

DOCTORAL

PROGRAMME
IN ARCHITECTURE

Univerza v Ljubljani
Fakulteta za arhitekturo



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1. DATA ON STUDY PROGRAMME

The doctoral study programme in Architecture lasts 4 years (8 semesters) and is comprised of a total of 240 *ects*—credits.

The study programme includes 60 *ects*—credits in organized study form, and 180 *ects*—credits of individual research work (basic or applied research). The organized forms are comprised of a general, architectural module and interdisciplinary optional modules, as well as of an annual research presentation (ranging from the presentation of the study plan to the defence of the dissertation). The scientific title acquired by the doctoral student in the field of architecture is: Doctor of Science The abbreviated form of the title placed in front of the name is: *Dr.*

2. BASIC GOALS OF THE PROGRAMME AND GENERAL COMPETENCES

BASIC GOALS:

The programme trains the independent scientific researcher in the widest problem area of architectural issues, demonstrating responsibility towards the cultural region and excellence at an international level.

Responsibility for architecture as both a field of scientific research and a cultural region derives from the significance of architectural design, the quality of buildings harmonizing with the environment, respect for natural and urban landscapes, which is in the public interest. The quality of physical space is protected in the public interest by Slovenian and European legislation.

GENERAL COMPETENCES:

- in-depth understanding of theoretical and methodological concepts deriving from the essence of architecture as science and art, and directly or indirectly related to architecture;
- qualification to independently develop new knowledge in the area of architecture as a generic field and/or in narrowly specified topics that are of significance in architecture and its connectedness with other areas;
- qualification to solve the most demanding problems by testing and improving established and discovering new solutions in achieving quality in architecture;
- qualification to manage the most demanding work systems and scientific research projects in a wide professional or scientific scope of spatial planning and design, emphasizing the quality of architectural space;
- qualification to develop critical reflection – social, group and personal research and/or creation.
- Qualification to convey and communicate research results in the following cases:
 - qualification of publishing scientific, professional and popular (for non-expert public) papers and other publications in the field of architecture;
 - qualification for transfer of scientific achievements and knowledge into architectural practice.

3. INTERNATIONAL COOPERATION

Erasmus+	https://www.fa.uni-lj.si/studij/izmenjave/
CA2RE Community for Artistic and Architectural Research	https://ca2re.eu/
ADAPT-r Architecture, Design and Art Practice Training-research	http://adapt-r.eu/
ARENA (Architectural Research Network)	http://www.arena-architecture.eu/
EAAE European Association for Architectural Education	https://www.eaae.be/

4. RESEARCH PROGRAMMES, PROJECTS, AGREEMENTS

<https://www.fa.uni-lj.si/raziskovanje/>

5. SCHEDULE OF SUBJECTS OF STUDY PROGRAMME, OPTIONAL SUBJECTS, MOBILITY

	Winter semester lectures	Winter semester other	Winter semester lectures	Summer semester other	Summer semester lectures	Σ Hours	Σ ects
1ST YEAR							
1.1 General module	15	235	—	—	250	10	
1.2 Architectural module	—	—	15	235	250	10	
1.3 Presentation of doctoral study plan	—	125	—	—	125	5	
1.4 Individual research work 1	—	375	—	500	875	35	
Total	15	735	15	735	1500	60	
2ND YEAR							
2.1 Interdisciplinary module	21	354	14	236	625	25	
2.2 Presentation of topic of doctoral dissertation	—	125	—	—	125	5	
2.3 Individual research work 2	—	250	—	500	750	30	
Total	21	729	14	736	1500	60	
3RD YEAR							
3.1 Individualno raziskovalno delo 3	—	750	—	750	1500	60	
Total	—	750	—	750	1500	60	
4TH YEAR							
4.1 Presentation prior and defence of doctoral dissertation	—	—	—	125	125	5	
4.2 Individual research work 4	—	750	—	625	1375	55	
Total	—	750	—	750	1500	60	
TOTAL STUDIES							
Organized study forms						60	
Individual study forms						180	
Total	3000			3000	6000	240	

1.1 10 ECTS

GENERAL MODULE

GENERIC KNOWLEDGE

LAH UL, Faculty of Architecture

Introduction to Scientific Research

— visiting lecturer

Scientific Approaches, Methods and Research Presentation

— teachers of generic subjects/modules

Scientific Research Subjects/Modules of Other Programmes

1.2 10 ECTS

ARCHITECTURAL MODULE

FIELD-SPECIFIC FUNDAMENTALS

ČEGERIN UL, Faculty of Architecture

Architectural Theory and Critique

FISTER UL, Faculty of Architecture (retired)

Corpus of the Slovene Architecture

VODOPIVEC UL, Faculty of Architecture

Strategies of Architectural Design

VUGA Sadar + Vuga

Architectural Research by Design

KOŽELJ UL, Faculty of Architecture (retired)

Contemporary Approaches to Urbanism

— visiting lecturer

Scientific Approaches to Research in Architecture

— teachers of architectural subjects/modules

Scientific Research Subjects/Modules of Other Programmes

2.1 25 ECTS

INTERDISCIPLINARY MODULE

DEEPENING AND/OR CROSS-LINKING

Thematic modules/emphasis – relations (legend of red dots – titles, disposition and structure of components is (pre) defined in accordance with the research policy of FA):

- Architectural Theory and Critique, Corpus of the Slovene Architecture – relation to humanism;
- Fine-Arts and Digital Theory and Methodology – relation to humanism and technology;
- Theory and Methodology of Urbanism – relation to social sciences and biotechnology;
- Theory of Planning and Technological Application in Architecture – relation to technology;
- Thematical Modules/Emphases – related to quality assured, comparable offer from visiting lecturers and other programmes.

- **5 ECTS**
- **ČEFERIN UL, Faculty of Architecture**
Analysis and Criticism of Contemporary Architecture
- **KOSELJ private researcher**
The Origins of Modernity
- **ZOREC UL, Faculty of Architecture**
Interpretation of Memory in Architecture
- **GLAŽAR UL, Faculty of Architecture**
Meaning in Architecture
- **AŽMAN MOMIRSKI UL, Faculty of Architecture**
Architectural Analogies
- **FISTER UL, Faculty of Architecture (retired)**
Corpus of the Slovene Architecture –
Selected Themes
- **DEU UL, Faculty of Architecture (retired)**
Identity of Slovene Architecture
- **FISTER UL, Faculty of Architecture (retired)**
Protection and Rehabilitation
of Architectural Heritage
- **LAH UL, Faculty of Architecture**
Integral Renewal
- **IFKO UL, Faculty of Architecture**
Heritage Interpretation
- **DEBEVEC UL, Faculty of Architecture**
Architectural Archetypes of the Sacred
- **JUVANEC UL, Faculty of Architecture (retired)**
Theory of Vernacular Architectural Origins
- **TOŠ Sistemprojekt, Zagreb (retired)**
Human Environment Anthropology
- **SVETINA UL, Faculty of Arts**
Architectural Psychology
- **RIHA ZRC, SAZU**
Selected Topics from Philosophy of Space and Time
- **KREČIČ Ljubljana Architecture Museum (retired)**
Art History

- **5 ECTS**
- **BONČA UL, Faculty of Architecture**
Systems of Plastic Arrangements
- **BONČA UL, Faculty of Architecture**
Architectural Versus Fine Art Relations
- **NOVLJAN UL, Faculty of Architecture**
Colours and Space
- **NOVLJAN UL, Faculty of Architecture**
Lighting in Architecture and Urban Environments
- **NOVLJAN UL, Faculty of Architecture**
Abstract Spatial Transformations Tools
- **JEZA UL, Academy of Fine Arts and Design**
Interior and Furniture Design
- **PEDERSEN Aarhus School of Architecture**
Quality of Doctoral Research and Fundamentals
of Research by Design
- **ETTLINGER UL, Faculty of Architecture**
Digital Methods and Presentations in Architecture
- **BOURDAKIS University of Thessaly**
Designing Virtual Environments
- **ACHTEN Technical University of Prague, Faculty of Architecture**
Digital Design Methods
- **DUARTE Penn State College of Arts and Architecture
and University of Lisbon, Faculty of Architecture**
Programming of Architectural Forms
- **DUARTE Penn State College of Arts and Architecture and
University of Lisbon, Faculty of Architecture**
Digital Fabrication
- **ZUPANČIČ UL, Faculty of Architecture**
Interfaces for Architectural Learning
and Collaboration
- **ZUPANČIČ UL, Faculty of Architecture**
Architectural Publishing
- **ROBINSON UL, FACULTY OF ARCHITECTURE**
Natura Animare: Transforming the Matter
in the Creation of Space

- **5 ECTS**
- **AŽMAN MOMIRSKI UL, Faculty of Architecture**
History of Urbanism
- **ČERPES UL, Faculty of Architecture**
Urban Planning
- **POGAČNIK UL, Faculty of Civil Engineering and Geodesy (retired)**
Architecture and Sustainable Spatial Development
- **ŠAŠEK DIVJAK Urban Planning Institute of the
Republic of Slovenia (retired)**
Sustainable City Development
- **DIMITROVSKA ANDREWS Urban Planning Institute
of the Republic of Slovenia (retired)**
Tools for Control of Urban Forms
- **ČERNE UL, Faculty of Arts**
Regional Planning
- **FIKFAK UL, Faculty of Architecture**
Environmental Management for Rural Tourism
and Recreation
- **VOIGT Vienna University of Technology,
Faculty of Architecture and Regional Planning**
Local Planning & Public Participation
- **CIRMAN UL, Faculty of Economics**
Urban Economics
- **ŠUBIC KOVAČ UL, Faculty of Civil Engineering and Geodesy**
Real Estate Economics – Selected Themes
- **HOČEVAR UL, Faculty of Social Sciences**
Sociological Concepts of Modern Urbanism
- **JUVANČIČ UL, Faculty of Architecture**
Townscapes and Interactive Cities
- **FIKFAK UL, Faculty of Architecture**
Landscape Settlements of Cultural Diversity
- **DEU UL, Faculty of Architecture (retired)**
Protection of Architectural Landscapes
- **GREGORSKI UL, Faculty of Architecture**
Methods of Ambient Design
- **ZUPANČIČ UL, Faculty of Architecture**
Sensitive Urban Places
- **GAZVODA UL, Biotechnical Faculty**
Design of Open Space
- **ČOK UL, Faculty of Civil Engineering and Geodesy**
Stakeholders in the Architectural
and Urban Design Process
- **ČOK UL, Faculty of Civil Engineering and Geodesy**
Spatial Design of Industrial, Business
and Entrepreneurial Zones

- 5 ECTS
- **TOŠ SISTEMPROJEKT, ZAGREB (RETIRED)**
Architectural Design Theory
- **ISAKOVIĆ** *UL, Faculty of Civil Engineering and Geodesy*
Integrated Practices and Building Modelling
- **MIŠČEVIĆ** *University of Zagreb, Faculty of Architecture*
High-Tech Architecture
- **ZBAŠNIK-SENEGAČNIK** *UL, Faculty of Architecture*
Contemporary Architectural Technology
- **DUARTE** *Penn State College of Arts and Architecture
and University of Lisbon, Faculty of Architecture*
Mass Customization of Housing
- **KUŠAR** *UL, Faculty of Architecture*
Fire Safety of Built Environment
- **ROSET** *Catalan Polytechnic University,
Superior Technical School of Architecture of Barcelona*
Environmental Physics for Architects
- **MEDVED** *UL, Faculty of Mechanical Engineering*
Energy and Environment Assessment of Buildings
- **MEDVED** *UL, Faculty of Mechanical Engineering*
Microclimate of Urban Areas and Buildings
- **ZBAŠNIK-SENEGAČNIK** *UL, Faculty of Architecture*
Renewable Sources of Energy in Buildings
- **SLIVNIK** *UL, Faculty of Architecture*
Selected Topics in Building and Construction History
- **KILAR** *UL, Faculty of Architecture*
Structures in Architecture
- **ISAKOVIĆ** *UL, Faculty of Civil Engineering and Geodesy*
Basics of Bridge Design
- **KILAR** *UL, Faculty of Architecture*
Earthquake Architecture

- 5 ECTS
- *visiting lecturer*
Theories and Methods of Scientific Research
- *teachers of subjects from other programmes*
Subjects/Modules of Scientific Research from other programmes

RATIO BETWEEN COMPULSORY AND OPTIONAL SUBJECTS

MODULES/SUBJECTS WITH COMPULSORY CONTENT

90% – 215 ects

- 1.1 General module
- 1.3 Presentation of doctoral study plan
- 2.2 Presentation of topics of doctoral dissertation
- 4.1 Presentation before defence and defence of doctoral dissertation

MODULES/SUBJECTS WITH OPTIONAL CONTENT

AND ITS STRUCTURE

10% – 25 ects

- 1.2 Architectural module
- 2.1 Interdisciplinary module
- 1.4 Individual research work 1
- 2.3 Individual research work 2
- 3.1 Individual research work 3 2
- 4.2 Individual research work 4

SELECTION OF SUBJECTS IN MODULES:

- according to the theme of dissertation;
- the candidate could maximally choose one subject from architectural or interdisciplinary module given by the course coordinator which is also the mentor or co-mentor of his individual research work or his doctoral dissertation;
- in the case the candidate acquired professional qualification in architecture: a minimum of 10 ects from the programme offer of other disciplines has to be selected;
- in the case of other professional qualifications: a minimum of 10 ects from the programme offered by lecturers – architects has to be selected;
- a maximum of 60 ects from other comparable programmes, i.e. of other UL faculties or other universities can be approved;
- the subjects of visiting lecturers are shaped on the yearly basis – the visiting lecturers have to fulfil preset requirements for course coordinators; the syllabus has to be approved by regular validation procedures.

MOBILITY:

Within the Erasmus programme or on the basis of other bilateral agreements of which the signatory is the Faculty of Architecture, the student can make use of the opportunity to study one or two semesters abroad in (and inclusive of) the second year of studies.

6. ENROLMENT CONDITIONS AND SELECTION CRITERIA IN CASE OF ENROLMENT LIMITATION

- TO ENROL IN THE DOCTORAL STUDY PROGRAMME IN ARCHITECTURE, CANDIDATES MUST FULFIL THE FOLLOWING CRITERIA:**
- completion of the study programme of the second cycle (Bologna master degree);
 - completion of uniform study programme comprised of 300 erts–credits (Bologna master degree);
 - completion of existing study programme for the acquisition of university education;
 - completion of existing specialist study programme upon conclusion of professional study programme at an institution of higher education, providing that the candidate has gained at least 30 erts in the uniform masters study programme Architecture from the following courses:
 - *Architectural Theory and Critique,*
 - *Introduction to Research in Architecture and Urbanism,*
 - *Theory of Physical and Regional Planning,*
 - *Action Planning and Strategic Assessment,*
 - *Design Concepts,*
 - *Countryside Settlement Culture,*
 - *Art History,*
 - *Comprehensive Preservation of Built Heritage,*
 - *Computer Supported Architecture and*
 - *Concepts of Structures.*

- IN ACCORDANCE WITH THE ENROLMENT CRITERIA, CANDIDATES CAN ENROL IN THE DOCTORAL STUDY PROGRAMME IN ARCHITECTURE IF:**
- they have acquired a master's in science upon completion of the study programme for the acquisition of university education; at enrolment, the candidate shall be awarded at least 60 erts–credits in accordance with the law;
 - they have completed the existing specialist study programme upon completion of the study programme for the acquisition of university education; at enrolment, the candidate shall be awarded at least 60 erts–credits in accordance with the law.
- SHOULD A RESOLUTION ON ENROLMENT LIMITATION BE ADOPTED (IN CASE THE NUMBER OF APPLYING CANDIDATES WHO FULFIL THE ENROLMENT CRITERIA IS IN EXCESS OF ENROLMENT PLACES), THE CANDIDATES SHALL BE SELECTED**
- according to performance in prior studies (20% weighting):
 - study programme of the second cycle (Bologna master degree) or
 - uniform masters study programme comprised of 300 erts–credits (Bologna master degree) or
 - existing study programme for the acquisition of university education or
 - existing specialist study programme upon conclusion of professional studies at an institution of higher education
 - and the additional study obligations from the first paragraph of the enrollment conditions; criteria are:
 - study grade average (15% weighting) and
 - grade of university diploma or masters thesis (5% weighting);
 - according to success at the selection exam (80% weighting).
- The exam is comprised by written and oral parts. The following elements are assessed:
- written and oral presentation of a Draft plan of doctoral studies (also referred to as: outline of the doctoral study plan) prepared in accordance with the Regulations on the procedure for the acquisition of the title of Dr. – doctor of science at the Faculty of Architecture (60% weighting),

- recommendations of distinguished scientists (10% weighting);
- research work prior to programme enrolment (10% weighting).

STUDY FEE, REGULAR/PART-TIME STUDIES

- The study fee is determined according to the applicable price list.
- The study is executed in a regular or part-time form; within the modules subjects may be chosen that are performed at distance, or combined. The lectures for part-time study are organized in the afternoon or at weekends (Wednesday, Thursday and Friday afternoons, and Saturday morning), 20% of lectures are replaced in the form of consultations. Candidates for part-time studies shall fulfil all aforementioned enrolment conditions.

7. PROVISIONS ON THE RECOGNITION OF KNOWLEDGE AND SKILLS ACQUIRED PRIOR TO PROGRAMME ENROLMENT

Students' knowledge that, both in content and level of excellence, complies with the study programme they enrolled in can be recognised.

Upon the candidate's request, the doctoral studies committee shall examine the possibility of recognition of the knowledge and skills that the candidate acquired prior to programme enrolment and that can be asserted for the doctoral study programme in architecture. This examination shall consider, in particular, the following:

- content conformity with the Draft plan of doctoral studies or the Plan of doctoral studies (specifically with the proposed research topic as described in the document submitted in accordance with the Regulations on the procedure for the acquisition of the title of Dr. – doctor of science at the Faculty of Architecture), and
- compliance of quality level of performance (certificates, documents, reviews of research publications...) as evidence of knowledge and skills which the candidate wishes to assert in the programme.

8. ASSESSMENT TYPES

In accordance with the law, the assessment types do not need to be specifically defined. However, because the quality of studies at the doctoral level is very important, the quality control system is mentioned here.

Within the framework of the subjects of the general architectural and interdisciplinary module, an assessment scale from 1 to 10 is planned (1–5: insufficient; 6–10: sufficient, good, very good and excellent).

As a special form of organized studies, emphasis is laid on the annual quality control of the individual research work, which helps the mentor or the group of mentors ensure quality: in the first year, this regards the presentation of the study plan, in the second year the presentation of the topic, and in the third year the presentation of results prior to the defence as well as the defence of the dissertation. Upon control, this obligation is either fulfilled or not – and no assessment scale is foreseen for the individual research work either. The quality of the fulfilled obligation shall be evaluated descriptively, in accordance with the Regulations on the procedure for the acquisition of the title of Dr. – doctor of science) in the field of architecture. The following parties are in charge of the quality of studies: mentors or groups of mentors, the doctoral studies committee of the Faculty of Architecture with a review system, the Senate of the Faculty of Architecture, the professional committee for the assessment of the topic, the dissertation and the defence, appointed by the Senate of the Faculty of Architecture, the doctoral studies committee and the Senate of the University of Ljubljana, at the proposal of the doctoral studies committee.

9. CONDITIONS FOR PROMOTION ACCORDING TO PROGRAMME

CONDITIONS FOR PROMOTION FROM THE FIRST TO THE SECOND YEAR, THE STUDENT SHALL

- complete the general module;
- perform a written and oral presentation of his/her doctoral study plan; the presentation is positive if approved by the doctoral studies committee and the Senate of the Faculty of Architecture;
- be awarded a minimum of 45 **ects**–credits in the first year of study.

TO BE PROMOTED FROM THE SECOND TO THE THIRD YEAR, THE STUDENT SHALL:

- complete the architectural and interdisciplinary modules;
- perform a written and oral presentation of the topic of his/her doctoral dissertation; the presentation is positive if the topic is approved by the doctoral studies committee and the Senate of the Faculty of Architecture;
- have been awarded a minimum of 60 **ects**–credits.

TO BE PROMOTED FROM THE THIRD TO THE FOURTH YEAR, THE STUDENT SHALL:

- give a presentation on the interim results of his/her research work at a doctoral seminar/conference,
- have an approved topic for his/her doctoral dissertation at the University of Ljubljana;
- been awarded a minimum of 120 **ects**–credits.

CONDITIONS FOR TEMPORARY SUSPENSION OF

STUDENT STATUS

A student may request temporary suspension of student status should he/she, for justified reasons, not be able to fulfil his/her student obligations. As such shall be considered: invalidity, illness (certificate of personal physician confirming an incapability of at least six months over the last year of study), maternity within the last three years of study, family and social circumstances in the last year of study (opinion of the Social Work Centre on his/her unfitness for study), top athlete or top artist status in the last year of study.

The doctoral studies committee of the Faculty of Architecture decides on temporary suspension of student status issues.

10. TRANSITION BETWEEN PROGRAMMES

Transition from a different doctoral programme to the doctoral programme in architecture at the Faculty of Architecture of the University of Ljubljana is possible if the student fulfils the conditions of enrolment in this programme. The same applies to the transition from hitherto existing master's/doctoral or specialist study programmes. At transition the candidate shall submit a certified confirmation on fulfilled study obligations from the study institution where he/she was enrolled, as well as an official extract from the applicable study programmes within the framework of which the afore-mentioned obligations were fulfilled. The request for transition shall be approved by the doctoral study committee and the senate of the Faculty of Architecture – namely through recognition of the examinations, in the preparation process of the doctoral study plan. Upon verification, the content compliance with the programme to which the candidate wishes to transit, and in particular, topic proposed in the document submitted pursuant to the Regulations on the procedure for the acquisition of the title of Dr. of science at the Faculty of Architecture).

11. TYPES OF IMPLEMENTATION OF STUDIES

The study is implemented in a regular or part-time form; within the modules subjects may be chosen that are performed at distance, or combined. The lectures for part-time study are organized in the afternoon or at weekends (Wednesday, Thursday and Friday afternoons, and Saturday morning), 20% lectures are replaced in the form of consultations.

12. CONDITIONS FOR COMPLETION OF STUDIES

To conclude his/her studies, the student shall fulfil all obligations in all subjects that he/she has enrolled in, complete his/her individual research work, prepare a doctoral dissertation, present the results to the Doctoral Study Committee and supervisor (and co-supervisor) prior to its defence, as lead author publish an original scientific article in an internationally-renowned journal or a scientific chapter in a monograph (UL and UL FA habilitation criteria shall be taken into account), and also successfully defend the dissertation. The successful completion of the dissertation shall be examined by the Committee for Dissertation Evaluation and Defence in accordance with the Regulations on the Procedure for the Acquisition of the Title of Doctor of Science at the Faculty of Architecture of the University of Ljubljana.

MENTORS

LIST OF POTENTIAL MENTORS

<http://www.f.a.uni-lj.si/default.asp?id=2842>

13. THE SHORT INTRODUCTION OF SUBJECTS

1.1 SUBJECT OF THE GENERAL MODULE

1.1 INTRODUCTION TO SCIENTIFIC RESEARCH

LJUBO LAH

The characteristics of scientific research work, in particular in the fields of architecture and urban design; assortment of methodological topics, scientific research methods and techniques; science in relation to philosophy, logics, ethics and psychology of creativity; errors in the scientific research work; definition of a relevant research problem, finding and selection and critical application of scientific information in the field of architecture and urbanism; methods: processing and presentation of results, survey and interview, quantitative methods and sampling, characteristics of critical reading, time management skills; processing and presentation of results, preparation of the so-called primary documents.

1.2 SUBJECTS OF THE ARCHITECTURAL MODULE

1.2 ARCHITECTURAL THEORY AND CRITIQUE

PETRA ČEFERIN

Architectural concept of Antiquity and Renaissance; from Renaissance to functionalism; functionalism and post-functionalism; Slovene atmosphere: a) sacral versus profane aesthetics; b) socrealism: functionalism: post-modernism; c) minimalistic mask of post-modernism; architectural critique in Slovenia.

1.2 CORPUS OF THE SLOVENE ARCHITECTURE

PETER FISTER

New research methods of architectural research in Slovenia with direct connection to the European research projects and integral knowledge of the corpus of Slovene architecture; reestablishment of new forms of interdisciplinary education with connections in Slovene and international environment and direct cooperation in European research projects.

1.2 ARCHITECTURAL RESEARCH BY DESIGN

BOŠTJAN VUGA

Comprehension of architectural design and architectural practice as a research laboratory; integration of traditional, pragmatic and liberal approaches in the development of architectural methodology; conceptualization of architectural experimental research design based on critical reflections of comparable solutions; possibilities of methodological developments based on architectural experimental design.

1.2 STRATEGIES OF ARCHITECTURAL DESIGN

ALEŠ VODOPIVEC

Modernistic and contemporary strategies of architectural design: form/function; volume/weight; symmetry/regularity; cubism/fourth dimension of space/decoration; free plan layout/space plan; load bearing structure/tectonics; new materials/narrativity of material; building envelope (façade)/transparency/scenography...

1.2 CONTEMPORARY APPROACHES TO URBANISM

JANEZ KOŽELJ

Introduction: an outlook into globalization processes, neo-liberal conditions, specifics of post-urban space and emerging rights to the city; inefficiency and critical analysis of traditional methods and techniques of urban planning and urban development – the reasons why current urbanism is not able to reflect the needs of post-industrial society; possibilities of computing and informational communication technology; new emerging modes of flexible urbanism: absence of unified theory; operative methods and techniques of processual and pro-active urban planning: light, regulative, operative, consensual, new, loose urbanism and pseudo urbanism; the role of the city governance in response to a changing environment, instruments of equity linkage and innovative modes of urban management.

2.1 SUBJECTS OF THE INTERDISCIPLINARY MODULE

Thematic modules/emphasis – relations (legend of red dots – titles, disposition and structure of components is (pre)defined in accordance with the research policy of FA)

▪ *Architectural Theory and Critique, Corpus of the Slovene Architecture*

– relation to humanism

▪▪ *Fine–Arts and Digital Theory and Methodology*

– relation to humanism and technology

▪▪▪ *Theory and Methodology of Urbanism*

– relation to social sciences and biotechnology

▪▪▪▪ *Theory of Planning and Technological Application in Architecture*

– relation to technology

▪ ARCHITECTURAL THEORY AND CRITIQUE, CORPUS OF THE SLOVENE ARCHITECTURE

– RELATION TO HUMANISM

▪ ANALYSIS AND CRITICISM OF CONTEMPORARY ARCHITECTURE

PETRA ČEGERIN

Introductory overview of the contemporary architectural production: populism, rationalism, structuralism, productivism, post–modernism, Neo–Avantgarde, critical regionalism, reflective practices, sustainable architecture. The significance and role of the media in contemporary architecture. The significance of the intertwining of architectural production as building and design, and the »less material« production of architecture in the media. Conditions of the emergence of contemporary architecture. The ways of engagement of architectural production/architecture with the economic, political and cultural contexts in which it works/ is made: architecture as an integral part of social reality vs. architecture as a transformation of architectural and social reality; the possibilities, conditions, structure of architectural invention in the contemporary production of architecture and the realms of its operation.

▪ THE ORIGINS OF MODERNITY

NATAŠA KOSELJ

The dialectic of the development, the origins and concepts of the Modernity through comparative analysis of the theory, individual works of art, their authors and the influences of the space and time of their origin; definition of Modernity, period, origins; the use of the term Modern; space, time and the essence of the creative process.

▪ INTERPRETATION OF MEMORY IN ARCHITECTURE

MARUŠA ZOREC

Review of the methods of studying architectural history, overview of the approaches and ways of interpretation of memory in architecture; architecture that joins old and new, overview of the historical examples, research of the concepts; development of the new concepts of interpretation of the memory in architecture; development of the new concepts in the relationship of old and new in architecture.

▪ MEANING IN ARCHITECTURE

TADEJ GLAŽAR

Origins and purpose of meaning in architectural environment; significance of architectural environment; power of meaning, messages; historical development and the role of architectural expression through developing architectural practice (questions on monumentality ...); potentials of architectural expression in modern practice.

▪ ARCHITECTURAL ANALOGIES

LUČKA AŽMAN MOMIRSKI

Basic terminology; comparisons of architecture and town planning with other disciplines; applicability of methods in studying the subject; interpretations during familiarization with content; simultaneous or alternate studying of two or more contents in order to identify common characteristics or differences.

▪ CORPUS OF THE SLOVENE ARCHITECTURE–SELECTED THEMES

PETER FISTER

Selected themes include chapters from: new research–methods of architecture in Slovenia with direct connection to the European research–projects and integral knowledge of the corpus of Slovene architecture; formation of new forms of interdisciplinary education with the connections within Slovenian and international environment as well as direct cooperation in European research projects.

▪ IDENTITY OF SLOVENE ARCHITECTURE

ŽIVA DEU

Methods and ways of recognizing entities of Slovenian architecture that define and determine the unique Slovenian architecture; analysis and proving of uniqueness; absolute and relative identity of architectural objects; difference in solutions with comparisons and analysis of architectural elements; origins of difference of Slovene architecture to other world architectures.

▪ **PROTECTION AND REHABILITATION
OF ARCHITECTURAL HERITAGE**

PETER FISTER

The education about protection and rehabilitation of cultural heritage is connected to the actual changes and experiences of special architectural method and theory with accentuation on Slovene-specific problems and on professionally and scientifically latest achievements and methods of tackling such problems.

▪ **INTEGRAL RENEWAL**

LJUBO LAH

The understanding of fundamental concepts in the field of integral preservation of architectural heritage, familiarization with the interpretations of international data-bases and documents forming the doctrine of integral preservation in the context of sustainable development; theoretical, methodological, legal and value based point of view; selected topics: creativity and renovation, renovation of a town/town section/rural area/settlement, renovation/rehabilitation of buildings, management and cultural heritage, feasibility studies, instruments and mechanisms of spatial planning, planning of adjusted and adapted use of structures in space, preservation of authenticity, conservation interventions, methods and concepts in planning renovation interventions, interdisciplinary and team nature of work.

▪ **HERITAGE INTERPRETATION**

SONJA IFKO

The role of heritage in modern society: identification of cultural identity, space development potential and economic developer; description of characteristic development of heritage protection and the history of presentation methods and techniques; theory and philosophy of protection of natural and cultural heritage: presentation of different categories of architectural heritage, basics of museumological theory and different protection approaches; presentation of heritage and actual trends; inclusion of heritage protection in development programs.

▪ **ARCHITECTURAL ARCHETYPES OF THE SACRED**

LEON DEBEVEC

Characteristics of the relationship between place and cult; forming layers on the archetypes of the sacred; »wrapping« method; sanctuaries of ancient religions (Egypt, Ancient Greece, Roman Empire); Christian sanctuaries (The Early Christian age, The Middle-age, Baroque, Second Vatican council); parallel spatial developments of other religions.

▪ **THEORY OF VERNACULAR ARCHITECTURAL ORIGINS**

BORUT JUVANEČ

Between techniques, technology, usability, anthropology, ergonomics and aesthetics in architecture: origins of primeval architecture, interrelation of architectural theory and theory of origins, definition of origins; development principles; primeval architecture, scientific research methods for definition of the essence of vernacular architecture and its contemporary conceptual interpretation.

▪ **HUMAN ENVIRONMENT ANTHROPOLOGY**

IGOR TOŠ

Interaction, interdependence and co-evolution of human being and the anthropogenous material and spatial environment. Human being as an »animal symbolism«, a biophysical and symbolical being. Human environment as a biophysical and symbolical milieu. Main concepts in semiotic and information theory. Origins of architecture and origins of city/anthropogenic landscape. Notions of contemporariety. Interdisciplinary structure of architectural anthropology. Methodology of interdisciplinary research, foundations of systems methodology.

▪ **ARCHITECTURAL PSYCHOLOGY**

MATIJA SVETINA

Introduction: definition of the domain of architectural psychology; sensual effects; social processes and environment; recognition of the environment; environment problems in settlements; accidents; psychology and planning; specifics of behaviour and experiencing in some special environments; environment for everyone.

▪ **SELECTED TOPICS FROM PHILOSOPHY
OF SPACE AND TIME**

RADO RIHA

This course develops systematical and enhanced philosophical reflection of space/time by analytic and phenomenological methods, and connection between metaphysical and "live-by" concepts and experiences of space and time. Themes: space and time in the history of philosophy; space and time in contemporary science and philosophy; real, phenomenal and virtual space & time.

▪ **ART HISTORY**

PETER KREČIČ

Art history and history of cultural formations through the prism of architecture and its theory; selected art history topics from different historical periods; theory of art, architectural theories; theories of avant-garde and modernism.

■ FINE-ARTS AND DIGITAL THEORY AND METHODOLOGY
— RELATION TO HUMANISM AND TECHNOLOGY

■ SYSTEMS OF PLASTIC ARRANGEMENTS

JAKA BONČA

Designing composition or a system that is based on the grid or on other forms of repetition. Systems as mathematical isometric projections: mirroring, vortex, repetition etc; the meaning of dimensions, modules, scales, ratios and proportions.

■ ARCHITECTURAL VERSUS FINE ART RELATIONS

JAKA BONČA

Designing architectural space and spatial forms regarding different levels that art and architecture depend on; communication and communication with spatial entity through spatial dialogue; combination of different media and different kinds of visual arts; the framework for new forms of residence (being, existence); confrontation with the relation between form and the product of the society: knowledge/ understanding, order/chaos, revolution/evolution, architecture/sculpture, etc.

■ COLOURS AND SPACE

TOMAŽ NOVLIJAN

Detailed overview of approaches and methods for colour design; colour design as a reflection of other professions from the perspective of the methods dealt with; professional profile as a starting point of possible methodological contributions; proposal of methodological developments.

■ LIGHTING IN ARCHITECTURE AND URBAN ENVIRONMENTS

TOMAŽ NOVLIJAN

Physical properties of the light; the natural light; shade, shadow, refraction, absorption; the lighting with electrical powered sources; essential differences between indoor and outdoor lighting; the comparison between the designed/ simulated and measured/achieved photometric quantities; quality and quantity of light; light and the perception of the space; light as the bearer of information; dynamic lighting as a substitution for natural lighting; sustainable lighting design; light pollution; lighting in virtual space; the role of a lighting designer in a building process.

■ ABSTRACT SPATIAL TRANSFORMATIONS TOOLS

TOMAŽ NOVLIJAN

Spatial perception; notions: space, abstraction, transformation; their application in the creative process; the chaos theory and self-similarity; basic conception of fractal theory and fractal geometry; application in the design process; ambient design in aggressive environments, habitats without direct connection to aboveground space; adaptation of principles and shaping the perception of natural-like effects into the confined spaces; colour, pattern, light.

■ INTERIOR AND FURNITURE DESIGN

PRIMOŽ JEZA

Detailed overview of composition and design methods of mobile and fixed interior equipment, interior composition and design and placing of street equipment in the urban environment; interior/furniture design and understanding of used methods through a reflection of other field of professions; professional profile as a starting point of possible methodological contributions; proposal of methodological developments.

■ QUALITY OF DOCTORAL RESEARCH AND FUNDAMENTALS OF RESEARCH BY DESIGN

CLAUS PEDER PEDERSEN

This course will introduce the participants into the criteria of doctoral research and into the basics of research by design. Any kind of inquiry in which design is a substantial constituent of the research process is referred to as research by design ... In research by design, the architectural design process forms a pathway through which new insights, knowledge, practices or products come into being. It generates critical inquiry through design work. Therefore research results are obtained by, and consistent with experience in practice. The course will give background theories and provide some examples and helpful methods.

■ DIGITAL METHODS AND PRESENTATIONS IN ARCHITECTURE

OR ETTLINGER

Logical and effective use of digital multimedia through the whole planning/building process; methods, software and hardware needed for efficient work; web based technologies, multimedia databases in the field of architecture and tools that enable successful integration of work and communication across world wide web.

■ DESIGNING VIRTUAL ENVIRONMENTS

VASSILIS BOURDAKIS

Cyberspace, Virtual Reality, scope of application of synthetic environments, synthetic environments design principles, design tools.

■ DIGITAL DESIGN METHODS

HENRI ACHTEN

Into the minds of designers – how designers think; the science of the artificial; digital methods of design; developments in digital design methodology.

■ PROGRAMMING OF ARCHITECTURAL FORMS

JOSÉ PINTO DUARTE

The theoretical and practical fundamentals for the exploration of the computational aspects or architectural knowledge and form; the basic paradigms for developing generative systems including parametric design, shape grammars, cellular automata, etc and the basic programming constructs such as symbolic expressions, control structures, cyclic functions, data structures, etc; the basics of the scripting language and the required support for development of the exercises/projects.

■ DIGITAL FABRICATION

JOSÉ PINTO DUARTE

The basics of advanced geometric modelling, computer aided manufacturing virtual reality and remote collaboration; the use of CAD/CAM tools and processes, namely, subtractive, additive, cutting, and forming processes; solving of complex problems, i.e. in collaboration with the industry; mass customization of housing, the design and production of complex forms etc.

■ INTERFACES FOR ARCHITECTURAL LEARNING AND COLLABORATION

TADEJA ZUPANČIČ

Levels of architectural awareness among different publics; problems of visual communication between professional and general public; blended professional and life-long architectural learning; tools for general and professional architectural learning, for interdisciplinary architectural and urban design collaboration and public participation.

■ ARCHITECTURAL PUBLISHING

TADEJA ZUPANČIČ

Introduction to (digital) library resources; types of scientific publications; submission, review and dissemination; detailed review of scientific book publications; detailed review of relevant references; impact analysis; ontology.

■ NATURA ANIMARE: TRANSFORMING THE MATTER IN THE CREATION OF SPACE

PAUL O. ROBINSON

This course is designed to equip the researcher in architecture with the tools needed to develop critical modes of research regarding the transformation of materials in the production of architectural form and space. The student will be challenged to engage the role of materials as situated in theoretical writings on art, architecture and cultural semiotics, and in the development of contemporary technologies that reshape the traditional, symbolic and political role of materials in the creation of the built environment.

■ THEORY AND METHODOLOGY OF URBANISM

— RELATION TO SOCIAL SCIENCES AND BIOTECHNOLOGY

■ HISTORY OF URBANISM

LUČKA AŽMAN MOMIRSKI

Basic notions and the genesis of (spatial) elements. Consistent city: Orient and America; classical antiquity. Post-antiquity (feudal): return of organic structures. Renaissance: ideal city. The rational »Georgette« city. The modern »tartan city«, 19th and 20th century. Feudal cities in Slovenia. From feudal to the functionalistic city. Contemporary Slovene urban structures.

■ URBAN PLANNING

ILKA ČERPES

Overview of contemporary urban planning theories, sustainable development of the cities, detection and evaluation of the urban development problems, balancing of different development interests, processing of information for the purpose of planning, land use setting and organization, infrastructural network, network of built and un-built space patterns, strategies for generation of built forms.

■ ARCHITECTURE AND SUSTAINABLE SPATIAL DEVELOPMENT

ANDREJ POGAČNIK

Architecture as a component of sustainable development of cities, rural areas and landscapes. Research of attractions, environmental carrying capacity and vulnerability of space. Theories of local accessibility analysis, economic justification and social acceptability. Models of plot development, urban and regional scenarios, simulations and games; behavioural, public-opinion, situational and other research. Visual – morphological research of building placement. Architecture and systems: transport, energy-communal systems, agricultural/forest systems, »green belt« systems. Architecture as a component of land use on municipality, regional and state level. Regionally and state wide important buildings (DLN). Architecture and aspects of sustainable development (ESDP, CEMAT, HABITAT etc). Discussion.

■ SUSTAINABLE CITY DEVELOPMENT

MOJCA ŠAŠEK DIVJAK

The definition of sustainable city development (by different authors), parameters and indicators of sustainable city development, comparison of different city models and urban patterns, the decentralized concentration model of settlement in different levels (region, city, quarter, community), good practices of sustainable cities, quarters, communities.

■ TOOLS FOR CONTROL OF URBAN FORMS

KALIOPA DIMITROVSKA ANDREWS

Town planning in modern planning systems. Aesthetic issues in town development. Methods for evaluation and stimulation of quality of urban design and economical sustainability of projects related to town development. Design measures for planning of town and other settlements: classification and their influence on the development of physical structures.

■ REGIONAL PLANNING

ANDREJ ČERNE

Regional aspects of development; regional problems; development trends and development opportunities; determination of regional development potentials; structure, functions and development of regions; inter- and intra- regional disparities; indicators and criteria as an instrument in regional planning and decision making, the concept of region; spatial division of areas; types of regions.

■ ENVIRONMENTAL MANAGEMENT FOR RURAL TOURISM AND RECREATION

ALENKA FIKFAK

Environmental ethics; psychological and sociological aspects of the environment; environmental economics: considering the supply and demand, considering the costs and benefits; the role of contractors and management of supporting civil/infrastructure services on the user's quality of life; the quality of ambience related to physical, mental and social health; the theory of active rest.

*** LOCAL PLANNING AND PUBLIC PARTICIPATION

ANDREAS VOIGT

»Local planning« and »public participation«.

Fundamentals of system theory, simulation theory and communication theory related to planning theory.

Planning processes – dealing with public issues various public and private actors; dealing with problems, complexity and various levels of detail. Advantages of various planning approaches. Bottom–up procedures in planning and methods of public participation, »best practice« examples.

*** URBAN ECONOMICS

ANDREJA CIRMAN

Introduction to real estate markets. Microeconomic analysis of property markets; Macroeconomic analysis of property markets; economic growth and metropolitan real estate markets; The impact of local governments on real estate markets: local government, property taxes, and real estate markets; public goods, externalities, and development regulation.

*** REAL ESTATE ECONOMICS–SELECTED THEMES

MARUŠKA ŠUBIČ KOVAČ

Definition of real estate economics, real estate life cycle, real estate development. Spatial planning and land use decision: location factors, impact of institutional factors on land use, economic returns to land use, decisions. Real estate development process: land availability, land policy, land acquisition, public and private interests weighting, land development and community infrastructure levy, construction and construction costs. Real estate valuation. Real estate analyses for real estate decision–making.

*** SOCIOLOGICAL CONCEPTS OF MODERN URBANISM

MARJAN HOČEVAR

Transformation of the cities at intertwining processes of globalization and localization (»glocalization«). The cities as reflective choice for an increasing number of actors. The instrumental significance of spatial practices and the increase role of the reflective practices linked to lifestyles. Intertwining of non–residential spatial practices and spectacle functions in redefinition of postulates of classical urbanism.

*** TOWNSCAPES AND INTERACTIVE CITIES

MATEVŽ JUVANČIČ

The notion of urban spaces as lively, ever changing, interactive and complex places, full of urban elements and users consisting of connections and interactions among them; research of urban landscapes, cityscapes and townscapes through the emerging (visual) urban vocabulary, system and data modelling for the purpose of communication, design and decision-making support; transfer and design of innovative, sustainable, low- and high-tech solutions and approaches based on contemporary (smart) cities; examining various means of communication and media (social-, web-based-, apps, etc.) for conveying urban issues at hand to experts and non-experts alike.

*** LANDSCAPE SETTLEMENTS OF CULTURAL DIVERSITY

ALENKA FIKFAK

Theoretical and historical basis for understanding forms and spaces. Basic notions (perceptual, experimental and living space); living culture, defining people needs; contemporary global social and economic changes. Designing living units, meaning of individual space as a basis of living units forming (light, communication and function). Elements of buildings in the meaning of sensing/experiencing, imagination of space; examples of contemporary organized building in country side; new forms, experimental models, etc.

*** PROTECTION OF ARCHITECTURAL LANDSCAPES

ŽIVA DEU

International documents about the protection of built environment. Architectural policy for sustainable Europe of diverse regions. The role of significance of the built environment, as an element which contributes to regional diversity. Architectural landscapes and regions of Slovenia. Methods which help to identify quality values and measures of the built environment in an architectural landscape as the prerequisite for quality refurbishment and new designs. Examples of good practice. Discussion on the methods used (architectural, art–historical, ethnological, social).

*** METHODS OF AMBIENTAL DESIGN

MOJCA GREGORSKI

Mechanisms of spatial perception and sensual formation of human living environment through several perception levels and different perception media. The concept of ambient (material and physical and emotional, intellectual, symbol). Systems of values generated in different historical periods and profession doctrines. Perception of micro–ambients. Perception on the macro–ambiental level. The multi–level experience of traditional town: ambient as realistic geometry, ambient as psychological challenge, ambient as recognizable form and ambient as cultural phenomena. Contemporary theory of perception (the generic city). New aesthetics of space based on individuality and diversity. Interdependence of aesthetics with particular social context and its system of values.

*** SENSITIVE URBAN PLACES

TADEJA ZUPANČIČ

Detailed review of architectural and urban research/design methods and the design of micro urban and architectural places in the city. Architecture as a reflection of other professions from the perspective of the methods dealt with. Professional profile as a starting point of possible methodological contributions. Proposal of methodological developments.

*** DESIGN OF OPEN SPACE

DAVORIN GAZVODA

Reasons for existence and typology of the objects of garden art. Transition of garden art in more complex design of open space. Built and green open space. Modern landscape design. Generation of landscape forms. Interdependence of architectural and landscape design. Inclusion of sociological, psychological and landscape–ecological issues in design of city open space. New paradigms in design of open space. Critical overview of recent design achievements in the field of open space design.

■■■ **STAKEHOLDERS IN THE ARCHITECTURAL AND URBAN DESIGN PROCESS**

GREGOR ČOK

Productive living and working environment. Spatial development – what is planned, for whom, and where? Stakeholders in the design process and their roles (user, profession, public, media, decision makers). Stakeholder approach in the design process. Measures for anthropogenic environment design.

■■■ **SPATIAL DESIGN OF INDUSTRIAL, BUSINESS AND ENTREPRENEURIAL ZONES**

GREGOR ČOK

Economic activities in the physical space. Strategic starting points for structural and programmatic zone design. Planning level (zone typology and location criteria). Project design level (typological elements). Alternative spatial forms and zone management.

■■■■ **THEORY OF PLANNING AND TECHNOLOGICAL APPLICATION IN ARCHITECTURE**

— **RELATION TO TECHNOLOGY**

■■■■ **ARCHITECTURAL DESIGN THEORY**

IGOR TOŠ

Design as an inter-subject, interdisciplinary, multi-phase and creative process of preparations for the intervention in environment. Factors that influence architecture. Subjects in architectural processes. Design as communication, agreement, coordination and integration of contributions. The role of an architect. Aspects, types and phases of design process. The role of regulations and norms. Design as a problem solving, decision making, as a creative process. Basic concepts in psychology of creativity. Foundations of design methodology and technology, basic general and specific methods and techniques, comparison of methods. Systems methods in design and the problem of specialization. Relation between standpoints and methods, theories and practice. Problem of goal, resource and solution assessment. Value systems and criteria. Ethics and aesthetics in design.

■■■■ **INTEGRATED PRACTICES AND BUILDING MODELLING**

TATJANA ISAKOVIĆ

Approaches to integrated practices: knowledge of project life-cycle. Integrated practices and project knowledge management, the systems thinking approach fundamentals and applications. The project system: environments, elements and relationships, the scope of projects and the role of design teams. Project and teamwork system analyses methodologies, technological, organizational and process analyses for collaborative practices. Team forming, collaborative work and communication. Digital project and optimization of collaborative practices. Integrated practices with building information modelling. Designed-built best practices, documentation, archiving and re-use. Management of design teams, CAD management and small groups.

■■■■ **HIGH-TECH ARCHITECTURE**

LJUBOMIR MIŠČEVIĆ

Contemporary building materials, systems and structures in architectural design and construction of high-tech architecture. Continuous development of architectural discourse and construction technologies through increasing world of discoveries, their application and monitoring, which pose new challenges to creativity. The obligation of architects in pursuing and adopting the high-tech technology in architectural practice. Selected themes: eco-tech, bioclimatic high-tech, extreme architecture, virtual high-tech.

■■■■ **CONTEMPORARY ARCHITECTURAL TECHNOLOGY**

MARTINA ZBAŠNIK-SENEGAČNIK

Subject is divided into following components: contemporary architectural technologies, building materials selection criteria, ecological building materials: natural, local, recycled, renewable, low energy, hydro- and thermo-insulating, smart building materials; nano building materials and techno textiles.

■■■■ **MASS CUSTOMIZATION OF HOUSING**

JOSÉ PINTO DUARTE

General production paradigms: handcrafted, mass production, lean production, mass customization. Approaches to mass housing: 19th century and beginning of the 20th century, the period between the Two World Wars, Post-World War II, from the 1960s to today. Prefabrication systems: light and heavy prefabrication; linear, planar and volumetric systems. Design systems: classical, Durand, Le Corbusier, Gropius, Fuller, Wright, Habraken's Theory and other recent approaches. Use of computer aided and building technologies for designing user adapted mass production that give mass produced objects the qualities of individually designed objects.

**** FIRE SAFETY OF BUILT ENVIRONMENT

DOMEN KUŠAR

While planning architects have to take safety of people, assets, building itself and its surroundings into the account.

The planners have to respect legislation as well. The course thus introduces three components of safety problematics: safety against fires – causes of fires and explosions, system of safety measures for prevention of fires, for restraint of spreading of fires, for evacuation and rescuing of people and assets and for intervention of firemen, firefighting devices, etc; safety at work – causes of danger, technology, measures behind expedition and reduction of danger such as: physical (falls, explosions, hits, vibrations, noise, hot blow, light blow, electric blow, etc), chemical (smoke, poisonous and pungent substances, etc.) biological or any other; safety against pollution – causes of pollution of air, waters and lands, measures for expedition of danger of environment pollution of, water treatment plants.

**** ENVIRONMENTAL PHYSICS FOR ARCHITECTS

JAUME ROSET

Studies in the field of environmental physics; thermal aspects; acoustics; lighting; »architectural combinations« of thermal, acoustics and lighting from the environmental physics perspective.

**** ENERGY AND ENVIRONMENT ASSESSMENT OF BUILDINGS

SAŠO MEDVED

Environment related problems caused by construction and utilization of contemporary buildings and settlements due to the materials and energy demand; environmental spheres, natural processes in environmental spheres and their change through anthropogenic sources of pollution; importance of rational use of materials and energy in buildings and principles and technologies for energy supply based on dissipate and district energy systems; analytical and numerical methods for energy and environment assessments of buildings are introduced; methods for technology and economy based feasibility studies of buildings related environment protection technologies.

**** MICROCLIMATE OF URBAN AREAS AND BUILDINGS

SAŠO MEDVED

Modelling of energy and mass flows in the urban environment, sensible and latent heat storage in built environments and nature, microclimatic balance in urban environment, flows ratio and transfer of pollutants in urban environment, mechanisms of heat transfer, discreet and gradual heat transfer through homogenous and inhomogeneous built structures, discreet and gradual water and humidity transfer through homogenous and inhomogeneous built structures, transfer of heat through transparent envelopments of buildings, heat-loss, modelling and evaluation of joints, transfer of sun radiation and sunlight in buildings (modelling), heat storage in built structures, adaptive models of living thermal comfort, thermal response of buildings, planning of interior living environment and energy use based on the thermal response of buildings.

**** RENEWABLE SOURCES OF ENERGY IN BUILDINGS

MARTINA ZBAŠNIK-ŠENEGAČNIK

Parameters of living comfort, building technologies of passive and low-energy houses, the components of passive and low-energy houses (a thermal insulation, windows and doors, the systems of warming and ventilation, sun protection, etc), the ecological passive houses (houses made from natural materials: straw, clay, earth, etc), big passive houses (offices, schools and kindergartens, mountain huts, factories, etc), the building renovation in passive house technology (thermal insulation, thermal bridges, ventilation, warming, etc), the newest technologies (activation of concrete mass, cooling and warming in the wall, etc).

**** SELECTED TOPICS IN BUILDING AND CONSTRUCTION HISTORY

LARA SLIVNIK

The course offers a critical examination of the transformations in architectural and constructional history: Crystal Palace, Palais des Machines, Le Corbusier's pavilion L'Esprit Nouveau, Mies's Barcelona Pavilion, etc and more recent from Hannover EXPO 2000 to Shanghai EXPO 2010.

**** STRUCTURES IN ARCHITECTURE

VOJKO KILAR

The course is oriented toward the preliminary design and analysis of structures. Main teaching topics include: computer models, loading, materials and simulations of structural behaviour with computer programs. Basic knowledge on selected programs for static analysis and basic information on structural modelling are given. Special attention is given to the communication between 3D architectural models and structural mathematical models. The course is also supported with prepared computer simulations of structural behaviour which enable a more direct connection with engineering component of the course.

**** BASICS OF BRIDGE DESIGN

TATJANA ISAKOVIĆ

The main topics of the course are conceptual design, analysis and basic procedures for estimation of the dimensions of structural elements. Students will obtain the knowledge about computer based modelling of bridges, including modelling of different materials, loads and different groups of structural elements. He or she will obtain the knowledge about the computer software, which is intended for the analysis and design of bridges. The special attention will be devoted to the proper modelling. Proper procedures for estimation of the bridge strength will be considered, too. The course is supported with computer simulations of structural response. Lectures will be combined with project base and problem oriented work.

■■■■ EARTHQUAKE ARCHITECTURE

VOJKO KILAR

In the first part the students get basic insight in the earthquake engineering field and actual philosophy of building design in earthquake prone areas. We describe the phenomena of earthquake loading as well as the importance of conceptual building design for actual behaviour of building during an earthquake. The second part is focused to architecture of earthquake resistant structures and analysis of existing or empirical mechanisms to achieve adequate horizontal stiffness of buildings. A special attention is given to the architectural identity of specific cultural region that can be accessed thru earthquake resistant building concept. The symbolic or metaphoric response of architect to earthquakes is also presented. The third part combines the first two parts and looks for a synergy between the earthquake engineering and architecture.