Univerza v Ljubljani
Fakulteta za gradbeništvo in geodezijo

Presentation of the study programme

3rd cycle doctoral study programme
BUILT ENVIRONMENT

DOCTORAL PROGRAMME
BUILT ENVIRONMENT
UNIVERSITY OF LJUBLJANA, FACULTY OF CIVIL AND GEODETIC ENGINEERING
FACULTY OF NATURAL SCIENCES AND ENGINEERING

Presentation of the study programme

1. Information about the study programme

In the academic year 2010/11 the third cycle doctoral study programme ***Built Environment*** substituted former postgraduate study programmes of the UL, Faculty of Civil and Geodetic Engineering (UL FGG) and UL, Faculty of Natural Sciences and Engineering (UL NTF):

- Postgraduate study programme Civil Engineering,
- Postgraduate study programme Geodesy, and
- Interdisciplinary postgraduate study programme Spatial and Urban Planning (IPSSUP), and
- Postgraduate study programme Geology.

The proposed third cycle doctoral study programme ***Built Environment*** represents from the aspect of its contents and methodology continuation of the 1st and 2nd cycle studies. It represents the scientific upgrading of the contents in the study programmes of Civil Engineering, Geodesy and Spatial Planning.

The main emphasis of the doctoral study is research work, the interdisciplinarity of the study and cooperation with internationally renowned Slovenian and foreign experts. According to the recommendations of the European University Association the study foresees exchange of students and publication of at least one scientific paper in internationally recognised journal as the final result of the research work. A special emphasis will be on adequate relationship between the doctoral student and the supervisor. The students will be able to choose their supervisors among internationally renowned and established scientists and experts. The whole programme is evaluated according to the European Credit Transfer System (ECTS) and can in this way cooperate in the international student exchange with the countries using this system.

The doctoral study programme ***Built Environment*** is divided into four scientific areas, the most extensive part being **Civil Engineering**. The study area of **Geodesy** includes scientific study of Geodesy and Geoinformation. The area of **Spatial planning and land management** is interdisciplinary, which is why it is foreseen for students from different graduate programmes to select elective courses from other members of UL, mainly Faculty of Architecture, Faculty of Arts, Biotechnical Faculty, Faculty of Natural Sciences and Engineering, Faculty of Economics and Faculty of Social Sciences. The study area **Geology** is designed to cover all the main areas of geological sciences and is at the same time oriented into specific geological conditions in the wider Central European and Mediterranean area.

The doctoral study programme ***Built Environment*** covers all scientific areas of the UL FGG and additional area of natural sciences which covers the largest part of geology at the UL NTF. Individual teachers and researchers from UL FGG and UL NTF with outstanding results from their research work can also actively cooperate in other doctoral programmes, primarily the university doctoral programme Environmental Protection.

The postgraduate doctoral study programme ***Built Environment*** lasts for 3 years (6 semesters) and consists of 180 credit points. The study programme is constituted from 60 ECTS of organised study activities, while the remaining 120 credit points are accumulated from individual research work for the doctoral thesis.

2. Basic goals of the programme and general competences

The basic goal of the doctoral programme ***Built Environment*** is to educate highly qualified researchers for individual scientific areas comprising the study programme. The programme leads to the award of the scientific title doctor of science from the following scientific areas:

- Civil Engineering,
- Geodesy,
- Spatial Planning and Land Management, and
- Geology.

The goal of the programme is to qualify graduates for scientific way of thinking and solving scientific problems, as well as for cooperation in solving demanding practical problems with interdisciplinary approach.

General competences

Graduates from the doctoral study will be capable of creative and independent scientific research work and of solving demanding problems for future employers. They will be qualified to approach problems in scientific way by using the latest scientific methods, to critically assess the research results, to develop new research methods and to transfer new technologies and knowledge into practice.

Course-related specific competences acquired through the programme

The doctoral students receive in-depth basic knowledge from different areas, and are qualified to research and solve demanding expert problems and acquire knowledge related to scientific methods and procedures. They are qualified to understand and give critical opinion on solving some demanding and complex scientific and research issues.

Additional subject-specific competences can be seen in individual course syllabi for each course.

3. Data on international cooperation of the higher education institution

The data on international cooperation of UL FGG are published at the web site: http://www3.fgg.uni-lj.si/raziskovalna-dejavnost/mednarodni-projekti/

The data on international cooperation of UL NTF are published at the web site: http://www.ntf.uni-lj.si/ntf/index.php?page=static&item=1429

4. Data on research programmes, projects and agreements

Both higher education institutions, UL FGG and UL NTF, cooperate in numerous national and international programmes and projects and have established wide and widespread networks of international connections and cooperation implemented based on mutual agreements. International cooperation runs on the level of institutions as well as individually through connections established by individual teachers and scientific associates.

Data on research programmes, projects and agreements are presented on the web site of UL FGG: http://www3.fgg.uni-lj.si/raziskovalna-dejavnost/mednarodni-projekti/ and on the web site of UL NTF: http://www.ntf.uni-lj.si/ntf/index.php?page=static&item=1429

5. Study programme syllabus with credit points according to ECTS

1st year:
- 10 ECTS: obligatory common course (Tools and methods in research of built environment)
- 10 ECTS: obligatory course from scientific area (for the areas Geodesy and Spatial Planning and Land Management)
- 15 ECTS: elective courses (for the areas Geodesy and Spatial Planning and Land Management)
- 25 ECTS: individual research work (for the areas Civil Engineering and Geology)
- 25 ECTS: individual research work (obligatory for all research areas)

2nd year:
- 10 ECTS: elective courses
- 5 ECTS: elaboration and presentation of doctoral theme
- 45 ECTS: individual research work

3rd year:
- 50 ECTS: individual research work
- 5 ECTS: presentation of doctoral thesis before public defence
- 5 ECTS: elaboration and public defence of doctoral thesis

Scientific area Civil Engineering:
Doctoral students from the area of Civil Engineering select courses totalling 35 ECTS (generally 25 ECTS in the first and 10 ECTS in the second year). They select minimum four courses (3 × 10 ECTS and 1 × 5 ECTS) and maximum five courses (2 × 10 ECTS and 3 × 5 ECTS). They can select them at UL FGG or outside UL FGG, with at least one course of at least 5 ECTS outside UL FGG. Students select elective courses in agreement with their supervisors, taking into account to the area of their research work, however not more than two courses of the same course coordinator.

Scientific area Geodesy:
Apart from obligatory courses, students select courses totalling 25 ECTS (generally 15 ECTS in the first and 10 ECTS in the second year). They select minimum three courses (2 × 10 ECTS and 1 × 5 ECTS) and maximum four courses (1 × 10 ECTS and 3 × 5 ECTS). They can select them at UL FGG or outside UL FGG, with at least one course of at least 5 ECTS outside UL FGG. Students select elective courses in agreement with their supervisors, taking into account the area of their research work, however not more than two courses of the same course coordinator.

Scientific area Spatial Planning and Land Management:
Apart from obligatory courses, students select courses totalling 25 ECTS (generally 15 ECTS in the first and 10 ECTS in the second year). They can select minimum three courses (2 × 10 ECTS and × 5 ECTS) and maximum four courses (1 × 10 ECTS and 3 × 5 ECTS). They can select them at UL FGG or outside UL FGG, however not more than two courses of the same course coordinator, with at least one course of minimum 5 ECTS outside UL FGG. Students select courses in agreement with their supervisors and with regard to the research work of their interest. Additionally, they must consider the following:

- students with diploma from a technical faculty are required to select one elective course from social sciences and one elective course from natural sciences (accounting to 5 to 10 ECTS);

- students with diploma from social sciences faculties are required to select one elective course from technical and another one from natural sciences (accounting to 5 to 10 ECTS);
- students with diploma from natural sciences faculties are required to select one elective course from technical sciences and another one from social sciences (accounting to 5 to 10 ECTS).

The scientific area Spatial Planning and Land Management is within UL linked mainly to the Faculty of Architecture, Biotechnical Faculty – Department of Landscape Architecture, Faculty of Arts – Department of Geography, Faculty of Economics and Faculty of Social Sciences.

Scientific area Geology:
Doctorate students from the area Geology select courses totalling 35 ECTS (in general 25 ECTS in the first and 10 ECTS in the second year). They can select at least four courses (3 × 10 ECTS and 1 × 5 ECTS) and maximum five courses (2 × 10 ECTS and 3 × 5 ECTS), either at UL NTF or outside, where at least one course in the scope of 5 ECTS should be selected outside UL NTF (beside the common course at the UL FGG). Students select elective courses in agreement with their supervisors, taking into account the area of their research work, however not more than two courses of the same course coordinator. Mobility is provided by requiring the doctorate students to do at least one course of minimum 5 ECTS outside UL FGG, possibly abroad. They can also do part of their individual research work outside UL FGG.

Obligatory common course Tools and methods in research of built environment (obligatory for all students)
It consists of two modules of 5 ECTS each, i.e.:
- Introduction to scientific research of built environment, and
- Selected chapters from mathematics in the research of built environment.

The modules of the common course foresee 50 hours of organised study activities per module.

Obligatory courses of scientific area (obligatory for all student of individual study area, totalling 10 ECTS)
- scientific area Geodesy: Research in geodesy,
- scientific area Spatial Planning and Land Management: Spatial planning research.

The courses consist of several modules that include several course coordinators. 50 hours of organised study activities per course are foreseen. Students of other areas can select them as elective courses.

Obligatory courses

No.	Teaching unit	Course coordinator	ECTS
1	Tools and methods in research of built environment	Prof. Dr. Matjaž Mikoš	10
2	Spatial planning research	Assoc. Prof. Dr. Maruška Šubic Kovač	5 and 10
3	Research in geodesy	Prof. Dr. Bojan Stopar	10
TOTAL			30 (35)

Elective courses

No.	Teaching unit	Course coordinator	ECTS
1	Applied environmental geochemistry	Assist. Prof. Dr. Nastja Rogan Šmuc	5
2	Approaches to spatial development and land use research	Assist. Prof. Dr. Alma Zavodnik Lamovšek	5
3	Bioclimatic design	Prof. Dr. Aleš Krainer	5
4	Biotic response to global paleo-ecological changes	Assist. Prof. Dr. Luka Gale	5
5	Deformation analysis of natural and built environment	Assoc. Prof. Dr. Tomaž Ambrožič	5
6	Dynamics of building structures applied to civil engineering	Acad. prof. Dr. Peter Fajfar	5 and 10
7	Daylight	Assist. Prof. Dr. Mitja Košir	5
8	Ductility and stability of steel structures	Assist. Prof. Dr. Franc Sinur	5 and 10
9	Experimentally supported design of masonry buildings	Assoc. Prof. Dr. Vlatko Bosiljkov	5 and 10
10	Empirical modelling of environmental systems	Assist. Prof. Dr. Nataša Atanasova	5
11	Geoarchaeology	Assoc. Prof. Dr. Nina Zupančič	5
12	Geophysical methods of research	Prof. Dr. Andrej Gosar	5
13	Geoinformation in science and real estate ontology	Assoc. Prof. Dr. Anka Lisec	10
14	Geochemical processes	Assoc. Prof. Dr. Nina Zupančič	5
15	GNSS in geodesy and geophysics	Prof. Dr. Bojan Stopar	5
16	Gravimetry in geodesy	Assist. Prof. Dr. Božo Koler	5
17	Hydrogeology of the Karst and inter-grain porous medium	Assoc. Prof. Dr. Mihael Brenčič	5
18	Hydrological measurements and hydrological modelling	Assist. Prof. Dr. Mojca Šraj	10
19	Hydrological and geotechnical landslide research	Assist. Prof. Dr. Ana Petkovšek	5 and 10
20	Selected chapters from hydrotechnical structures	Assist. Prof. Dr. Andrej Kryžanowski	5
21	High strength steel in structural engineering	Assist. Prof. Dr. Primož Može	5
22	Karst processes and fractals	Assoc. Prof. Dr. Timotej Verbovšek	5
23	Shells and membranes	Prof. Dr. Boštjan Brank	5
24	Mathematical modelling and turbulence in hydraulics	Prof. Dr. Matjaž Četina	5 and 10
25	Mathematical modelling in traffic engineering	Assoc. Prof. Dr. Marijan Žura	10
26	Measurements and modelling of erosion and sedimentation	Prof. Dr. Matjaž Mikoš	5 and 10
27	Methods of engineering-geology research for demanding structures	Assist. Prof. Dr. Karmen Fifer Bizjak	5
28	Methods of foundation ground improvement	Assist. Prof. Dr. Boštjan Pulko	5

29	Finite element methods in structural engineering	Prof. Dr. Boštjan Brank	5 and 10
30	Numerical modelling methods	Prof. Dr. Jože Korelc	5 and 10
31	Modelling of underground structures	Assoc. Prof. Dr. Janko Logar	5
32	Modelling of matter transmission and transformation in water environment	Assoc. Prof. Dr. Dušan Žagar	5
33	Knowledge-supported open engineering	Prof. Dr. Žiga Turk	5
34	Planning of healthy buildings	Assist. Prof. Dr. Mateja Dovjak	5 and 10
35	Advanced petrology of magmatic and metamorphic rock	Assist. Prof. Dr. Mirijam Vrabec	5
36	Advanced methods of project design and monitoring	Prof. Dr. Jana Šelih	5
37	Advanced mortar and concrete technologies	Prof. Dr. Violeta Bokan Bosiljkov	5 and 10
38	Advanced constructional complexes – ACC	Assist. Prof. Dr. Roman Kunič	5
39	Nonlinear analysis of concrete structures	Assoc. Prof. Dr. Sebastjan Bratina	5
40	Nonlinear analysis and design of earthquake resistant reinforced concrete buildings	Prof. Dr. Matej Fischinger	5 and 10
41	Nonlinear analysis of composite structures	Prof. Dr. Igor Planinc	10
42	Nonlinear dynamics	Prof. Dr. Miran Saje	5
43	Nonlinear mechanics of deformable bodies	Prof. Dr. Miran Saje	5 and 10
44	Nonolinear structural mechanics	Prof. Dr. Miran Saje	10
45	Nonlinear fire analysis	Assist. Prof. Dr. Tomaž Hozjan	10
46	New materials	Prof. Dr. Zvonko Jagličič	5 and 10
47	Numerical methods in structural mechanics	Prof. Dr. Dejan Zupan	5
48	Numerical methods in research of built environment	Assoc. Prof. Dr. Gašper Jaklič	5 and 10
49	Numerical methods for elastoplasticity	Prof. Dr. Jože Korelc	5
50	Remote sensing image processing	Assoc. Prof. Dr. Krištof Oštir	5 and 10
51	Renovation of real property cultural heritage	Prof. Dr. Roko Žarnić	5
52	Assessment of river basin water management	Prof. Dr. Franc Steinman	10
53	Programming of distributed engineering applications	Assoc. Prof. Dr. Vlado Stankovski	5
54	Design and reinforcement of reinforced concrete bridges at seismic areas	Prof. Dr. Tatjana Isaković	5 and 10
55	Spatial planar structures	Prof. Dr. Dejan Zupan	5
56	Research for establishment and management of topographic data	Assist. Prof. Dr. Dušan Petrovič	5
57	X-ray structural analysis	Assoc. Prof. Dr. Matej Dolenec	5
58	Sedimentary evolution of Tetide	Assoc. Prof. Dr. Boštjan Rožič	5
59	Sedimentary pools and sedimentary environments	Assoc. Prof. Dr. Andrej Šmuc	5 and 10
60	Seismological analyses and	Prof. Dr. Andrej Gosar	5 and 10

	research		
61	Modern terrestrial geodetic measuring technology	Assoc. Prof. Dr. Dušan Kogoj	5
62	Stable isotopes and physical processes	Assoc. Prof. Dr. Matej Dolenec	5
63	Stability of structures	Prof. Dr. Igor Planinc	5
64	Stratigraphy of Phanerozoic	Assoc. Prof. Dr. Boštjan Rožič	5
65	Technical real estate management – selected chapters	Assoc. Prof. Dr. Maruška Šubic Kovač	5
66	Tectonic structures and processes	Assoc. Prof. Dr. Marko Vrabec	5
67	Theory of structural reliability	Prof. Dr. Goran Turk	5
68	Spatial data quality management	Assoc. Prof. Dr. Tomaž Podobnikar	5 and 10
69	Water regime management	Prof. Dr. Mitja Brilly	5
70	Probability methods in built environment	Prof. Dr. Goran Turk	5
71	Acquisition and modelling of Earth's surface in risk assessment	Assoc. Prof. Dr. Tomaž Podobnikar	5 and 10
72	Reliability of structures with use in earthquake engineering	Prof. Dr. Matjaž Dolšek	5 and 10
73	Water environment protection	Assoc. Prof. Dr. Jože Panjan	5
TOTAL			405 (515)

6. Conditions for enrolment and selection criteria when enrolment is restricted

The third cycle doctoral study programme ***Built Environment*** allows the enrolment of graduates from:

- Second cycle study programmes,
- Study programmes leading to professions, regulated by directives of the European Union, evaluated by 300 credit points, or other unified master study programmes evaluated by 300 credit points.
- Prior study programmes leading to specialisation, who previously finished the professional bachelor degree programmes; individual additional programme for such graduates in the scope up to 60 ECTS can be defined by the Study Board of the UL FGG doctoral study,
- Prior study programmes leading to the title master of science or specialisation after the study programme leading to the university degree from the area of technical and natural sciences (for the area of land management and spatial planning also social sciences); candidates are acknowledged prior study obligations in the scope of 60 ECTS,
- Prior study programmes leading to the university education adopted before 11/06/2004.

The doctoral study programme Built Environment is also available for the enrolment of students from other international universities. Assessment of adequacy of prior education abroad is established in the procedure of acknowledgement of foreign education according to Article 121 of the University Statute.

The intake number is 20. In case of restricted enrolment the selection of candidates is based on:

- average grade of study (15%)
- evaluation of diploma or master thesis (5%), and
- **success from elective course (80%), consisting of written exam from the area of natural sciences and engineering. Candidates can replace 40% of the grade with a grade from prior scientific and professional work in the area of the study programme.**

The main criteria for scientific work are publications, e.g.:

- scientific monograph,
- independent scientific essay in a monograph,
- original scientific articles in journals with impact factor (JCR) or in journals indexed in data bases SCI, SSCI or A&HCI.

The main criteria for professional work are:

- professional monograph or review
- independent professional essay in a monograph
- published professional paper in conference
- professional articles and/or reviews of articles
- editorship of monograph or journal
- other forms of documented professional activity

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

In case of restricted enrolment, in the selection procedure knowledge and skills acquired with formal, informal or empirical learning before the enrolment to the programme will be acknowledged according to the Criteria for the accreditation of study programmes. The Study Board of the UL FGG for doctoral study decides about the acknowledgement of knowledge and skills that a candidate acquired before the enrolment into the programme.
For the acknowledgement of such knowledge and skills the following shall be considered:
- professional specialisation,
- diploma from another higher education institute,
- prior scientific and research work,
- published scientific works,
- expert qualifications, or
- adequate work experiences.

8. Assessment

According to the Statute of University of Ljubljana success in exam is assessed by grades 1-10, where grades 6-10 are considered positive. According to the programme, exams can be written or oral, and also the preparation and oral presentation of seminars may be graded.

9. Conditions for progression through the programme

Conditions for the progression from the 1st to the 2nd year of the doctoral study consist of completed study obligations amounting to at least **45 ECTS**.
Candidates may enrol to the 3rd year of the doctoral study, if they complete all study obligations of organised study activities from the 1st and 2nd years and upon consent of the University Senate to the theme of the doctoral thesis.
The last, third year, is intended to individual research work and elaboration and defence of doctoral thesis.

10. Conditions for transitions through programmes

Thransition means suspenson of a student's education in the originally enrolled study programme and its continuation in another programme, where part or all of obligations from the original study programme are acknowlddged as performed obligations in the new study programme (Conditions for transitions between study programmes (Official Gazette of RS, No. 45/94)). Applications of candidates for the transitions to the doctoral study programme Built Environment will be dealt with individually at the Study Board of the doctural study programme Built Environment

11. Implementation method of the study

The doctoral study programme Built Environment is implemented as part-time study.

12. Conditions for completion of the study

The condition for completion of the study and for the award of the scientific title **doctor of science** is that the candidate successfully completes all study obligations defined by the programme and successfully defends the doctoral thesis. Doctoral students must publish at least one scientific paper

from the area of the doctoral thesis in a journal with SCI or SSCI indexation. Scientific paper shall be published or adopted to publication before the defence of the doctoral thesis.

The scientific title is awarded according to the Professional and Academic Titles Act and is **doctor of science**.

13. Short presentation of individual courses

Tools and methods in research of built environment

The course consists of two equivalent modules:
Module I – Introduction to scientific research of built environment contains the following contents:
Science and profession; ways of research (basic, applied, targeted, developmental); research ethics and basic research methods (hypothesis, field and laboratory experimental work, repeatability, standards, precision, computer modelling), Data collection and handling; displaying of results; writing research publications (original and review paper, IMRAD, poster, abstract, monograph, review, peer review, dissertation, examples of good and bad practice, author rights, citing literature, guidelines for forming theses and works on FGG) for periodicals and professional conferences; laws and standards in the field of documentation in the Republic of Slovenia; Scientific excellence, evaluation of SR in the Republic of Slovenia and abroad, world lists of class universities (Shanghai, Times), citation and self-citation (Thomson Reuters, SCOPUS, SCIRUS, Google Scholar), h-index; Research work in the Republic of Slovenia: organisation and financing sources (SAZU, IAS, SATENA, MVSZT, ARRS, MR, SGTP); Research work in Europe (European Research Area, bilateral projects, platforms: ECTP) resp. in the world (bilateral cooperation), Lisbon strategy, Research & Development impact on the development and industrial productivity; innovation and competitive position; Intellectual property: main terms, patents, improvements, inventions, protection of intellectual property, author rights, patent application, conditions at UL (LUI Ljubljana University Incubator, IRI UL Institute for Innovation & Research, technological park; Data bases with adequate professional literature in the field of built environment: CTK & NUK, DIKUL as the entrance point, DOAJ, specialised data bases in the field of technics (SCI-Expanded, SCOPUS, Thomson Reuters, Science Direct, Springer Link, Wiley, Compendex, ICONDA, ASCE) and other data bases such as of standards and patents (PATLIB center CTK); world wide web and Google Scholar, SCIRUS; key words; author's search and search after cited works.
Module II – Mathematics in built environment research contains the following contents:
Refreshing the foundations (all, 10 hours of lectures): logic and set theory, functions of scalar and vector argument, analytic and differential geometry, matrix calculus, probability; Statistics (group A, 20 hours of lectures): basics on random processes, hypothesis testing, advanced statistical methods (regression analysis, analysis of variance, factor analysis), specialized statistical tests, basics on nonparametric statistics; Numerical methods and optimization (group B, 20 hours of lectures): sources of error, numerical solution of nonlinear equations and systems of equations, finding extrema of multivariate functions, calculus of variations, combinatorical optimization, linear programing.

Research in geodesy

The course contains the following contents:
Geodesy as a science, branch and service. Organizational structures of geodesy at a scientific, institutional and data level in international and national level (IUGG, IAG, FIG, ICA, ISPRS, ICA, IHO, SZGG, ZGS); Mathematical, physical and conceptual foundations of geodesy and disciplines closely related with geodesy: surveying, surveying engineering, topography, cartography, photogrammetry, remote sensing, GIS, spatial data sets and data registry – current state and trends; Conceptual and mathematical models for space description, concept and purpose of observations,

establishment of the relations among physical and virtual space, spatial data analysis, presentation of model space – current state and trends; Concepts, methodologies, technologies, instrumentation and sensors for point to point and massive spatial data acquisition – current state and trends; Modern and traditional coordinate systems in geodesy, relation and transformation of coordinate systems; Concepts and definitions of quality measures in geodesy and surveying – current state and trends Temporal variations of space, acquisition, analysis and presentation of temporal variations of space; Geodesy and its relations with other disciplines and branches in contemporary information society – current state and trends.

Spatial planning research

The course in the scope of 5 ECTS contains the following contents:

Theories, methods and technics in spatial research; Attractiveness, vulnerability and capacity of the space; Projections of needs for land; Location theories; Balances, models, simulations, games, optimisation in spatial planning; Interpretation and use of results of sociological research in spatial planning; Planning of alternatives and their estimation; Design of urban built environment and other settlements, landscape design; aesthetic evaluation of installation of objects into space, visual simulations; Spatial research on the local level; Spatial research on the regional level; Spatial research on the state level; Spatial research on the EU level and on the other international levels; Lectures of invited lecturers for special research topics (one lecture);

Study of selected literature.

The course in the scope of 10 ECTS contains the following contents:

Theoretical basis for plans realization analysis and evaluation of measures; Land management models as tool for realisation of plans on local levels; Systems and components of managing the characteristic real - estate groups; Methods of defining potentials and optimum use and utilisation of urban space; Methods of valuation of justification and effectiveness of investments in the public and private sectors for the characteristic real-estate groups; Models of land management and methods of valuation of best land uses in the real estate lifelong cycle;

Factors relevant to sustainable development, evaluation methods, impact on market value and real estate market; Lectures of invited lecturers for special research topics (one lecture); Study of selected literature.

List of potential supervisors

Title	Name	Last name	Link to references of potential supervisor (SICRIS catabase; updated June 2015)
Assoc. Prof. Dr.	Tomaž	Ambrožič	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=Toma%C5%BE%20Ambro%C5%BEi%C4%8D
Assist. Prof. Dr.	Nataša	Atanasova	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opt=2&subopt=1&opdescr=search&code1=cmn&code2=auto&search_term=nata%C5%A1a%20atanasova
Prof. Dr.	Violeta	Bokan Bosiljkov	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=bokan%20bosiljkov%20violeta
Assoc. Prof. Dr.	Vlatko	Bosiljkov	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=bosiljkov%20vlatko
Prof. Dr.	Boštjan	Brank	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=brank%20bo%C5%A1tjan
Assoc. Prof. Dr.	Sebastjan	Bratina	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=bratina%20sebastjan
Assoc. Prof. Dr.	Miha	Brenčič	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=bren%C4%8Di%C4%8D%20miha
Prof. Dr.	Mitja	Brilly	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=brilly%20mitja
Prof. Dr.	Matjaž	Četina	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=%C4%8Detina%20matja%C5%BE
Assoc. Prof. Dr.	Matej	Dolenec	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opt=2&subopt=1&opdescr=search&code1=cmn&code2=auto&search_term=matej%20dolenec
Assist. Prof. Dr.	Matevž	Dolenc	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opt=2&subopt=1&opdescr=search&code1=cmn&code2=auto&search_term=matev%C5%BE%20dolenc
Prof. Dr.	Matjaž	Dolšek	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=dol%C5%A1ek%20matja%C5%BE
Assist. Prof. Dr.	Mateja	Dovjak	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=Dovjak%20Mateja
Prof. Dr.	Peter	Fajfar	http://www.sicris.si/public/jqm/rsr.aspx?lang=slv&opdescr=search&opt=2&subopt=300&code1=cmn&code2=auto&psize=10&hits=3&page=1&count=1&search_term=fajfar%20peter&id=3956&slng=slv&order_by=
Assist. Prof. Dr.	Karmen	Fifer Bizjak	http://www.sicris.si/public/jqm/search_basic.aspx?lang=slv&opdescr=search&opt=2&subopt=1&code1=cmn&code2=auto&search_term=fifer%20bizjak
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