Curricula Development in Bologna Process

Bela MARKUS, Hungary

Key words: Curricula Models, Quality Issues of Education and Training

SUMMARY

Nowadays extensive changes take place in all economical and social spheres, outlining the era of a knowledge-based society. People of the new millennium have a growing demand for information. Globalization in a good sense, the increase of data sources, the growing of communicational channels and the demand for complex analysis induct this process. The traditional suppliers of such information have experienced profound transformation in recent years. It is essential for the education to follow this transformation, which means the renewal of the foregoing educational forms, the alteration of the curriculum, the potential change of the organizational structure and the development of the infrastructure.

The Bologna Process generates a wide ranging reform of higher education in Europe. The main aim is to create a European Higher Education Area by 2010 in which mobility of staff and students and recognition of studies will be easier. The new system would place the diversified national systems into a common frame based on three outcome levels - Bachelor, Master and Doctoral.

The paper is dealing with the curricula development efforts of the College of Geoinformatics, University of West Hungary regarding Bologna Process. The main market for us is land administration. Land registry and mapping sector has such important tasks as e.g. providing digital spatial infrastructure for the information society, recording tasks related to the agrarian assistance and the redistribution of land property together with its preparations. Geoinformation technology will soon spread in land offices. Well prepared specialists are required for these tasks. The curriculum should be proactive taking into account both the Bologna Process and the new needs of the society. Results of the investigations will be presented in the paper.

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1. BACKGROUND

The Bologna process is a challenge to create an open European higher education area, a frame that is expected to facilitate closer cooperation between higher education institutions, make easy student and staff mobility. The basic aims of the Bologna Declaration may be summarised in three key words: mobility, employability, and competitiveness. In more detail, the objectives are the following (Teodosiu, 2003):

- adoption of a system of easily readable and comparable degrees;
- adoption of a system essentially based on two main cycles, undergraduate (bachelor - BSc) and graduate (master – MSc);
- establishment of a system of credits – such as in the European Credit Transfer System (ECTS) - as a proper means to promoting the most widespread student mobility;
- promotion of mobility by overcoming obstacles to the effective exercise of free movement;
- promotion of European co-operation in quality assurance with a view to developing comparable criteria and methodologies; and
- promotion of the necessary European dimensions in higher education.

The Berlin Communique of the Conference of Ministers responsible for Higher Education (2003) underlined the importance of all elements of the Bologna Process for establishing the European Higher Education Area and stress the need to intensify the efforts at institutional, national and European level. However, to give the Process further momentum, it is proposed to foster the process in the next two years. It is important to strengthen the efforts to promote effective quality assurance systems, to step up effective use of the system based on two cycles and to improve the recognition system of degrees and periods of studies.

Quality Assurance: The quality of higher education has proven to be at the heart of the setting up of a European Higher Education Area. Therefore, the Communique proposed that by 2005 national quality assurance systems should include:

- A definition of the responsibilities of the bodies and institutions involved.
- Evaluation of programmes or institutions, including internal assessment, external review, participation of students and the publication of results.
- A system of accreditation, certification or comparable procedures.
- International participation, co-operation and networking.

Degree structure: all Ministers commit themselves to start the implementation of the two cycle system by 2005.

The changes are now reaching Hungarian universities and the dimensions set in the process are being adapted or taken in consideration also by the University of West Hungary. In view of the above, several actions were started:

- 2002 - the introduction of a credit accumulation system compatible with the ECTS, in order to enhance the flexibility of national higher education system and to promote mobility;
- 2003 - the implementation of a common national frame of reference for qualifications, serving as a reference point (in BSc studies), but also allowing for differences (in MSc courses); and
- 2004 - the adaption of a European dimension in quality assurance, evaluation and accreditation, by means of compatible quality management systems.

A new Act on Higher Education is under preparation, planned to be issued in May 2004. The Ministry of Education expects the introduction of the two-cycle, linear BSc-MSc system in 2006.

2. PRESENT SITUATION

The College of Geoinformatics, University of West Hungary in Székesfehérvár had an important place in lands and mapping education and training in the last three decades, and it will have to carry out a task of at least the same importance in the first decades of the new millennium. It has a great influence on the different sectors of the national economy, the security of private property, the digital map supply of infrastructure development, the information systems of public administration on the basis of data supply required.

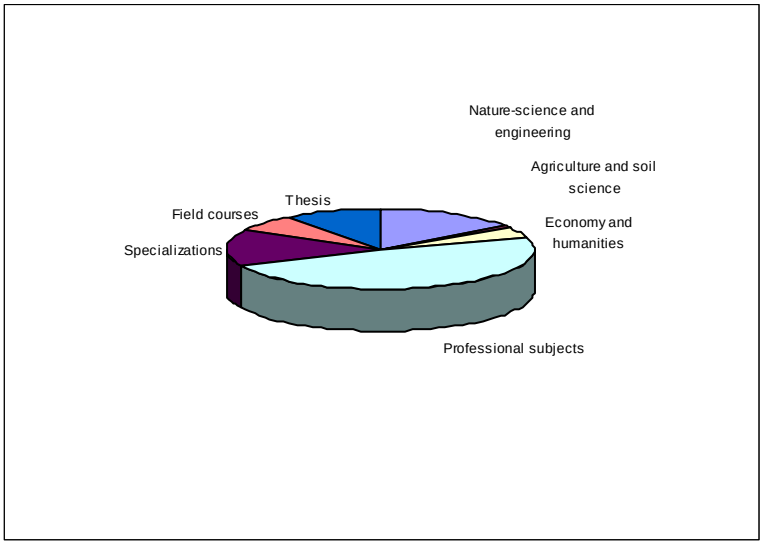
Students in the surveying and land management branch has such important tasks as e.g. providing digital spatial infrastructure for the information society, administrative and technical tasks related to the agrarian assistance and the redistribution of land property together with its preparations. Geoinformation technology is widely used in the country. Well prepared specialists are required for these tasks.

The College of Geoinformatics was not only able to preserve its dominant role in the last period, but expanded the target area and have launched a new (land administration) branch in 2001 (the first diplomas have been handed over just this year). This successful technical-legal course has opened up new perspectives in the life of the College. The number of students increased from 300 to 1000 within the last 3 years.

Due to the good relationship with the land offices, the trade and the industry, the College led many successful continuing study courses. We got leadership in the National Cadastral Program educational project and in the training of the new computer-based TAKAROS, TAKARNET and META system. Relying on the college traditions, we would like to continue these initiations broadening and intensifying them with all our might.

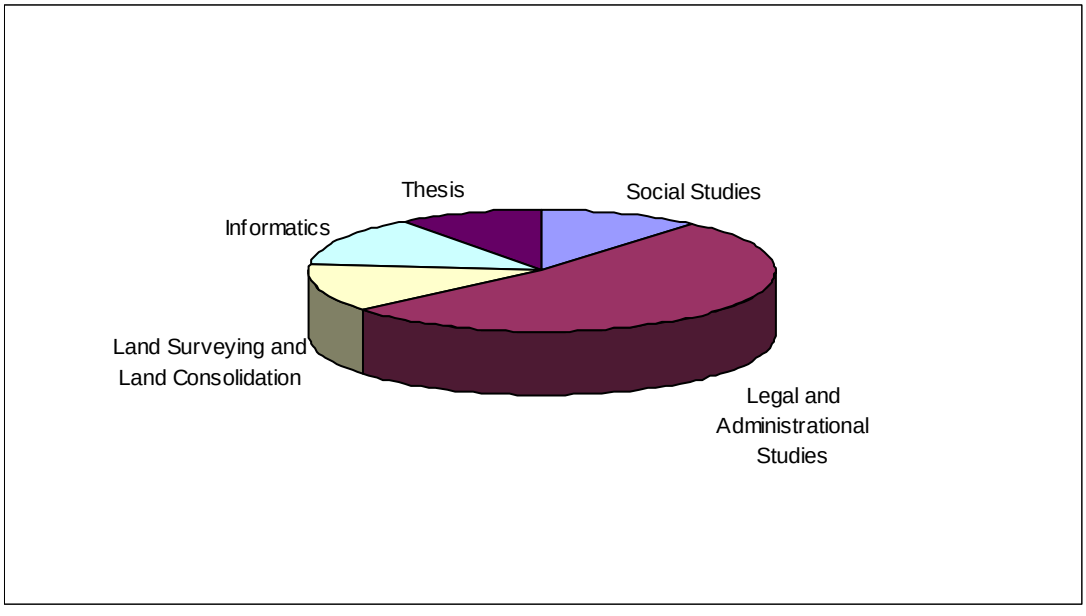
Overview of the subjects of the Surveying and Land Management branch

Subjects	**Credits**	**Rates**
Nature science and engineering Mathematics, Geometry, Physics, Information Technology I.	26	15 %
Agriculture and soil science Geology and soil science	2	1 %
Economy and humanities Economy, Quality Management, Engineering ethics, Public administration and law	8	4 %
Professional subjects Information technology II, Geodesy, Mapping, Photogrammetry, Projections, Adjustment, Geoinformatics, Geodetic networks, Engineering studies, Engineering geodesy, Topography, System organization and planning, Land surveying, Land registry, Geodesy I, Management	87	48 %
Specializations on **surveying or land management**	26	15 %
Field courses Land surveying (3 weeks), Cadastral surveying (2 weeks), Topography (1 week), Geodetic networks (2 weeks)	13	7 %
Thesis	18	10 %
Total	**180**	**100 %**



Overview of the subjects of the Land Administration branch

Subjects	**Credits**	**Rates**
Social Studies Economics, Statistics, Organizing and Management, Sociology	20	11 %
Legal and Administrational Studies Constitution Law, Public Administration Law, Fundamental Legal Doctrines, International Private Law, Civil Proceedings, Civil and Family Law, Civil Procedural Studies, Agricultural Law, Real Estate Law, Land Registry, Financial Law	95	53 %
Land Surveying and Land Consolidation Land Surveying, Land Management and Landscaping, Land- and Real Estate Evaluation Studies	23	13 %
Informatics Informatics, Geoinformatics, Digital Base Maps	24	13 %
Thesis	18	10 %
Total	**180**	**100 %**



3. LAND DEVELOPMENT NEEDS

Arable land is one of Hungarian national natural resources, which cannot be substituted, but should be improved from time to time. Important economic interest is involved in its protection and its adequate utilisation. One prominent field among the activities of Land Offices is to perform tasks connected with the protection of arable land and with its proper use (MARD-FÖMI, 2003).

Arable lands can be used for non-agricultural purposes only by the leave of authority. To the utilisation of arable lands for industry, mining, water conservancy, transport, community development and/or other purposes, a permission has to be granted by the Land Offices.

However, the utilisation of arable land under permission does not provide preventing force all by itself and further, the areas should be compensated which inevitably have to be used to investments. Therefore, in case of non-agricultural utilisation of arable land, besides the permission, a land protection fee should be paid by the user, too.

As an undesired by-product of land privatisation carried out in the last decade, scattered property patterns have been formed in our country, e.g. properties of arable lands belonging to a single landowner dispersed at 5-10 different field units, far from each other. This fact is very disadvantageous from the point of view of economical production. To overcome this situation, the present legislation offers one possibility: spontaneous land exchange. Arrangement of such exchanges, especially in case of several property owners, needs much skill and proficiency. Therefore, since the possibility is legally given, those intending to exchange their lands would rather do request the assistance of the competent land office.

In connection with land utilisation, Land Offices have a dual task. One of them is checking the obligations of farming the land, the other is promoting land consolidation by means of spontaneous land exchanges.

The aim of the new land consolidation concept is to define the relation between land property and land use. This consolidation makes it possible to form reasonable sized agricultural farms on the basis of private farming and lease-firm and to improve the ownership structure with the required state support. The aim of the new concept is to transform the relations of the landed properties and land use:

- marketable agricultural producing on the basis of the private farming and lease-firm;
- to improve the ownership structure with required state support;
- to shape the optimal size of the state farming and forestry;
- the production structure adjust to agricultural environmental conditions;
- make agreement between the plans of the land consolidation and regional development;
- demands of the soil protection;
- protect the natural worth and the environment;
- protect historical and archaeological sites;

4. LAND DEVELOPMENT BRANCH

As a consequence of the land reform process – compensation, shared property arrangement, privatization – the land use structure in Hungary became unsuitable for competitive, profitable agriculture, with special regard to Hungary's EU accession. A number of measures have been taken to support the development of competitive cultivation units (family estates, farm leasing enterprises, etc.). Land consolidation in the future will be realized through the objectives of the Strategic Programs of Regional Development together with a change in agricultural systems.

To fullfil the above mentioned needs the College is focusing on the design of a curriculum of a new specialization (land development). The course will be realized with an environmental approach, emphasizing regional aspects, adjusted to the regions' development concepts. According to our plan, the curriculum flexibly ensures launching specialists trends at the faculties of the University of West Hungary. The course structure follows the two-stage Bologna Declaration: after 3 years of study a bachelor degree (BSc), and a 2 year complementary study a master degree (MSc) can be achieved.

According to the Munich Statement in 2002 "*the small and fragmented parcels, sometimes scattered over different political, juridical and administrative boundaries obstruct spatial/territorial planning especially in terms of land administration, land use planning, and land management. This hampers the implementation of rural regional development policies, strategies, programmes, and projects aimed to improve rural livelihoods. Land consolidation: a gate towards sustainable rural development*." The statement underlines the need to evolve necessary competence and skills. The accreditation and introduction of the land developer engineer branch fits smoothly into these guidelines.

In order to harmonize the tasks, the Hungarian Parliament framed a law in 1996 (XXI.) on land management, in which the organizational structure of land development is also defined.

Outcomes of the land development course are engineers, experts who will be able to create syntheses of opposing processes with a regional focus in a given area. This is an interdisciplinary training with a complex approach, whose pillars are society, economy and environment.

The land development strategies of EU countries are very diverse. The structures of agriculture, forestry, and education are serving these. Among them we can find examples, which can be used to work out a Hungarian model conform to local conditions and national features. We have to learn and teach that building a land development strategy is an objective oriented process in which elements succeed one another in an orderly manner from intentions to realization and verification.

In the last years – as a part of county-level and regional strategies and future organizations – some objectives have been formed:

- the shaping and management of regional and sub-regional programs,
- increasing the volume of R+D,

- exploiting cooperation between research and higher education,
- enforcement of sustainable development.

According to governmental programs in order to establish the profitability and competitiveness of agriculture, a suitable land structure has to be formed. Unlike former models, the new models will be executed as a part of sub-regional programs with "SAPARD" support, and will solve regional development problems. It utilizes German and Dutch experiences.

Since 1980 the College has worked out several variants to upgrade the land management education.

- In 1989 as a part of the strategic development of agrarian education the curriculum of a 4-year training has been prepared.
- In 1995-96 we prepared and submitted a modernized curriculum of land management course to the National Accreditation Committee.
- In 1997 referring to the modified higher educational law a request for an MSc course foundation has been prepared.

4.1 The Aim of the New Bsc – MSc course

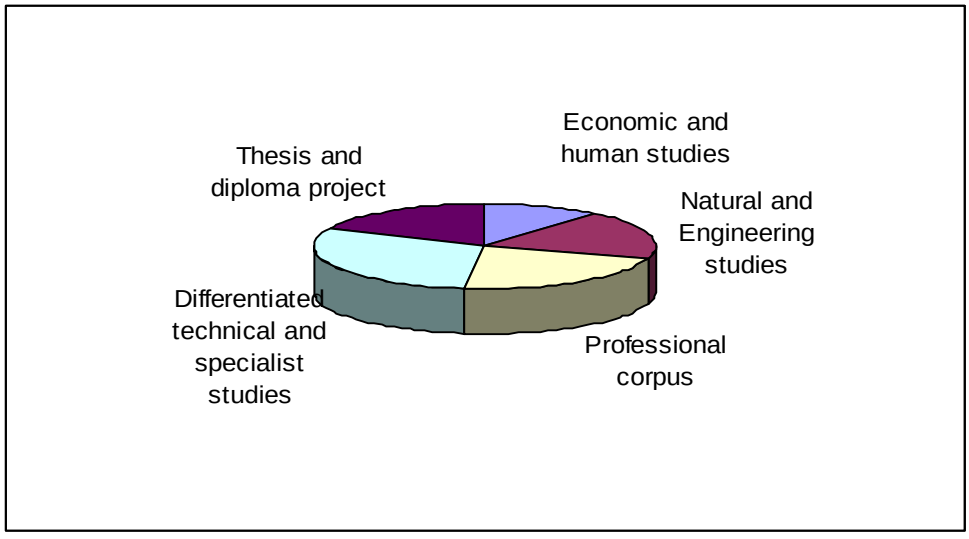
The aim is to educate land developer experts of a higher degree for organs of land and regional development, associations of local-governments, land management, agriculture and forestry, who:

- know and are able to apply the complex and delicate processes and legal background of land development,
- examine processes in natural and man-made environment, society and economy focusing on regional approaches,
- contribute to the region's environmentally conscious development and assure the strategic objectives of environmental protection and sustainability,
- understand, plan and operate models of regional development and land consolidation, are able to formulate regional programs, participate in organs of execution and disposition,
- by practice are suitable to guide development and scientific activity,
- are able to improve their skills and expertise continuously adjusted to the changing conditions,
- through thorough grounding are able to prepare national and international applications,
- through technical and language skills are able to collaborate in EU projects with different partners.

Overview of the subjects of the Land Development (MSc) branch

Subjects	Credits	Rates
Economic and human fields General law, Administrative law, EU law and institutions, Agrarian law, Economics, Regional economy, Sociology	34	11%

Subjects	Credits	Rates
Natural and Engineering fields Mathematics, Statistics, Geography, Biology, Information technology, Surveying, Geoinformatics, Construction, Base maps, Topography	56	19%
Professional corpus Basic agriculture, Environmental protection, Rural development, Land development, Land use, Regional planning, Resettlement, Regional and settlement marketing, Project management, Landscape management, Forestry	66	22%
Differentiated technical and specialist fields Applied mathematics, Photogrammetry, Structural funds (EU), GIS decision making, GIS applications, Environmental management, Land development politics and strategies, Forest and land consolidation, Photointerpretation and remote sensing, Landscape planning, Digital cartography, Transport and water systems, Public finance and procurement, Land assessment, Municipal management, Enterprises and human resources management, Land registration, Urban sociology, Global economy, Logistics, Fiscal law **Miscellaneous optional subjects** Communication, Quality Assurance, Tourism, Ecology, Political science, Accounting, Cultural heritage protection	90	30%
Thesis and diploma project	54	18%



4.2 The Duration of the course

- Number of *semesters:* BSc level 6, MSc level 4.
- Total amount of *study hours***:** 4150+2700=6850.
- Number of *contact hours*: 2006+1296=3302.
- *Credits* needed to receive a diploma: 180+120=300.

Minimal and maximal percentage of credits:

- *Compulsory* subjects (A): min 61% (BSc level), max 53% (MSc level)
- *Required* for specialization subjects (B): min 33% (BSc level), max 40% (MSc level)
- *Optional* subjects (C): min 6% (BSc level), max 7% (MSc level)

4.3 Ratio of theoretical and practical training

- BSc level: 73% theoretical, 27% practical
- MSc level: 70% theoretical, 30% practical

On the basis of the above mentioned details the establishment of the BSc and MSc level course on land development is fulfilling both the educational needs and the requirements of the society.

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BIOGRAPHICAL NOTES

Bela Markus is a land surveyor, M.Sc., Ph.D., professor of Geoinformatics, and director of the College of Geoinformatics, University of West Hungary. He has 30 years teaching experience in surveying, 15 years in teaching GIS and 10 years in development and organization of open, distance learning professional courses for land administration. Prof.

Markus has over seventy published papers on various aspects of using GIS. He is actively involved in many national and international academic programmes, is chairman of the National Committee, Association of Hungarian Surveyors and Cartographers, chairman of the Hungarian UNIGIS Course Board. He is member of Board of Directors of FIG Foundation. From 2002 he is chairing the FIG Working Group 2.4 – Knowledge in Spatial Information Management. Prof. Markus is member of AGILE Council and EUROPACE Executive Committee.

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Curriculum for Land Development Engineering, Full-time education, Land Consolidation branch →																			
BSc Semesters and credits per semester											**MSc Semesters and credits per semester**								
Subject	**1(15)**	**2(14)**	**3(15)**	**4(14)**	**5(15)**	**6(10)**	**Credits**	**Lec**	**Pra**	**Sum**	**Subject**	**7(15)**	**8(14)**	**9(15)**	**10(10)**	**Credits**	**Lec**	**Pra**	**Sum**
Mathematics	2+2v						A/5	30	30	60	Applied mathematics	2+2v				A/4	30	30	60
Statistics		2+1v					A/4	28	14	42	Photogrammetry	3+2v				A/5	45	30	75
Geography I. II.	2+0v	2+0v					A/2+2	58	0	58	Structural funds (EU)				3+0v	A/3	30	0	30
Biology I. II.	3+0v	3+0v					A/4+4	87	0	87	GIS decision making	2+2v				B/4	30	30	60
Information technology I. II.	3+3v	3+3v					B/6+5	87	87	174	GIS application		2+3f			B/5	28	42	70
General Law I. II.	3+0v	3+0v					A/4+4	87	0	87	Environmental management I. II.	3+0v	2+0v			A/3+2	73	0	73
Economics I. II.	3+0b	3+0b					A/4+3	87	0	87	Land devt. politics and strategy. I. II.	3+0v	4+0v			A/5+4	101	0	101
Regional economics			3+0v				A/3	45	0	45	Forest and land consolidation I. II.			2+0b	2+0v	A/3+2	50	0	50
Agriculture	3+0v						A/3	45	0	45	Photointerpret. and remote sensing		2+2v			B/4	28	28	56
Administrative law I. II.		2+0v	3+0v				A/3+4	73	0	73	Landscape planning I. II.		3+1v	2+1v		B/4+4	72	29	101
Surveying			2+1v				B/4	30	15	45	Digital cartography			2+1v		C/3	30	15	45
Environm. and nat. protection		3+0b					B/3	42	0	42	Transport and water systems I. II.	2+1v	2+0v			B/2+3	58	15	73
Rural development I. II.			3+1v	3+0v			A/5+3	87	15	102	Public finance and procurement			3+0v		A/3	45	0	45
Land development I. II. III.				3+2v	3+2v	3+2v	A/6+6+6	117	78	195	Land assessment	2+0b				C/2	30	0	30
Rural tourism			2+0b				B/2	30	0	30	Municipal management				3+1v	A/5	30	10	40
Land use			2+0v				B/2	30	0	30	Enterprises and HR management I. II.			2+1b	2+1v	A/3+3	50	25	75
Geoinformatics I. II.					2+2b	2+2v	B/4+4	50	50	100	Land registration		2+1v			C/3	28	14	42
EU law and institutions				3+0v			A/4	42	0	42	Communication training				0+3a	C/3	0	30	30
Land consolidation I. II.				2+0v	2+0v		A/3+3	58	0	58	Urban sociology				2+0b	B/2	20	0	20
Urban development I-II				2+1v	3+1v		A/4+4	73	29	102	Resource management			3+0v		A/4	45	0	45
Sociology						2+0v	C/2	20	0	20	Global economic issues			2+0v		B/2	30	0	30
Construction I. II.			2+2f	2+2v			A/4+4	58	58	116									
Regional and settl. marketing					3+2v		A/5	45	30	75									
Project management I. II.					2+2v	2+2v	A/4; C/4	50	50	100									
Base maps				2+2b			C/4	28	28	56									
Landscape management			3+0v				B/3	45	0	45									
Agrarian law						3+0v	B/3	30	0	30									
Diploma work						0+6a	B/24	0	60	60	Diploma work			0+5a	0+7a	B/30	0	145	145
Total	24	24	24	24	24	24	Ö: 180	1462	544	2006	Total	24	24	24	24	Ö: 120	853	443	1296
Lec - lectures	19	20	20	17	15	11					**Lec** - lectures	17	17	16	12				
Pra - practicals	5	4	4	7	9	13					**Pra** - practicals	7	7	8	12				
Foreign lang. (comm, tech.)	60	56	60	56	0	0					Foreign lang. (comm, tech.)	2 weeks in 4. and 8. semester= 2×2 week= 160 lessons							
Examination	6	6	6	6	5	5					Examination	6	6	5	4				
Project Report	1	2	1	1	1	0					Project Report	1	0	2	1		Total:		3462
Facultative subjects																			
Communication				2+2b			C/4	28	28	56	Media studies			2+1v		C/3	30	15	45
Settlement history						2+0v	C/2	20	0	20	Ecology	2+0b				C/2	30	0	30
Topography						2+2v	C/4	20	20	40	Political science		3+0v			C/3	42	0	42
Contract studies						2+2v	C/4	20	20	40	Accounting				1+2v	C/3	10	20	30
Quality Assurance						2+0v	C/2	20	0	20	Cultural heritage protection	2+0b				C/2	30	0	30

Abbreviations: v – exam, b – project report, A – compulsory, B – required for LD specialization, C - optional