of coordinates, area clipping.
- Landscape modelling, spatial models.
- GIS – alphanumeric and graphic information.
- Topologic data. Infrastructure modelling.
- Methods of data selection and processing. Data analysis.



Multimedia creation

- Preparation, production and finalization of film, television, video, and multimedia work – from the script to cutting, from montage to final approval.
- Audiovisual creation and aesthetics.
- Presentation of multimedia program work, photographic creation and presentation.

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Image composition and stylistics

- Basics of the image analysis. Image organization and structure.
- Rules of the image composition - tone, sharpness, scale and arrangement.
- Detail and its function in the image creation.
- Black and white composition of the image. Coloured composition of the image.
- Light - importance and function in the image creation.
- Image stylistics. Lighting technology.
- Methods of the image framing..

