ECAP

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Methodological Manual for Curricula Development

based on the view of European partners

Work package 2

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1 Introduction

This manual is designed as guideline, how to develop and/or to modify programmes and/or courses of universities in Kazakhstan and Uzbekistan to meet the requirements of the Bologna Process with its aim to harmonize higher academic education in Europe. The document was created by the ECAP project consortium under the supervision of the project coordinator, the Slovak University of Agriculture in Nitra (SUA), with essential contributions from the Czech University of Life Sciences Prague (CULS) and from the University of Natural Resources and Life Sciences Vienna (BOKU).

The main purpose of the current Curriculum Manual is to facilitate development of study programmes, courses and syllabuses focused to higher academic education in the fields of Environmental Protection and Land Management.

SUA in Nitra prepared templates for a real Bachelor degree study programme in the field of Environmental Protection, which are tailored for conditions of Kazakh and Uzbek partners based on particular environmental challenges the countries have to face.

The material is based on European standards concerning the creation of study programmes. However, Kazakh and Uzbek partners have to reflect their national conditions of accreditation bodies and of other relevant stakeholders when creating their study programmes. Additionally, universities and/or faculties have the responsibility to recognize that any development, implementation, and evaluation, which takes place at the university, has to meet the needs of the students.

The Curriculum Manual provides:

- Guidelines for creation of templates of study programmes
- Guidelines for creation of templates of courses and syllabuses

2 European Credit Transfer System

In 1991, the European Union (EU) and Eastern European countries (including the former Czechoslovakia as a candidate country) created the European Convention on Assistance in the process of full integration in the fields of politics, economy, and trade. As a part of this binding document, the part *Freedom of movement for persons* was created. Its aim is to ensure that young people aspiring for quality education in the EU countries can study at universities of any EU Member State. According to this part, the European Union adopted also *Non-discrimination principle*, which does not allow the discrimination of any nationality or ethnic group.

EU provided help to the associated countries via the programme PHARE. However, the TEMPUS programme had the crucial role in accepting the OECD principles and helped most of the Slovak universities to make major changes in the organization and structure of education. The biggest problem, the Slovak Republic and other entrants had to deal with, was disunity of education systems. Each country had its own specifics that were decisive for them. To some extent, this problem was solved by the OECD, which had regularly innovated and united catalogues with science and study programmes. Within this process, the crucial document was the "*Sorbonne Declaration*" (Paris La Sorbonne) that was based on three following principles:

1. Facilitating the mobility of students in the European area and their integration into the European labour market, thus related to the mobility of teachers.
2. Improving the international transparency and recognition of qualifications by means of gradual convergence towards a common framework of qualifications and cycles of study.
3. Supporting the return to study or study continuation in the same or another institution, or within European mobility.

Based on the principles mentioned above, the "*Bologna Declaration on European Higher Education Area*" was established in 1999. It declares the following six principles:

1. Facilitating the readability and comparability of qualifications.
2. Implementing a system based essentially on two main cycles.
3. Establishment of a credit system such as ECTS (European Credit Transfer System).
4. Promoting European cooperation in quality assurance.
5. Extension of measures to promote mobility of students, teachers, and researchers.
6. Promoting the European dimension in higher education in terms of curricula and interinstitutional cooperation.

The Bologna Process is a collective effort of public authorities, universities, teachers, and students, together with stakeholder associations, employers, quality assurance agencies, international organizations, and institutions, including the European Commission (www.ec.europa.eu.)

The most important action in unification of European Area of Higher Education (EAHE) was establishment of the university education form consisting of two degrees - bachelor and master degree. Almost all signatory countries of the Bologna Declaration supported and understood the importance of implementation of such system. Later, in 2003, Ministers of Education of the European Bologna Declaration signatory countries agreed to promote closer links between European educational and research space. Diversification of education system continued by addition of the third level of higher education (doctoral degree).

Why to introduce and use ECTS?

The harmonisation of the academic education system in Europe as described above has its undoubtful benefits. Particularly, it makes study programmes "easy to read" and it allows comparing the knowledge, the skills and the competences of students – on national and on European level. EAHE facilitates also the mobility of students and enables the recognition of documents and grades for partial study, selected courses, or various forms of practice. ECTS significantly supports universities to organize, to connect and to revise study programmes. ECTS can be used in all study programmes provided by a university. ECTS is a modern system of higher education that make study programmes attractive for students from different continents.

2.1 European Credit Transfer System (ECTS) – the principle

ECTS originally was used as a basic credit transfer system for student mobility within the Erasmus programme. With the establishment of the Bologna Declaration, it has become the core of the process in which the European higher education was harmonized. ECTS has become the basis for the national credit systems not only in terms of "transfer system", but also in terms

of “accumulation”. According to the current definition, ECTS is regarded as implemented when it is:

- Included in the current legislation;
- Applies to all programmes offered by higher education institutions;
- Meets the requirements of 60 credit points in the annual study plan;
- Used to transfer and accumulation of credits.

ECTS supports the planning, the delivery, and the evaluation of study programmes, and makes study programmes more transparent. By most of the countries in the European Higher Education Area, ECTS has been adopted and is increasingly used elsewhere (ECTS Users' Guide). The system facilitated the recognition of periods of study abroad and thus enhanced the quality and volume of student mobility in Europe.

ECTS is also used in other documents that help to organize students´ learning mobility, including: The Course Catalogue, The Learning Agreement, The Transcript of Records.

ECTS is targeted at students – mainly because it helps an institution to develop and offer the study plan for the programme that is adapted to the needs and expectations of students. This system provides a choice of the course by its content. Teachers only encourage students to form their own ways of acquiring knowledge and own experience. Teachers get into the position “to teach students to think” and not “to teach students the subject matter”.

Learning outcomes describe what a student should know, what he/she should understand and what he/she should be able to do after successful completion of study. Descriptions of learning outcomes normally describe understanding, ability to apply knowledge, analysis, synthesis, evaluation, etc. They are verifiable statements of what the students, who obtained a qualification or completed a programme or its part should know, what they should understand, and what they should be able to do. This underlines the link between teaching, educating and assessment.

For the comparison, in the approaches aimed at teachers (not the students) the requirements on course, teaching process as such, and amount of “learned knowledge” are considered as the main attributes of education. (Source: Eurydice, 2005)

2.2 Key Features of ECTS

ECTS is based on the convention that 60 credits are equivalent to the workload of a full-time student during one academic year. The student workload of a full-time study programme in Europe amounts to 36/40 weeks per year and in those cases one credit stands for 25 to 30 working hours. Workload refers to the scheduled duration of time, which an average learner is expected to achieve the required learning outcomes. ECTS includes the time students spent in attending lectures, seminars as well as for independent study and for taking of examination, etc.

Credit system

A credit system is a systematic way of describing an educational programme by attaching credits to its components. The definition of credits is based on student workload, learning outcomes, and contact hours. Credit is also a way of quantifying the outcomes of learning. Learning outcomes are sets of competences, expressing what the student will know, understand, or be able to do after completion of a process of learning, short or long. Learning outcomes are describing qualitatively the results of learning.

Credits are numerical values assigned to the courses, expressing the amount of work required for the acquisition of prescribed learning outcomes. Allocation of the credits to the courses is part of the curriculum development, and it is done with respect to the national qualification framework, to the level of descriptors, and to descriptors of professional qualification.

The allocation of ECTS credits

Credit allocation is the process of assigning a certain number of credits to qualifications, programmes or courses. ECTS credits are allocated based on a typical workload necessary to achieve the prescribed learning outcomes.

In general, credits are assigned by the concerned institution and therefore it lies in the responsibility of university and scholars (external subjects may be invited as well).

In a first step - before credits to individual components of the study programme are allocated - the profile of the specific study programme and graduate profile has to be defined clearly. Profile means the description of the programme in terms of its main principles and specific objectives.

In the second step, the workload of the student has to be estimated. The workload is not based only on contact hours (i.e. the hours that students spend by activities managed by pedagogical staff), but it includes all educational activities required to achieve the expected results. This includes the time spent for independent work, for compulsory practice, for preparation of tests and for time needed to pass the exams. The estimated workload regularly has to be monitored and evaluated according to the feedback of students (http://www.rug.nl/let/tuningeu).

Credits are allocated to all educational components of a study programme (modules, courses, placements, diploma thesis, dissertation thesis, coaching, teamwork, library study, self-directed studies, etc.).

As mentioned above, 60 credits are the equivalent of a full year of study or work. According to the EAHE, the following three cycles of degree programmes are proposed:

- typical “first cycle” (or Bachelor's) Degree usually consists 180 or 240 credits,
- typical “second cycle” (or Master's) Degree usually consists 90 or 120 credits,
- the “third cycle” (or PhD. level) may vary.

The performance of the student

The performance of the student is documented by a local/national grade. It is good practice to add an ECTS grade, particularly in case of credit transfer. The ECTS grading scale ranks the students on a statistical basis. Therefore, statistical data on student performance is a prerequisite for applying the ECTS grading system. Grades are assigned among students with a pass grade as follows:

- A best 10% of students
- B next 25% of students
- C next 30% of students
- D next 25% of students
- E next 10% of students

A distinction is made between the grades FX and F, which are used for unsuccessful students. FX means “fail-some more work required to pass” and F means: “fail-considerable further work required”. The inclusion of failure rates in the Transcript of Records is optimal (ee.europa.eu).

2.3 ECTS Key Documents

ECTS key documents facilitate and support Credits accumulation and their transfer. These records include the

- Catalogue of Courses,
- Transcript of Records,
- Application Form,
- Diploma Supplement,
- and other documents.

Key documents are considered as an acceptable way of transferring information. They are important for students, academic and administrative staff, as well as for other stakeholders. The proper use of ECTS key documents guarantees transparency and increases the quality of the educational process.

Few years ago, SUA in Nitra has introduced university information system, which includes ECTS key documents. Examples of them are described in the following chapters.

The Regular Course Catalogue

The Course Catalogue is a guide for the students. Therefore, the information describing the courses has to be detailed, has to be easily accessible and has to be up to date. The catalogue is published on the website of the university and can be accessed by all stakeholders. Content of the catalogue is available in national and English language (for increased transparency at the international level). It is important that the catalogue is provided in advance before the start of new academic year to enable students individual choice when drawing up their curricula (http://ec.europa.eu/educa-tion/lifelong-learning-policy/).

For illustration purposes, a list of recommended content units of Course Catalogue is documented below, giving information about qualifications offered, about teaching and evaluation procedures, about the level of programmes, etc. The Catalogue also gives evidence about the supervisor of a study programmes, about student advisors, about contact persons at the departments. It is recommended to include information how to contact these people.

Proposal of the content units of Course Catalogue (ECTS User´s Guide)

i. Information about institution/university
   - Name and address
   - Academic calendar
   - General description of the institution
   - The list of programmes offered
   - General admission requirements
   - General rules for the recognition of prior learning
   - Registration procedures
   - General principles for the allocation of credits

ii. Information about the study programmes
   - Name of the study programme
   - Level of qualification
   - Specific admission requirements

- Specific measures for the recognition of prior learning
- Description of the programme
- Form of education (full-time, part-time)
- Characteristics of the graduate and professional description
- Possibility of further education
- Structure of the study programme (with credit evaluation)
- Examination regulations, assessment, and classification
- Requirements for graduation

iii. Description of the study programme (courses)

- Code and name of the course
- Type of the course (obligatory, obligatory elective, elective)
- Level of education for which it is delivered (1st, 2nd and 3rd degree)
- Year of study (approximately, if it is recommended)
- Semester(s) in which the subject is taught
- Number of ECTS credits
- Name of the teacher (lecturer, instructor)
- Evaluation of the course and evaluation methods
- Pre-requisites
- Course content
- Teaching language
- The practical part of the course (practical seminars, field work, excursions)

iv. General information for the students

- Study department
- Study rooms, library
- Accommodation and meals
- Health security
- Facilities for students with special needs
- Scholarships and social security
- International programmes, internships
- Sports and recreational facilities
- Cultural activities
- Student associations

The Learning Agreement

The Learning Agreement contains the list of courses to be taken by and agreed between the student and the responsible academic body of the institution concerned. In the case of student mobility, the Learning Agreement has to be agreed between the student, the home institution of the student and the institution selected for exchange. The agreement has to be signed before the students´ departure and it has to be updated immediately in cases of changes (Gemlich et al., 2008). An example of a Learning Agreement is attached in Annex 1.

The Transcript of Records

Transcript of records documents the performance of a student by showing the list of courses taken, the credits gained as well as the local grades and possibility of ECTS grades awarded. In case of credit transfer, home institution has to issue the Transcript of Records for outgoing students before departure and by the host institution for incoming students at the end of their period of study (Gemlich et al., 2008). An example of a Transcript of Records is in the Annex 2.

3 Guidelines for creation of templates for study programmes

This chapter provides an overview about steps and to be followed when developing a study programme. Instructions how to proceed when compiling such study programme are outlined.

A study programme is a set of courses consisting of training and education activities. It includes a set of rules compiled so that their successful completion together with the state examination allows the university education to be gained on the relevant study level.

The basis for creating study programmes is the credit system. The credit system enables collection and transfer of credits. Credits are – as outlined above - numeric values assigned to individual courses through which the load of the student connected with completion of individual courses within the study programme is assessed. Credit system also allows the student to choose the pace of learning. After a successful completion of the course, the student gains a certain number of credits assigned to each course within the study programme. Credits gained by completion of courses are summed up. During his/her study, the student is allowed to gain credits for each specific course only once. When following the recommended study plan, the student gains appropriate number of credits in each academic year. The recommended study plan is designed that students have to gain a prescribed number of credits to complete a proper degree (e.g. Bachelor, Master).

The graduate profile and employability contains a brief description of the professional framework and general characteristics of the graduate, i.e. especially his/her profile and supposed possible workplace in the practice. The graduate definition also involves the most important knowledge, skills, and competences the graduate has to gain within the relevant study field (subject). The content of academic education and training has to match the specific study field and finally the specific study programme. In other words, the study programme has to cover the complete content of the study field.

The objectives of the study programme

The objectives of the study programme are developed on the basis of general principles that include the needs of society in terms of the labour market.

When outlining the objective of the specific study programme, it is necessary to consider following strategies and principles:

- Development prognosis in relevant professional field
- Requirements of the labour market
- Strategic objectives of the university and the faculty
- Opinions of teachers, potential coordinators as well as students of the Faculty
- Opinions of practitioners and graduates of the faculty

Guarantor of the study programme

A guarantor of the study programme has to assure that the curriculum meets the current requirements as well as the trends of science and development of the society. It is also his/her task to take care that teaching means (e.g. methods, forms, teaching aids, didactic techniques, information technologies) are up-to-date and optimal for achieving good study results.

Coordinator of the study programme

The coordinator must have a complex vision about the graduate profile, since he/she complies appropriate profesiogram and suitable study plan. The coordinator ensures the flexibility of the study.

Flexibility of curricula provides more opportunities for students to create their own path to achieve qualification. Flexibility can be enabled by classifying (or dividing) courses with regard to attendance obligation and/or prerequisites.

In terms of attendance obligation, study programme courses can be classified to:

a) obligatory – students have to select the specific course,
b) obligatory elective – students have a choice to select courses out of a pool of courses defined in the curriculum,
c) elective – students may select courses of different study programme (including those offered by other faculties or universities).

In terms of prerequisites, study programme courses are divided into:

d) courses with no prerequisites – these courses can be registered without completion of any other courses,
e) courses with the prerequisite of completion of some other courses – registration of such course is conditioned by completion of some other course(s) (prerequisite courses).

For the bachelor degree it is recommended to hold the percentage of obligatory courses and courses with the prerequisites very high at the beginning, as basic knowledge must be gained by all students. In general, selectivity of courses should be greatly limited in the bachelor programmes. Nevertheless, the selectivity of courses could increase in the later semester to meet the interests of students and to enable them some specialization (focus) for further studies.

4 Proposal of study programmes at partner universities in CA countries

Based on the project focus on the environmental protection and land management and their substantial features we are providing partners at CA universities with proposal of specific study programmes, which can be used either as new study programmes or for innovation/adaption of existing study programmes.

For the study programme *Environmental Protection* the proposal for the study programme is very detailed and contains also explanations. The description of the study programme *Land Management* is focused to the content to avoid redundant information.

4.1 Environmental protection

4.1.1 Graduate Profile

Section “graduate profile” is an essential part of the study programme preparation. It contains information about the knowledge, skills, and competencies of graduate. Profile informs potential employers, businesses, public institutions, and institutions providing higher education. Last, but not least it also informs the applicant for study as well as other stakeholders interested in the assumptions about graduate pursuit of a profession in a field.

Graduate profile includes a brief description of the characteristics of the programme and their integrity with the structure of academic disciplines. It also includes the name of the profession if this is in accordance with the profession resulting from the title of the study programme (e.g. Environmental manager, Bc.).

Graduates of the study programme *Environmental management* (1st degree) have knowledge of human – environment system functioning and its multi-causality and variability; and impact of decryption and definition of subsystems on personal, social, and economic (technological) problems. They are able to define basic environmental issues, prioritize solutions on how to solve them and describe possibilities of effective and considerate human actions in the environment. Graduates are qualified to work with all age groups in order to shape their environmental awareness.

Therefore, environmental management is a system of company management purposefully aimed at the environmental protection and creation in terms of sustainable development at global, regional, and local level. Experts are preparing to implement environmental principles and environmental policy at state, municipal and non-governmental level. The structure of the study programme reflects the methods of higher education and a holistic view of the existence of man and nature, with an emphasis on management, coordination, mediation, and assessment of human impact on the environment (Figure 1).

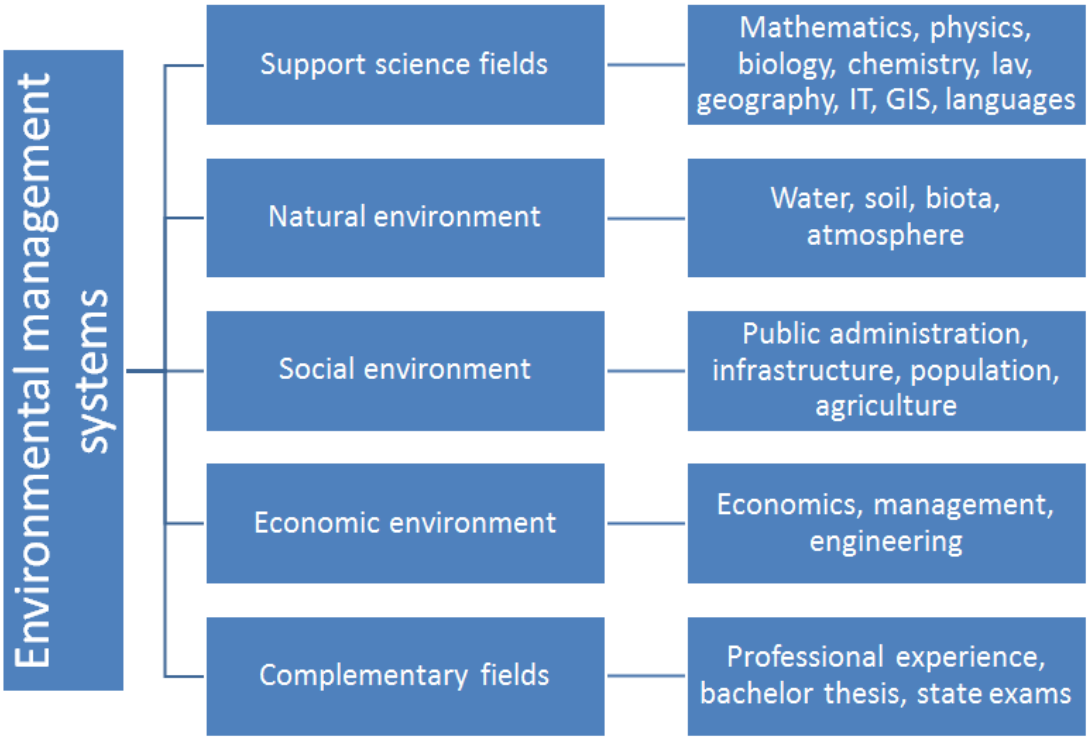

Fig.1 Structure of science areas involved in graduate profile of the study programme "Environmental management". (Húska 2016)

Theoretical knowledge

- Structure of basic components of environment and environmental context
- Principles of rational use of natural resources
- Legislative limits and standards in the environmental field
- Management of environmental processes, including prevention of ecological risks and accidents
- Programme resources in processing of environmental projects
- Psychosocial and educational determinants of development of man and society development

Practical knowledge and skills

Graduate is able to analyse the components of environmental processes (biological, ecological, economic, social) and to propose their implementation at various levels. Graduate is able to make effective managerial decisions in a relation to sustainable development, knows and applies tools of effective performance on the population awareness processes.

Additional knowledge, abilities and skills

- Knowledge of the basic information technology
- Ability to work with information sources and to effectively evaluate and use them
- Knowledge of various communication tools and their appropriate use

Main themes of the core knowledge (1st degree) – in the range of 60 credits in each year

1. Courses of the general basis of the study field 90 credits
   - Natural science basis of the study field
   - Ecologic and environmental basis of the study field
   - Legislative and law in the environment
2. Courses of management basis 50 credits
   - Socio-psychological basis
   - Pedagogical and didactic basis
     - eco-philosophical context
     - environmental education and management
3. Complement courses 30 credits
   - Principles of computer science and database creation
   - English language

Bachelor thesis 10 credits

State exam (1st degree)

- Final thesis defence (abstract in foreign language)
- Commission examination from the basic selected themes of the core knowledge according to graduate professional profile

Graduate employability

Graduates may be employed as environmental instructors, coordinators, advisors for the public relations work in protected areas, at the level of state administration, local governments, the third sector and eco-centres.

4.1.2 Structure of the model study programme – environmental protection

Structure of 4 years´ study programme Environmental Protection									
	No. credits	I. Year		II. Year		III. Year		IV. Year		Course completion
		WS	SS	WS	SS	WS	SS	WS	SS	
1	5	Mathematics, basics of statistics	Environmental microbiology	GIS software and its application	Nature protection	Landscape ecology	Environmental management	Environmental monitoring	Environmental economics	
2	5	Environmental biology	Environmental chemistry	Economic geography	Basis of water management	Sustainable ecosystems	Environmental management systems	Environmental protection	Circular economy	
3	5	Climatology	Soil science	Basics of agriculture	Basics of forestry	Environmental ethics	Protection of biodiversity and landscape	Management of arid vegetation area	Socio-economic function of vegetation	
4	5	Informatics	Hydrology	Plant ecology	Protection of water resources	Methodology of scientific research	Project environmental management	Management of flooded areas	The concept of sustainability	
5	5	Environmental policies and law	Environmental ecology	Geo-ecology	Protection of natural resources	Eco-technology	Renewable resources in the environment	Ecological disasters	**	
6 *	5	World language	World language	Discussion on climate change	Practices of microbiology; Practices of	Eco-tourism and revitalization of flows	Methods of bioremedation *	Invasions and invasive organisms	***	

					environmental chemistry*						
	30 cred./semester									∑	%
	∑	30	30	30	30	30	30	30	30	240	100
	Obligatory courses	5	5	3	3	2	2	2	2	24	50
	Obligatory elective courses	0	0	2	2	2	2	2	2	12	25
	Elective Courses	1	1	1	1	2	2	2	2	12	25
	Courses	6	6	6	6	6	6	6	6	48	100
Specialized practices						*					
Exercises in situ (summer school)						*					
State exams						**					
4 elective courses						***					

Table 1 – The proposed structure of the model study programme – environmental protection

Notes on the content and structure of the programme:

* 5 credits may be earned from more subjects

Study programme Environmental protection is a four-year bachelor´s degree programme which completion requires cumulation of 240 credits. Courses are divided into obligatory courses, obligatory elective courses, and elective courses.

There are 24 compulsory courses in total. They cover theoretical basis (8), the basis of the study programme (8), and 8 of them are profile courses.

To simplify the application of the credit system, 5 credits are proposed for each course. Student obtain 25 credits from compulsory and selective courses each semester. The rest of the credits is covered by elective courses that include courses on the basis of discussion, or practices, methodical seminar and others. These courses are completed only by credit and therefore, there will be no more than 5 exams.

Study programme Environmental Protection belongs to the environmental and ecological sciences focused on the problems arising from the interaction between man and the environment in which he/she lives. Study programme enables understanding of the scientific, political, and socio-economic problems of the country in the field of environment.

Study programme is designed to be appropriate for gaining the theoretical knowledge and practical skills for employment in the field of environmental protection. The graduate is able to solve technical problems, analyze and independently submit simple proposals and projects. Graduate is able to formulate, verify and interpret the obtained data as well as to decide on control mechanisms.

As part of the acquired skills, the graduate knows the basics of modern technologies. He/she is ready to perform the quality control of environment, to control and evaluation of a spatial planning projects, to manage interventions in the ecological and environmental disasters. During the study, students may specialize on protection against pests, soil and water protection, drainage and management during natural fires.

4.1.3 Possible focus of study programme on specific topics

Based on specific problems in partner countries as well as output of Target Group Needs Analysis we propose to consider also possible focus of above mentioned study programme into two directions:

1. Direction "Wild-fire restoration" belongs to current areas of study, particularly in countries where the natural catastrophic fires occur in higher frequency. Fires destroy ecosystems, pollute the atmosphere, disrupt the water cycle. As a consequence of natural fires there are extensive soil erosion, landslides slope and rapid runoff mainly due to the destruction of root stabilizing soil. Soil erosion and sudden outflow of large quantities of water represent the significant safety risk and are leading to serious damage to natural resources and property. Graduates of study direction can foresee and analyse the risk, prepare a precautionary measure (e.g. liquidation of invasive vegetation, slope reinforcement). Graduate is able to implement technical measure to ensure the stability of the area and to use of strategies and methods of forest regeneration.
2. Direction "Dessertification prevention" - desertification is the degradation of land in arid (dry), semi-dry (semi-dry) and dry sub humid areas. Locally can even been caused by poor land management, deforestration, improper use and protection of water resources. The most significant factor is drought and global warming. Graduates know the factors causing desertification and understand principles of maintaining vegetation cover that protects the soil from erosion and soil salinization. Graduates know the basics of organic farming and other technologies for sustainable land management as well as principles of water regime he/she is able to identify the sources of water and it´s storage

in local conditions. Knowledge on the ecology of the flowing water and of lakes can be used for the revitalization of alluvial habitats.

Credits	Wild-fire restoration	Desertification prevention
5	Geomorphology	Soil degradation
5	Risk analysis	Soil and water conservation
5	Population biology	Soil water management
5	Invasive plants management	Wind erosion and soil protection
5	Prevention of wildfire	Water distribution technology
5	Post-fire erosion mitigation	Management of water resources
5	Wild-fire restoration	River and lake ecology
5	Hillslope restoration	Organic farming
5	Grassland foundation	Desertification prevention
5	Restoration strategies	Rain water harvesting

Table 2 – The proposed possible directions of the model study programme – environmental protection

4.2 Land Management

The structure of the study programme Land Administration and Land Development is based on relations within study areas illustrated on the Figure 2:

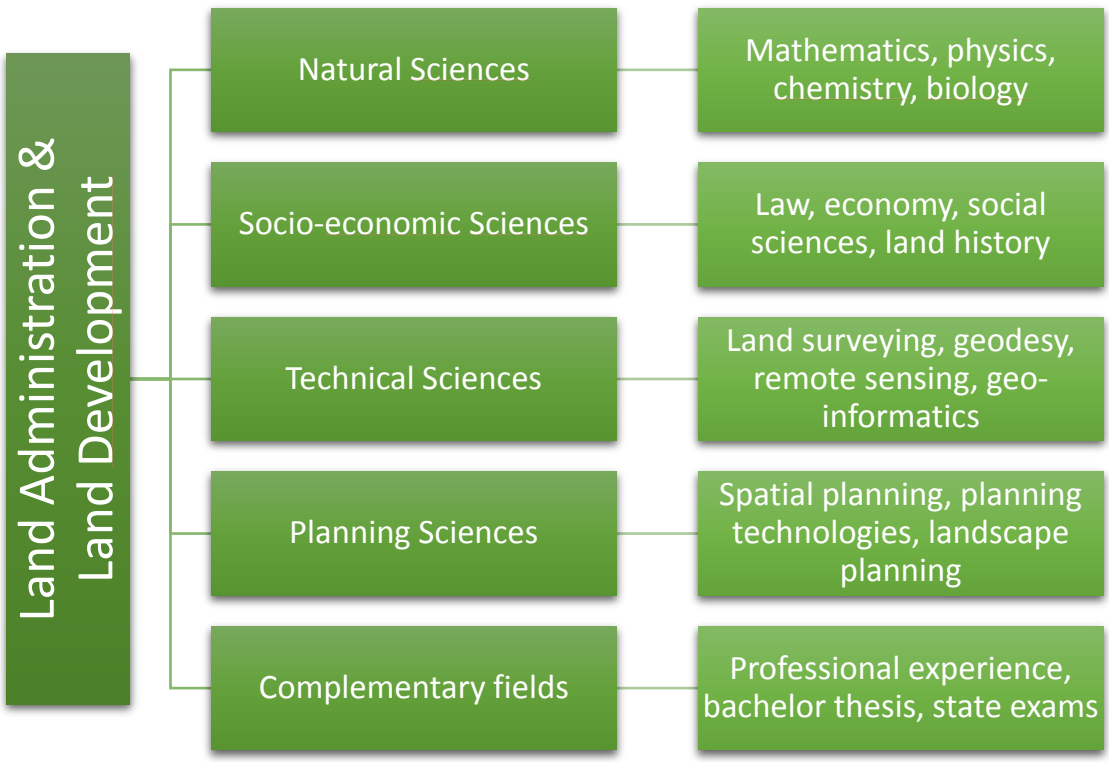

Fig.2 Structure of science areas involved in graduate profile of the study programme "Land Administration and Land Development"

Structure of 4 years' study programme Land Administration and Land Development

No. credits	I. Year		II. Year		III. Year		IV. Year		Course completion	
	WS	SS	WS	SS	WS	SS	WS	SS		
5	Mathematics & Basics of statistics	Mathematics & Geometry	Geodesy	GNSS	Cartography & Mapping	Geoinformatics	Land Administration Systems	Land Valuation		
5	Physics and Chemistry	Basics in Ecology	Basics in Water Management	Land Law & Land Rights	Image Processing	Remote Sensing	Advanced Remote Sensing	Integrative Project		
5	Legal Basics & Land Law	Planning Theory	Land Use Planning	Rural Development	Photogrammetry	Advanced Geodesy	Advanced Geoinformatics	Time Series of Satellite Imates		
5	Informatics	Fundamental of Economics	Business Administration	Land Economics	Landscape / Advanced Land Use Planning	Advanced Geodesy	Project Management	Bachelor Thesis		
5	Land Surveying	Land Surveying	Land Policy & Land Governance	Protection of Natural Resources	Real Estate Management	Land Market	Disaster Management			
5	World language	World language	Landscape Planning	Landscape Architecture	Environmental Protection	Moderation & Communication	Methodology of scientific research	State Exam		
30 credits per semester									∑	%
∑	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*240*	*100*
Obligatory courses	5	5	4	3	3	2	2	6	30	62%
Obligatory elective courses	0	0	1	2	2	2	2	0	9	19%
Elective Courses	1	1	1	1	1	2	2	0	9	19%
Courses / Modules	6	6	6	6	6	6	6	6	48	100%

5 Guidelines for creation of templates of courses and syllabuses

Each course within the study programme is realised through the training activities, especially lectures, seminars, semester work, project, laboratory work, internship, excursion, field practices, expert practices and diploma practices. Normally, expert of departments competent in the relevant field carried out these activities.

Gaining the credit confirms meeting of requirements defined by the supervisor in the information sheet of the course. Student is acknowledged with these requirements at the beginning of the semester. The exam verifies student's knowledge of the whole content of the course and his/her capability creatively to present gained theoretical and practical knowledge. Exams can be outlined in written, oral, practical, or combined forms. Students with specific needs are allowed to modify the form of the exam in accordance with the specifics of his/her needs.

The supervisor proposes a time and content schedule, which contains information of teaching, content of lectures and seminars, conditions for credit assignment, exam requirements and obligatory and recommended literature.

5.1 The course syllabus

The course syllabus is an instrument for planning the course. It is a basic aid for the course supervisor when preparing the content and when organising the course. It is recommended to take sufficient time for the preparation of a detailed syllabus, as it is a proper tool to determine the objectives of the course. In fact, the syllabus is a "flyer" reducing students' doubts on attending the course. It provides students with exact information on the course content, teaching methods and requirements on the course completion. It also encourages students to choose the course through emphasizing the importance of the course. As the syllabus is accessible to students and teachers (through the university webpage, intranet, catalogue of courses, etc.), there is a possibility for the course supervisor to discuss the syllabus and its content with a wide audience.

(Source: https://teachingcenter.wustl.edu/resources/getting-started/preparing-a-syllabus/)

Authors of syllabuses should provide following information:

1. Description of the course : how will the course contribute to the student's expert profile; what will be the benefit for student when attending the course; where is the relation between the course and the content and principles of the discipline; emphasized knowledge and abilities; definition of main advantages for students attending the course – will the student gain something from the course?
2. Teaching philosophy: describing the approach of teacher, defining the teaching methods;
3. Way of evaluation: it is necessary to clearly define the method by which students will be evaluated:
    - is only credit enough or is the exam necessary?
    - if only credit, what is required from the student (final project, semester work, oral interview, written test)?

- if exam is required, it is necessary to differ between assigning the credit (e.g. final project is required for assigning the credit) and the examination (e.g. 2 parts of exam – 1st part written test and 2nd part oral interview);

(Source: https://distance.fsu.edu/docs/instruction_at_fsu/Chptr3.pdf)

Additionally, the syllabus fulfils further tasks, especially the task of the reference guide. It provides students with complex information on the course:

- university and faculty;
- course unit code;
- course title;
- level of study (bachelor or master);
- coordinator (name);
- supervising department;
- semester (winter or summer);
- teaching hours per week (hours of lectures per week / hours of seminars per week);
- planned learning activities and teaching methods (lectures/hours, seminars/hours, excursions, field practices/hours, semester work/hours, individual work/hours);
- mode of delivery (face to face, distance learning);
- mode of completion and ECTS credits allocated (only credit, exam, when exam, then written test, oral exam or both);
- prerequisites for registration (is it necessary for student to complete other courses for attending this course?);
- assessment methods;
- objectives and learning outcomes of the course unit;
- course content;
- recommended literature, etc.

The above-mentioned points can be also used as a checklist when preparing the syllabus. Template of the course syllabus is in Annex 3.

(Source: https://teachingcenter.wustl.edu/resources/getting-started/preparing-a-syllabus/)

5.2 Teaching methods to achieve learning outcomes

For good learning outcomes, it is crucial to achieve harmony between outcomes of education, teaching methods and techniques (adequate teaching methods) and evaluation criteria.

University lecture

Lecture is the basic form of teaching at every university. Each lecturer is a teacher, educator and scientist. Before the teaching of the course, lecturer should start with self-reflection and questions:

- How to teach?
- How to motivate students?
- How to develop their thinking, creativity, etc.?

Thus, it is not enough to be good expert in the specialized field. A good teacher must be able to organize a well-structured teaching unit, to manage the teaching, to mobilize students in particular through group work and modern teaching methods, and to make the lesson interesting. A good teacher communicates with students outside the class, raises problems, lead students to system solutions, but leaves the own solution on them.

Other forms of university teaching

The so-called additional, but equally important forms of university teaching and learning are practical seminars, laboratory work, consultations, field work, seminars, team work, group presentations, non-university programmes. Proposals of the most appropriate teaching methods and forms is crucial in order to understand the subject properly. It is up to the teachers what methods and forms are proposed, but it always depends on the nature of the course. This requires a lot of skill and experience.

For example, to gain knowledge and proper understanding of the subject, the most appropriate form is the university lecture and seminar. In order to acquire the ability of analysis and synthesis but mainly to obtain problem-solving skills, the most appropriate form are practical seminars that can be implemented in workroom, laboratories, natural or field conditions. During such practical seminars, individually practical tasks and projects are assigned, and are subsequently presented and discussed during work in groups.

Professional experience – practice

The practice is an indispensable component of the educational process. Practice has to be part of the professional development of student. It is also a good opportunity to validate gained knowledge in specific working conditions.

The aim of the practice is:

- To gain knowledge on a specific technology and specific work processes,
- Acquisition of practical skills at the specific workplace.

During the professional experience, student may gain valuable knowledge, experience and contacts that may help him/her later in order to resolve the topic of final thesis, or even the searching employment.

5.3 Learning outcomes

Evaluation and assessment of knowledge must always be in accordance with the methods and forms of teaching as well as forms of assessment. Kennedy et al. (2006) critically reviewed so-called summative approach when assessing student. According to the authors, it is inappropriate if student performance is evaluated only at the end of the teaching process of the course. They recommend a so-called formative approach, which creates favourable (during whole semester) environment for the characteristics of the student and for receiving the feedback. Modern and relatively objective approaches are so-called educational (didactic) tests, which should not be confused with the written form of examination. The least appropriate form is oral examination “face to face”.

5.4 Monitoring and review of study programmes according to standards and guidelines for the quality assurance

The quality of an education system is defined as measurable and verifiable set of knowledge, skills and competences acquired by individual students after completion of education as a whole

or after completion of its partial sections. These results are defined in the graduate profile of the study programme, as well as in the definition of minimum and maximum knowledge level of graduate. It is a tool for measuring the quality of education.

The learning outcomes are stated for each graduate also in the Diploma Supplement, which is part of the documentation of the study completion. Knowledge and skills the graduate gained in the specific study programme are outlined in this certificate. From that point of view, this is a very important document for the employer.

Profile and knowledge level are also documented for the study applicants in the promotional materials and websites of the faculty. Teachers, students, and the public are informed as well.

The monitored indicator for quality assessment of the study programme graduates´ are influenced by the conditions that are created for its implementation. The institution, its amenities, literature availability, information resources, technical support of education, and other support for students are evaluated. Regular feedback from employers and practice also can be used for monitored the quality of the study programme.

6 Literature

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