

University  
of Ljubljana

Faculty  
*of Civil and Geodetic  
Engineering*



**Presentation of the study programme**

**2<sup>nd</sup> CYCLE MASTER STUDY PROGRAMME**  
***SPATIAL PLANNING (MA)***

Valid from study year 2018/2019

## 1. Information about the study programme

The second cycle master's study programme *Spatial Planning* consists of 2 years (4 semesters) and amounts to 120 ECTS points. The study programme does not include orientations. The study program is carried out as a regular and a part-time study.

## 2. Basic goals of the programme

The study qualifies students to top professionals in the areas of sustainable spatial planning, regional planning and spatial environment protection for the work with spatial plans and in sectorial planning, in the administration, development, research and educational work. Apart from the employment positions in business companies for spatial planning and spatial management, some other major work areas are government, regional and municipal administration, regional development agencies, regional research, international planning, positioning of major projects into space. The study also qualifies experts for special spatial sciences such as spatial planning of tourism, industry, agriculture and forestry, location decisions, traffic planning, spatial planning of electricity and water supply, municipal environmental and other systems, education of experts for the evaluation of impacts on environment and for international spatial planning. The graduate will be qualified for the work of authorised spatial planner and urbanist with licence of the Chamber of Architecture and Spatial Planning of Slovenia (ZAPS).

The study is organised in the framework of the studies offered at UL, FGG, the Department of Geodesy, but due to its interdisciplinary nature it is also interesting for students from other faculties with finished first degree who wish to focus on spatial planning. For students who already possess basic knowledge from spatial sciences there are no entry conditions, all other shall pass differential exams. In the majority of the developed European countries and the world spatial planners get the main skills at the second degree, when their special knowledge is upgraded with interdisciplinary knowledge of spatial planning.

The study program qualifies students for spatial planners – generalists with balanced knowledge and skills from the areas of spatial planning, environment protection, geoinformation, urban and regional geography, spatial legislation, spatial economy, spatial sociology, infrastructural systems and other spatial sciences.

## 3. General competences

- generally well-informed and possessing knowledge from academic areas and scientific methods of work,
- development of skills to define, research, understand and creatively solve problems, principles and theories,
- critical observation and understanding of the situation in space, planning as individuals or within teams, independent collection of knowledge and search for sources,
- development of abilities of critical, analytical and synthetic thinking,
- qualified for the transfer and use of theoretic knowledge in practice and solving of professional and practical problems,
- development of professional and ethical responsibility,
- development of scientific literacy, public appearance and communication with customers,
- presentation and explanation of knowledge and results,
- general communication competences acquired mainly through presentations and discussions in seminars and within field work as preparation for practical tasks,
- ability to use foreign professional language in written and oral communication, communication in national and international scientific circles,
- ability to use information-communication technology,
- skills for creating interdisciplinary connections,
- respect for safety, functional and economic planning, nature protection and ecological aspects at work,
- development of moral-ethical standards (integrity of working with clients, unbiased advice, independence and expertise according to valid legislation),
- building an objective view to environment and society,
- acceptance of professional responsibilities to participants in spatial planning and to society as a whole

## 4. Course-related competences

Course-specific competences acquired with the programme:

- understands the role and importance of spatial planning in modern society;
- understands the role and importance of implementing sustainable principles of interventions into space, environment protection and natural resources;
- is qualified for spatial planning at the local, regional, national and international levels;
- acquisition of licence for spatial planning and urbanism ZAPS (Chamber of Architecture and Spatial Planning),
- is qualified for the work at responsible positions in government administration regarding location decisions, inspections, for the coordination of sectors related to interventions into space;
- is qualified for the work with strategic development plans and implementation plans of municipalities, regions, state and with strategic plans of economic public services; inclusion into international spatial planning (in EU and outside);
- is qualified for the harmonisation of development and safety demands within interventions into space;
- is qualified for ensuring democratic principles within interventions into space and acceptability in social environment;
- is qualified for assuring market success and economic land development;
- is qualified for managing spatial databases, managing GISs for different tasks, spatial analyses and forecasts;
- is capable of synthesising spatial-environmental, economic, social, cultural and other components of integral planning;
- is capable of creating new knowledge in the profession with the emphasis on interdisciplinary character of phenomena in the space;
- is qualified for educational, research and development work in the areas of spatial planning and environment.

## 5. Conditions for enrolment

The second cycle master's study program Spatial Planning is available to the graduates from:

- a) 1<sup>st</sup> cycle studies from the areas of spatial studies and spatial development;
- b) 1<sup>st</sup> cycle higher education professional studies before the introduction of the Bologna reform from the area of spatial studies and spatial development;
- c) graduates of 1<sup>st</sup> cycle academic programmes of related studies, provided that before enrolment candidates finish study obligations essential for the continuation of study and containing contents from spatial planning, statistics and use of GIS tools; any missing contents shall be defined considering the differences of the professional field in the form of differential exams consisting of 10 to 60 ECTS. Candidate may pass such exams during the 1<sup>st</sup> cycle studies or before the enrolment to the master study of Spatial Planning;
- d) 1<sup>st</sup> cycle higher education professional study before the introduction of Bologna reform from related areas, provided that before enrolment candidates finish study obligations essential for the continuation of study and containing contents from spatial planning, statistics and use of GIS tools; any missing contents shall be defined considering the differences of the professional field in the form of differential exams consisting of 10 to 60 ECTS; Candidate may pass such exams during the 1<sup>st</sup> cycle studies or before the enrolment to the master study of Spatial Planning.

Obligations of the individual bridging programme shall be defined by the Study Board of the Department of Geodetic Engineering according to the missing knowledge of the candidate as obtained in previous education. The same is valid for the enrolment of students from other higher education institutions in Slovenia, EU and elsewhere.

The number of places is determined in the Call for enrolment into second cycle study programmes of the University of Ljubljana individually for each academic year.

## 6. Selection criteria when enrolment is restricted

In case of restricted enrolment the following conditions shall be considered: grade obtained in the first cycle study (100%).

## **7. Criteria for recognising knowledge and skills acquired before enrolment in the programme**

The student can be acknowledged the knowledge that matches the contents and scope of the study in the programme Geodesy and Geoinformation. The Study Board of the Department of Geodesy UL FGG takes decisions regarding the acknowledgement of knowledge and skills acquired before the enrolment, based on the student's written application, the enclosed certificates and other documents evidencing the successfully acquired knowledge and contents of this knowledge, and in accordance with the Rules on the procedure and criteria for the acknowledgement of informally acquired knowledge and skills, adopted on 29 May 2007 at the 15th meeting of the Senate of UL, 29.5.2007.

For the acknowledgement of knowledge and skills the following shall be considered:

- certificates and other documents evidencing finished courses and other forms of education,
- evaluation of plans, studies, research work, publications and other original works of the student,
- evaluation of knowledge acquired by the student based on self-education or learning from experiences (possibility of completing study obligations without participation at lectures, practical work, seminars),
- adequate work experiences.

Shall the Study Board of the department establish that the acquired knowledge may be acknowledged, this shall be evaluated with the same number of points according to ECTS as the number of points in the subject.

## **8. Methods of assessment**

The assessment methods are in accordance with the [Statute of University of Ljubljana](#) and listed in the Course Syllabi.

## **9. Conditions for progression through the programme**

### **9.1 Conditions for progression from one year to another**

The student may enrol to subsequent year, if they complete by the end of the study year all the obligations foreseen by the study plan, amounting to at least 45 ECTS.

Exceptionally the student may enrol to subsequent year if he/she has not completed all his/her obligations defined by the study programme as the condition to enrol to higher year, if they have justifiable reasons as defined by Article 153 of the Statute of UL (maternity, longer disease, exceptional family and social circumstances, certified status of a person with special needs, active cooperation at top expert, cultural and sports events, active cooperation in the bodies of the University).

Under the conditions from the above paragraph the student may enrol to subsequent year with at least 30 ECTS points collected. The Study Board of the Department of Civil Engineering of UL FGG adopts the decisions about the enrolment from the above paragraph.

Students with above average study results will be allowed faster advancement. Based on the student's application and justified opinion of the Study Board of UL FGG the final decision about such advancement is adopted by the Senate of UL FGG. With its decree the principles of faster progress shall be defined.

### **9.2 Conditions for repeated enrolment in the same year**

Failing to meet all the obligations defined by the study programme for the advancement in the next year, students may enrol in the same year for the second time. They are entitled to the repeated enrolment only once for the duration of the study, provided that they achieve at least 30 credit points according to ECTS.

## **10. Transfers between study programmes**

Transfer between programmes shall mean termination of education in the student's original study programme (first programme) and continuation of education in the second cycle master study programme of Spatial planning (second programme), in which a part of the completed study requirements from the first study programme are recognised as completed.

Transfers are possible from the second cycle study programmes, and until their expiration also from the undergraduate academic study programmes adopted after June 11 2004, where the competences of the finished studies are comparable and according to the acknowledgement criteria at least half of the obligations according to ECTS from the first study programme related to compulsory courses of the second study programme can be acknowledged. Considering the scope of acknowledged obligations from the first study programme in the Republic of Slovenia or abroad student may enrol to the same or higher year in the second study programme. Transferring students shall fulfil the conditions for the enrolment to the second study programme.

Applications of candidates for the transfer to the second cycle master study programme Spatial planning and the scope of acknowledged obligations in the study programme will be examined individually by the Study Board of the Department of Geodesy. If in the procedure of acknowledging obligations for the purpose of transfer the candidate is approved at least the amount of credit points and those point that are required for the enrolment to a higher year of the second cycle master study programme Spatial planning, the candidate may enrol to the higher year of the second cycle master study programme Spatial planning.

## **11. Conditions for completion of the study**

Students finish the study by accomplishing all the prescribed obligations totalling 120 points according to ECTS, including practical training and submission and defence of the Master thesis.

## **12. Conditions for completion of individual parts of the programme**

The Study is uniform.

## **13. Qualification, professional or academic title**

- magister prostorskega načrtovanja (second cycle graduate in spatial planning)
- magistrica prostorskega načrtovanja (second cycle graduate in spatial planning)

## **14. Qualification, professional or academic title (abbreviation)**

- mag. prost. načrt.

## **15. Classifications**

- KLASIUS-SRV: Master study (2<sup>nd</sup> cycle Bologna)/master study (2<sup>nd</sup> cycle Bologna) (17003)
- ISCED: architecture, urbanism and civil engineering (58)
- KLASIUS-P: Architecture and urbanism (drugo) (5819)
- Frascati: Technical sciences (2)
- Level SOK: Level SOK 8
- Level EOK: Level EOK 7
- Level EOVK: Second cycle

## 16. Study programme courses, Syllabus

1 <sup>st</sup> YEAR	Contact hours							Σ SO*	ECTS*
	L	S	ST	LT	FW	OW	Σ CH*		
<b>1<sup>st</sup> semester</b>									
Property Law	30		30				60	120	4
Elective Course I	45	30	15				90	180	6
Basics of Spatial Sociology	30		15				45	90	3
Landscaping and Environment Protection	30			25	5		60	120	5
Composition and design	30			30			60	120	4
Spatial Planning Methodology with Project Work	45		75		30		150	300	10
<b>Total 1<sup>st</sup> semester</b>	<b>210</b>	<b>30</b>	<b>120</b>	<b>55</b>	<b>35</b>		<b>450</b>	<b>900</b>	<b>30</b>

<b>2<sup>nd</sup> semester</b>									
Cartographic Representation	30			45			75	150	5
Urban Planning with Project Work	30		45		15		90	180	6
Spatial Data Analyses	30			30			60	120	4
Rural Planning	45		45				90	180	6
Cadastral Land Rearrangement	30			30			60	120	4
Municipal Economics and Housing Policies	30	15	45				90	180	6
Elective subjects I (FGG or UL)	45		30	15			90	180	6
<b>Total 2<sup>nd</sup> semester</b>	<b>180</b>	<b>15</b>	<b>135</b>	<b>105</b>	<b>15</b>		<b>450</b>	<b>900</b>	<b>30</b>

<b>Total 1<sup>st</sup> and 2<sup>nd</sup> semester</b>	<b>345</b>	<b>120</b>	<b>255</b>	<b>160</b>	<b>50</b>		<b>900</b>	<b>1800</b>	<b>30</b>
---	------------	------------	------------	------------	-----------	--	------------	-------------	-----------

2 <sup>nd</sup> YEAR	Contact hours							Σ SO*	ECTS*
	L	S	ST	LT	FW	OW	Σ CH*		
<b>3<sup>rd</sup> semester</b>									
Spatial Statistics	30		30				60	120	4
Regional Spatial Planning	30		30				60	120	4
Spatial Economics	21		24				45	90	3
Infrastructural Systems with Seminar	15	30	45				90	180	6
Elective course II	45		45				90	180	6

<b>Total 3<sup>rd</sup> semester</b>	<b>147</b>	<b>30</b>	<b>174</b>			<b>120</b>	<b>399</b>	<b>870</b>	<b>29</b>
--------------------------------------	------------	-----------	------------	--	--	------------	------------	------------	-----------

<b>4<sup>th</sup> semester</b>									
Real Estate Management	30		15				45	90	3
Infrastructural Systems with Seminar	30		15				45	90	3
Introduction to Master Thesis	5		45			10	60	120	4
Project task with seminar		60	60			30	150	300	10
Master thesis						150	150	300	10
<b>Total 4<sup>th</sup> semester</b>	<b>50</b>	<b>75</b>	<b>150</b>			<b>190</b>	<b>465</b>	<b>930</b>	<b>31</b>

<b>Total 3<sup>rd</sup> and 4<sup>th</sup> semester</b>	<b>197</b>	<b>105</b>	<b>324</b>			<b>330</b>	<b>864</b>	<b>1800</b>	<b>60</b>
---	------------	------------	------------	--	--	------------	------------	-------------	-----------

<b>ELECTIVE PROFESSIONAL COURSES</b>	<b>Contact hours</b>							<b>Σ SO*</b>	<b>ECTS*</b>
	<b>L</b>	<b>S</b>	<b>ST</b>	<b>LT</b>	<b>FW</b>	<b>OW</b>	<b>Σ CH*</b>		
Remote Sensing	30			15			45	90	3
Real Estate Valuation	45		45				90	180	6
Spatial Data Positioning and Acquisition	45			45			90	180	6
Environment Planning and Impact Assessment	15		30				45	90	3
Urban Renewal	15		30				45	90	3
Water-Related Outdoor Activities	30		45			15	90	180	6
<b>Total Elective professional courses</b>	<b>180</b>		<b>165</b>	<b>45</b>		<b>15</b>	<b>405</b>	<b>810</b>	<b>27</b>

L – lectures; S – seminar; SP – seminar practicals; LP – laboratory practicals; FW – field work; OW – other work; CH – contact hours;

SO – study obligations

\* student obligations total 60 ECTS/year, which agrees with 1800 hours/year; hours include contact hours + independent work

## 17. Possibilities of elective courses and mobility

During the study student selects two elective subjects: one in the 2nd semester and one in the 3rd semester. Each elective subject is evaluated with 6 ECTS. The study programme proposes six elective professional subjects (Spatial Data Positioning and Acquisition, Urban Renewal, Remote Sensing, Real Estate Valuation, Environment Planning and Impact Assessment and Water-Related Outdoor Activities). Among other elective subjects from FGG, students are recommended to select subjects from the areas of traffic infrastructure and hydrology. Among external elective subjects from other faculties as members of UL, from other universities and higher education institutions in Slovenia or abroad, mainly contents from the areas of law, spatial economics, administration, communicology, computer science, foreign language, etc., are recommended.

Student may transfer 30 ECTS points of the programme (one study semester, regardless of compulsory and elective units) from any other area of civil engineering, provided that there exists an adequate agreement signed with UL FGG.

## **18. Presentation of individual courses**

### **18.1 Obligatory courses**

#### **PROPERTY LAW (4 ECTS)**

The aim of the course Property Law is to gain basic theoretical knowledge in the field of property law, in particular of real estate law, and to perform an in-depth analysis of applicable legislation and relevant case-law in those segments that are essential to understanding all relevant property law issues of spatial planning. The course is designed multidisciplinary as it covers both substantive and procedural aspects of property law. In addition to theoretical knowledge of property law being a *conditio sine qua non* for successful work of graduates of spatial planning studies, the students will also acquire certain practical skills that will be useful for their future practice. Through various forms of implementation of the study process, in particular through more active participation of the students in the implementation of the curriculum (tutorials, seminars, debates), the students will develop the ability to understand and assess all relevant property-law related technical terms, rules and procedures which will be of utmost importance for their current or future working experience in the field of spatial planning.

#### **BASICS OF SPATIAL SOCIOLOGY (3 ECTS)**

Conceptual and terminological questions; Modes of social construction of space; Dynamics of spatial changes and emerging of new spatial identities; Value changes in »post/modern« societies. New spatial trends: suburbanisation, desurbanisation, new »colonisation of rural space« etc. Some specific characteristics of slovene spatial development. Social implications of spatial projects and the legitimisation problems Analysis of spatial development case studies.

#### **LANDSCAPE IN AND ENVIRONMENTAL PROTECTION (5 ECTS)**

Ideas and concepts, analysis, representation of conditions and processes in landscape, landscape evaluation, conservation and management, landscape in relation to agriculture, agricultural land and soil management, forest and forestry, conservation of cultural heritage, water management and nature conservation, European landscape convention, regional distribution of landscape types in Slovenia, guidelines for landscape management, landscape planning, landscape within administrative procedures, spatial and environmental legislation, green system, improvement/revitalization of degraded landscapes, environmental problems and dilemmas, types of environmental conservation, reconciliation of spatial interests, environmental impact assesment, alternatives, legal/administrative system.

#### **COMPOSITION AND DESIGN**

Spatial elements. Abstraction. Point, line and plane, spatial characteristics, color, texture, scale, the forms of order in space, relations between elements, composition, fine art variables, relations between plane and volume in space, visual perception of elements, observation, drawing, positive and negative space. abstract thinking, landscape in change. light and shadows. seasons. social factors, development of landscape / architectural design and composition, generating new concepts in design, understanding space, spatial perception, orientation.

#### **CARTOGRAPHIC REPRESENTATION (5 ECTS)**

Thematic cartography, thematic presentations, presentation of abstract and dynamic phenomena, analytical and synthetic maps, 3D thematic maps, mountain maps, town maps or settlement maps, aviation maps, school maps, tactile maps, relief maps, anaglyphs, cartographic animation, design of maps for transportable devices, navigational maps, location services and telecartography, multimedia cartography, electronic atlases, web cartography, virtual reality, augmented reality, mapping of nongeographic spaces.

#### **SPATIAL PLANNING METHODOLOGY WITH PROJECT WORK (10 ECTS)**

General information about the course, the multi-disciplinary approach and intra- and transdisciplinarity in the studying and planning of space; relevant paradigms of urban planning (UP), spatial planning (SP) and environmental management; illustration and discussion about lecturer's own projects and experience.



Taxonomy of entities in scientific and professional activities, and planning and plannable categories. Critical approach to spatial (structural) problems with introductory explanations about the domains of architecture, landscape architecture, urban design and landscape design and spatial planning. Methods of rational and planned interventions in corrective actions. Critical analysis of operation of state administration and local self-government in the field of spatial planning, protection and environmental improvement. Different interpretations of planning procedures and procedures for elaboration of plans of different levels, »as products«. Review of the existing spatial legislation with a commentary. Analytic methods and techniques in SP and UP. Visual design analysis in SP and UP. Cycle of guest lecturers.

#### URBAN PLANNING WITH PROJECT WORK (6 ECTS)

Introduction, basic notions and terminology in urban spatial planning; sustainable principles of urban development; development of settlements, settlement typology, urban system; urbanisation and urban land use; urban planning documentation and administrative services; inspection; development of urban areas: land allotment for building development, land acquisition, urban planning; implementation of urban planning documents; databases, urban information systems and their application; urban ecology, environmental impact assessment in urban areas, urban renovation; lectures on housing, production and central land uses; green, transport and municipal areas, and infrastructure systems; visits to urban planning institutions and the Urban Planning Department of the City Administration; design of the implementation plan (construction development plan, municipal detailed spatial plan, spatial management conditions (P.U.P.), renovation plan), based on the master plan or other regulations; analysis of land ownership; land allotment and urban infrastructure (textual and graphical report); to analyse and work on evidence bases for the project in question; data acquisition, land acquisition, plan implementation, and marketing.

#### SPATIAL DATA ANALYSIS (4 ECTS)

Overview of course content, terminology and literature, vector and raster data – comparison, strengths, weaknesses, overview spatial analysis – development and characterization of spatial analysis, implementation of spatial analysis in gis, operators in spatial analysis, overview spatial analysis methods, introduction to geostatistical analysis and spatial statistics, processing of raster layers – logical operations, mathematical algebra, analysis of vector data – topology, algebra, data overlay, analysis of density, distance and direction, neighbourhood analysis, network analysis, values extraction and inquiries, generalization of values, surface modelling – overview of methods, features of interpolation methods, kriging, creating contours, triangulation with optimization, visualisation of spatial data, three-dimensional representation of the terrain and of spatial objects, animated displays spatial plane.

#### RURAL PLANNING (5 ECTS)

The notion of rural areas and their functions, multifunctional significance of rural areas, integration of urban and rural areas (urban–rural continuum), rural settlements (types) and their functions (infrastructure, utilities) , Natural setting and social conditions in rural areas of Slovenia, Rural planning methods and objectives of rural development, understanding of integrated rural development in Slovenia and other European countries, International and national rural development documents, connectivity with measures of agricultural policy and other sectoral documents, Management and development of rural settlements: integrated approach to planning and development of rural settlements, role and significance of interdisciplinary work and significance of various stakeholders, databases for settlement development and planning, agriculture and its requirements in village development, reconciliation of land uses in villages, public utilities in villages, renovation, remediation and reconstruction design, village expansion, acquisition of building land etc., Rural planning using agricultural operations, stages of realisation of these projects, taking into account the overall spatial needs.

#### CADASTRAL LAND REARRANGEMENT (4 ECTS)

Historical background of land policy in Slovenia (agrarian reform, nationalization/restitution, current land policy); Cadastral (re)arrangement for the purpose of construction: land subdivision plan and restrictions; land consolidation; Cadastral (re)arrangement at agrarian operations (land amalgamation and subdivision, consolidation, subdivision for infrastructure projects, expropriation, easements and other legal regimes in the cadastral system), the importance of road network and of other entities in the agrarian landscape; Procedures of mass cadastral rearrangements (management of mass data on land plots and their owners, development of a new land plot structure plan using the concepts of optimization), analyses of current and planned situation; assessment of benefits; Actors and institutions in charge in the field of land rearrangement; motivation of participants (communication, motivation, public hearing, conflict solutions, negotiation and mediation, effective organization of teams and other resources for implementation of land rearrangements); Legal

restrictions of cadastral land rearrangements (land rights and their changes during realization of spatial planning acts, real property rights, easements); sustainable development and influence of land rearrangements using land operation measures; Spatial data infrastructure (SDI) for land rearrangement in Slovenia and EU, land information system (LIS) and software solutions to assist land rearrangements in the Republic of Slovenia; Assessment of data suitability for their use in the procedures of land rearrangements (data quality, logical consistency, topologic and geometrical control); Controlling of data quality and procedures of land rearrangements; system of harmonisation of land cover and planned land use based on updated spatial data and GIS technology.

#### MUNICIPAL ECONOMICS AND HOUSING POLICIES (6 ECTS)

Public needs, public utility, public infrastructure, concept and role of municipal activities, cost aspects of municipal activity implementation, organization of public utilities, public finance system at local level, environmental protection economic instruments, methods of evaluating investment projects in the field of public technical infrastructure, basic concepts related to housing, property and other rights to housing, housing in spatial planning, housing market and residential buildings, state and municipal real estate management, multi-dwelling houses management, costs and housing expenses (rent).

#### SPATIAL STATISTICS (4 ECTS)

The meaning and application of spatial statistics, types of spatial data. Some descriptive examples of spatial data. Basics on theory of probability the definition of random variables, vectors and random functions, Random sampling of random variables and vectors, the inverse method, acceptance-rejection method, Random sampling of random vector, dependent random variables. Monte Carlo method, variance reduction techniques. The definition of moments of random vectors (mean, variance, covariance) and the corresponding moments for random functions (covariance function, variogram). The definition of stationary random fields and processes. The definitions of the distance between points: Euclidian, Mahalanobis, Manhattan, cost distance, resources, number of neighbors. Geostatistical data: definition and examples. Analyses of geostatistical data, the definition and use of scatter plots or crossplots. The definition and meaning of sample variogram, covariance function, correlation function, cross-correlation function, Moran's index, Geary's ratio, hypothesis testing for spatial independence. Kriging, idea and different types. Simple kriging. Ordinary kriging, kriging with trend. Differences and advantages of different methods. Spatial patterns, data types, examples. The definitions of central element, spatial distribution, mean linear direction. Quadrat analysis, nearest neighbor analysis. Spatial regression, linear regression, least-squares method, the meaning of spatial, geographically weighted regression. The basics of random field and random process generation, based on kriging and autocorrelation functions.

#### REGIONAL SPATIAL PLANNING (4 ECTS)

Definition, content, the aim, development and the role of regional planning in the system of planning; definition of a region, methods of regionalization; methods of regional planning: professional basis, coordination of stakeholders, public participation, cartographic presentations; elements of regional spatial plans, regional development and regional policy in the European union and Slovenia; spatial planning on the regional level: experiences from abroad, historical and recent approaches in Slovenia, selected topics from social geography.

#### SPATIAL ECONOMICS (3 ECTS)

Globalization, economic restructuring and location of economic activity; theory of regional economics, integration of location, theoretical sources of spatial economic arrangement; theories of regional growth, concept of local economic development, migration as regional economic factor; models of (regional) growth in Europe; regional development inequalities and models of (regional) growth in Europe; development and EU cohesion policies: theory and empirics, convergence?; national, regional and local governments: division of development responsibilities (fiscal federalism); land use and land values; the pattern of urban land use; the growth of urban areas and problems of urban areas; cities as factors of growth and innovation: new growth poles and old »success stories«.

#### INFRASTRUCTURE SYSTEMS WITH SEMINAR (10 ECTS)

Infrastructure systems concept and infrastructure characteristics, infrastructure development and its impact on space, urban and regional development, the legal basis of infrastructure placement and infrastructure development, infrastructure as operational instrument of spatial planning documents, technical infrastructure financing, public infrastructure planning, management and disposal of infrastructure systems, public

infrastructure records, infrastructure in the implementation of public service as a built public good, relationship between owner and public service contractor, accounting for assets depreciation and use of infrastructure, compensation for the use of infrastructure; Transport planning , traffic analysis and prognosis, integrity of traffic and transport terminals; Traffic ecology, design and evaluation of alternatives routes road, Problems connected with water supply, waste water disposal, drinking and waste water treatment at the national level, hydraulic infrastructure, water balance, water supply, drainage and irrigation, flood protection and water erosion; Problems of waste management at the national level; Energy supply, types of energies and energy balance; routes and facilities energy infrastructure at the national level; unconventional energy sources.

#### REAL ESTATE MANAGEMENT (3 ECTS)

Basic concepts related to economics of real estate, real estate life cycle from real estate development to real estate reuse, urban economics and real estate market analysis, land development potential, investing in real estate, role and conceptual definition of certain types of investments, methods of evaluating investment projects in micro- and macro-economic level, importance, legal basis and evaluating methods of public investment efficiency; taxation of real estate; real estate brokers' activities, legal and cost aspects of real estate brokers' activities, property as factor of production, facility management.

#### PROJECT TASK WITH SEMINAR (10 ECTS)

Social, political and cultural environments in spatial and urban planning. Integrated approach to spatial development and planning, and environmental management: connections between spatial planning, environmental impact assessment and preventive planning; organisation of plan and project implementations, as an introduction to the project assignment. Sustainable aspect of planning. Methodological tools. Analysis of specific cases of national plans and/or development and planning problems in EU. Part of the lectures is used for the introduction to the methods and tools of scientific research.

#### PRACTICAL TRAINING

Student is introduced to the performance of work done by graduate in practice. Especially, students are: aware of the organizational structure and technology in the field of spatial planning, familiar with the regulations about safety at work and their implementation in practice, familiar with current developments in an organization, introduced to executive aspect of work when undertaking field work or in office, self-performed work on current project under the guidance of a mentor; they develop the use of scientific research methods in a broad spectrum of problems in the profession, develop critical reflection, social and communication skills for teamwork management, show initiative and independence in the management of most complex work systems under the supervision of mentor.

#### INTRODUCTION TO MASTER THESIS

Introduction into scientific research methods, finding sources and source management, developing a msc proposal by defining the problem and compiling the relevant literature, public presentation of the master's thesis topic.

The master's thesis should include the following: introduction, basic starting-points, and problem definition, working hypothesis or research question, definition of the working method, description of the work, results and confirmation/rejection of the working hypothesis, conclusions and discussion, references

#### MASTER'S THESIS (10 ECTS)

The Master's Thesis is prepared under the mentorship of a selected teacher. The members of the evaluation committee give further guidance and advice. The work is publicly presented at the end of the studies. It shall include: - Introduction, baselines, and problem definition, - Working hypothesis, - Methodology, description of work, - Results and correction of the hypothesis, - Discussion, - Summary, - References. Generally, the Master's Thesis addresses complex, demanding tasks in spatial planning, and provides solutions based on the knowledge acquired during the studies and own research.

#### REMOTE SENSING (3 ECTS)

Current satellite systems for data acquisition of the Earth's surface by emphasizing high resolution systems, data ordering and the use of the images; methods for georeferencing high resolution satellite images; digital image processing; orthophoto and its use in spatial planning; object classification and the use of its products in spatial planning; aerial laser scanning: physical characteristics of a laser pulse, components of the system, main phases of data acquisition and processing, products and their use; generation of digital terrain models

from remote sensing sources; 3D landscape and city models; data fusion from different sources and analyses; selected examples from the practice.

## **18.2 Elective courses**

### **REAL ESTATE VALUATION (6 ECTS)**

Real estate market and market real estate valuation: valuation subject, value and real estate valuation approaches; land valuation in specific cases, real estate valuation in the process of consolidation, real estate valuation in cases of easement and other restrictions of rights, real estate valuation in specific cases, taking into account elements of sustainable development, process of individual real estate valuation and application of standards, public records for real estate valuation, real estate valuation reporting, starting points for individual work on real estate report (seminar), mass real estate valuation, acquisition of data, analysis of the real estate market and the real estate valuation models.

### **SPATIAL DATA POSITIONING AND ACQUISITION (6 ECTS)**

Definition of areas and geodetic tasks; description of geodetic jurisdiction; geodesy as a profession for the social data infrastructure: from the national aspect in terms of creation and maintenance of the basis of the infrastructure, as well as from the users' point of view; historic overview of the geodesy, determination of mathematical and physical figure of the Earth; coordinate systems in surveying (international, regional, state); geodetic datum, reference surfaces, cartographic projections and transformations; introduction to GNSS positioning with GNSS technology as well as GNSS surveying methods; methods of terrestrial geodetic measurements, instruments for terrestrial geodetic survey, processing of measurement data, interpretation, analysis and presentation of the data obtained; basic concepts of the geodetic plan, and the basis of any activities affecting the physical environment; definition of remote sensing and photogrammetry, main terms and historical milestones; electromagnetic spectrum; interaction of light with the atmosphere and Earth surface; operation of image sensors, digital image, basics of image processing; characteristics of satellite systems and image ordering; image classification; basics of aerial laser scanning and applications; orientation of a stereopair and stereoscopic data acquisition; ortophoto production and its use; national topographical sources and data.

### **WATER-RELATED OUTDOOR ACTIVITIES (6 ECTS)**

Principles of hydrology, water balance, climate change, basic of river hydraulics; natural hazards and risk management: torrents, floods, erosion, avalanches, and landslides; water-based outdoor activities: forms and concessions (water sports, rafting, kayaking, canoeing, boating, diving, bathing), impacts on nature protection and water protection, special features in mountains (mountaineering, hiking, skiing, skiing resorts); proposal of the plan for the selected area, proposal for measures to improve water environment status; field workshop in a local area.

### **ENVIRONMENTAL PLANNING AND IMPACT ASSESSMENTS (3 ECTS)**

Topics, problems, concepts of environmental planning. History and development of environmental planning: an overview of influential ideas. Protection approaches and strategies: restoration and prevention, standardization and optimization. Technological standards and norms, spatial standards – reservations. Optimization as a tool for environmental protection: environmental aspects of spatial planning: approaches and methods. Spatial analysis: concepts and methods; vulnerability studies and non-conflict corridors. Protection issues in developing alternative planning proposals. Evaluation of alternative planning proposals: comparative assessment of alternative options. Strategic environmental impact assessments, territorial impact assessments, sustainability impact assessments. Decision making: social framework, decision strategies, multicriteria methods. Environmental planning within the planning and management legal framework and regulations. Sectoral and integrated approaches in environmental management: management of protected areas, management of natural resources.

### **URBAN RENEWAL (3 ECTS)**

Study course introduces to students characteristics of urban and architectural renewal in urban regeneration processes. Content of course lectures: what is urban regeneration, historical and developmental aspects and contemporary processes, characteristic of heritage preservation and preservation of urban build heritage through history; developmental role of heritage preservation, aspects of preservation: cultural heritage spatial-developmental, economy, societal; international charters and recommendations and national legislation on heritage preservation; preservation methodology: urban and architectural scale; heritage preservation as

developmental concept of regeneration processes; renewal and re-use of buildings without heritage values; concepts of re-use of abandoned urban areas and brownfields; feasibility studies methodology; case-studies.