



Sveučilište u Zagrebu
Arhitektonski fakultet
University of Zagreb
Faculty of Architecture

UNDERGRADUATE STUDY OF ARCHITECTURE AND URBAN PLANNING SYLLABUS

CONTENTS:

I. YEAR

1st SEMESTER

ISVU	COURSE NAME
20756	History of Architecture 1 Architecture in Croatian Regions – Zagreb
20787	Basics of Descriptive Geometry
34203	Drawing 1
20708	Introduction to Computer-aided Design Architectural Technology and Materials 1
20713	Load-bearing Structures 1
95667	Mathematics
186680	Architectural Design 1
186681	English for Architecture 1
47759	Physical/Health Education 1
20738	
20742	

2nd SEMESTER

ISVU	COURSE NAME
20757	History of Architecture 2
20788	Architecture in Croatian Regions – North-Western Croatia
34200	Descriptive Geometry and Perspective
20709	Drawing 2
186683	Computer-Aided Architectural Design 1
98149	Architectural Technology and Materials 2
51008	Load-bearing Structures 2
51010	Architectural Design 2
51011	Introduction to Design of Residential Buildings
20729	Urban Planning 1
20739	English for Architecture 2
20743	Physical/Health Education 2

II. YEAR

3rd SEMESTER

ISVU	COURSE NAME
34215	History of Architecture 3
20710	Modelling 1
186693	Computer-Aided Architectural Design 2
98150	Architectural Technology and Materials 3
51013	Building Installations 1
51014	Load-bearing Structures 3
186684	Design Studio I – Architecture
186685	Design Studio I – Urban Planning
	Design Studio I – Architectural Structures
186686	Residential Buildings 1
20720	Urban Planning 2
51017	Physical/Health Education 3
34221	

4th SEMESTER

ISVU	COURSE NAME
40165	History of Architecture 4
34206	Architecture in Croatian Regions – Slavonia
186687	Modelling 2
186688	Art practices
34219	Building Installations 2
186689	Building Physics
186690	Design Studio II – Architecture
186691	Design Studio II – Urban Planning
	Design Studio II – Architectural Structures
186692	Residential Buildings 2
186694	Environmental Sociology
51023	Landscape Architecture
20735	Physical/Health Education 4
20745	

III. YEAR

5th SEMESTER

ISVU	COURSE NAME
186695	Modern and Contemporary World Architecture
186696	Preservation and Rehabilitation of Built Heritage
186697	Planning and Project Management 1
39905	Building Technology
186699	Design Studio III – Architecture
	Design Studio III – Landscape Architecture
227317	Design Studio III – Architectural Structures
186701	Buildings for Educational Purposes
39906	Sustainable Architecture
186702	Urban Planning 3
39907	

6th SEMESTER

ISVU	COURSE NAME
186703	Modern and Contemporary Croatian Architecture
39908	Introduction to the Theory of Architecture
20790	Architecture in Croatian Regions – Istria
186698	Planning and Project Management 2
186704	Design Studio IV – Architecture
227318	Design Studio IV – Physical Planning
186706	Design Studio IV – Architectural Structures
20726	Office and Commercial Buildings
186707	Introduction to Physical Planning
186708	Architecture and Urban Planning Legislation
51029	Landscape Planning

Learning outcomes of the study programme

Undergraduate Study of Architecture and Urban Planning

Upon completion of the undergraduate study programme, the student will be able to:

- P1** Creatively apply knowledge and methods in the field of technical sciences and arts, as well as social and natural sciences in architectural and urban design solutions that meet the aesthetic and technical requirements of the discipline
- P2** identify the architect's responsibility to preserve the values of the natural and built environment
- P3** select information and criteria essential to the development of an architectural and urban design project
- P4** demonstrate knowledge of the basic typologies, language, principles and theoretical concepts that articulate and express ideas in the discipline of architecture and urban planning
- P5** identify universal principles from examples in architectural history that inform contemporary design decisions
- P6** propose an architectural and urban conceptual design in accordance with a given design programme of medium complexity within a realistic physical, economic, social, cultural, legislative, technical and artistic context, which meets the requisite aesthetic and technical standards
- P7** design parts of the architectural, physical planning and technical documentation and integrate these components into a unified whole
- P8** when collaborating in the development of an architectural and urban design project, propose the appropriate materials, technologies, technical, installation, transport, safety systems and structural solutions, with the aim of integrating them into a functional whole, meeting basic building requirements and achieving sustainability
- P9** apply knowledge of physical, technological and functional solutions with the objective of protecting the building from external climatic influences and achieving a comfortable internal microclimate
- P10** apply knowledge of the organisation, technologies and legislation relating to the construction process involved in the realisation of a project and plan
- P11** critically evaluate the designed or realised architectural and urbanistic conceptual design
- P12** demonstrate visual and technical culture when applying tools for the development and presentation of an architectural and urban planning project
- P13** accurately graphically, textually and verbally present an architectural and urban planning project
- P14** collaborate on architectural and interdisciplinary projects and in research teams on professional, scientific and artistic projects
- P15** plan the continuation of their education by enrolling in graduate studies in the field of architecture and urban planning
- P16** apply the principles of professional ethics and codes of conduct

FIRST SEMESTER

History of Architecture 1

Course status	Compulsory
Course lecturer(s)	Nataša Jakšić
Course associate(s)	Jakšić; Seitz
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Introduction to architecture. Architecture of the Ancient World. Structural, functional and formal aspects of architecture. Architectural theory and architectural practice.

Development of general and specific competences – knowledge and skills:

Basic knowledge of the architecture of the Ancient World, with special emphasis on examples in Croatia. Insights into architecture as a result of various technical, functional and artistic demands. Understanding of functional typology of architecture as a basis for creative interpretation. Historical environmental limitations (climate, building materials) and adjustment. Understanding of mutual relations of materials, technology and architectural design. Understanding of architectural drawings as two-dimensional representations of three-dimensional reality.

Course curriculum

- 1 Introduction to architecture
- 2 Architecture of prehistory
- 3 Egyptian architecture: introduction, residential and funerary architecture
- 4 Egyptian sacred architecture
- 5 Architecture of Mesopotamia and surrounding regions
- 6 Aegean architecture: Troy, Crete, and Mycenae
- 7 Greece – introduction, typology and structure of temples, Greek orders
- 8 Classical orders and the language of classical architecture
- 9 Greek sacred architecture
- 10 Greek secular architecture
- 11 Roman architecture: introduction, Vitruvius, construction techniques
- 12 Roman sacred architecture
- 13 Roman secular architecture
- 14 Roman residential architecture: domus and insula
- 15 Roman residential architecture: villas and palaces

Other forms of teaching and knowledge assessment

test

Compulsory literature

- 1 D. Watkin: History of Western Architecture, Laurence King Publishing, London, 2011, (5th edition, selection)
- 2 R. Ivančević: Umjetničko blago Hrvatske, Zagreb, Motovun, 1993 (selection)
- 3 W. Müller, G. Vogel: Atlas arhitekture I., Golden marketing i IGH, Zagreb, 1999 (selection)

Additional literature

- 1 Vitruvije: Deset knjiga o arhitekturi, Golden marketing, Zagreb, 2000.

Requirements for obtaining a signature

Regular class attendance

Type of exam

Written (drawing) and oral.

Learning outcomes of this course

- 1 – Identify the fundamental principles of ancient architecture.
 - 2 – Demonstrate an understanding of architecture as the result of various technical, functional and artistic requirements.
 - 3 – Understand functional typologies of architecture as a basis for creative interpretation.
 - 4 – Understand historical environmental limitations (climate, building materials) and adjustment.
 - 5 – Understand the mutual relations of materials, technology and architectural design.
 - 6 – Use architectural drawings as two-dimensional representations of complex spatiality.
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Learning outcomes of the study programme

P03, P04, P05, P11, P15

Architecture in Croatian Regions – Zagreb

Course status	Compulsory
Course lecturer(s)	Zrinka Barišić Marenić
Course associate(s)	Barišić Marenić; Bertina; Čavlović; Smode Cvitanović
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	1
ECTS credits	0.5

Framework of course content

The field course provides students with an insight into the architectural and urban development of the city of Zagreb. It consists of two parts: introductory lectures and guided field tours with professional on-site presentations.

The two introductory lectures focus on the development of the city and architecture of Zagreb from its beginnings to the present day: "Zagreb – The City and Architecture from its Origins to the End of the 19th Century" and "Zagreb – The City and Architecture of the 20th and 21st Centuries". The field tours, guided by prepared materials and expert commentary from lecturers leading each topic, are divided into two sections: "Historic Zagreb: Kaptol and the Upper Town" and "12 Constitutive Examples of Architecture and Urban Space (Lower Town)".

During the tours, students will sketch and analyse the buildings and spaces they visit, selecting sketches from their graphic journals to submit as a portfolio at the end of the semester.

Development of general and specific competences – knowledge and skills:

In addition to introducing students to facts about the city and its architecture, this course aims to encourage students to engage in the interpretation of the cultural environment from which architecture emerges. Students will develop the habit of studying architecture on-site, and of recording and analysing what they observe.

Course curriculum

1st introductory lecture: "Zagreb – The City and Architecture from its Origins to the End of the 19th Century" (prof. Zrinka Barišić Marenić, PhD)

2nd introductory lecture: "Zagreb – The City and Architecture of the 20th and 21st Centuries" (prof. Zrinka Barišić Marenić, PhD)

1st field tour: "Historic Zagreb: Kaptol and the Upper Town";

2nd field tour: "12 Constitutive Examples of Architecture and Urban Space (Lower Town)"

Other forms of teaching and knowledge assessment

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Compulsory literature

1 Laslo, A. (2011), Arhitektonski vodič, Zagreb 1898.-2010., Profil, Zagreb (thematic chapters)

2 Karač, Z., Žunić, A. (2012) Antologijski arhitektonski vodič Zagreba. 100 izabranih zgrada, Faculty of Architecture at the University of Zagreb and UPI 2-M books, Zagreb (thematic chapters)

Additional literature

- 1 Bedenko, V. (1989), Zagrebački Gradec, kuća i grad u srednjem vijeku, Školska knjiga, Zagreb
 - 2 Blau, E., Rupnik I. (2007), Project Zagreb: Transition as Condition, Strategy, Practice, GSD, Harvard and Actar, Barcelona
 - 3 Knežević, S. (1996), Zagrebačka zelena potkova, Školska knjiga, Zagreb
 - 4 Korlaet, L. (ed., 2013) Zagreb, džepni vodič arhitekture, Društvo arhitekata Zagreba, Zagreb
 - 5.*** (2001), Werk, bauen + wohnen / Zagreb Agram, 09, Zürich
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Requirements for obtaining a signature

Attending introductory lectures, attending tours and submitted drawings and analyses of the sites visited.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Collection of analytical drawings and seminar paper

Learning outcomes of this course

A student completing this course will be able to:

- 1 identify and describe the most significant historical and modern achievements in the areas of the Upper and Lower Town of Zagreb;
 - 2 understand the genesis of the visited historical and contemporary architectural achievements;
 - 3 identify and describe the basic spatial qualities of the visited historical and contemporary architectural works;
 - 4 sketch the fundamental spatial characteristics of the most notable historical and modern architectural achievements.
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Learning outcomes of the study programme

P02, P05, P11, P13

Basics of Descriptive Geometry

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Marija Šimić Horvath
Course associate(s)	<u>Šimić Horvath</u> ; Tarandek
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.5

Framework of course content

Methods of parallel projections, rules of transformation, representation of geometric elements and figures, and their interrelationships in the floor plan, elevation, and plane view. Solving 3D problems and their relations depicted in a plane using classical techniques or supported by CAD software. Application of axonometric methods for representing 3D objects with special view to the architectural dome and vaults. Writing programmes in axonometry (oblique axonometry, orthogonal axonometry, Eckhart's method). Visualisation with GeoGebra and Rhinoceros.

Development of general and specific competences – knowledge and skills:

When solving geometric problems, descriptive geometry is used to represent spatial figures and their interrelationships through graphic representations and by creating models, either virtual on the computer or real. This develops the ability to represent space as a factor of human intelligence, as well as visualisation, which is necessary in architectural design. The course is designed to prepare students for the application of geometry in urban planning and architectural design.

Course curriculum

1. Introduction (basic concepts of descriptive geometry and its significance in architecture and urban planning, types of projection).
2. Methods of projection (parallel projection, introduction to orthogonal projection).
3. Plane figures and second-degree curves, regular and semi-regular polyhedra and examples in architecture, plane transformations – visualization with GeoGebra.
4. Orthogonal projection onto two planes (representation of points, lines and planes, application on the example of a roof structure).
5. Orthogonal projection onto two planes (perpendicularity).
6. Orthogonal projection onto three planes (side view and application of the plane view method).
7. Rotation around the trace (projecting and general planes, plane figures).
8. Rotation around the trace (circle).
9. Orthogonal projection of geometric solids (regular polyhedral bodies and rotational surfaces in floor plan, elevation, and side view).
10. Oblique axonometry (introduction and principles).
11. Oblique projection (principles and application in drawing façades).
12. Orthogonal axonometry (principles and advantages of this method of representation).
13. Section of a sphere in orthogonal axonometry, domes (hanging dome, Czech dome, and Byzantine dome with pendentives – visualization with Rhinoceros).
14. Eckhart's method (quick drawing technique from the floor plan and elevation of a given structure).

Teaching modes: lectures, auditory exercises, construction exercises (independent tasks), mixed e-learning

Other forms of teaching and knowledge assessment

Tests, programme creation (by hand with pencil on A3 or using CAD programme) with explanations of construction procedures, making models and homework (continuous monitoring).

Compulsory literature

1. S. Gorjanc, E. Jurkin, I. Kodrnja, H. Koncul, *Deskriptivna geometrija*, <http://www.grad.hr/geometrija/udzbenik/>
2. P. Kurilj, N. Sudeta, M. Šimić, *Perspektiva*, Golden marketing-Tehn. knjiga, Zagreb, 2005.
3. URL <https://arhitektzg.sharepoint.com/I/ONG>, teaching material
4. URL <http://www.grad.hr/geomteh3d/radne.html>, repository of teaching material

Additional literature

- 1 I. Babić, K. Horvatić-Baldasari, *Nacrtna geometrija*, Sand d.o.o., Zagreb, 1997.
- 2 V. Szivovica, E. Jurkin, *Deskriptivna geometrija* (CD-ROM), HDGG i GF Zagreb, Zagreb, 2005.
- 3 I. Babić, S. Gorjanc., A. Sliepčević, V. Szivovica, *Nacrtna geometrija-Zadaci*, HDGG, Zagreb, 2007.
- 4 V. Niče, *Deskriptivna geometrija*, Školska knjiga, Zagreb 1992.
- 5 H. Pottman, A. Asperl, M. Hofer, A. Kilian, *Architectural Geometry*, Bentley Institute Press, 2007.

Requirements for obtaining a signature

Regular attendance at lectures and exercises, submitted assigned programs, models and assignments

Type of exam

Passed tests.

Learning outcomes of this course

- 1 Reproduce regular and semi-regular polyhedra and their nets.
 - 2 Explain the relationships and properties of spatial geometric formations.
 - 3 Sketch orthogonal projections of spatial geometric formations onto three mutually perpendicular planes (floor plan, elevation, side view / plane view).
 - 4 Distinguish between different axonometric methods.
 - 5 Illustrate the application of a sphere section in the representation of domes.
 - 6 Justify the optimal representation of a 3D object in axonometry.
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Learning outcomes of the study programme

P01, P12, P13, P15

Drawing 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Renata Waldgoni
Course associate(s)	Waldgoni; Bakić; Tutek; Pavlović; Hrastar
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	3
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.0

Framework of course content

Through the selected topics and assignments in the course Drawing 1, students will become familiar with the basic elements of visual language. By observing spaces and objects and analysing their geometry, students will create drawings and, through drawing, develop tools for generating concepts and spatial ideas at all scales. Drawing will thus become a means of understanding the visual complexity of phenomena and the world around them.

Encouraging artistic expression, mastering the construction of spatial and architectural thought and its visual representation are key aspects of the learning process in this course. This approach encourages the development of visual intelligence, graphic culture and a sense of innovative artistic and spatial solutions.

Development of general and specific competences – knowledge and skills:

An evolved system of thought. Developing visual intelligence, graphic culture and a sense of artistic spatial solutions.

Course curriculum (to be elaborated as precisely as possible according to teaching units and teaching weeks – take 15 weeks and, if necessary, elaborate lectures and exercises separately; emphasise the way the exercises are carried out – practical, laboratory, calculation, computer, etc.)

1 – 3 Geometric composition of two-dimensional figures of choice. Drawing motor skills, control, intensity and character of line.

Two-dimensional composition, relationships between part/whole/paper format, linear and graphic drawing, translating figure compositions into body compositions and recognising shifts necessary to maintain coherence.

4 – 6 Study of a plaster cast of a classical statue, reduction and geometrization of a complex natural form, study of proportions, spatial relationships, mass, structure and balance. Translating perceived anthropomorphic features from the model into a drawing. Recognising the relationship between the human figure and geometric voluminosity.

7 – 9 Drawing an observed object, studying a simpler, geometrically regular model.

10 – 12 Drawing of a spatial arrangement given by a floor plan and a cross-section. Perspective, axonometry, framing, expressiveness of representation.

Drawing/study the space we are in, rationalising the motif and visual memory.

13 – 15 Observing and drawing the structural composition of an object – a chair (style, B. Bernardi, etc.).

Other forms of teaching and knowledge assessment: Homework, consultations and discussions both in groups and individually.

Compulsory literature

1 Rudolf Arnheim: Umetnost i vizuelno opažanje, Univerzitet umetnosti u Beogradu, Belgrade, 1981.

2 Vittorio M. Lampugnani: Architecture of 20th Century in Drawings, Rizzoli, New York, 1982.

3 Matko Peić: Pristup likovnom djelu, Školska knjiga, Zagreb, 1985.

4 Charles Baudelaire: The Painter of Modern Life, Phaidon, London, 1964.

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

- 1 Bernard Hamburger: Exact and Approximate Dimension, Lotus 37/1983, Milano
 - 2 Wolfgang Keler: Geštalt psihologija, Nolit, Belgrade, 1985.
 - 3 Žan Pjaže: Psihologija inteligencije, Nolit, Belgrade, 1977.
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Requirements for obtaining a signature (**regular class attendance / passed test / submitted programme / seminar paper / research project, etc.**)

Regular class attendance, positive grade and student acknowledgment of provided information and indicated shortcomings and qualities.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

There is no exam. The skill will be assessed on the basis of the programmes submitted.

Upon successful completion of this course, the student will be able to:

- analyse a spatial object (chair, sculpture, etc.);
 - identify the relationships between the elements that make up a complex shape;
 - identify regularities (geometric, constructive, spatial, material, etc.) within the whole of an object;
 - draw a simplified representation of space;
 - apply the basic rules of drawing in a given format;
 - use elementary graphic techniques;
 - deepen knowledge of basic concepts and elements of the visual language;
 - learn different ways of visual thinking and its application in different situations.
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Learning outcomes of the study programme
P01, P12, P13

Introduction to Computer-aided Design

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Bojan Baletić
Course associate(s)	Baletić; Careva; Lisac; Vdović; Pap
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	1
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.5

Framework of course content

This course introduces students to modern information technologies, the IT infrastructure and resources available at the institution. The course content focuses on the acquisition of practical skills in the use of modern software tools. Students are expected to gain an understanding and mastery of 2D computer graphics (raster and vector) and the basics of technical drawing using CAD software. The second part of the course focuses on the fundamentals of creating conceptual models using a 3D conceptual modelling tool tailored to architectural work. The course is complemented by computer presentation skills which consolidate the course outcomes.

Development of general and specific competences – knowledge and skills:

The aim of the course is to master the basics of computer operation, working in a networked environment, as well as working with peripheral input and output devices. It includes an overview of techniques and modern tools and their applications in architecture.

Students will be introduced to 2D computer graphics, raster graphics, vector graphics and CAD drawing. They will learn the basics of scanning as a basis for processing raster data and as a basis for vector processing. Students will master basic and advanced techniques, as well as the specifics of working with raster data. They will also master the processing of 2D vector graphics, including the conversion of raster data (vectorisation) and the specifics of working with vector graphics and creating illustrations.

The course also covers the basics of working with a 3D conceptual modelling tool. Students will create 3D spatial models, modify models, explore presentation methods, and analyse models through interactive cross-sections and shadow studies. The course includes software integration by embedding raster and vector backgrounds and saving 3D models.

Course curriculum

The course is carried out through demonstration and counselling exercises, independent exercises and presentations in the following teaching units:

1. Introduction and organisation of course work, IT infrastructure and computer resources of the faculty.
2. 2D Graphics – raster, vector, CAD, scales, examples.
3. 2D CAD drawing – interface, elements, coordinates, construction.
4. 2D CAD drawing – creation, modification, transformations, block.
5. 2D CAD drawing – dimensioning, elevations and descriptions, formats.
6. 3D concept – interface, 3D space, elements, model.
7. 3D concept – creation, modification and transformations.
8. 3D concept – components, cross-sections, descriptions.
9. 3D concept – shadows, views, displays.
10. 3D concept – scenes, export, formats.
11. 2D raster graphics – input, processing, formats.
12. 2D raster graphics – transformations, layers, effects.
13. 2D raster graphics – curves, editing, compositions.
14. Presentation – poster, integration, content.
15. Final presentation I.

Other forms of teaching and knowledge assessment

In addition to required class attendance, students' progress is continuously monitored through personal assignments throughout the semester and during the semester exams, and the results are presented at the end of the semester.

Compulsory literature

1. Course script
2. Software manuals

Additional literature

- 1 Szalapaj, P.: CAD Principles for Architectural Design, Architectural Press, ISBN 0750644362
- 2 Radford, A., Stevens, G.: CADD Made Easy, ISBN 0070510946
- 3 Cotton, B., Oliver, R.: "Understanding hypermedia – from multimedia to virtual reality, Phaidon Press Ltd, London, 1994, ISBN 07148290805.

Requirements for obtaining a signature

Regular class attendance (min. 80%), successful completion of the exam and presentation of the final results of the work during the semester in a public presentation.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Students' acquired skills and knowledge are assessed through continuous monitoring of their work on exercises throughout the semester, the successfully completed project and the final examination.

Learning outcomes of this course

- 1 The student demonstrates an understanding of the basics of 2D CAD graphics for three different scales: urban scale, conceptual architectural design scale and architectural detail scale.
- 2 The student understands the capabilities and application of conceptual 3D tools for modelling orthogonal volumes.
- 3 The student uses simple tools for presentation in 3D space.
- 4 The student uses 2D raster graphics tools to create posters.

Learning outcomes of the study programme

P12, P13

Architectural Technology and Materials 1

Course status	Compulsory
Course lecturer(s)	Mateo Biluš
Course associate(s)	Biluš; Binički; Cvitanović; Duplančić; Mrinjek Kliska; Muraj; Ostojić; Pavlović; Šneler; Užarević
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	3
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	6.0

Framework of course content

Introduction to solid structures, building structural systems, monolithic and masonry structures, staircases, waterproofing, thermal insulation, finishing coatings and flooring.

Development of general and specific competences – knowledge and skills:

(describe the aim of the course, i.e. what knowledge and skills the student will acquire through the course)

Through lectures and practical exercises, students will develop a basic knowledge of materials, elements and building systems for solid masonry and monolithic concrete structures, as well as basic knowledge of building physics, thermal insulation, cladding materials, solid ceiling structures and lightweight roof structures. They will acquire skills in graphical expression through architectural drawings, reading and understanding individual elements and details, and integrating them into a cohesive whole.

Course curriculum

Content of lectures:

- 01 Introductory lecture: materials in architecture; general overview, applications, properties
- 02 Building structural systems; general overview, solid structures
- 03 Modular coordination; solid structures – masonry; masonry elements
- 04 Solid structures – load-bearing walls, masonry rules, openings, materials, and masonry systems
- 05 Solid structures – general overview, load-bearing walls; non-load-bearing partition walls – masonry and prefabricated
- 06 Construction details – basics/positions, materials, layers, joints, elements (introduction to exercises)
- 07 Solid structures – monolithic; concrete, reinforced concrete
- 08 Solid structures – monolithic; execution, formwork; Solid ceilings – monolithic; execution, formwork
- 09 Solid structures – solid ceilings – semi-prefabricated, prefabricated, vaults
- 10 Solid staircases – basics
- 11 Solid structures – foundation systems of buildings; building physics; overview of physical influences on the architectural structure (heat, humidity, sound, fire, light)
- 12 Waterproofing: materials, introduction to waterproofing systems; Thermal insulation: materials, thermal insulation systems
- 13 Finishing coatings; materials, compact façade systems, plasters and coatings, floor coatings
- 14 Floors, floor structures, and finishing floor coverings
- 15 Building installations elements; examples of integrated test questions – exam preparation

Content of exercises:

- 01 TECHNICAL DRAWING: Drawing room / introductory exercises; arranging furniture (tables, chairs) into a new spatial configuration according to the assignment
- 02 TECHNICAL DRAWING: Drawing room plan / exercise work; drawings – floor plan, sections, views / technical drawing and graphic symbols for materials and elements
- 03 STRUCTURAL MODEL: Construction model / graded exercises; collaborative working model of a solid wall system according to the assignment
- 04 STRUCTURAL MODEL: Construction drawings / graded exercises; drawing plans (floor plans, sections) of the collaborative construction model, scale 1 : 100
- 05 ASSIGNMENT: Solution of a simple building / graded exercises; assignment, defining the building envelope through sketches on the template
- 06 ASSIGNMENT: Construction of a simple building / graded exercises; determining and drawing the structural system for the individual task, scale 1 : 50
- 07 – 14 EXECUTION DESIGN / introductory exercises
- 15 EXECUTION DESIGN / review and submission of the programme

Other forms of teaching and knowledge assessment

Projects, model making, homework

Compulsory literature

Materials from lectures and exercises – course library on Virtual AF

Additional literature

- 1 Štulhofer, Veršić: Crtanje arhitektonskih nacрта - pribor i oprema, 1998.
- 1 Ching: Building Construction Illustrated, 2009.
- 2 Deplazes: Constructing Architecture, Materials Processes Structures, 2005.

Requirements for obtaining a signature

Regular attendance at lectures and exercises, all assignments and projects submitted on time and positively graded.

Type of exam

The exam written and, if necessary, also oral.

Learning outcomes of this course

- 1 Demonstrate sufficient technical knowledge and application of solid structures, materials and building technologies in architecture.
- 2 Design parts of the architectural and technical documentation and integrate them into a whole.
- 3 Apply appropriate material use and structural solutions when collaborating in the development of an architectural project to achieve a functionally efficient whole.
- 4 Appropriately understand and reproduce knowledge of physical, technological and functional solutions and the logic of building construction with the objective of protecting the building from external climatic influences and achieving a comfortable internal microclimate for solid construction systems.
- 5 Demonstrate visual and technical proficiency in the use of tools for basic architectural graphic expression.

Learning outcomes of the study programme

P02, P03, P07, P09, P13

Load-bearing Structures 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Josip Galić
Course associate(s)	Galić; Medić; Turčić; Zovko
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	4.0

Framework of course content

A brief introduction and review of historical facts, forces and loads on structures, and units of measurement. Basic concepts of structures, systems of forces in planes and space. Concepts of equilibrium of forces. Principles of action and reaction. Static determinacy and indeterminacy, effect of forces on structures, favourable and less favourable structures. Simple load-bearing structures: beams, cantilevers, cantilevered beams, columns, force transfer. Static systems of continuous beams, Gerber beams, curved beams (examples of stairs, laminated roof structures, etc.). Columns with concentric and eccentric loading, and force transfer to the foundations. Detailed analysis of force transfer using the example of a solid house made of brick and reinforced concrete. Detailed analysis of force transfer using the example of a skeletal house made of steel or wood. Basics of construction materials relevant to force transfer (concrete, steel, wood, glass), and elasticity modules. Truss systems for load-bearing structures, principles of force transfer, principles of the Cremona diagram of forces. More on truss systems and the Ritter method for calculating forces in a truss. Load-bearing systems composed of multiple discs, whether solid or trussed, various potential cases of force transfer. Analysis of load effects on beam systems. Favourable and unfavourable loads. Two and three hinged systems with and without tie rods, application in roof structures. Suspended and arched structures, the action of forces and their transfer to bearings.

Development of general and specific competences – knowledge and skills:

Familiarisation with the basics of calculating simple framed structures and the example of solid and skeletal residential buildings. Transfer of surface loads and representation of linear and point forces. Developing an understanding of structural elements and methods of force transfer within structures. Principles of force action on structures, reactionary forces and the equilibrium of all internal and external forces in a structure. Various examples from the simplest to more complex, including trussed, framed, arched, etc. Calculation of mechanical characteristics of sections for dimensioning. Principles of structural stability, the effect of forces on columns, buckling stability in compressive elements, lateral stability for overturning of larger beam or truss systems. Material properties of sections, Steiner's theorem, the concept of simple stress states. Modelling and basic computer calculations of simple structures using the TOWER programme.

Course curriculum

- 1 A brief introduction and review of historical facts, forces and loads on structures, and units of measurement.
- 2 Basic concepts of structures, systems of forces in planes and space. Concepts of equilibrium of forces. Principles of action and reaction, loads, materials for structures. Detailed analysis of force transfer using the example of a solid house made of brick and reinforced concrete.
- 3 Static determinacy and indeterminacy, effect of forces on structures, favourable and less favourable structures.
- 4 Simple load-bearing structures: beams, cantilevers, cantilevered beams, columns, force transfer; M, T and N diagrams.
- 5 Analysis of load effects on beam systems. Favourable and unfavourable loads. Static systems of continuous beams, Gerber beams. Materials, Hooke's law, elasticity modules.
- 6 Truss systems for load-bearing structures, principles of force transfer, principles of the Cremona diagram of forces, Ritter's method.
- 7 Characteristics of cross-sections used in calculations, determination of the moment of inertia and sectional modulus.
- 8 Introduction to pressure rods and stability. Basic buckling forms, determination of critical force. Columns with concentric and eccentric loading, and force transfer to the foundations.
- 9 Principles of computer modelling of structures as preparation for using WinSTRUDL.
- 10 WinSTRUDL for structure calculations: principles of data input and obtaining results using simple examples.
- 11 Analysis of force transfer using the example of skeletal steel or wood structures, buckling stability and overturning.
- 12 Sloped roofs and bent beams, staircases (examples of staircases, laminated roof structures, etc.).
- 13 Load-bearing systems composed of multiple discs, whether solid or trussed, various potential cases of force transfer.
- 14 Two and three hinged systems with and without tie rods, application in roof structures.
- 15 Presentation of modelling a more complex structure as preparation for the programme to be covered in Load-bearing Structures 2.

Other forms of teaching and knowledge assessment

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Compulsory literature

Salvadori/translated by D. Diklić: Nosive konstrukcije u arhitekturi
B.N.Sandaker & A.P.Eggen: The structural basis of Architecture (1992)
Krauss/Führer/Neukäter: Grundlagen der Tragwerklehre 1 (2002)
Haiman: Lecture materials in electronic form
D. Diklić: Internal script of current lectures 2005/2006
Kiričenko: Tehnička mehanika I dio – Statika (1990.)
Bazjanac: Mehanika I dio – Statika
Kane: Statics and strength of Materials for Architecture and Building Construction (1998)
Wujek: Applied Statics, Strength of Materials and building Structure Design (1998)

Additional literature

Medić: Zbirka zadataka za TM I i TM II

Requirements for obtaining a signature

Positively solved projects.

Type of exam

Written and oral exam.

Learning outcomes of this course

- 1 Correctly create and design the load-bearing structure according to the selected materials.
- 2 Differentiate (understand) the types of load-bearing structures and choose the correct dimensions
- 3 Analyse and compare different structures and select the most appropriate solution.
- 4 Propose the most favourable solution and, if necessary, modify the load-bearing structure.
- 5 Design and select the most appropriate structure in terms of the flow of forces.

Learning outcomes of the study programme

Mathematics

Course status	Compulsory
Course lecturer(s)	Gorana Aras-Gazić
Course associate(s)	Aras-Gazić
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	1
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.0

Framework of course content

Analysis and solving problems related to vector algebra and analytic geometry. Course content includes vectors in planes and space, equations of lines and planes, and relationships between lines and planes in space. This will develop the mathematical skills necessary for the analytical solution of problems in the Load-bearing Structures course. The GeoGebra software is used to visualise problems.

Exploring functions of a single variable, including differentiation techniques used to explain the behaviour of functions. Learning the concept of integration and its application in calculating the area between curves and the volume of a solid of revolution. This will establish the basic principles of mathematical analysis and apply them to solving simpler problems.

Development of general and specific competences – knowledge and skills:

Analysing and solving mathematical problems develops the ability to solve problems in new and unfamiliar situations. Precision, creativity, abstract and critical thinking are also developed. This provides a foundation for lifelong learning, openness to new technologies and collaboration in interdisciplinary scientific and artistic projects.

Course curriculum

1. Vectors (directed segments). Collinearity and coplanarity of vectors.
2. Addition of vectors. Multiplication of a real number and a vector. Unit vector. Linear combination of vectors.
3. Basis and coordinate system.
4. Scalar product of vectors. Vector projection.
5. Rectangular coordinate system. Dividing a line segment in the golden ratio.
6. Vector product of vectors.
7. Mixed products of vectors.
8. Analytic geometry (plane in space).
9. Analytic geometry (line in space).
10. Functions. Limit of function.
11. Derivation of functions.
12. Applications of derivation.
13. Primitive functions. Indefinite integrals.
14. Definite integrals.
15. Applications of definite integrals in calculating areas of figures and volumes of solids of revolution.

Other forms of teaching and knowledge assessment

Tests or a written exam, homework.

Compulsory literature (please provide detailed information about the publisher and year of publication)

1. G. Aras-Gazić, M. Šimić Horvath, D. Tarandek, *Matematika za studente arhitekture i dizajna*, Sveučilište u Zagrebu Faculty of Architecture, 2024 (university textbook under review), available in the Mathematics Library at: <https://arhitektzg.sharepoint.com/I/MAT>

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

1. J. Hrnčević, *Matematika*, 2011 (unreviewed teaching material), available in the Mathematics Library at: <https://arhitektzg.sharepoint.com/I/MAT>
2. A. Aglič Aljinović, I. Brnetić, V. Čepulić, N. Elezović, Lj. Marangunić, M. Pašić, D. Žubrinić, V. Županović, *Matematika 1*, Element, 2014.
3. I. Slapničar, *Matematika 1*, Kartular, Split, 2018.
4. I. Slapničar, *Matematika 2*, Kartular, Split, 2019.
5. N. Elezović, *Linearna algebra*, Element, 2006.

Requirements for obtaining a signature (**regular class attendance / passed test / submitted programme / seminar paper / research project, etc.**)

Regular class attendance and submission of homework.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Passed both tests or passed written exam on the exam dates.

Learning outcomes of this course

The student will be able to:

- 1 Understand vector calculus and its spatial representation.
- 2 Reproduce the algebraic definition and explain the geometric meaning of the scalar and vector product.
- 3 Solve geometric problems using algebraic equations of lines and planes.
- 4 Compare the analytic method and the descriptive geometry method in interpreting relationships between lines and planes.
- 5 Explain the concept of a limit of a function.
- 6 Understand the concept of a derivation of a function.
- 7 Apply derivation to explain the behaviour of functions.
- 8 Understand the concept of the indefinite integral.
- 9 Recognise the ways definite integrals are formed.
- 10 Apply definite integrals to calculate the area between curves and the volume of a solid of revolution.

Learning outcomes of the study programme
P1, P12

Architectural Design 1

Course status	Compulsory
Course lecturer(s)	Petar Mišković
Course associate(s)	Mišković; Bakić; Bertina; Glasinović; Husnjak; Latin; Martinis; Paver Njirić; Smode Cvitanović; Žarnić
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	3
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	5.0

Framework of course content

Introducing students to architectural syntax. Positioning architecture as a discipline within society, time, and culture. An introduction to the fundamental themes and methods of architectural design through clearly defined tasks that address the core principles of architectural creation. Through architectural design as a cognitive process, students will discover themes characteristic of architecture, inherent problems, basic tools and limitations. The determinants of architecture are understood: linearity, flatness, spatiality, construction, function, communication, position, light, measure, scale, materiality.

Development of general and specific competences – knowledge and skills:

To familiarise students with the fundamentals of architectural design, both theoretically and practically. By solving simple design tasks, students master the basic methods of creating and organising space. Guided by the logic of the tasks, through their own work, students come to understand the design process and the development and articulation of the architectural construct within a limited number of basic architectural parameters (space, time, tectonics). Students will develop the ability to break down into spatial units and combine units into assemblies; the understanding of the relationships between space, context, function and construction; and the ability to present architectural ideas.

Course curriculum

Identity and construction. The architect's idea is spatial: floor plan / spatiality / plasticity. Three stages in the development of the spatial concept. Organisation of space from human to extra-human scale / spatial determinants. Configurations of spatial units. Levels of architectural composition. Problem : phenomenon : idea : plan : strategy : means : realisation. Architectural body and ground. Why / what / how. Function in space / human activities and spatial framework. Multiplication / reciprocity of unit and whole. Dividing and uniting: spatial unit and spatial assembly. Legacy of the 20th century and contemporaneity. Basic concepts and contemporaneity. "Exploring space", getting to know space; single-space, multi-space; the meaning of the modular grid, centre, edge, extension, compression, tension, transition, separation, direction, movement; observing dualities: inside/outside, enclosed/free, light/dark, movement/stillness, dynamic/static, subordinate/dominant. Scales 1 : 100, 1 : 50 / floor plans, sections, perspective and/or axonometry, model. "Connecting spatial units into an assembly / space in-between", connecting units into a horizontally or vertically structured assembly; articulated or compact composition; connecting, interpenetrating, overlapping, transitions. Scale 1 : 100 / floor plans, sections, perspective and/or axonometry, model. "Connecting unambiguous units into an assembly", functional processing of the unit; space stimulates human activities, use and functions; interdependence of unit and whole. Scale 1 : 50, 1 : 200 / plans, sections, perspective and/or axonometry, model.

Other forms of teaching and knowledge assessment (in addition to attending classes, it is recommended that other forms of continuous student work and assessment be introduced, such as homework, tests, seminar papers, project work, etc.)

Continuous development of project assignments.

Compulsory literature

- 1 Steen Eiler Rasmussen : "Experiencing Architecture". The MIT Press, Cambridge, 1997.
- 2 Colin Rowe i Robert Slutzky : "Transparency". Birkhäuser Verlag, Basel, 1997.
- 3 Herman Hertzberger : "Space and the Architect / Lessons in Architecture 2". 010 Publishers, Rotterdam, 2000.
- 4 Juhani Pallasmaa: "The Eyes of the Skin". Wiley-Academy, Chichester, 2007.

Additional literature

- 1 Sinclair Gauldie: "The Appreciation of the Arts: Architecture". Oxford University Press, London, 1975.
- 2 Mladen Bošnjak: "Kompozicija i oblikovanje u arhitekturi" (Tehnička Enciklopedija, vol. 7), JLZ, Zagreb, 1980.
- 3 Herbert Bayer, Walter Gropius i Ise Gropius : "Bauhaus 1919 – 1928". MOMA, New York, 1990.
- 4 Peter G. Rowe: "Design Thinking", The MIT Press, Cambridge, 1991.
- 5 Herman Hertzberger : "Lessons for Students in Architecture". 010 Publishers, Rotterdam, 1993.
- 6 Simon Unwin: "Analysing Architecture". Routledge, London, 1997.
- 7 B. Leupen, C. Grafe, N. Körnig, M. Lampe and P. Zeeuw: "Design and Analysis". 010 Publishers, Rotterdam, 1997.
- 8 Bruno Zevi: "Znati gledati arhitekturu", Naklada Lukom, Zagreb, 2000.
- 9 Ernst Neufert, Peter Neufert: "Elementi arhitektonskog projektiranja", Golden marketing, Zagreb, 2002.

Requirements for obtaining a signature

Regular class attendance, submitted and positively graded projects.

Type of exam: The skill will be assessed on the basis of the programmes submitted.

Learning outcomes of this course

- 1 A student who passes this course will be able to analyse the spatial structure of an architectural object.
- 2 A student who passes this course will be able to distinguish between the spatial organisation of architectural entities and their corresponding architectural properties.
- 3 A student who passes this course will be able to represent an architectural object through technical drawings, spatial representations and models.

Learning outcomes of the study programme

P04, P11, P12, P13

English for Architecture 1

Course status	Compulsory
Course lecturer(s)	Neda Borić
Course associate(s)	Borić
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	1
Field Course (days)	0
ECTS credits	1.5

Framework of course content

Based on selected authentic texts from various sources related to the field of architecture and urban planning, this course covers basic professional terminology, develops skills in reading professional texts, and improves and expands knowledge of both specialised and general vocabulary, as well as oral and written communication skills.

Topics include: architecture as an artistic and scientific field, history of architecture, mathematics in architecture throughout history, geometry in architecture, proportion and scale, architecture of Ancient Rome, building materials.

Development of general and specific competences – knowledge and skills:

(describe the aim of the course, i.e. what knowledge and skills the student will acquire through the course)

Primary goal: To develop oral and written competence in the English language in the field of architecture.

Specific Goals:

- to develop reading strategies to effectively access information from knowledge sources;
- to acquire basic and frequently used professional terminology, linguistic structures and textual features in the professional language;
- to improve general and technical vocabulary;
- to develop an awareness of how vocabulary works in order to reduce mistakes in oral and written production;
- to promote independence in learning and working in English.

Knowledge and skills achieved through these goals:

Knowledge: Ability to use the English language for academic education and future professional activities in architecture.

Skills:

- Ability to read professional or scientific texts in English.
- Knowledge of professional terminology.
- Ability to describe (projects, buildings, etc.).
- Ability to transfer various types of information from texts.
- Oral communication skills.

Course curriculum (to be elaborated as precisely as possible according to teaching units and teaching weeks – take 15 weeks and, if necessary, elaborate lectures and exercises separately; emphasise the way the exercises are carried out – practical, laboratory, calculation, computer, etc.)

1 INTRODUCTION – course content, instructions

2 ARCHITECTURE (discussion: the relationship of architecture with other sciences; reading: identifying main ideas in the text, lexical connections, synonymy)

3 ARCHITECTURE (discussion: the subject of architecture; basic characteristics of architecture as an artistic and scientific field, detailed reading, lexicon: collocations; professional terminology and Croatian equivalents, translation exercises, paraphrasing, additional reading)

4 THE HISTORY OF ENGINEERING – part I (reading for global understanding, text structure, professional terminology)

5 THE HISTORY OF ENGINEERING – part II (collocations, parts of speech, translation exercises, practice transferring vocabulary to a new context; relative pronouns and relative clauses, summary writing, additional reading)

6 MATHEMATICS IN ARCHITECTURE – part I (reading for specific information, reorganising information from text, professional terminology, numerical expressions)

7 MATHEMATICS IN ARCHITECTURE - GEOMETRY – part II (reading for global understanding, reorganising information from the text, professional terminology, vocabulary of geometric terms, dimensions)

8 GEOMETRY IN ARCHITECTURE – part II (polysemy of professional terms, contextual meanings, professional vocabulary for describing position, shape, size; precise understanding of definitions in English and transposition of information (text-visual representation and vice versa), translation exercises)

9 PROPORTION AND SCALE (reading for specific information, classifying information from the text, professional terminology and Croatian equivalents, prepositions, text cohesion – use of connectors)

10 PROPORTION AND SCALE (lexical connections, synonymy, collocations and semantics of professional terms, additional texts for informative reading)

11 ANCIENT ROMAN ARCHITECTURE – part I (reading, professional terminology, contextual meanings, Latin prefixes and their meanings – English examples, internationalisms in professional lexicon, phrasal verbs)

12 ANCIENT ROMAN ARCHITECTURE – part II (parts of speech; sub-technical lexicon, text functions – description, text cohesion – contrast with the use of connectors, translation, additional reading texts)

13 BUILDING MATERIALS – part I (reading for specific information – selection and categorisation of information according to specific criteria, professional terminology and Croatian equivalents, text function – definition, other text functions)

14 BUILDING MATERIALS - part II (professional terminology, text organisation; referential connections within the text; means of text coherence and logical presentation of ideas; cause/effect connectors, writing, translation exercise, additional texts)

15 Review of material

Other forms of teaching and knowledge assessment (in addition to attending classes, it is recommended that other forms of continuous student work and assessment be introduced, such as homework, tests, seminar papers, project work, etc.)

- regular class attendance;
 - continuous monitoring of student performance;
 - homework;
 - exam;
 - tests (2 per semester).
-

Compulsory literature (please provide detailed information about the publisher and year of publication)

– University TEXTBOOK:

BORIĆ, N. (2012). *English for Architecture and Urban Planning*

Golden marketing, Tehnička knjiga. Zagreb.

– GENERAL AND PROFESSIONAL DICTIONARIES

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

- texts from English trade journals, as well as books and monographs.
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Requirements for obtaining a signature (**regular class attendance / passed test / submitted programme / seminar paper / research project, etc.**)

Regular class attendance.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Written

Learning outcomes of this course

1 The student will be able to understand and interpret simple professional texts.

2 The student will be able to recognise, understand and correctly use basic professional terminology in written and spoken language in new communication situations.

- 3 The student will acquire new, extended general English vocabulary and use it correctly in new situations.
- 4 The student will understand and use sub-technical vocabulary in the profession.
- 5 The student will acquire some grammatical structures relevant to the professional language and know how to use them successfully in new communication situations.
- 6 The student will be able to independently read professional texts and give a short presentation.
- 7 The student will be able to transcode written information into drawings and vice versa.

Learning outcomes of the study programme
P13, P14, P15

Physical/Health Education 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Dalibor Vračan
Course associate(s)	Vračan
Year of study	First
Semester of study	1 st
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	0.0

Framework of course content

Sports gymnastics. Sports games. Swimming. Walking tours.

Development of general and specific competences – knowledge and skills:

Knowledge of technology for the development of psychomotor skills. Development of specific skills and abilities by sports branches. Knowledge of sports physiology and hygiene.

Course curriculum

- 1 Sports games: Football – technique. Volleyball – technique.
- 2 Sports games: Football – technique. Volleyball – technique.
- 3 Sports games: Football – technique. Volleyball – technique.
- 4 Sports games: Basketball – technique.
- 5 Sports games: Basketball – technique.
- 6 Sports games: Basketball – technique.
- 7 Sports gymnastics.
- 8 Sports gymnastics.
- 9 Swimming – technique.
- 10 Swimming – technique.
- 11 Swimming – technique.
- 12 Aerobic.
- 13 Aerobic.
- 14 Stretching: creating small exercise systems according to a specific sport.
- 15 Persevering movements in nature with orientation.

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 Mišigoj Duraković M. et al. (1999) Tjelesno vježbanje i zdravlje, Zagreb: Grafos.

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

- 1 Trninić S. (1996) Analiza i učenje košarke, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 2 Janković, V., Marelić N. (2003) Odbojka za sve, Zagreb, Authors' edition.
- 3 Volčanšek B. (2002) Bit plivanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 4 Šnajder V., Milanović D. (1991) Atletika hodanja i trčanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 5 Sertić H. (2004) Osnove borilačkih sportova, Zagreb: Fakultet za fizičku kulturu.

Requirements for obtaining a signature

Regular class attendance

Type of exam

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The course does not contribute to the achievement of a professional qualification.

The course does not contribute to the achievement of a professional qualification.

SECOND SEMESTER

History of Architecture 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Nataša Jakšić
Course associate(s)	Jakšić; Seitz
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Medieval architecture. The relationship between spirituality, liturgical function and the design of sacred architecture in different periods from early Christianity to the end of the Middle Ages. The synthesis of ideas, technology and construction in Gothic architecture.

Development of general and specific competences – knowledge and skills:

Basic knowledge of the medieval architecture, with special emphasis on examples in Croatia. Insights into architecture as a result of various technical, functional and artistic demands. Understanding of functional typology of architecture as a basis for creative interpretation. Historical environmental limitations (climate, building materials) and adjustment. Understanding of mutual relations of materials, technology and architectural design. Understanding of architectural drawings as two-dimensional representations of complex spatiality.

Course curriculum

- 1 Early Christian architecture: faith, liturgy and space; longitudinal buildings
- 2 Early Christian architecture: central buildings; Salona and Poreč
- 3 Early Christian architecture: Justinian's synthesis; Byzantine architecture
- 4 Islamic architecture
- 5 Pre-Romanesque architecture
- 6 Pre-Romanesque architecture in Croatian
- 7 Romanesque architecture in the Roman Empire and Central Europe
- 8 Romanesque architecture of Northern and Central Italy
- 9 Romanesque Architecture in Southern Italy and Mediterranean Croatia
- 10 Romanesque Architecture in France and England
- 11 Introduction to Gothic: liturgy, theoretical foundations and construction. Early gothic architecture
- 12 High Gothic and Rayonnant architecture
- 13 The spread of Gothic architecture in France and England
- 14 Gothic architecture in Germany and Central Europe
- 15 Italian Gothic architecture; Gothic residential and public architecture

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 D. Watkin: History of Western Architecture, Laurence King Publishing, London, 2011., (5th edition, selection)
- 2 R. Ivančević: Umjetničko blago Hrvatske, Zagreb, Motovun, 1993 (selection)
- 3 W. Müller, G. Vogel: Atlas arhitekture I., Golden marketing i IGH, Zagreb, 1999 (selection)
- 4 W. Müller, G. Vogel: Atlas arhitekture II., Golden marketing i IGH, Zagreb, 2000 (selection)

Additional literature

- 1 N. Coldstream: Medieval Architecture, Oxford UP, 2002.
- 2 R. Stalley: Early Medieval Architecture, Oxford UP, 1999.

Requirements for obtaining a signature

Regular class attendance.

Type of exam

Written and oral exam.

Learning outcomes of this course

- 1 Identify the fundamental principles of medieval architecture.
- 2 Demonstrate an understanding of architecture as the result of various technical, functional and artistic requirements.
- 3 Understand functional typologies of architecture as a basis for creative interpretation.
- 4 Understand historical environmental limitations (climate, building materials) and adjustment.
- 5 Understand the mutual relations of materials, technology and architectural design.
- 6 Use architectural drawings as two-dimensional representations of complex spatiality.

Learning outcomes of the study programme **P03, P04, P05, P11, P15**

Architecture in Croatian Regions – North-Western Croatia

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Zrinka Barišić Marenić
Course associate(s)	Barišić Marenić; Bertina; Mandić; Užarević
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	2
ECTS credits	0.5

Framework of course content

This course covers the wider area of North-Western Croatia, with the main part of the teaching taking place in the field, including active visits to numerous sites and on site interpretation. The aim of the course is to provide students with an informative, integral insight into all layers of the urban and architectural heritage of the observed area, with equal emphasis on urban themes (historical cities, contemporary achievements), architectural works (the most significant monumental buildings, prominent or award-winning contemporary realisations), a selection of complementary topics related to the visual arts (major works of mural painting, church inventory, etc.), as well as archaeological sites and contemporary presentations. Introductory lectures at the Faculty will present the most significant historical and contemporary achievements, while field visits with expert presentations will provide an unparalleled insight into the achievements of architecture and urban planning in North-Western Croatia.

Development of general and specific competences – knowledge and skills:

Students are directly acquainted with the most important works of the urban and architectural heritage of North-Western Croatia. The selected works included in the itinerary are interpreted in such a way as to develop the students' method of analytical evaluation of architecture in context and time.

Course curriculum

Two introductory lectures (Prof. Zrinka Barišić Marenić, PhD):

Architecture in Croatian Regions – North-Western Croatia – Historical Layers

Architecture in Croatian Regions – North-Western Croatia – 20th and 21st Century Architecture

Field visits in the form of two day trips from Zagreb:

1 DAY ONE: Popovača – Sisak – Karlovac – Samobor

2 DAY TWO: Hrvatsko Zagorje / castle – Zabok – Krapina – Lepoglava – Varaždin - Koprivnica

Other forms of teaching and knowledge assessment

In addition to attending classes during the field visit, students are required to produce a collection of analytical architectural drawings or a seminar paper.

Compulsory literature

- 1 Maroević, I.: Sisak – grad i graditeljstvo, Sisak, 1998. (thematic chapters)
- 2 Dumbović Bilušić, B.; Odak, T.; Šmit, E.: Vodič arhitekture Samobora i okruženja. Samobor: Društvo inženjera i tehničara grada Samobora, 2003. (thematic chapters)
- 3 Radna skupina Varaždin, Arhitektura 20. stoljeća u Varaždinu, Društvo arhitekata Varaždin, Varaždin, 2018. (thematic chapters)
- 4 Obad Šćitaroci, M.: Dvorci i perivoji Hrvatskog Zagorja, Zagreb, 1991. (thematic chapters)

Additional literature

- 1 Galijašević, T.; Jošić, M.; Vlahović, D. (ed.): Zgrade društveno poticane stanogradnje, Zagreb, 2006. (thematic chapters)
- 2 Vukičević-Samardžija, D.: Gotičke crkve Hrvatskog Zagorja, Zagreb, 1993. (thematic chapters)
- 3 Lentić-Kugli, I.: Zgrade varaždinske povijesne jezgre, Zagreb, 2001. (thematic chapters)

Requirements for obtaining a signature

Field course completed in its entirety. Submitted collection of analytical drawings or seminar paper.

Type of exam

Collection of analytical drawings and seminar paper

Learning outcomes of this course

A student completing this course will be able to:

- 1 identify and describe the most significant historical, modern and contemporary achievements in North-Western Croatia;
 - 2 understand the genesis of the historical and contemporary achievements visited in the area of North-Western Croatia;
 - 3 show and demonstrate the basic spatial qualities of the historical and contemporary achievements visited in North-Western Croatia;
 - 4 schematise or sketch the basic spatial qualities of the most significant historical and contemporary achievements visited in North-Western Croatia.
-

Learning outcomes of the study programme

P02, P05, P11, P13

Descriptive Geometry and Perspective

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	<u>Marija Šimić Horvath</u>
Course associate(s)	<u>Šimić Horvath</u> ; <u>Aras-Gazić</u> ; <u>Tarandek</u>
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.5

Framework of course content

Perspective (methods, parameters, frontal and rotated, interior, measuring in the horizontal plane). Sections of rotational surfaces. Light and shadows, application in the floor plan and elevation of an object, axonometry and perspective. Contour projection (topographical surfaces, plateau and access road, roof surfaces). Visualisation with GeoGebra and Rhinoceros.

Development of general and specific competences – knowledge and skills:

When solving geometric problems, descriptive geometry is used to represent spatial figures and their interrelationships through graphic representations and by creating models, either virtual on the computer or real. This develops the ability to represent space as a factor of human intelligence, as well as visualisation, which is necessary in architectural design. Students will be trained to represent spatial figures and their relationships in perspective using both traditional drawing tools and CAD software. Familiarity with topographical surfaces, access roads to plateaus, longitudinal and cross-sectional terrain profiles as preparation for application in urban and physical planning. Solving light and shadow issues on compositions of cubes, rotational surfaces, niches and lesenes.

Course curriculum

1. Perspective (introduction and presentation of basic elements)
2. Perspective (methods for constructing perspective images)
3. Perspective (selecting parameters for constructing perspective images, visualisation in GeoGebra)
4. Perspective (perspective images of circular elements and curves, visualisation in GeoGebra)
5. Perspective (interior, visualisation in Rhinoceros)
6. Perspective (measuring in the horizontal plane)
7. Sections of rotational surfaces with planes (cylinder, cone, sphere)
8. Application of sections (axonometric representation, examples in architecture)
9. Application of sections (roof surfaces, visualisation in Rhinoceros)
10. Light and shadows (types of lighting, types of shadows, shadows of angular and curved bodies – shown in floor plan, elevation, and axonometry)
11. Application of light and shadows (shadows of one object on another, cube compositions, axonometric representations)
12. Shadows in perspective (parallel lighting)
13. Application of light and shadows (shadows on façades, niches, and lesenes)
14. Contour projection (scale, embankment, cutting, profiles)
15. Contour projection (topographical surfaces, plateau and access road, visualisation in Rhinoceros)

Teaching modes: lectures, auditory exercises, construction exercises (independent tasks), mixed e-learning

Other forms of teaching and knowledge assessment

Tests, programme creation (by hand with pencil on A3 or using CAD programme) with explanations of construction procedures, making models and homework (continuous monitoring).

Compulsory literature

1. S. Gorjanc, E. Jurkin, I. Kodrnja, H. Koncul, *Deskriptivna geometrija*, <http://www.grad.hr/geometrija/udzbenik/>
2. P. Kurilj, N. Sudeta, M. Šimić, *Perspektiva*, Golden marketing-Tehn. knjiga, Zagreb, 2005.
3. URL <https://arhitektzg.sharepoint.com/I/NGP>, teaching material
4. URL <http://www.grad.hr/geomteh3d/radne.html>, repository of teaching material

Additional literature

- 1 I. Babić, K. Horvatić-Baldasari, *Nacrtna geometrija*, Sand d.o.o., Zagreb, 1997.
- 2 V. Szivovicza, E. Jurkin, *Deskriptivna geometrija* (CD-ROM), HDGG i GF Zagreb, Zagreb, 2005.
- 3 I. Babić, S. Gorjanc., A. Sliepčević, V. Szivovicza, *Nacrtna geometrija-Zadaci*, HDGG, Zagreb, 2007.
- 4 V. Niče, *Deskriptivna geometrija*, Školska knjiga, Zagreb 1992.
- 5 H. Pottman, A. Asperl, M. Hofer, A. Kilian, *Architectural Geometry*, Bentley Institute Press, 2007.

Requirements for obtaining a signature

Regular attendance at lectures and exercises, submitted assigned programs, models and assignments

Type of exam

Passed tests.

Learning outcomes of this course

The student will be able to:

- 1 identify types of sections in examples from everyday practice;
 - 2 construct perspective images of objects in frontal and rotated positions relative to the picture plane;
 - 3 select perspective parameters to obtain the optimal perspective image of an object;
 - 4 identify shadows on planes and bodies;
 - 5 apply sections and penetrations in determining shadows;
 - 6 compare the representation of shadows in perspective and axonometry;
 - 7 solve complex roof problems and situations involving earthworks on a given terrain.
-

Learning outcomes of the study programme

P01, P12, P13, P15

Drawing 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Renata Waldgoni
Course associate(s)	Waldgoni; Bakić; Hrastar; Pavlović; Spudić; Tutek
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	3
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.0

Framework of course content

Through the selected topics and assignments in the course Drawing 2, students will become familiar with the basic elements of visual language. By observing spaces and objects and analysing their geometry, students will create drawings and, through drawing, develop tools for generating concepts and spatial ideas at all scales. Drawing will thus become a means of understanding the visual complexity of phenomena and the world around them.

Encouraging artistic expression, mastering the construction of spatial and architectural thought and its visual representation are key aspects of the learning process in this course. This approach encourages the development of visual intelligence, graphic culture and a sense of innovative artistic and spatial solutions.

Development of general and specific competences – knowledge and skills:

An evolved system of thought. Developing visual intelligence, graphic culture and a sense of artistic spatial solutions in architecture.

Course curriculum

1 – 3 Study of a plaster cast of a classical statue, reduction and geometrization of a complex natural form, study of proportions, spatial relationships, mass, structure and balance. Translating perceived anthropomorphic features from the model into a drawing. Recognising the relationship between the human figure and geometric voluminosity.

4 – 6 Drawing/studying a more complex spatial model, considering the spatial relationships of elements within the whole and the relationship between free and geometrically regular shapes.

7 – 9 Drawing/studying an object created by a simple process on site. Drawing of the stages of the process. Development and form dependency, drawing as a tool for representation and as an autonomous abstract form.

10 – 12 Sketching an observed object and sketching an imagined object as a primary means of expression in the study and contemplation of spatial relationships. Perception and imagination as mutually complementary components of the creative process.

13 – 15 Sketch/study in an outdoor setting. Fieldwork – drawing urban spatial assemblages of different scales and periods of origin.

Other forms of teaching and knowledge assessment

Homework, consultations and discussions both in groups and individually.

Compulsory literature

- 1 Rudolf Arnheim: Umetnost i vizuelno opažanje, Univerzitet umetnosti u Beogradu, Belgrade, 1981.
- 2 Vittorio M. Lampugnani: Architecture of 20th Century in Drawings, Rizzoli, New York, 1982.
- 3 Matko Peić: Pristup likovnom djelu, Školska knjiga, Zagreb, 1985.
- 4 Charles Baudelaire: The Painter of Modern Life, Phaidon, London, 1964.
- 5 Oscar Wilde: De Profundis - The Ballad of Reading Goal, Wordsworth Classics, London, 1999.

Additional literature

- 1 Rudolf Arnheim: Umetnost i vizuelno opažanje, Univerzitet umetnosti u Beogradu, Belgrade, 1981.
 - 2 Bernard Hamburger: Exact and Approximate Dimension, Lotus 37/1983, Milano
 - 3 Wolfgang Keler: Gešalt psihologija, Nolit, Belgrade, 1985.
 - 4 Žan Pjaže: Psihologija inteligencije, Nolit, Belgrade, 1977.
 - 5 Vittorio M. Lampugnani: Architecture of 20th Century in Drawings, Rizzoli, New York, 1982.
 - 6 Hubert Damisch: Porijeklo perspektive, Institut za povijest umjetnosti, Zagreb, 2006.
 - 7 Robin Evans: The Projective Cast, MIT Press, Cambridge Massachusetts, 1944.
 - 8 Mario Carpo: The Art of Drawing, Architectural Design, 2013.
 - 9 John May: Everything is Already an Image, Log #40, Anyone Corporation, New York, 2017. –
-

Requirements for obtaining a signature

Regular class attendance, positive grade and student acknowledgment of provided information and indicated shortcomings and qualities.

Type of exam

The skill will be assessed on the basis of the programmes submitted.

Upon successful completion of this course, the student will be able to:

- 1 identify characteristic parts of an object's whole;
 - 2 apply the observed laws of the whole to the drawings of individual parts;
 - 3 compare different characteristics of forms through drawing;
 - 4 link contrasting forms through abstract representation;
 - 5 create a new spatial representation by connecting analysed parts;
 - 6 use drawing as a tool in the exploration of spatial ideas;
 - 7 develop personal potential and creativity through knowledge of the elements and syntax of visual language;
 - 8 acquire the ability to select and evaluate different artistic techniques and apply them in creating his/her own expression.
-

Learning outcomes of the study programme

P01, P12, P13

Computer-Aided Architectural Design 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Bojan Baletić
Course associate(s)	Baletić; Careva; Lisac; Vdović; Pap
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.5

Framework of course content

Practical exercises involve freeform 3D modelling and model visualisation. Building on previous knowledge of 3D modelling, these exercises will introduce students to the opportunities and challenges of visualising complex models.

Development of general and specific competences – knowledge and skills:

The aim of the course is to develop skills in the use of freeform 3D modelling by creating an interior model. Students will be introduced to the functions of the tools, the types of constructions used to create models and the ways in which models can be modified and transformed. They will master advanced techniques for editing and refining spatial surfaces and solids in the creative design process. Students will gain the ability to work in three-dimensional space and learn the basics of model visualisation.

Students will be introduced to tools for 3D computer visualisation and presentation. They will be given an overview of the basics, while intensive practical work will enable them to acquire skills and understanding of the concepts embedded in software tools in this area.

Course curriculum:

The course is carried out through demonstration and counselling exercises, independent exercises and presentations in the following teaching units:

1. Basics of 3D modelling – freeform, solids, generative, parametric – examples and application
2. 3D modelling – interface, elements (curves, surfaces, solids)
3. 3D modelling – element creation, snap
4. 3D modelling – editing and refining elements and models
5. 3D modelling – transformations of elements and models
6. 3D modelling – deformations of elements and models
7. 3D modelling – organic, generative, parametric
8. Visualisation basics – elements of a 3D scene – model, camera, light sources, materials, and textures
9. Visualisation – model optimisation, formats, data exchange
10. Visualisation – light sources, types of sources, shadows
11. Visualisation – surface editing, colours, materials, procedures
12. Visualisation – textures and working with maps
13. Visualisation – calculation algorithms, display types, direct and general illumination
14. Visualisation – static, dynamic, and interactive displays
15. Final presentation II

Other forms of teaching and knowledge assessment

In addition to required class attendance, students' progress is continuously monitored through personal assignments throughout the semester and during the semester exam, and the results are presented at the end of the semester.

Compulsory literature

- 1 Baletić, B., Vdović, R.: Primjena računala u arhitekturi, script, Faculty of Architecture, revised for each academic year
- 2 Software manuals

Additional literature

- 1 Goodman, C.: Digital Vision – Computers and Art, Abrams Everson Museum of Art, 1987, 0810918625
- 2 Engeli, M.: Bits and Spaces, Birkhauser, 2001, ISBN 3764364165
- 3 Baker, R.: Designing the Future, Thames and Hudson, 1993
- 4 Birn, J.: Digital Lighting & Rendering, New Riders Publishing, Indianapolis, 2002, ISBN 1562059548
- 5 Parrish, D.: Inspired 3D Lighting & Compositing, Muska & Lipman/Premier-Trade, 2002, ISBN 1931841497
- 6 Demers, O.: Digital Texturing & Painting, New Riders Publishing, Indianapolis, 2001, ISBN 0735709181

Requirements for obtaining a signature:

Regular class attendance, successful completion of the exam and presentation of the final results of the work during the semester in a public presentation.

Type of exam: Students' acquired skills and knowledge are assessed through continuous monitoring of their work on exercises throughout the semester, the successfully completed project and the final examination.

Learning outcomes of this course

- 1 The student understands the capabilities of 3D computer tools.
- 2 The student can select the appropriate tool to create a specific model.
- 3 The student is able to analyse model elements by design methods.
- 4 The student knows how to present the constructed 3D model using photorealistic techniques and as technical documentation.

Learning outcomes of the study programme P12, P13

Architectural Technology and Materials 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Mateo Biluš
Course associate(s)	Biluš; Binički; Cvitanović; Duplančić; Mrinjek Kliska; Ostojić, Pavlović; Šneler; Užarević
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	3
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	6.0

Framework of course content

Materials, elements, and systems of lightweight constructions: wood and steel; pitched roofs; coverings; flat roofs; parts of buildings below ground; finishing surfaces.

Development of general and specific competences – knowledge and skills:

The course aims to develop knowledge of the relationships between form, selection, function and physical properties of materials used in lightweight constructions, with an emphasis on practising the fundamentals of detail design. Emphasis is placed on the construction and deconstruction of skeletal structures and the layering of building envelopes while designing details. The course also covers load-bearing structures, execution details, the physical function and drainage systems of modern pitched and flat roofs, terraces and balconies. Waterproofing systems and detailing for modern materials and waterproofing concepts for flat and pitched roofs, as well as building sections below ground, are discussed – all in the context of addressing modern architectural detailing at critical points in buildings.

Course curriculum

Content of lectures:

- 01 LIGHTWEIGHT STRUCTURAL SYSTEMS – overview
 - WOOD – wood as a material, overview, wood products
 - application of wood, basics of simple structural systems
- 02 WOOD – methods for resolving individual structural components, execution details
- 03 STEEL – material and products,
 - basic structural logics of simple assemblies
- 04 STEEL – elements of architectural constructions and specificities,
 - contemporary application / reconstruction and sustainability
- 05 WOOD – STEEL – comparison
 - WOOD – preparation for exercises
- 06 PITCHED ROOFS – overview, constructions
- 07 PITCHED ROOFS – roof physics, coverings
- 08 PITCHED ROOFS – gutters, flashings, sheet metal materials
- 09 FLAT ROOFS – overview, drainage, physics of flat roofs
 - details and flat roof systems
- 10 FLAT ROOFS – flat roof systems
 - balconies, terraces / constructions, layers, details, railings
- 11 PARTS OF BUILDINGS IN THE GROUND
- 12 PARTS OF BUILDINGS IN THE GROUND AND BUILDING FOUNDATIONS
- 13 FLOORS – floor structures and finishing floor coverings
- 14 STONE – stone claddings
 - CLADDING MATERIALS AND ELEMENTS MADE OF OVEN-BAKED CLAY
 - EXAMPLES OF INTEGRATED TEST QUESTIONS – exam preparation

Content of exercises:

- 01 FORMWORK PLAN – FOUNDATIONS
- 02 FORMWORK PLAN – CEILING / ROOF
 - Homework 1: Staircase – plan and section details of the formwork plan for a double-flight staircase, scale 1 : 20
- 03 FORMWORK PLAN – drawing the formwork plan according to the assignment
- 04 HOUSE PROJECT – LIGHTWEIGHT CONSTRUCTION: handing out the assignments and model setup
 - Homework 1: Creating a volume model of a simple house
- 05 CONSTRUCTION MODEL – skeletal or panel construction – setting up the construction
- 06 CONSTRUCTION MODEL – skeletal or panel construction – elaboration the construction
- 07 LIGHTWEIGHT CONSTRUCTION HOUSE PROJECT – introduction to execution design
- 08 DETAILED DESIGN – drawing plans, floor plans, sections, façades, details
- 09 DETAILED DESIGN – drawing plans, floor plans, sections, façades, details
- 10 DETAILED DESIGN – drawing plans, floor plans, sections, façades, details
- 11 DETAILED DESIGN – drawing plans, floor plans, sections, façades, details
- 12 DETAILED DESIGN – drawing plans, floor plans, sections, façades, details
- 13 DETAILED DESIGN – creating and reviewing the entire programme
- 14 LIGHTWEIGHT CONSTRUCTION HOUSE PROJECT SUBMISSION – review and submission of the programme

Other forms of teaching and knowledge assessment

Projects, making a model, homework, written and oral exam.

Compulsory literature

Materials from lectures and exercises – course library on Virtual AF

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

- Natterer J., Winter W., Herzog T., Schweitzer R., Volz M. (2004): Timber Construction Manual, Birkhäuser, DETAIL Construction Manual, Munich
- Hugues T., Steiger L., Weber J. (2004): Timber Construction, Modern Timber Construction and Products, Birkhäuser, DETAIL Practice, Munich
 - Reichel A., Ackermann P., Hentschel A., Hochberg A. (2007): Building with Steel, The diversity of steel construction in detail, Birkhäuser, DETAIL Practice, Munich
 - Sedlbauer K., Schunck E., Barthel R., Künzel H. (2010): Flat Roof Construction Manual, Birkhäuser, DETAIL Construction Manual, Munich
 - Schunck E., Oster H.J., Barthel R., Kießl K. (2003): Roof Construction Manual, Pitched Roofs, Birkhäuser, DETAIL Construction Manual, Munich
- Materials from lectures and exercises – course library
- Staib G., Dörrhöfer A., Rosenthal A. (2008): Components and Systems, Modular building: design, construction, new technologies, DETAIL Construction Manual, Munich
 - Schittich C. (2005): Single Family Houses, Birkhäuser, in DETAIL, Munich
 - Schittich C. (2005): Building simply, Birkhäuser, in DETAIL, Munich
 - Schittich C. (2004): High – Density Housing, Birkhäuser, in DETAIL, Munich
 - Watts A. (2010): Modern Construction Handbook, SpringerWienNewYork, Vienna
 - Watts A. (2005): Modern Construction Facades, SpringerWienNewYork, Vienna
 - Schittich C., Staib G., Balkow D., Schuler M., Sobek W. (2007): Glass Constructio Manual, Birkhäuser, Edition DETAIL, Munich
 - Herzog T., Krippner R., Lang W. (2004): Facade Construction Manual, Birkhäuser, Edition DETAIL, Munich
 - Kolb J. (2008): Systems in Timber Engineering, Birkhäuser Lignum DGfH, Basel Boston Berlin
 - Bruno A., Bollinger + Grohmann Ingenieure, Feldmann M., Mazzolani F., O'Sullivan G., Rambert F., Reichel A., van Wyk L. (2009): Featuring steel. resources, architecture, reflections, Birkhäuser, DETAIL Development, Munich
 - Bollinger K., Grohmann M., Feldmann M., Giebler G., Pfanner D., Zeumer M. (2011): Atlas Moderner Stahlbau, Birkhäuser, DETAIL Atlas, Munich
 - Brennecke W., Folkerts H., Haferland F., Hart F. (1990): Atlas krovnih konstrukcija: kosi krovovi, Građevinska knjiga, Belgrade
 - Watts A. (2005): Modern construction roofs, SpringerWienNewYork, Vienna
- Trade journals
- DETAIL, Review of Architecture and Construction Detail, Institut für internationale ArchitekturDokumentation GmbH & Co.
 - PRESJEK, časopis za detalj u arhitekturi, Hiperprostor, Zagreb

Requirements for obtaining a signature

Regular attendance at lectures and exercises, all assignments and projects submitted on time and positively graded.

Type of exam

The exam written and, if necessary, also oral.

Learning outcomes of this course

- 1 Demonstrate sufficient technical knowledge and application of lightweight wooden and steel structures, materials and building technologies in architecture.
- 2 Demonstrate sufficient technical knowledge and application of roofing components and coverings, thermal and waterproofing materials for pitched and flat roofs, terraces and balconies, as well as of parts of buildings below or at ground level.
- 3 Design parts of the architectural and technical documentation and integrate them into a whole in relation to outcomes 1 and 2.
- 4 Apply appropriate materials and construction solutions to achieve a functional and efficient whole, resulting in contemporary architectural detailing in critical locations related to outcomes 1 and 2.

5 Appropriately understand and reproduce knowledge of physical, technological and functional solutions and the logic of building construction with the objective of protecting the building from external climatic influences and achieving a comfortable internal microclimate for solid construction systems related to outcomes 1 and 2.

6 Demonstrate visual and technical proficiency in the use of tools for basic architectural graphic expression related to outcomes 1 and 2.

Learning outcomes of the study programme

P02, P03, P07, P09, P13

Load-bearing Structures 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Josip Galić
Course associate(s)	Galić; Andrić; Medić; Stepinac; Turčić; Zovko
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	4.0

Framework of course content

Further study of material resistance, complex states, internal forces, balance of internal and external forces and the method of sections. Calculation of more complex structures, principles of force distribution in multi-storey buildings, resistance of building elements to specific actions (wind, earthquake, soil pressure, groundwater, etc.). Calculation of structural deformations using simple examples and comparison with more complex models using WinSTRUDL. Foundations and foundation systems, retaining walls, stability against overturning. Slabs, slab capacity, examples, suspended structures, roof structures. Developing a sense of structural dimensions. Feasibility and considerations, with a specific example.

Design principles and calculations (for all materials). Properties of materials (concrete and steel for concrete structures). Basics of dimensioning concrete and masonry structures. Serviceability limit state design of concrete structures, detailed elaboration. Prestressing of concrete structures.

Development of general and specific competences – knowledge and skills:

Introduction to the basics of calculating internal forces in structures and working through examples. Developing a feeling for the dimensions of structural elements. More complex systems, coupling of the same or different materials, extension and principles of computerised structural analysis, examples of simple spatial calculations. Introduction to the basics of design and calculation and elementary dimensioning – enabling students to approximate the dimensions of structural elements.

Course curriculum

- 1 More detailed study of material resistance and additional knowledge building on the basics covered Load-bearing Structures 1
- 2 Actions on structures that cause forces and stresses, commonly known actions, the effects of heat, water, humidity, soil pressure, groundwater, etc.
- 3 Complex stress states, examples of combinations of tension and compression with bending, core of the section, examples of forces acting on foundations.
- 4 Inclined bending of steel or timber beams, analysis of stress states in the direction of the principal axes, shear and principal stresses in elements.
- 5 Structural deformations, stiffness as an extension of the basics covered in Load-bearing Structures 1, deflections, calculations through simple examples, visualisation through computer simulations (video presentations).
- 6 Complex composite beams, examples of timber-concrete, steel-concrete and new modern materials such as EPS concrete. Applications to examples such as prefabricated house construction or restoration of old buildings. Complex frame and arch structures with larger spans, spatial structures, nets, domes, geodesic domes, etc.
- 7 Final lecture on the feasibility of different types of structures, with examples of completed projects. Complexity of their calculations.
- 8 Overview of concrete structures, basics of design and calculation requirements, safety (for all materials), durability of concrete structures.
- 9 Material properties, general dimensioning – computational strengths and diagrams, behaviour of beams under load to failure.
- 10 Dimensioning for bending and shear.
- 11 Dimensioning for centric and eccentric longitudinal force.
- 12 Dimensioning for local pressure, torsion and punching shear.
- 13 Masonry structures – overview, materials, calculations.
- 14 Serviceability limit state design of concrete structures, detailed elaboration.
- 15 Prestressing of concrete structures.

Other forms of teaching and knowledge assessment

Tests and projects.

Compulsory literature

Salvadori, translated by Diklić: Nosive konstrukcije u arhitekturi, 1995.

Sandaker, Eggen: The Structural basis of Architecture, Oslo, Norway, English translation, USA, 1992.

Haiman: Lecture materials available in Virtual AF

Ivo Podhorsky, Nosive konstrukcije, Golden Marketing – Tehnička knjiga i AF, 2003.

Additional literature

Krauss, Fuhrer, Neukater: Grundlagen der Tragwerklehre 2, Aachen, 2002.

Kraus, Fuhrer, Jurges: Tabellen zur Tragwerklehre, 9. Auflage, Aachen, 2003.

Requirements for obtaining a signature

Regularly submitted projects during the semester

Type of exam

Written and oral

Learning outcomes of this course

- 1 Correctly create and design the load-bearing structure according to the selected materials.
- 2 Differentiate (understand) the types of load-bearing structures and choose the correct dimensions.
- 3 Analyse and compare different structures and select the most appropriate solution.
- 4 Propose the most favourable solution and, if necessary, modify the load-bearing structure.
- 5 Design and select the most appropriate structure in terms of the flow of forces.

Learning outcomes of the study programme**P01, P07, P08, P11, P13, P14**

Architectural Design 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Petar Mišković
Course associate(s)	Mišković; Bertina; Glasinović; Hušnjak; Latin; Martinis; Rister; Roth Čerina; Smode Cvitanović; Žarnić
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	3
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	5.0

Framework of course content

Introducing students to architectural syntax. Positioning architecture as a discipline within society, time, and culture. An introduction to the fundamental themes and methods of architectural design through clearly defined tasks that address the core principles of architectural creation. Through architectural design as a cognitive process, students will discover themes characteristic of architecture, inherent problems, basic tools and limitations. The determinants of architecture are understood: linearity, flatness, spatiality, construction, function, communication, position, light, measure, scale, materiality.

Development of general and specific competences – knowledge and skills:

To familiarise students with the fundamentals of architectural design, both theoretically and practically. By solving simple design tasks, students master the basic methods of creating and organising space. Guided by the logic of the tasks, through their own work, students come to understand the design process and the development and articulation of the architectural construct within a limited number of basic architectural parameters (space, time, tectonics). Students will develop the ability to break down into spatial units and combine units into assemblies; the understanding of the relationships between space, context, function and construction; and the ability to present architectural ideas.

Course curriculum

Architectural space and space as a medium for other artistic disciplines. Ready-made, spontaneous emergence of spatial organisations. Architecture as a means, not an end. Measurement - scale - modular systems. Dimensioning according to human scale (objects, spaces, communication surfaces and ancillary spaces), use and design. Zoning, montage, scenario, layers as ways of organising spatial relationships.

Natural environment. Integration of the architectural construct, design approaches: adaptation, emphasis, contrast, complement, healing. Relocation of human activities to the realm of nature. Achieving unity between interior and exterior spaces.

Urban environment. The relationship between the content programme and the space / use scenarios. Contact and access spaces, experiential transparency. Spatial and structural design, breaking of causality.

Introductory exercise 1: "Complex surface" – transforming a given flat material into an architectural topography without leaving any material behind; collective topography. Scale 1 : 1, model.

Introductory exercise 2: "Bricolage of shadows" – ready-made; material and its properties as a starting point for architectural space; the limitations of material versus the freedom of design. Free representation.

"Connecting multifaceted units into an assembly" – communication as a means of unification; experiencing and perceiving space. Scale 1 : 200, 1 : 100 / plans, sections, perspective and/or axonometry, model.

"Leisure time" – relation to the natural environment; minimal architectural tools; defining space through the absence of an object; approach: organic, functional-plastic, prefabricated, revitalisation, recycling. Scale 1 : 200, 1 : 100, 1 : 50 / plans, sections, perspective and/or axonometry, model.

"Vertical connection of spaces" – limits and rules of the urban environment; literal versus experiential transparency; basic content programming; contact zone, relationship: street – interior spaces. Scale 1 : 200, 1 : 100 / plans, sections, perspective and/or axonometry, model.

Portfolio booklet of works, a summary of all projects in a 20 × 25 cm booklet.

Other forms of teaching and knowledge assessment

Continuous development of project assignments.

Compulsory literature

- 1 Steen Eiler Rasmussen : "Experiencing Architecture". The MIT Press, Cambridge, 1997.
 - 2 Colin Rowe i Robert Slutzky : "Transparency". Birkhäuser Verlag, Basel, 1997.
 - 3 Herman Hertzberger : "Space and the Architect / Lessons in Architecture 2". 010 Publishers, Rotterdam, 2000.
 - 4 Juhani Pallasmaa: "The Eyes of the Skin". Wiley-Academy, Chichester, 2007.
-

Additional literature

- 1 Sinclair Gauldie: "The Appreciation of the Arts: Architecture". Oxford University Press, London, 1975.
 - 2 Mladen Bošnjak: "Kompozicija i oblikovanje u arhitekturi" (Tehnička Enciklopedija, vol. 7), JLZ, Zagreb, 1980.
 - 3 Herbert Bayer, Walter Gropius i Ise Gropius : "Bauhaus 1919 – 1928". MOMA, New York, 1990.
 - 4 Peter G. Rowe: "Design Thinking", The MIT Press, Cambridge, 1991.
 - 5 Herman Hertzberger : "Lessons for Students in Architecture". 010 Publishers, Rotterdam, 1993.
 - 6 Simon Unwin: "Analysing Architecture". Routledge, London, 1997.
 - 7 B. Leupen, C. Grafe, N. Körnig, M. Lampe and P. Zeeuw: "Design and Analysis". 010 Publishers, Rotterdam, 1997.
 - 8 Bruno Zevi: "Znati gledati arhitekturu", Naklada Lukom, Zagreb, 2000.
 - 9 Ernst Neufert, Peter Neufert: "Elementi arhitektonskog projektiranja", Golden marketing, Zagreb, 2002.
-

Requirements for obtaining a signature

Regular class attendance, submitted and positively graded project in Architectural Design 2 and a portfolio booklet of works.

Type of exam

The skill will be assessed on the basis of the programmes submitted.

Learning outcomes of this course

- 1 A student who passes this course will be able to understand the conditions of architectural realisation.
 - 2 A student who passes this course will be able to design a preliminary architectural concept of a lower level of complexity.
 - 3 A student who passes this course will be able to represent an architectural object through technical drawings, spatial representations and models and explain his/her own architectural idea.
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Learning outcomes of the study programme

P04, P11, P12, P13

Introduction to Design of Residential Buildings

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Alenka Delić
Course associate(s)	Delić
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	1
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

The course "Introduction to Design of Residential Buildings", which is part of the architectural design education, deals with the topic of housing by systematising groups of problems into methodological units.

The first cycle of three lectures introduces students to the fundamental issues of housing. This is followed by a cycle of four lectures covering the main functional groups.

The last three lectures provide information on the importance of external factors; the site and immediate surroundings of the dwelling, climate and, in particular, exposure to sunlight.

The course is rounded off with two survey sessions and at least two guest lectures on the topic.

Development of general and specific competences – knowledge and skills:

By studying the relationship between people and their dwellings, the course addresses architectural issues of living spaces, elements, organisation, layout, spatial standards, the relationship between living spaces and their immediate environment, and provides an introduction to the architectural design of residential buildings.

Course curriculum

- 1 Introductory remarks. Human dimensions as a basic factor in architectural design. The purpose of creating enclosed spaces. The concept of space in architecture.
- 2 Issues of housing. The dwelling and its functions. Arrangement of the floor plan. Grouping of rooms, types of dwellings. Relationships between rooms and groups within the dwelling.
- 3 Basic principles of architectural design. Architectural analysis of living spaces.
- 4 Survey session.
- 5 Group of rooms for movement within the dwelling. Entrance area. Corridors and passageways. Vertical movement in the dwelling.
- 6 Group of rooms for sleeping. Types of bedrooms, wardrobes and bathrooms.
- 7 Guest lecturer.
- 8 Group of utility rooms. Kitchen, its evolution, types of kitchens. Utility space within the dwelling. Pantry, storerooms, WC.
- 9 Group of living spaces. Space to relax, work, eat. Multipurpose living room. Purpose of the layout and orientation of the exterior spaces of the dwelling.
10. Guest lecturer.
- 11 The plot and immediate surroundings of the dwelling. Individual garages, home workshops. Storerooms, laundry rooms, etc.
- 12 Survey session.
- 13 Climate and housing. Orientation and exposure to sunlight of the rooms in the dwelling. Ventilation of the dwelling. Natural and artificial lighting. Macroclimate and sanitary standards.
- 14 Sun in architecture. Solar Architecture.
- 15 Guest lecturer.

Other forms of teaching and knowledge assessment

Ongoing assessment is carried out by means of exercises and surveys, and final assessment by means of written and oral exams.

Compulsory literature

Biondić, Lj.: Uvod u projektiranje stambenih zgrada,
Zagreb, 2011, Golden marketing – Tehnička knjiga
Strižić, Z.: Arhitektonsko projektiranje 1 i 2,
Zagreb, 1956. Školska knjiga
Knežević: Višestambene zgrade,
Tehnička knjiga, Zagreb, 1986
Norberg-Schultz: Stanovanje,
Građevinska knjiga, 1990.
Norberg-Schultz: Egzistencija, prostor i arhitektura
Građevinska knjiga, Beograd, 1976.
Perec G.: Vrste prostora
Meandar/Psefizma, Zagreb, 2005.
Neufert: Elementi arhitektonskog projektiranja
Golden Marketing, Zagreb, 2002.

Additional literature

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Requirements for obtaining a signature

Regular class attendance, submitted exercise projects, survey classes.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Written

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- 1 Relate human dimensions to the functionality of residential spaces;
 - 2 Analyse rooms and groups of rooms in a dwelling/residential space;
 - 3 Interpret the relationship between the interior and exterior spaces of the dwelling;
 - 4 Analyse the impact of climatic zone and conditions on the architectural solution of residential spaces.
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Learning outcomes of the study programme P03, P06, P13

Urban Planning 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Ivan Mlinar
Course associate(s)	Mlinar
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

Introduction to urban design. Perception and spatial characteristics. Changes in urban forms Diversity of spaces. Understanding the characteristics of a place. Perception of urban space. Spatial analysis. Analytical and graphical representations. Human space. Evaluating space. Identification of spatial problems. Urban heritage. Understanding the principles of urban design. Urban design and planning. Development of residential areas.

Development of general and specific competences – knowledge and skills:

Introduction to urban planning and urban design.
Development of spatial perception.
Analysis and critical examination of urban situations.
Organisation of residential areas and typology of individual buildings. Proposals and first design interventions in space.

Course curriculum

- 1 Introduction to urban planning
- 2 Spatial perception, perception, image of the city
- 3 The relationship between built and unbuilt space
- 4 Structure of built space
- 5 Typology of individual construction
- 6 Attached housing (terrace houses, courtyard houses)
- 7 Scale, measurements and dimensions of space
- 8 Public space in a residential neighbourhood with individual housing
- 9 Traffic organization in a residential neighbourhood with individual housing
- 10 Technical elements for the dimensioning of streets and garage-parking areas
- 11 Detailed zoning plan: what it is, what it contains, and how it is made
- 12 Individual housing construction – domestic examples
- 13 Individual housing construction – foreign examples
- 14 Individual housing construction – student projects
- 15 Seminar

Other forms of teaching and knowledge assessment

Preparation of a seminar paper on the principles of urban planning or single-family housing.

Compulsory literature

- 1 Chapman D. W. & Larkham P. J.: Understanding Urban Design; an introduction to the processes of urban Change; Faculty of Built Environment, School of Planning, Birmingham, 1994, ISBN 1-869954-25-4
- 2 Reinborn, Koch: Entwurfstraining im Städtebau, W. Kohlhammer BmbH, Stuttgart. 1992.
- 3 Prinz, D.: Städtebau - Städtebauliche Gestalten, W. Kohlhammer GmbH, Stuttgart. 1990.
- 4 Prinz, D.: Städtebau-Städtebauliche Entwerfen. W.Kohlhammer GmbH, Stuttgart, 1995.
- 5 Greed, Clara: Introducing Town Planning, Longman LTD., 1996., isbn 0-582-29300-6

Additional literature

- 1 Pegan, S.: Urbanizam I, AF 1997 (script)
- 2 Dellale, R.: Traganje za identitetom grada, Izdavački centar Rijeka, Rijeka, 1988
- 3 Cullen, G.: The Concise Townscape, Butterworth & Co. Publ., Ltd. 1971.

Requirements for obtaining a signature

Regular class attendance

Type of exam

Written and oral exam, test.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- 1 Interpret the factors of spatial perception in a city;
- 2 Identify the scale, measurements and dimensions of space;
- 3 Evaluate the structure of the built environment of a city;
- 4 Compare settlement structures;
- 5 Analyse the transport system of a settlement;
- 6 Identify the elements of an urban development plan.

Learning outcomes of the study programme

P02, P04, P11, P15

English for Architecture 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Neda Borić
Course associate(s)	Borić
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	1
Field Course (days)	0
ECTS credits	1.5

Framework of course content

Based on selected authentic texts from various sources related to the field of architecture and urban planning, this course covers professional terminology, develops skills in reading professional texts, and improves and expands knowledge vocabulary, as well as oral and written communication skills.

Topics include: structural solutions throughout the history of architecture, design, typology of buildings, apartments and rooms, famous architects and world-famous buildings.

Development of general and specific competences – knowledge and skills:

PRIMARY GOAL: To develop students' oral and written competence in the English language in the field of architecture.

SPECIFIC GOALS:

1 to develop reading strategies for efficient and rapid access to information in knowledge sources (books, journals, internet, dictionaries, databases, etc.) in the field; text cohesion;

2 to acquire basic and frequently used professional terminology, linguistic structures and textual features in the professional language;

3 to expand general and professional English vocabulary;

4 to develop an awareness of how vocabulary works in order to reduce mistakes in oral and written production;

5 to promote independence in learning and working in English.

KNOWLEDGE AND SKILLS achieved through these goals:

1 KNOWLEDGE: Ability to use the English language for academic education or future professional activities in architecture.

2 SKILLS:

a) ability to read professional or scientific texts;

b) knowledge of professional terminology

c) ability to describe projects, buildings, etc.

d) Oral communication skills.

Course curriculum

- 1 INTRODUCTION – course content, instructions
- 2 STRUCTURAL SOLUTIONS THROUGH HISTORY (reading, classifying information from the text, professional terminology, antonyms, collocations, important verbs in architecture, phrasal verbs, translation, additional reading)
- 3 PRELIMINARY STEPS IN DESIGN AND CONSTRUCTION
- BUILDING SITE – Part I (reading for specific information, professional terminology, polysemy of technical terms, modal verbs)
- 4 PRELIMINARY STEPS IN DESIGN AND CONSTRUCTION
- ARCHITECTURAL DRAWINGS – Part II (reading – selection and categorization of information from the text, professional terminology, prepositions of place, phrasal verbs, describing the location and floor plan, transposing information from text to visual representation and vice versa, translation, additional reading)
- 6 FRANK LLOYD WRIGHT (reading with tasks; extracting information from text - organising data, contextual meaning, antonyms, word formation, compound adjectives)
- 6 FRANK LLOYD WRIGHT – GUGGENHEIM MUSEUM (reading with tasks, avoiding traps of superficial reading and understanding; professional terminology, prepositional verbs, essay or presentation, additional reading)
- 7 REAL ESTATE BUSINESS – Part I (reading, professional terminology – typology of houses, synonymy, collocations, polysemy, translation exercises)
- 8 REAL ESTATE BUSINESS – Part II (professional terminology, lexical subsets, subject-predicate agreement in number, translation exercises, oral communication exercises, additional reading)
- 9 ARCHITECTURAL DESIGN IN PRACTICE, Part I – Case study, professional terminology, typology of dwellings, passive voice, translation, describing dwelling layouts
- 10 ARCHITECTURAL DESIGN IN PRACTICE, Part II – Case study (phrasal verbs, translation exercises, dialogue, additional reading)
- 11 IN THE ARCHITECT'S OFFICE – Part I (professional terminology – key terms in project development; reading for specific information: extracting information – completing sentences with information from the text, identifying project phases, achieving expression economy, collocations, phrasal verbs, text cohesion – time-sequence connectors)
- 12 IN THE ARCHITECT'S OFFICE, Part II (professional terminology, focus on key elements of American and British varieties of professional English, phrasal verbs, translation, additional reading)
- 13 MODERN HOUSES, Part I – Single-family House
- 14 MODERN HOUSES, Part II – Case Study (independent work in groups with selected assignments based on students' interests)
- 15 TEST

Other forms of teaching and knowledge assessment

- regular class attendance;
- continuous monitoring of student performance;
- homework;
- exam.

Compulsory literature

- 1 – University textbook:
Borić, N. (2007). *English for Architecture and Urban Planning*
Golden marketing, Tehnička knjiga. Zagreb.
2. general and professional dictionaries

Additional literature

- expert texts from architectural magazines, books and monographs

Requirements for obtaining a signature

Regular class attendance

Type of exam

Written

Learning outcomes of this course

- 1 The student will be able to understand all English professional texts in the field.
- 2 The student will be able to extract information from professional texts and apply it successfully in a new context (e.g. writing a summary).
- 3 The student will master the most common professional terminology and language structures characteristic of the field and use them correctly in speech and in writing.
- 4 The student will know how to describe projects, their work, buildings, technical drawings, etc. in oral and written communication in English.
- 5 The student will know how to apply what they have learnt when translating professional texts into and from English.
- 6 The student will be able to participate in oral communication and discussion.
- 7 The student will be able to give a public presentation in English on a professional topic.

Learning outcomes of the study programme

Physical/Health Education 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Dalibor Vračan
Course associate(s)	Vračan
Year of study	First
Semester of study	2 nd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	0.0

Framework of course content

Sports gymnastics. Sports games. Orientation walking tours.

Development of general and specific competences – knowledge and skills:

Knowledge of technology for the development of psychomotor skills. Development of specific skills and abilities by sports branches. Knowledge of sports physiology and hygiene.

Course curriculum

- 1 Sports games: Football – technique. Volleyball – technique.
- 2 Sports games: Football – technique. Volleyball – technique.
- 3 Sports games: Football – technique. Volleyball – technique.
- 4 Sports games: Basketball – technique.
- 5 Sports games: Basketball – technique.
- 6 Sports games: Basketball – technique.
- 7 Sports gymnastics.
- 8 Sports gymnastics.
- 9 Swimming – technique.
- 10 Swimming – technique.
- 11 Swimming – technique.
- 12 Aerobic.
- 13 Aerobic.
- 14 Stretching: creating small exercise systems according to a specific sport.
- 15 Persevering movements in nature with orientation.

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 Mišigoj-Duraković M. et al. (1999) Tjelesno vježbanje i zdravlje, Zagreb: Grafos.

Additional literature

- 1 Trninić S. (1996) Analiza i učenje košarkaške igre, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 2 Janković V., Marelić N. (2003) Odbojka za sve, Zagreb: Authors' edition.
- 3 Volčanšek B. (2002) Bit plivanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 4 Šnajder V., Milanović D. (1991) Atletika hodanja i trčanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 5 Sertić H. (2005) Osnove boričkih sportova, Zagreb: Faculty of Kinesiology at the University of Zagreb.

Requirements for obtaining a signature

Regular class attendance

Type of exam

The course does not contribute to the achievement of a professional qualification.

The course does not contribute to the achievement of a professional qualification.

THIRD SEMESTER

History of Architecture 3

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Nataša Jakšić
Course associate(s)	Jakšić; Seitz
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Renaissance and Baroque architecture. Continuity and variations from the beginning of the early modern period to the mid-18th century. Distinctive features of national architectures.

Development of general and specific competences – knowledge and skills:

Basic knowledge of the Renaissance and Baroque architecture, with special emphasis on examples in Croatia. Understanding of the ideas of classical architecture as defined in the Renaissance and their transformations through Baroque architecture. The relationship between actual architecture and the intended perception of architectural spaces: architecture as a bearer of messages. Insights into architecture as a result of various societal, functional and artistic premises. The relationship between architecture and society.

Course curriculum

- 1 Renaissance: introduction, theories and treatises
- 2 Early Renaissance: Florence, Brunelleschi, Alberti
- 3 Urbino, Venice, Croatia in the 15th century
- 4 Croatia in the early 16th century, Lombardy, Rome
- 5 High Renaissance: Introduction, Rome, Bramante and his circle
- 6 Venice, Michelangelo
- 7 St. Peter's Basilica in Rome, Mannerists
- 8 Palladio, the city, Mediterranean Croatia
- 9 Renaissance in Central and Western Europe
- 10 Baroque: introduction, Roman Baroque
- 11 Baroque in Italy: Venice and Piedmont
- 12 Baroque in Italy. Baroque in Mediterranean Croatia
- 13 Baroque in France, Baroque palace and castle
- 14 Baroque in Central Europe
- 15 Baroque in Northern Croatia. Development of fortresses from the 15th to the 18th century

Other forms of teaching and knowledge assessment

Compulsory literature (please provide detailed information about the publisher and year of publication)

- 1 D. Watkin: History of Western Architecture, Laurence King Publishing, London, 2005. (4th edition, selection)
- 2 R. Ivančević: Umjetničko blago Hrvatske, Zagreb, Motovun, 1993 (selection)
- 3 W. Müller, G. Vogel: Atlas arhitekture I., Golden marketing i IGH, Zagreb, 1999. (selection)
- 4 W. Müller, G. Vogel: Atlas arhitekture II., Golden marketing i IGH, Zagreb, 2000 (selection)

Additional literature

1 P. Murray: Architecture of the Italian Renaissance, Thames and Hudson, 1969.

Requirements for obtaining a signature: Regular class attendance

Type of exam

Written and oral exam.

Learning outcomes of this course

- 1 Identify the fundamental principles of Renaissance and Baroque architecture.
 - 2 Demonstrate familiarity with the ideas of classical architecture, their definition in the Renaissance and their transformation in Baroque architecture.
 - 3 Understand the relationship between actual architecture and the intended perception of architectural spaces and architecture as a bearer of messages.
 - 4 Demonstrate an understanding of architecture as the result of various societal, functional and artistic requirements.
 - 5 Understand the relationship between architecture and society.
 - 6 Use architectural drawings as two-dimensional representations of complex spatiality.
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Learning outcomes of the study programme

P03, P04, P05, P11, P15

Modelling 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Renata Waldgoni; Siniša Justić
Course associate(s)	Bakić; Justić; Pavlović; Spudić; Tutek
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.5

Framework of course content

The course provides an overview of visual elements and requires the application of basic techniques to visually cultivate and complement the engineering component of the architectural thought process. (point, line, plane, body, space, proportions, order, tone, colour).

Development of general and specific competences – knowledge and skills:

The course explores, demonstrates and applies the principles and elements of visual composition through abstract forms. Abstract forms are arranged in a hierarchical, harmoniously organised composition, multiplied into a non-hierarchical coherent structure, observed in classical painting and noted in the basic rules of typography. The research is carried out in a visual medium, emphasising the intermediality of the basic art rules. The findings do not lead to a precisely defined set of design rules. Instead, the results remain abstract and individual, enriching each student's visual and knowledge base as part of a comprehensive preparation for the future creative process of architectural design.

Course curriculum

- 1 Introductory lecture: course overview, recommended literature, guidelines for successful completion of the course
- 2 Composition – introduction: from optical processes to perception (definition by measurement, analytical and geometric simplification of phenomena, transparency, construction – links with mathematics and descriptive geometry)
3. Composition – elaboration: size and placement of the composition within the format, visual characteristics of squares and rectangles, their placement, size and interrelations
- 4 Composition: final study and project submission
- 5 Structure – introduction: the appearance, development and significance of grids in contemporary art and architecture, structure and the process of creation, structure over time, serial structures and monotony/monochrome, series and authorship
- 6 Structure formed by the multiplication of an elementary form
- 7 Structure between intention and chance – process-based form, project submission
- 8 Painting analysis – introduction, choosing a painting
- 9 Painting analysis – elements and process of analysis
- 10 Painting analysis – synthesis, execution and submission of the project
- 11 Basic composition on a typographic template – introduction
- 12 Basic composition on a typographic template – elaboration
- 13 Basic composition on a typographic template – final remarks and project submission
- 14 Semester syllabus – an overview of all the projects completed during the semester in a summarised form, following the specified format and layout.
It may include a number of examples and impressions that further explain the work on the assignments.
- 15 Guest lecturer (renowned artist or expert in the psychology of perception), syllabus submission

Other forms of teaching and knowledge assessment

Homework with corrections before submission every two weeks.

Analytical coverage of cultural events.

Compulsory notebook in which lectures, assignments and personal observations are recorded in the form of text, drawings and reproductions.

Compulsory literature

- 1 Rudolf Arnheim: Umetnost i vizuelno opažanje, Univerzitet umetnosti u Beogradu, Belgrade, 1981.
 - 2 E.H. Gombrich: Umetnost i iluzija, Nolit, Belgrade, 1984.
 - 3 Gillo Dorfles: Kič, Golden marketing, Zagreb, 1997.
 - 4 C.G. Jung: Čovjek i njegovi simboli, Mladost, Zagreb, 1974.
 - 5 Rosalind Krauss: The originality of avantgarde an other modernist myths, The MIT Press, Cambridge, Massachusetts.
-

Additional literature

- 1 N. Mišćević, M. Zinaić: Plastični znak, Izdavački centar Rijeka, Rijeka, 1982.
 - 2 H.W. Janson: Povijest umjetnosti (hrvatsko prošireno izdanje), Stanek, Varaždin, 2003.
 - 3 J. Itten: Umetnost boje, priručnik, Umetnička akademija u Beogradu, Belgrade, 1973.
 - 4 Josep Lluís Mateo, Florian Sauter: Natural metaphor, ETH Zurich, 2007. (essay collection)
 - 5 Paul Overy: De Stijl, Thames&Hudson World of Art, London, 1991, 2000.
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Requirements for obtaining a signature

Regular class attendance, regular submission of papers, projects and homework assignments.

Type of exam

The grade is based on the projects submitted.

Upon successful completion of this course, the student will be able to:

- 1 Evaluate the chosen template in terms of visual composition;
 - 2 Apply drawing in the process of research and compositional analysis;
 - 3 Creatively interpret and present a conclusion using an appropriate visual technique;
 - 4 Formulate a logical process for structuring a composition;
 - 5 Design a visually satisfactory composition;
 - 6 Apply appropriate manual and digital techniques to visual representations;
 - 7 Design a conceptual representation by integrating various graphic elements (text, drawing, photograph).
-

Learning outcomes of the study programme

P11, P12, P13

Computer-Aided Architectural Design 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Bojan Baletić
Course associate(s)	Baletić; Careva; Lisac; Vdović; Pap
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.5

Framework of course content

This course introduces students to the contemporary development of information technologies, their impact on modern scientific knowledge and creative sensibilities, and their influence on changes in architectural practice and related fields. Working in groups during exercises, students gain practical knowledge and skills, including teamwork, in the use of software tools for 3D modelling and visualisation in architecture and virtual construction progress tracking.

Development of general and specific competences – knowledge and skills:

An overview of current developments in information and communication technologies. Specific knowledge is directed towards the challenges and opportunities that new tools offer in architectural design and practice. Students will master both basic and advanced techniques in working with CAAD systems (including the basics of BIM), as well as complex techniques and tools intended for the building information modelling process for architects. Use of tools to create a 3D architectural model of a building. Gaining familiarity with model creation functions, construction elements and procedures for model modification and refinement. Using a 3D model, students will be introduced to the concept of virtual building, interactive working and dynamic modification of technical drawings derived from the model. They will also become familiar with complex libraries of parametric objects, associative dimensioning and dynamic detailing of drawings through different scales.

Course curriculum

The course is delivered through lectures, demonstrative exercises, consultative exercises, independent work and presentations. Lectures:

1. Information society
2. Development of computer graphics
3. Computer visualisation of architecture
4. Computer visualisation of landscapes
5. Interactive multimedia
6. Internet and 3D web
7. CAD
8. Concept of virtual building
9. GIS
10. Dynamic simulations – statics
11. Dynamic simulations – lighting and energy
12. Artificial intelligence
13. Hardware for architects
14. Software in architecture
15. Future developments

Exercises:

1. CAAD concepts – basics, 2D vs. 3D vs. BIM, examples
2. Virtual construction – basics, examples (possibility of teamwork in certain project phases)
3. 3D CAAD – interface, elements, coordinates
4. 3D CAAD – scale, defining 3D elements, model construction
5. 3D CAAD – model modifications
6. 3D CAAD – advanced constructions and modifications via executed drawings
7. 3D CAAD – model views, 3D sections
8. 3D CAAD – shadow analyses
9. 3D CAAD – documentation – processing drawings from the model, scales, dimensioning, descriptions
10. 3D CAAD – documentation – publishing, printing, exchange and backgrounds
11. Architectural visualisation – using the virtual model, framing
12. Architectural visualisation – natural and artificial lighting
13. Architectural visualisation – surface characteristics and textures
14. Presentation – linear and interactive presentations
15. Portfolio presentation I, II, III

Other forms of teaching and knowledge assessment

Students' progress is continuously monitored through personal assignments throughout the semester and during the semester exam, and the results are presented at the end of the semester.

The examination of the theoretical part is carried out by a written exam which, together with other elements of continuous knowledge testing, results in an overall grade.

Compulsory literature

- 1 Course script
- 2 Software manuals

Additional literature

- 1 Szalapaj, P.: CAD Principles for Architectural Design, Architectural Press, 1987, ISBN 0750644362
- 2 Crosley, M.L.: The Architects Guide to Computer-Aided Design, 1988, ISBN 0471624330
- 3 Galssner, A.S.: 3D Computer Graphics: A User's Guide for Artists and Designers, Design Press, 1989, ISBN 0830610030
- 4 Porter, T.: The Architect's Eye: Visualization and depiction of space in architecture, E&FN Spon, 1997, ISBN 0419212302
- 5 Steele, J.: Architecture and Computers: action and reaction in the digital design revolution, Laurence King Publishing, 2001, ISBN 1856692205

Requirements for obtaining a signature

Regular class attendance, successful completion of the exam and presentation of the final results of the work during the semester in a public presentation.

Type of exam

At the end of the course, the theoretical part is tested by a written exam which, together with other elements of continuous knowledge testing, results in an overall grade.

Learning outcomes of this course

- 1 The student will understand the basics of using BIM software.
- 2 The student will gain experience in constructing a 3D model of a family house (based on the drawings of an existing project) that they have previously analysed in detail, selecting methods for its modelling.
- 3 The student will develop skills in preparing computer illustrations and creating a multimedia presentation of a 3D model.

Learning outcomes of the study programme
P07, P12, P13

Architectural Technology and Materials 3

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Zoran Veršić
Course associate(s)	Veršić; Muraj, Binički
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Staircases – general, requirements and calculation methods. Light staircases. Types of staircases: spiral, suspended, and cantilevered. Building envelope solutions - structural assemblies and cladding materials. Partition openings: windows and doors – types, materials, technical characteristics, requirements, methods of construction and installation of windows and doors. Solar protection. Glass in architecture: types, characteristics and safety requirements. Solar protection: types, materials, requirements and calculation methods. Glazed and double façades: materials, types, characteristics, methods of construction and installation. Partition walls: types, materials, methods of construction. Dry construction systems: characteristics, requirements, materials and methods of construction.

Development of general and specific competences – knowledge and skills:

This course builds on the topics of Architectural Technology and Materials 1 and 2. Introduction to the elements of architectural structures (staircases, building envelopes, façades, elements installed in openings, solar protection, partitions) and their integration into structural assemblies and systems. Introduction to the elements and materials of cladding and their applications. Dry construction systems for walls, floors and ceilings.

Course curriculum

- 1 Staircases – general. Wooden and steel staircases.
- 2 Glass staircases. Calculation methods for spiral staircases.
- 3 Building envelope construction – structural assemblies.
- 4 Building envelope construction – cladding materials – metal and wood.
- 5 Openings – doors.
- 6 Openings – windows.
- 7 Solar protection.
- 8 Glass in architecture.
- 9 Glazed façades.
- 10 Double glazed façades.
- 11 Façades and openings – execution and installation.
- 12 Partition walls.
- 13 Dry construction systems – general, materials.
- 14 Dry construction systems – vertical partitions and ceilings.
- 15 Dry construction systems – floors and other elements.

Other forms of teaching and knowledge assessment

Exam: written / oral

Compulsory literature

- 1 Mittag, Baukonstruktionslehre, Vieweg, 2000.
- 2 Tehnička enciklopedija, vol. X – Otvori, Hrvatski leksikografski zavod, Zagreb
- 3 Schittich, Staib, Balkow, Schuler, Sobek: Glasbau Atlas, Institut für Internationale Architektur-Dokumentation GmbH, Munich, 1998.
- 4 Tichelmann, Pfau, Becker: Trockenbau Atlas, Teil I, II, Verlagsgesellschaft Rudolf Müller, Cologne, 2005.
- 5 Course material on the course website (AF Virtual)

Additional literature

- 1 Compagno, Intelligente Glasfassaden, Birkhauser, Basel, 2002.
- 2 Oestrele, Liebe, Lutz, Heusler: Doppelschalige Fassaden, Callwey, Munich, 1999.
- 3 Čokić, Okov građevne stolarije, Tehnička knjiga, Zagreb, 1980.
- 4 W.Fasold, E. Veres, Schallschutz+Raumakustik in der Praxis, Verlag für Bauwesen, 1998.

Requirements for obtaining a signature

Regular attendance and completed and positively assessed assignments within Design Studio I – Architectural Structures course.

Type of exam

Written (and, if needed, also oral) exam

Learning outcomes of this course

- 1 Apply knowledge and methods of architectural structures and materials to architectural and urban design solutions.
- 2 Propose appropriate use of materials and structural solutions to meet the basic requirements of the building when collaborating on the development of an architectural and urban project.
- 3 Analyse the characteristics of building elements and the building as a whole.
- 4 Apply knowledge and methods of engineering solutions to meet building physics and other fundamental building requirements.
- 5 Apply knowledge of building regulations involved in project realisation.

Learning outcomes of the study programme P03, P07, P08, P09, P10

Building Installations 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Tihomir Rengel; Damir Prodan Abramović
Course associate(s)	Rengel; Prodan Abramović; Abrashi
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Air conditioning, gas and electrical installations (lighting, EM drives, lightning conductors, telephones, antenna systems) and vertical transport systems in buildings, taking into account their function, location in the building, space requirements and integration into modern architectural designs and construction technologies.

Development of general and specific competences – knowledge and skills:

The main objective of this course is to study and analyse possible solutions for all building installations and to define the conditions that influence the architectural and structural solutions of a building in order to achieve an optimal building design. Students will acquire knowledge of systems and installation elements that ensure microclimatic conditions, functionality (use) and fire safety for buildings with different purposes. The knowledge acquired in this course will contribute to making informed decisions in the design and construction of buildings and to participating in the selection of installation systems, taking into account different construction technologies and environmental protection.

Course curriculum

- 1 Water supply and possible sources of potable water; consumption assessment.
- 2 Water supply schemes; function, materials and execution of individual elements and assemblies; water consumption measurement.
- 3 Individual and central hot water preparation systems; selection and types of systems for increasing pressure in the water supply network.
- 4 Water-based fire protection in buildings; basic schemes, function, materials and execution of individual elements and assemblies.
- 5 Legal regulations; external and internal hydrant networks; automatic sprinkler systems; gas and foam fire suppression.
- 6 Types of wastewater and sewage systems; schemes; function, materials and execution of individual elements and assemblies.
- 7 Sanitary fixtures and equipment: ergonomic usage spaces; prefabricated elements; sanitary partition walls and cabins.
- 8 Dimensioning of sewage installations; the equivalent factor method (DIN 1986); Küter's calculation method.
- 9 Methodology for calculating heat supply and losses; their impact and possible methods for mitigation; approximate methods.
- 10 Historical development of heating; classification; heat sources; basic installation schemes; calculation of installation elements.
- 11 Types of heating units, materials, installation methods, required space; determining location, calculation.
- 12 Natural ventilation, solutions, and principles of natural ventilation; mechanical ventilation: basic schemes.
- 13 Ventilation system elements, their function, position, material, heat recovery; noise and solutions for its reduction.
- 14 Air conditioning: system classification; basic schemes, elements, function, position, installation methods and locations.
- 15 Cooling: historical development, SPLIT systems and their development and application; VRV systems and their development and application.

Other forms of teaching and knowledge assessment

Tests. The written part of the exam consists of ten questions. The oral part of the exam is held if the candidate scores at least 60 per cent in the written part.

Compulsory literature

- 1 Cetinić, I.: Vodovod i kanalizacija, learning materials – lecture scripts and exercises
 - 2 Cetinić, I.: Plinske instalacije, learning materials – lecture scripts and exercises
 - 3 Cetinić, I.: Grijanje, hlađenje, ventilacija i klimatizacija, learning materials – lecture scripts and exercises
 - 4 Cetinić, I.: Električne instalacije, learning materials – lecture scripts and exercises
-

Additional literature

- 1 Radonjić, M.: Vodovod i kanalizacija u zgradama, Croatiaknjiga, 2004.
 - 2 Tušar, B.: Kućna kanalizacija, Građevinski fakultet, 2001.
 - 3 Tušar, B.: Ispuštanje i pročišćavanje otpadne vode, Croatiaknjiga, 2004.
 - 4 Tadić, D.: Kućne instalacije, BGZ, Belgrade, 1963.
 - 5 Strelec i suradnici: Plinarski priručnik, Energetika marketing, Zagreb, 2001
 - 6 Recknagel; Sprengel; Schramek: Priručnik za grijanje, hlađenje, ventilaciju i klimatizaciju, V. Banja, 2002.
 - 7 Labudović et al.: Priručnik za ventilaciju i klimatizaciju, Energetika marketing, Zagreb, 2000.
 - 8 Podlipnik, B.: Svjetlotehnički priručnik, Elektrovodna, Maribor, 1978.
-

Requirements for obtaining a signature

Regular class attendance and submitted and defended Technical studio project.

Type of exam: Written and oral exam.

Learning outcomes of this course

- 0 Demonstrate sufficient technical knowledge and application of various types of installations, materials and building technologies in architecture.
 - 1 Demonstrate visual and technical proficiency in the use of tools for basic technical graphic expression.
 - 2 Creatively apply knowledge and methods from the field of installations in architectural and urban design solutions.
 - 3 Identify the architect's responsibility to preserve the values of the natural and built environment.
 - 4 Prepare sections of technical documentation for water supply, sewage, gas, and heating installations and integrate these parts into a cohesive whole.
 - 5 Propose appropriate use of installation, transport and safety solutions when collaborating on the development of an architectural and urban project, aiming to integrate these into a functional and efficient entity that meets the building's fundamental requirements.
 - 6 Appropriately understand and reproduce knowledge of physical, technological, and functional solutions and the logic of building installations, with the aim of achieving a comfortable indoor microclimate for all building systems.
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Learning outcomes of the study programme P07, P08, P09, P10

Load-bearing Structures 3

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Josip Galić
Course associate(s)	Galić; Andrić; ; Stepinac; Vukić; Zovko
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.0

Framework of course content

Fundamentals of metal and timber structures, including load conditions and internal forces in planar and spatial systems. Different types of systems in metal and timber structures. Required heights and limit spans, with methods for calculating elements under tension, compression, bending, lateral buckling and dimensioning of structural elements.

Development of general and specific competences – knowledge and skills:

Students will be introduced to the elements and systems of metal and timber structures. Methods of dimensioning metal and timber structures, taking into account the mechanical properties of the materials and the internal forces of the structure.

Course curriculum

- 1 Development and basic properties of metal and timber structural systems. Advantages and disadvantages, criteria for selecting metal and timber structures.
- 2 Systems in metal structures. Mechanical behaviour of systems and limit spans with required heights.
- 3 System responses with model coefficients for system elements under different actions on the structure. Examples of load-bearing capacity calculations.
- 4 Buckling of steel compression members, the concept of critical force and equilibrium, algorithm for direct dimensioning of compressed members. Analogy between EC-3 calculations for steel columns and EC-4 calculations for composite columns.
- 5 Checking tensile elements and elements under bending stress, checking for lateral buckling. Spatial stabilisation of halls and single-span buildings. Practical examples of global system stabilisation.
- 6 Planar truss girders. Various systems depending on the span. Planar and spatial steel frames. Examples of completed systems and methods for calculating the load-bearing capacity of system elements.
- 7 Types of ceilings in steel structures. Steel beams combined with a slab and slender composite columns.
- 8 Definitions of layout schemes for metal structures, actions on the structure with load-bearing capacity checks of system elements.
- 9 - 10 Presentation and defence of projects from exercises in metal structures, including definitions of layout schemes, actions on the structure, load-bearing capacity checks of system elements and details.
- 11 Mechanical properties of timber structure elements under stress from various load cases. Load-bearing capacity of elements made from traditional timber and glued laminated timber structures.
- 12 Timber structural systems with mechanical behaviour (selection of timber for structures). Required heights and limit spans.
- 13 Internal forces in timber structure elements and load-bearing capacity checks. Methods for calculating structural elements under compression, tension and bending.
- 14 Glued laminated timber beams. Global stability of the system. Timber truss systems according to various patented designs and assembly methods. Practical examples.
- 15 Presentation and defence of projects in timber structures.

EXERCISES:

- 1 Load analysis (calculated load); planar steel trusses; mechanical behaviour; dimensioning for bending and tension.
- 2 Layout scheme for a steel hall; overall stability of halls.
- 3 Computer simulation of planar and spatial systems (assumed dimensions – HEA for frames and round tubes for truss members).
- 4 Control of the computer analysis of the system. Dimensioning of compression members.
- 5 Dimensioning of members for a combination of bending with longitudinal force (compression or tension).
- 6 Load-bearing capacity checks of structural elements and global stability; details of connections and supports.
- 7 Dimensioning of composite roof structure beams.
- 8 Project corrections.
- 9 Presentation and defence/submission of assignments in steel structures.
- 10 Timber halls with glued laminated beams.
- 11 Layout scheme.
- 12 Dimensioning of timber beams for compression and bending.
- 13 Details.
- 14 Presentation and defence/submission of assignments in timber structures.

Other forms of teaching and knowledge assessment

Regular lectures and exercises attendance, assignments submission and presentation.

Compulsory literature

- 1 M. Sulyok-Selimbegović: Čelične konstrukcije u arhitekturi, Golden marketing and Faculty of Architecture, 2008
 - 2 M. Sulyok-Selimbegović: Drvene konstrukcije u arhitekturi, 2008
- Textbooks for architecture students

Additional literature

- 1 H. Schultz, W. Sobek, K. Habermann: Steel Construction Manual, 2000
- 2 Herzog, Natterer, Schweitzer, Volz, Winter: Timber Construction Manual, 2004

Requirements for obtaining a signature (**regular class attendance / passed test / submitted programme / seminar paper / research project, etc.**)

Continuous class attendance, including assignment presentation and defence. Submitted projects in exercises.

Type of exam

Test

Learning outcomes of this course

- 1 Design and select the most appropriate structure in terms of the flow of forces.
 - 2 Critically evaluate the designed or realised architectural and urbanistic conceptual design.
 - 3 Analyse and compare different structures and select the most appropriate solution.
 - 4 Propose the most favourable solution and, if necessary, modify the load-bearing structure.
 - 5 Creatively apply knowledge and methods in the field of technical sciences and arts, as well as social and natural sciences in architectural and urban design solutions that meet the technical requirements of the discipline.
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Learning outcomes of the study programme

P01, P07, P08, P11, P13, P14

Design Studio I – Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Ivana Ergić
Course associate(s)	Delić; Ergić; Horvat; Ilić; Modrčin; Pelivan; Rajčić; Relić; Virag
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	6
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	7.0

Framework of course content

Design Studio I is an integral course that addresses the theme of individual housing. It is delivered as a layered urban-architectural assignment, divided into the components of urban planning, architectural design and architectural structures. Each component deals with a specific scale and tasks relevant to that scale. The core of the assignment is an original project for a family house, which is simultaneously developed with an urban component through the design of a residential neighbourhood and a technical component through the elaboration of the house structure and specific details.

Development of general and specific competences – knowledge and skills:

Design Studio I – Architecture, together with Design Studio I – Urban Planning and Design Studio I – Architectural Structures, forms a whole that combines different aspects of individual housing: the architectural design of a family house, the design of a residential neighbourhood and, on the other hand, the structure of the house and specific details. Through studio work, students are introduced to the design process where space is developed through context, form, function, technology and material.

The design process integrates knowledge from a range of professional disciplines. The Design Studio I courses involve active participation of lecturers specialising in various aspects of the built environment and construction. Design Studio I provides a framework within which students acquire the necessary knowledge and skills in the processes of architectural design of a family house, planning of low density neighbourhoods and elaboration of the technical specifics of a house.

The working process fosters an understanding of the relationship between the architect and society, as well as the development of a building culture.

Course curriculum

Design Studio I is an integral course that addresses the theme of individual housing. It is delivered as a layered urban-architectural assignment, divided into three interrelated courses: Design Studio I – Architecture, Design Studio I – Urban Planning and Design Studio I – Architectural Structures. Each course deals with specific issues and tasks relevant to a particular scale. The core of the assignment is a project for a family house, which is simultaneously developed with an urban component through the design of a residential neighbourhood and a technical component through the elaboration of the house structure and specific details.

The Design Studio I course is based on an intensive and individualised approach to practical work. It includes site visits, focused seminars, joint presentations and discussions throughout the semester, culminating in a final project presentation and defence. Work in the course is organised into 8 groups.

Other forms of teaching and knowledge assessment

Project assignments, seminar papers, field work, presentations, project defence.

Compulsory literature (please provide detailed information about the publisher and year of publication)

Recent reviews in the field of architecture and urban planning (journals and monographs).

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

Literature listed in the courses that thematically accompany the work in the Design Studio course.

Requirements for obtaining a signature

Regular class attendance and successful defence of the design solution.

Type of exam

Students' knowledge is assessed through successfully completed practical assignments.

Learning outcomes of this course

- 1 Evaluate, interpret, and critically assess examples of family houses.
- 2 Apply learned typologies in one's own architectural project.
- 3 Demonstrate acquired architectural criteria and methods through project work.
- 4 Illustrate the conceptual basis of one's own project.
- 5 Design a preliminary design for a family house in the given context.
- 6 Write a conceptual and technical description of a family house project.
- 7 Prepare a presentation of an architectural project for a family house.
- 8 Defend an architectural project for a family house.

P01, P02, P03, P04, P05, P06, P07, P08, P09, P11, P12, P13, P15, P16

Design Studio I – Urban Planning

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Ivan Mlinar
Course associate(s)	Duić; Gašparović; Karač; Mlinar; Mravunac Sužnjević; Zaniović; Žunić
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	4
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	4.0

Framework of course content

Design Studio I – Urban Planning covers the themes, tasks, and methods of developing an urban planning solution for a residential neighbourhood of individual housing, from analysis and concept development to solutions and detailing of basic individual housing typologies and essential communal standards, from road infrastructure to other public spaces and facilities.

Development of general and specific competences – knowledge and skills:

Through practical work in the Design Studio I - Urban Planning course, students will creatively apply their knowledge of urban design solutions to individual residential neighbourhoods.

Course curriculum

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Other forms of teaching and knowledge assessment

Project assignments, seminar papers, field work, presentations, project defence.

Compulsory literature (please provide detailed information about the publisher and year of publication)

Recent reviews in the field of architecture and urban planning (journals and monographs).

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

Literature listed in the courses that thematically accompany the work in the Design Studio course.

Requirements for obtaining a signature

Regular class attendance and successful defence of the design solution.

Type of exam

Students' knowledge is assessed through successfully completed practical assignments.

Learning outcomes of this course

Upon successful completion of the Studio I – Urban Planning course, students will be able to:

- apply urban planning methods for spatial analysis and analysis of residential individual housing neighbourhoods;
- creatively apply theoretical and practical knowledge about space and residential individual housing neighbourhoods;
- design an urban planning solution for a residential individual housing neighbourhood.

P02, P03, P04, P05, P06, P11, P12, P13

Design Studio I – Architectural Structures

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Iva Muraj, Professor
Course associate(s)	Binički; Jaklenec; Mandić; Mrinjek Kliska; Muraj; Ostojić; Pavlović; Užarević; Ževrnja Andrić; Medić; Stepinac; Turčić; Vukić Abrashi; Rengel; Prodan Abramović
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

The Design Studio I courses focus on individual housing, approached holistically from the perspectives of urban planning, architectural design and architectural structures.

The Design Studio I – Architectural Structures course integrates specific themes and assignments related to the technical component (architectural structures, load-bearing structures and building installations) for the typology of single-family houses. The first part involves analysis and research of specific parts of the building relevant to the design task. The second part involves the development of sections of the project's technical documentation based on the design brief, focusing on the structural details of the single-family house and specific technical elements.

Development of general and specific competences – knowledge and skills:

The Design Studio I courses focus on individual housing, approached holistically from the perspectives of urban planning, architectural design and architectural structures.

Design Studio I – Architectural Structures is a practical course where knowledge from several technical subjects—architectural structures and materials, building physics, load-bearing structures, and building installations—is simultaneously integrated. During the work process, students acquire knowledge about the process of developing the architectural design of a single-family house – from the whole structure to individual structural elements.

This course is also a process of integral development of load-bearing structures and building installations. In addition to knowledge integration, the course encourages a creative and individualised approach to project development for each student. Throughout the course, students engage in analysis, research and the use of modern materials and technologies. In the process, they gain an understanding of the relationship between engineers and society, professional ethics, environmental sustainability, project management and effective communication.

Course curriculum

Development of a single-family house – content:

Preliminary design of the house, scale 1 : 200

– copies of all drawings from the preliminary design developed in the Design Studio I – Architecture course, with marked sections to be developed within the Design Studio I – Architectural Structures component.

ARCHITECTURAL STRUCTURES COMPONENT

Technical Description

Materials/systems catalogue

Graphic attachments

– cross-section of the house, scale 1 : 50

(characteristic detailed drawing of the building's cross-section through the staircase, including layer descriptions)

– façade detail / cross-section of the façade from foundation to roof, scale 1 : 20

(execution detail of the façade cross-section from foundation to roof, including a typical floor plan and elevation view of the façade segment with a library of applied materials)

– lightweight construction details of the house, scales 1 : 20, 1 : 10, 1 : 5

(staircase, railing, canopy, etc.)

LOAD-BEARING STRUCTURES COMPONENT

Technical Description

(selection of materials and structural system type, element dimensions, etc.)

Graphic attachments

– representation of the load-bearing structure for all floors, scale 1 : 100

(floor plan of the foundations, ground floor structure, upper floor and roof)

– a cross-section (or multiple of them), scale 1 : 100

– spatial representation of the load-bearing structure

BUILDING INSTALLATIONS COMPONENT

Technical Description

Graphic attachments

– site plan (connections to infrastructure), scale 1 : 200

– floor plan of all levels with the installation systems marked: plumbing and drainage, lighting, gas, scale 1 : 100

Other forms of teaching and knowledge assessment

Project assignments, field work, presentations, successful project defence.

Compulsory literature (please provide detailed information about the publisher and year of publication)

Recent reviews in the field of architecture and urban planning (journals and monographs).

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

Literature listed in the courses that thematically accompany the work in the Design Studio course.

Requirements for obtaining a signature

Regular class attendance and successful defence of the design solution.

Type of exam

Students' knowledge is assessed through successfully completed practical assignments.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

– creatively apply knowledge and methods from technical sciences;

– interpret knowledge about residential typologies (single-family house);

– integrate various parts of architectural and technical documentation into a cohesive whole;

– anticipate the appropriate use of materials, technologies, technical, installation and construction solutions with the aim of integrating them into a functionally efficient whole, meeting the basic requirements for buildings and achieving the sustainability of the solution;

– accurately graphically, textually and verbally present an architectural project.

P01, P06, P07, P08, P09, P13, P15

Residential Buildings 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Ivana Ergić
Course associate(s)	Ergić
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

The course content covers the architecture of single-family houses and associated types of low-density residential buildings, which represent the most common building stock in the spatial context.

Development of general and specific competences – knowledge and skills:

The aim of the course is to acquaint students with all the essential factors involved in the design of detached houses and other types of individual residential buildings, to explain the various design approaches and to increase their knowledge of characteristic and anthological examples in this field of architecture.

Course curriculum

- 1 Heritage and Modernism in Zagreb as an introduction. Overview of lectures and references to available literature.
- 2 Values, needs, requirements. The single-family house in the context of pragmatic (biological/physiological) demands and symbolic (mental/spiritual) needs in a given space and time – conflicts.
- 3 Design conditions for single-family houses. Natural, technical, social (climate – sun, topography – views).
- 4 Plot organisation. Size, shape, positioning, orientation, relationship between house and plot, connection between interior and exterior.
- 5 Single-family houses on sloping terrain. Incline, terrain orientation, access.
- 6 Dimensions of single-family houses. Types of houses according to volume distribution (compact, elongated, articulated, etc.).
- 7 Functional properties of single-family houses. Positioning of certain functions, privacy-intimacy-spatiality.
- 8 Concepts of spatial connectivity in single-family houses. Connections with entry halls, lobbies, corridors, spatial interaction.
- 9 Modulating and modelling. Geometric matrices in defining space.
- 10 Design. Deconstruction of the box, boxing-in, "5 points".
- 11 Mass construction of single-family houses. Substandard... high-tech prefabricated.
- 12 Low-density residential buildings. Semi-detached houses, rows, linked buildings, terraced construction.
- 13 The situation in Croatia – second half of the 20th century. Context, regulations, outcomes.
- 14 Recent domestic examples. Comparative and relevant examples from around the world.
- 15 Personal Experience. Context, references, lessons learned.

Other forms of teaching and knowledge assessment

Development of report.

Compulsory literature

- 1 Z. Stržić: O stanovanju, Psefizma, Zagreb
- 2 S. Planić: Problemi suvremene arhitekture, Psefizma, Zagreb
- 3 Le Corbusier: Oeuvre Complete 1, 2, Boesiger, Zurich
- 4 F.L. Wright: The Natural House, Bramhall, New York
- 5 York: modern House, Architectural Press, London
- 6 N. Filipović: Obiteljska kuća (doctoral dissertation)
- 7 L. Pleština: various texts

Additional literature

- 1 Arieff&Burkhart (2002), Pre-Fab, Gibbs Smith, SLC
- 2 Boissiere, O. (1998), Twentieth-Century House, Terrial, Paris
- 3 Parker, L. (2003), Minimalist Houses, Harper, N.Y.
- 4 Weston, R. (2002), The House in the 20th Century, Laurence King, London
- 5 Welsh, J. (2001), Modern House, Phaidon, N.Y.

Requirements for obtaining a signature

Regular class attendance.

Type of exam

Oral exam.

Learning outcomes of this course

- 1 Demonstrate knowledge of the basic typologies, language, principles and theoretical concepts that articulate and express ideas in the discipline of individual residential architecture.
- 2 Evaluate and critically assess examples of individual residential architecture.
- 3 Explain, in writing and verbally, the spatial concept of different single-family house examples.
- 4 Interpret and compare characteristic and specific themes of individual housing based on reference examples.
- 5 Recognise and justify design decisions that contribute to architectural quality.
- 6 Apply the acquired knowledge to one's own projects.

Learning outcomes of the study programme **P02, P03, P04, P05, P08, P10, P11, P14**

Urban Planning 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Ana Mrđa
Course associate(s)	Mrđa
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

Residential districts with a population density greater than 100 inhabitants per hectare. Methods of urban design. Forms and spatial requirements of residential buildings. Typology of residential buildings. Contemporary residential neighbourhoods. Contemporary residential neighbourhoods in Croatia. Residential neighbourhoods of the 19th and 20th centuries. Traffic. Pedestrian traffic. Ancillary buildings. Community infrastructure. Public space. Recreation. Quantified indicators in urban design. Implementation of detailed urban plans.

Development of general and specific competences – knowledge and skills:

The knowledge covered in this course is fundamental to the work of every architect. The aim of the course is to provide students with an understanding of detailed urban plans and the methodology for their preparation. The advantages and disadvantages of proposed solutions are presented through contemporary reference examples of detailed urban plans. The topics of this course form an integral part of the knowledge base for the preparation of the Design Study 2 two in the third year of the Undergraduate programme and the Urban Workshops in the Graduate programme at the Faculty of Architecture.

Course curriculum

- 1 Residential neighbourhoods – urban neighbourhoods
- 2 Methods of urban design – analysis
- 3 Methods of urban design – planning
- 4 Forms and spatial needs
- 5 Typology
- 6 Contemporary residential neighbourhoods
- 7 Contemporary residential neighbourhoods – Croatia
- 8 Residential neighbourhoods of the 19th century
- 9 Residential neighbourhoods of the 20th century
- 10 Traffic
- 11 Pedestrian traffic
- 12 Ancillary content
- 13 Public spaces
- 14 Quantified indicators
- 15 Implementation of urban plans

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 Colquhoun, I.; Fauset, P. G. (1991) Housing Design in Practice, Longman Lt., UK, ISBN 0582063604
- 2 Curdes, G. (1995) Stadstrukturelles Entwerfen, Stuttgart: Kolhammer Verl., ISBN 317012627X
- 3 Hangarter, E. (1999) Bauleitplanung, Duesseldorf: Werner Verl., ISBN 3-8041-2081-4
- 4 Pegan, S. (1997) Urbanizam – Uvod u detaljno urbanističko planiranje, Acta Arhitectonica, Udžbenici i priručnici 5, Faculty of Architecture at the University of Zagreb, ISBN 978-953-6229-59-8

Additional literature

- 1 Bramm, W. (1999) Stadtplanung, Duesseldorf: Werner Verl., ISBN 3-8041-4235-4
- 2 Catanese, J. A. (1979) Urban Planning, McGraw Hill, ISBN 0-07-010229-5
- 3 Hayward, R.; McGlynn, S. (1993) Making Better Places, Urban Design Now, Butterworth Ltd., Oxford, ISBN 0750605367
- 4 Greed, C. (1996) Implementing Town Planning, Longman Publ., ISBN 0582234239
- 5 Rudlin, D.; Falk, N. (2001) Building 21st Century Home, The Sustainable Urban Neighborhood, Architectural Press, Oxford, ISBN 0750625287
- 6 Prinz, D.: Urbanizam I – Urbanističko planiranje, GMTK – AF, Zagreb, 2006.
- 7 Prinz, D.: Urbanizam II – Urbanističko oblikovanje, GMTK – AF, Zagreb, 2008.
- 8 Mozas, J.; Per, A. F.; Density, New collective housing, a + t ediciones, Vitoria – Gasteiz, 2006, ISBN 84-611-1203-2
- 9 Per, A. F.; Arpa, J.: Density Projects, 36 new concepts on collective housing, a + t ediciones, Vitoria–Gasteiz, 2007., ISBN 978-84-9612-1335-1

Requirements for obtaining a signature: Regular class attendance.

Type of exam

Written and oral exam.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- 1 Compare urban design methods;
- 2 Identify typologies of residential neighbourhoods;
- 3 Evaluate the transport system of a residential neighbourhood;
- 4 Analyse quantified indicators in the urban design process;
- 5 Outline the method for implementing urban plans.

Learning outcomes of the study programme P02, P04, P11, P15

Physical/Health Education 3

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Dalibor Vračan
Course associate(s)	Vračan
Year of study	Second
Semester of study	3 rd
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	0.0

Framework of course content

Fitness training. Sports games. Swimming. Aerobic. Orientation in nature.

Development of general and specific competences – knowledge and skills:

Training programme personalisation.

Course curriculum

- 1 Football – tactics. Volleyball – tactics.
- 2 Football – tactics. Volleyball – tactics.
- 3 Football – tactics. Volleyball – tactics.
- 4 Basketball – tactics.
- 5 Basketball – tactics.
- 6 Basketball – tactics.
- 7 Swimming – racing.
- 8 Swimming – racing.
- 9 Swimming – competition preparation.
- 10 Aerobics.
- 11 Aerobics.
- 12 Designing different programmes to develop motor skills.
- 13 Training programmes.
- 14 Running in nature.
- 15 Walking tours with orientation.

Other forms of teaching and knowledge assessment

Compulsory literature

- 1 Mišigoj-Duraković M. (1999) Tjelesno vježbanje i zdravlje, Zagreb: Grafos.
- 2 Milanović D. (1996) Priručnik za sportske trenere, Zagreb: Faculty of Kinesiology at the University of Zagreb.

Additional literature

- 1 Trninić S. (1996) Analiza i učenje košarke, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 2 Janković V., Marelić N. (2003) Odbojka za sve, Zagreb: Authors' edition.
- 3 Volčanšek B. (2002) Bit plivanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 4 Šnajder V., Milanović D. (1991) Atletika hodanja i trčanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 5 Sertić H. (2004) Osnove boričkih sportova, Zagreb: Faculty of Kinesiology at the University of Zagreb..

Requirements for obtaining a signature

Regular class attendance

Type of exam

The course does not contribute to the achievement of a professional qualification.

The course does not contribute to the achievement of a professional qualification.

FOURTH SEMESTER

History of Architecture 4

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Nataša Jakšić
Course associate(s)	Jakšić; Seitz
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Architecture of the 19th century from the Industrial Revolution to the emergence of modern architecture at the end of the century. Theories and practices of architecture.

Development of general and specific competences – knowledge and skills:

Basic knowledge of the architecture from 1750 to 1900, with special emphasis on examples in Croatia. Insights into architecture as a result of various technical, functional and artistic demands. The relationship between architecture and society. Understanding functional typologies of architecture as a basis for creative interpretation of the abundance of types at the end of the 19th century. The roots of modern architecture in the 19th century.

Course curriculum

- 1 Introduction to classical architecture. Architecture of Palladianism and classicism in Great Britain.
- 2 Classical architecture in France.
- 3 Classical architecture in Germany.
- 4 Classical architecture in Central Europe.
- 5 Classical architecture in Croatia.
- 6 Introduction to historicist architecture. The city in the 19th century.
- 7 Typology of 19th-century architecture. Analysis of the development of specific types.
- 8 Technical aspects and design in the 19th century.
- 9 The role of historical styles in the 19th century. The quest for a personal style. Design methods.
- 10 Historicist architecture in England and France.
- 11 Historicist architecture in Germany.
- 12 Early historicism in Vienna. Early historicism in Croatia.
- 13 High historicism in Vienna.
- 14 High historicism in Croatia.
- 15 High historicism in Croatia.

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 D. Watkin: History of Western Architecture, Laurence King Publishing, London, 2005. (4th edition, selection)
- 2 *** Historicismizam u Hrvatskoj, katalog, MUO, Zagreb, 2000. (selection)
- 2 W. Müller, G. Vogel: Atlas arhitekture II., Golden marketing i Institut građevinarstva Hrvatske, Zagreb, 2000. (selection)

Additional literature

- 1 B. Bergdoll: European Architecture 1750-1890, Oxford UP, 2000.
- 2 N. Pevsner: A History of Building Types, Thames and Hudson, 1976.

Requirements for obtaining a signature

Regular class attendance

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Oral.

Learning outcomes of this course

- 1 Identify the fundamental principles of classical and historicist architecture.
- 2 Demonstrate an understanding of architecture as the result of various societal, technical, functional and artistic requirements.
- 3 Understand the relationship between architecture and society.
- 4 Understand functional typologies of architecture as a basis for creative interpretation of the abundance of types at the end of the 19th century.
- 5 Understand the roots of modern architecture in the 19th century.
- 6 Use architectural drawings as two-dimensional representations of complex spatiality.

Learning outcomes of the study programme
P03, P04, P05, P11, P15

Architecture in Croatian Regions – Slavonia

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Ivan Mlinar; Zorana Sokol Gojnik
Course associate(s)	Mlinar; Sokol Gojnik; Muraj; Pavlović
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	3
ECTS credits	1.0

Framework of course content

Familiarisation with the historical and contemporary urban and architectural values in Slavonia. Contextualisation of these values and the Genius Loci of the space and society in which they were created. Many of the architects of the buildings to be visited will be local guides.

Development of general and specific competences – knowledge and skills:

Students learn how works of architecture fit into the environment in which they are built, how they function and how they change. They learn about the culture of the space, the way of life and the materiality of the environment. Students acquire knowledge that synthesises theory and practice.

Course curriculum

Day 1 – Tour: Vinkovci, Ilok, Ovčara, Vukovar, Borovo, Bizovac
Lectures: G. M. Ivanković: "Secession Architecture in Osijek"
M. Pavlinić: "Modern Architecture in Osijek"
Day 2 – Tour: Našice, Donji Miholjac, Valpovo, Osijek
Day 3 – Tour: Đakovo, Slavonski Brod, Požega, Pakrac, Lipik.
Introductory lectures: Z. Karač: "Slavonia – Historical Cities and Architecture"
M. Jošić: "Slavonia – Modern and Contemporary Architecture"

Other forms of teaching and knowledge assessment

Sketches on site
Seminar paper

Compulsory literature

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Additional literature

- 1 Croatian Art Encyclopaedia
 - 2 Journal "Arhitektura"
 - 3 Journal "Čovjek i prostor"
 - 4 Monographs
 - 5 Study Archive
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Requirements for obtaining a signature

Seminar paper

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Seminar paper

- 1 Upon completion of this course, students will be able to identify and describe the most significant historical and modern architectural achievements in the Slavonia region.
 - 2 They will understand the genesis of the visited historical and contemporary architectural achievements.
 - 3 They will present the basic spatial qualities of the visited historical and contemporary architectural works.
 - 4 They will draw/sketch basic spatial features of the architectural works visited.
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Learning outcomes of the study programme

P02, P05, P11, P13

Modelling 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Renata Waldgoni; Justić
Course associate(s)	Justić; Bakić; Pavlović; Spudić; Tutek
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.0

Framework of course content

The course provides an overview of visual elements and requires the application of basic techniques to visually cultivate and complement the engineering component of the architectural thought process. It develops an awareness of the relationships between visual elements and their correct application in the design process.

The course interprets the discipline of architecture through its contribution to visual culture, guiding students through artistic principles and their application in all phases of architectural and urban projects. It emphasises the importance of understanding selected artistic practices and interpreting their critical contribution to collective experience and the culture of space. Through carefully designed exercises, procedures are applied to achieve artistic correctness and develop a visual culture in approaching architecture. Sensitivity to the principles of composition is developed, while a study of colour explores the origins of colour concepts and observes the spatial effect of colour in highlighting the characteristics of selected architectural examples. The interdependence of material and immaterial values that shape the structure and atmosphere of space is explored and presented. Rules of visual communication are applied to create a clear representation of the architectural project. The results of the research foster a sense of responsibility in the students towards the creative process of architectural creation through an understanding of the origins of architectural decisions within the community culture.

Development of general and specific competences – knowledge and skills:

The course explores, demonstrates and applies the principles and elements of visual composition through abstract forms. By creating tonal perspectives, the relationship between volume and light, and between object and frame, is explored. A colour study considers the spatial effects of colour in highlighting the characteristics of a selected architectural example. The interdependence of the physical, mental, rational and emotional aspects of the overall architectural experience is examined. Students learn the principles of effective presentation of architectural projects. Instead, the results remain abstract and individual, enriching each student's visual and knowledge base as part of a comprehensive preparation for the future creative process of architectural design.

Course curriculum

- 1 Introductory lecture: course overview, recommended literature, guidelines for successful completion of the course
 - 2 Tonal perspective: introductory lecture, selection of examples, framing.
 - 3 Tonal perspective: enlargement, composition within a given format of the chosen composition. Sketching, enlarging. Applying tones to edges and surfaces, with pencil.
 - 4 Tonal perspective: corrections, completion and submission of the project.
 - 5 Colour in architecture: introductory lecture on the role of colour in architectural and broader cultural contexts, introduction to the exercise.
 - 6 Colour in architecture: development and fine-tuning of tonal scale in the selected colour register. Meaning, symbolism, dynamic, psychological, and tonal values. Examples. Application of tones in tempera technique. Three-dimensionality of the composition of applied tones.
 - 7 Colour in architecture: Colour study of the selected and prepared architectural template, submission of the project.
 - 8 Concept of reciprocity: introductory lecture – form in context, the process and reasons for the emergence of forms, form as a manifestation of creative and logical sequences of decisions, introduction to the assignment.
 - 9 Concept of reciprocity: exercise under the working title "Imprint". Individual discussions on how to approach the assignment.
 - 10 Concept of reciprocity: development, individual corrections and submission of the project.
 - 11 Typographic principles and project presentation – introductory lecture, introduction to the assignment.
 - 12 Typographic principles and project presentation – development and corrections.
 - 13 Typographic principles and project presentation – corrections, completion and submission of the project.
 - 14 Semester syllabus – an overview of all the projects completed during the semester in a summarised form, following the specified format and layout. It may include a number of examples and impressions that further explain the work on the assignments.
 - 15 Guest lecturer (renowned artist or expert in the psychology of perception), syllabus submission.
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Other forms of teaching and knowledge assessment

Homework with corrections before submission every two weeks.

Analytical coverage of cultural events.

Compulsory notebook in which lectures, assignments and personal observations are recorded in the form of text, drawings and reproductions.

Compulsory literature (please provide detailed information about the publisher and year of publication)

- 1 Rudolf Arnheim: Umetnost i vizuelno opažanje, Univerzitet umetnosti u Beogradu, Belgrade, 1981.
 - 2 Juhani Pallasmaa: The thinking hand, Wiley&Sons Ltd., 2009.
 - 3 Christian Norberg-Schulz: Intencije u arhitekturi, Jesenski i Turk, Zagreb, 2009.(Croatian edition)
 - 4 Nikola Tanhofer: O boji: na filmu i srodnim medijima, Novi Liber, Zagreb 2000.
 - 5 Rosalind Krauss: Passages in modern sculpture, The MIT Press, Cambridge, Massachusetts., 1977.
-

Additional literature

- 1 H.W. Janson: Povijest umjetnosti (hrvatsko prošireno izdanje), Stanek, Varaždin, 2003.
 - 2 J. Itten: Umetnost boje, priručnik, Umetnička akademija u Beogradu, Belgrade, 1973.
 - 3 Steven Holl: Intertwining, Princeton arch.press., 1996.
 - 4 B. Tchumi: Arhitektura i disjunkcija, AGM, Zagreb, 2001.
 - 5 Naoto Fukasawa, Jasper Morrison: Supernormal-sensations of the ordinary, Lars Mueller, Baden, 2008.
 - 6 Tania Kovatch: The Drawing book, Black dog, London 2007.
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Requirements for obtaining a signature

Regular class attendance, regular submission of papers, projects and homework assignments.

Type of exam

The grade is based on the projects submitted.

Learning outcomes of this course:

The student will be able to:

- 1 Apply the principles of artistic composition to the design of architectural forms;
 - 2 Create an abstract idea of the architectural object from existing representations;
 - 3 Create a colour composition of selected elements according to specific rules;
 - 4 Integrate colour principles into the approach to architectural solutions;
 - 5 Integrate the principles of light usage in architectural projects;
 - 6 Identify the interdependence of material and immaterial values in architecture.
-

P11, P12, P13

Art practices

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Mirjana Vodopija
Course associate(s)	Vodopija; Žuti
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	0
Seminars (hours per week)	2
Field Course (days)	0
ECTS credits	1.0

Framework of course content

This subject provides insight into a range of examples from the field of critical and reflective artistic production. Each selected example is studied and understood through a series of choices that form a logical structure of culturally relevant concepts. Individual works are examined through the reflection of a clear stance rooted in the society and culture of their time, highlighting the conditioning of the personal by the collective and vice versa. The course serves as a platform for learning about art, facilitating discussions about the author's approach to the shared physical and intellectual environment of the community. It describes contemporary artistic practices to illustrate the spirit of the times and openly contemplates intellectual positions capable of generating cultural value.

Development of general and specific competences – knowledge and skills:

The course emphasises the cultural necessity of questioning the position from which we approach the act of creation within community spaces. Through knowledge and understanding of contemporary artistic practices, students gain insight into the zeitgeist and milieu. At a time when "sustainable development, climate change, the dissolution of traditional values and relationships with the 'Other' and the different" demand active engagement, an appropriate intellectual position develops that allows for a global perspective. It offers space for a temporary distancing aimed at reflection, translating the potential arbitrariness and insignificance of the authorial gesture into a considered adequacy.

Course curriculum

The curriculum changes according to the lecturer's interpretation.

Other forms of teaching and knowledge assessment

Compulsory literature (please provide detailed information about the publisher and year of publication)

Literature will be selected according to the topic of the seminar paper.

Additional literature

Requirements for obtaining a signature

Regular class attendance, seminar paper.

Type of exam

Positively graded seminar paper.

Learning outcomes of this course:

- 1 Analyse the social and cultural significance of authorial practices in art.
 - 2 Defend the cultural conditioning of the architectural discipline.
 - 3 Identify the personal and collective human condition as a fundamental argument for action in the physical and intellectual public space.
 - 4 Interpret artistic processes through an approach to architecture.
 - 5 Illustrate architectural intentions with examples from the field of art.
-

P3, P4, P11, P14

Building Installations 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Tihomir Rengel; Damir Prodan Abramović
Course associate(s)	Rengel; Prodan Abramović; Abrashi
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

This course covers the study of hydraulic installations (water supply, sewerage and fire protection), thermo-technical installations (heating, cooling, ventilation and air conditioning), gas and electrical installations (lighting, EM drives, lightning conductors, telephones, antenna systems) and vertical transport systems in buildings, taking into account their function, location in the building, space requirements and integration into modern architectural designs and construction technologies.

Development of general and specific competences – knowledge and skills:

The main objective of this course is to study and analyse possible solutions for all building installations and to define the conditions that influence the architectural and structural solutions of a building in order to achieve an optimal building design. Students will acquire knowledge of systems and installation elements that ensure microclimatic conditions, functionality (use) and fire safety for buildings with different purposes. The knowledge acquired in this course will contribute to making informed decisions in the design and construction of buildings and to participating in the selection of installation systems, taking into account different construction technologies and environmental protection.

Course curriculum

- 1 Types of wastewater treatment devices: grease, oil, and petrol separators; collection and septic tanks; biodiscs.
- 2 Systems and devices for swimming pool water conditioning.
- 3 Calculation of hot water preparation using alternative energy sources: sizing the pipe network for water supply.
- 4 Basic schemes for hot water preparation systems using solar energy.
- 5 Space for the installation of various types of solar collectors within a building.
- 6 Cooling plants: principles of operation, heat pumps and the possibility of using renewable energy sources.
- 7 Types and uses of gas; gas installation schemes; function, materials and construction of individual elements and assemblies.
- 8 Types of consumers, installation conditions; types and sizing of gas chimneys.
- 9 Legal regulations; sizing of gas installations.
- 10 Electrical installations: strong and weak current; basic schemes, connections, layouts and measurements; backup generators.
- 11 Types of light sources; artificial lighting: installation solutions and calculation methodology.
- 12 Telephone installations: DTK network, basic schemes, integration with information technology; central monitoring system.
- 13 Audio-visual installations; lightning protection installations: function, materials, elements, position and execution.
- 14 Types and sizing of lifts; solutions and placement of lift machinery, escalators and moving staircases.
- 15 Information on special installations: medical gases, cutting and welding gases, swimming pool technology.

Other forms of teaching and knowledge assessment

Tests. The written part of the exam consists of ten questions. The oral part of the exam is held if the candidate scores at least 60 per cent in the written part.

Compulsory literature (please provide detailed information about the publisher and year of publication)

- 1 Cetinić, I.: Vodovod i kanalizacija, learning materials – lecture scripts and exercises
 - 2 Cetinić, I.: Plinske instalacije, learning materials – lecture scripts and exercises
 - 3 Cetinić, I.: Grijanje, hlađenje, ventilacija i klimatizacija, learning materials – lecture scripts and exercises
 - 4 Cetinić, I.: Električne instalacije, learning materials – lecture scripts and exercises
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Additional literature

- 1 Radonjić, M.: Vodovod i kanalizacija u zgradama, Croatiaknjiga, 2004.
 - 2 Tušar, B.: Kućna kanalizacija, Građevinski fakultet, 2001.
 - 3 Tušar, B.: Ispuštanje i pročišćavanje otpadne vode, Croatiaknjiga, 2004.
 - 4 Tadić, D.: Kućne instalacije, BGZ, Belgrade, 1963.
 - 5 Strelec i suradnici: Plinarski priručnik, Energetika marketing, Zagreb, 2001
 - 6 Recknagel; Sprengel; Schramek: Priručnik za grijanje, hlađenje, ventilaciju i klimatizaciju, V. Banja, 2002.
 - 7 Labudović et al.: Priručnik za ventilaciju i klimatizaciju, Energetika marketing, Zagreb, 2000.
 - 8 Podlipnik, B.: Svjetlotehnički priručnik, Elektrovina, Maribor, 1978.
-

Requirements for obtaining a signature

Regular class attendance and submitted and defended Technical studio project.

Type of exam

Written and oral exam.

Learning outcomes of this course

- 0 Demonstrate sufficient technical knowledge and application of various types of installations, materials and building technologies in architecture.
 - 1 Demonstrate visual and technical proficiency in the use of tools for basic technical graphic expression.
 - 2 Creatively apply knowledge and methods from the field of installations in architectural and urban design solutions.
 - 3 Identify the architect's responsibility to preserve the values of the natural and built environment.
 - 4 Prepare sections of technical documentation for water supply, sewage, gas, and heating installations and integrate these parts into a cohesive whole.
 - 5 Propose appropriate use of installation, transport and safety solutions when collaborating on the development of an architectural and urban project, aiming to integrate these into a functional and efficient entity that meets the building's fundamental requirements.
 - 6 Appropriately understand and reproduce knowledge of physical, technological, and functional solutions and the logic of building installations, with the aim of achieving a comfortable indoor microclimate for all building systems.
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Learning outcomes of the study programme

P07, P08, P09, P10

Building Physics

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Zoran Veršić
Course associate(s)	Veršić; Biluš; Binički; Muraj; Ostojić; Pavlović; Užarević
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	1
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.5

Framework of course content

Basic elements of building physics. Energy conservation, thermal insulation, sound insulation, fire protection, principles of natural lighting and elements of indoor comfort.
Practical problem solving in the design of building elements and the preparation of project documentation in the fields of thermal insulation and energy conservation, as well as noise and fire protection. Analysis of specific project examples from Design Studio I and II.

Development of general and specific competences – knowledge and skills:

Students will analyse the characteristics of building and insulation materials relevant to the assessment of the physical properties of building elements and structures. They will examine building elements and whole buildings for thermal performance, moisture vapour diffusion, acoustic and fire performance. Students will become familiar with relevant and current technical regulations in the areas of thermal protection and energy conservation for buildings, noise protection and sound insulation, fire safety, natural lighting and indoor comfort requirements. They will also develop the ability to produce project documentation in the fields of thermal insulation, energy conservation and noise protection.

Course curriculum

LECTURES:

Content of lectures:

- 1 Introduction. Heat – basic concepts and quantities. Physical properties of building materials.
- 2 Heat flow, heat losses.
- 3 Calculation fundamentals: heat, moisture vapour diffusion, dynamic thermal characteristics.
- 4 Energy conservation and thermal protection of buildings – basic concepts and requirements.
- 5 Sun protection, thermal balance.
- 6 Designing buildings and building components (location, orientation, shape, materials and building components, thermal bridges).
- 7 Measurement methods (infrared thermography, Blower Door Tests). Computer software – calculation examples.
- 8 Sound and noise – basic concepts.
- 9 Airborne sound.
- 10 Impact sound.
- 11 Spatial acoustics.
- 12 External noise.
- 13 Fire protection.
- 14 Fundamentals of natural lighting.
- 15 Indoor comfort. Concepts and requirements.

EXERCISES:

- 1 – 7 Preparation of an energy-efficient design and thermal protection project for a family house (based on the student's own project from the Design Studio I course).
- 8 – 15 Preparation of a noise protection study report (noise protection and sound insulation) for a multi-dwelling housing (based on the student's own project in the Design Studio II course).

Other forms of teaching and knowledge assessment

projects – project assignments / exam

Compulsory literature

- 1 Veršić: Arhitektonska akustika, digital textbook, 2017., <https://www.arhitekt.hr/hr/radovi/rad/arhitektonska-akustika,427.html>
- 2 Hegger, Fuchs, et al. Energy Manual – Sustainable Architecture, Birkhäuser, Edition Detail, 2008.
- 3 Fisher, Jenisch, et al. Lehrbuch der Bauphysik, Vieweg+Teubner, Wiesbaden, 2008.
- 4 Vilems, Schield, et al. Građevinska fizika – priručnik, parts I & II, Građevinska knjiga, Beograd, 2006.
- 5 Course material on the course website (AF Virtual)

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

- 1 Tehnička enciklopedija, vol. I – Akustika, vol. IV – Elektroakustika, Hrvatski leksikografski zavod, Zagreb
- 2 Technical Regulation on Rational Energy Consumption and Thermal Protection in Buildings (NN 128/2015) and binding Croatian national standards
- 3 Noise Protection Act (NN 30/2009) and Ordinances derived therefrom, and binding Croatian national standards
- 4 Šmihel: Zvučna izolacija dvostrukih pregradnih zidova, Arhitektonski fakultet, Zagreb, 1983.
- 5 Šimetin: Građevinska fizika, Zagreb, Faculty of Civil Engineering Sciences, Zagreb, 1983.
- 6 Jelčić Rukavina, Carević, Banjad Pečur: Zaštita pročelja zgrada od požara – Priručnik za projektiranje i izvođenje, University of Zagreb – Faculty of Civil Engineering, Zagreb, 2017
- 7 Jelčić Rukavina, M.; Carević, M.; Veršić, Z.: Sigurna uporaba toplinsko-izolacijskih materijala u građevinama s aspekta zaštite od požara, Tehnički priručnik za projektiranje i izvođenje, University of Zagreb – Faculty of Civil Engineering, Zagreb, 2020
- 8 Fire Protection Act (NN 58/93, 33/05)
- 9 TRVB – Austrian Fire Safety Guidelines
- 10 NFPA 101 – Life Safety Code
- 11 Lutz et al. Lehrbuch der Bauphysik, Stuttgart: Teubner, 1997.
- 12 Fasold, Veres: Schallschutz + Raumakustik in der Praxis, Verlag für Bauwesen, 1999.

Requirements for obtaining a signature

Regular class attendance, submitted and positively graded projects.

Type of exam

Written (and, if needed, also oral) exam

Learning outcomes of this course

- 1 Apply knowledge and methods from the field of building physics in architectural and urban design solutions.
- 2 Propose solutions for buildings that meet the technical requirements in the field of building physics.

- 3 Propose appropriate use of materials and structural solutions to meet the basic requirements of the building related to thermal protection, energy conservation, noise protection and fire safety when collaborating on the development of an architectural and urban project.
- 4 Analyse the characteristics of building elements and the building as a whole from the perspective of building physics.
- 5 Apply knowledge of physical solutions aimed at thermal protection, energy conservation, protection against external climatic influences, achieving indoor comfort, noise protection, fire safety and natural lighting.
- 6 Implement knowledge and methods from the field of building physics (thermal protection, energy conservation, noise protection, fire safety, indoor comfort) to protect the environment.
- 7 Apply knowledge of building regulations involved in project realisation.

Learning outcomes of the study programme
P01, P06, P08, P09, P10

Design Studio II – Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Leo Modrčin
Course associate(s)	Delić; Ergić; Horvat; Ilić; Modrčin; Pelivan; Rajčić; Relić; Virag
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	6
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	8.0

Framework of course content

Design Studio II is an integral course that addresses the theme of individual housing. It is delivered as a layered urban-architectural assignment, divided into three interrelated courses: Design Studio II – Architecture, Design Studio II – Urban Planning and Design Studio II – Architectural Structures.

Design Studio II – Architecture focuses on the design of multi-dwelling housing, which is simultaneously developed alongside the urban component of a residential neighbourhood project.

The task involves analysing the built context, planning documentation and reference examples. It includes harmonising with the broader and narrower built context, organising pedestrian and vehicular access to the site and incorporating living areas and green spaces.

Architectural design of the building involves examining and selecting the optimal building form (lamella, block, tower, combinations, etc.), the type of building organisation (one/two/three apartments per staircase, internal/external galleries, etc.), apartment types (core apartments with circular flow, apartments with a central living room, etc.), load-bearing structures (cross or longitudinal load-bearing walls, frames, combinations, etc.), building installations (heating methods, installation nodes, etc.), and the materiality/appearance of the building/envelope (shapes and arrangement of openings, cladding materials, etc.).

Development of general and specific competences – knowledge and skills:

Design Studio I – Architecture is a foundational exercise course in the 4th semester of the Undergraduate programme, which, alongside Design Studio I – Urban Planning, forms a cohesive whole connecting various aspects of collective housing: the architectural project of multi-dwelling housing and the urban plan for a neighbourhood of multi-dwelling housing developments. Through studio work, students are introduced to the design process where space is developed through context, form, function, technology and material.

Design Studio II – Architecture provides a framework within which students acquire the necessary knowledge and skills in the processes of architectural design of multi-dwelling housing, as well as planning for neighbourhoods of multi-dwelling housing developments. More specifically, the course aims to master the cause and effect relationship between a larger housing programme, spatial and legal constraints and the author's concept for a multi-dwelling housing of 30–50 apartments (approximately 3000–5000 m² gross).

Students will develop a basic knowledge of collective/social housing through a range of fundamental analyses across different domains and scales: from the city and neighbourhood to the multi-dwelling housing as the central scale, down to its materiality, load-bearing structure and detailed elaboration.

The working process fosters an understanding of the relationship between the architect and society, as well as the development of a building culture.

Course curriculum

Design Studio II is based on individual work. It also includes site visits, focused seminars, joint presentations and discussions throughout the semester, culminating in a final project presentation and defence.

Other forms of teaching and knowledge assessment

Project assignments, seminar papers, field work, presentations, project defence.

Compulsory literature

1 Colquhoun, I.; Fauset, P. G. Housing Design in Practice, Longman Lt., , UK 1991., ISBN 0582063604 2 Curdes, G.: Stadstrukturelles Entwerfen, Kolhammer Verl., Stuttgart, 1995., ISBN 317012627X 3 Galijašević, T.; Jošić, M.; Vlahović, D.: Zgrade društveno poticajne izgradnje, Arhitektonski fakultet, Zagreb Hangarter, E.: Bauleitplanung, Werner Verl., Dusseldorf, 1999., ISBN 3-8041-2081-4 4 Pegan, S.: Urbanizam – Uvod u detaljno urbanističko planiranje, Acta Architectonica, Udžbenici i priručnici 5, Faculty of Architecture at the University of Zagreb, Zagreb, 1997, ISBN 978-953-6229-59-8 5 Prinz, D.: Urbanizam, vol. 1 – Urbanističko planiranje, Udžbenik za studij arhitekture, Golden marketing – Tehnička knjiga, Zagreb, 2006., ISBN 953-212-216-8 6 Prinz, D., Urbanizam II - Urbanističko oblikovanje, GMTK - AF, Zagreb, 2008., ISBN 978-953-212-217-6 7 Reinborn, D.: Stadtebau im 19 und 20. Jahrhundert, Kolhammer Verl., 1996., ISBN 3170125478

Additional literature

1 Bramm, W.: Stadtplanung, Werner Verl. 1999., Dusseldorf, ISBN 3-8041-4235-4 2. Catanese, J. A.: Urban Planning, McGraw Hill, Inc. 1979., ISBN 0-07-010229-5 3. Cullen, G.: The Concise Townscape, Butterworth & Co. Publ., Ltd. 1971. 4. Dellale, R.: Traganje za identitetom grada, Izdavački centar Rijeka, Rijeka, 1988 5. Hayward, R. & McGlynn S.: Making Better Places, Urban Design Now, Butterworth Ltd., Oxford, 1993., ISBN 0750605367 6. Per, A. F.; Arpa, J.: Density Projects, 36 new concepts on collective housing, a + t ediciones, Vitoria –Gasteiz, 2007., ISBN 978-84-9612-1335-1 7. Rudlin, D. & Falk, N.: Building 21st Century Home, The Sustainable Urban Neighborhood, Architectural Press, Oxford, 2001., ISBN 0750625287 8. *** Recent reviews in the field of architecture and urbanism (journals and monographs). 9. *** Literature listed in the courses that thematically accompany the work in the Design Studio course

Requirements for obtaining a signature

Regular class attendance, submission and successful defence of an urban and architectural solution of the prescribed content.

Type of exam

Successful completion of practical assignments from the Design Studio II curriculum. Presentation and defence of the assignment before a panel of workshop lecturers.

Learning outcomes of this course

- 1 Critically evaluate examples of multi-dwelling housing.
 - 2 Apply learned typologies in one's own architectural project.
 - 3 Demonstrate acquired architectural criteria and methods through project work.
 - 4 Illustrate the conceptual basis of one's own project.
 - 5 Design a preliminary design for a family house in the given context.
 - 6 Write a conceptual and technical description of a multi-dwelling housing project.
 - 7 Prepare a presentation of an architectural project for a multi-dwelling housing.
 - 8 Defend an architectural project for a multi-dwelling housing.
-

Learning outcomes of the study programme

P02, P03, P04, P05, P06, P07, P13

Design Studio II – Urban Planning

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Ana Mrđa
Course associate(s)	Duić; Ivanković; Krajnik; Mlinar; Mravunac Sužnjević; Šmit; Zaninović
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	4
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	5.0

Framework of course content

The Design Studio II - Urban Planning course involves the creation of an urban design solution for an urban district (of an area of 10 hectares, with a housing density of 50–150 inhabitants per hectare) intended for mixed, predominantly residential development. The thematic content of the task complements the preparation of an Urban Development Plan (UDP) for the urban district defined by a higher level plan within a low-consolidated urban area under new regulations for undeveloped land. The task involves the development of a plan within the context of the proposed programme, which includes apartment blocks, smaller apartment blocks, terraced housing, "carpet" development and hybrid housing; together with a primary school and nursery with day care; a community centre for commercial, service and public purposes; public squares and meeting places; and a neighbourhood park, walkways and public spaces with landscaping – all designed to meet contemporary urban and architectural criteria.

Development of general and specific competences – knowledge and skills:

Through Design Studio II exercises, students are introduced to the planning and design process that develops spaces and buildings through context, form, function, technology and material. The plan developed in this course integrates knowledge from different study courses. In addition to this knowledge integration, this course encourages a creative and individualised approach to problem solving for each student. Design Studio II also develops problem analysis, research and the use of traditional and modern technologies. In the process, they gain an understanding of the relationship between engineers and society, professional ethics, environmental sustainability, plan and project management, as well as effective communication.

Course curriculum

Design Studio II is based on individual work. It also includes site visits, focused seminars, joint presentations and discussions throughout the semester, culminating in a final project presentation and defence.

Other forms of teaching and knowledge assessment

Project assignments, seminar papers, field work, presentations, project defence.

Compulsory literature

1 Colquhoun, I.; Fauset, P. G. Housing Design in Practice, Longman Lt., , UK 1991., ISBN 0582063604 2 Curdes, G.: Stadstrukturelles Entwerfen, Kolhammer Verl., Stuttgart, 1995., ISBN 317012627X 3 Galijašević, T.; Jošić, M.; Vlahović, D.: Zgrade društveno poticajne izgradnje, Arhitektonski fakultet, Zagreb Hangarter, E.: Bauleitplanung, Werner Verl., Dusseldorf, 1999., ISBN 3-8041-2081-4 4 Pegan, S.: Urbanizam – Uvod u detaljno urbanističko planiranje, Acta Arhitectonica, Udžbenici i priručnici 5, Faculty of Architecture at the University of Zagreb, Zagreb, 1997, ISBN 978-953-6229-59-8 5 Prinz, D.: Urbanizam, vol. 1 – Urbanističko planiranje, Udžbenik za studij arhitekture, Golden marketing – Tehnička knjiga, Zagreb, 2006., ISBN 953-212-216-8 6 Prinz, D., Urbanizam II - Urbanističko oblikovanje, GMTK - AF, Zagreb, 2008., ISBN 978-953-212-217-6 7 Reinborn, D.: Stadtebau im 19 und 20. Jahrhundert, Kolhammer Verl., 1996., ISBN 3170125478

Additional literature

1. Bramm, W.: Stadtplanung, Werner Verl. 1999., Dusseldorf, ISBN 3-8041-4235-4 2. Catanese, J. A.: Urban Planning, McGraw Hill, Inc. 1979., ISBN 0-07-010229-5 3. Cullen, G.: The Concise Townscape, Butterworth & Co. Publ., Ltd. 1971. 4. Dellale, R.: Traganje za identitetom grada, Izdavački centar Rijeka, Rijeka, 1988 5. Hayward, R. & McGlynn S.: Making Better Places, Urban Design Now, Butterworth Ltd., Oxford, 1993., ISBN 0750605367 6. Per, A. F.; Arpa, J.: Density Projects, 36 new concepts on collective housing, a + t ediciones, Vitoria –Gasteiz, 2007., ISBN 978-84-9612-1335-1 7. Rudlin, D. & Falk, N.: Building 21st Century Home, The Sustainable Urban Neighborhood, Architectural Press, Oxford, 2001., ISBN 0750625287 8. *** Recent reviews in the field of architecture and urbanism (journals and monographs). 9. *** Literature listed in the courses that thematically accompany the work in the Design Studio course

Requirements for obtaining a signature

Regular class attendance, submission and successful defence of an urban and architectural solution of the prescribed content.

Type of exam

Successful completion of practical assignments from the Design Studio II curriculum. Presentation and defence of the assignment before a panel of workshop lecturers.

Learning outcomes of this course

- apply urban-architectural and other methods of spatial analysis in the context of urban space development;
 - implement knowledge of the planning and design process that develops spaces and buildings through context, form, function, technology and material;
 - identify the factors of spatial identity;
 - design an integrated spatial-programme urban solution for the area.
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**Learning outcomes of the study programme
P02, P03, P04, P05, P06, P07, P13**

Design Studio II – Architectural Structures

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Vedran Duplančić
Course associate(s)	Binički; Duplančić; Jaklenec; Ostojić; Pavlović; Šneler; Užarević; Ževrnja Andrić; Medić; Stepinac; Turčić; Vukić; Abrashi; Prodan Abramović; Rengel
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3.0

Framework of course content

This interdisciplinary course involves the application of knowledge gained in Architectural Technology and Materials, Load-bearing Structures and Building Installations to a personal project.

The course theme is linked to Design Studio II – Architecture. In the same project of a multi-dwelling housing, students are required to integrate modern building installation systems, determine the structural scheme and develop the architectural design of key project components using an engineering approach.

In their individual projects, the students propose the appropriate materials, technologies, technical and installation systems, as well as constructive solutions, with the aim of integrating them into a functional whole that corresponds to the conceptual idea established at the outset of the multi-dwelling housing project.

Development of general and specific competences – knowledge and skills:

Design Studio II – Architectural Structures is a practical course where knowledge from several technical subjects—architectural structures and materials, building physics, load-bearing structures, and building installations—is simultaneously integrated. During the work process, students acquire knowledge about the process of developing the architectural design from the whole structure to individual structural elements.

Course curriculum

The course is practical, meaning project documentation is developed based on individual assignments. The course consists of 30 teaching hours over 10 weeks (once a week for 3 hours). Having developed the conceptual idea for the multi-dwelling housing project in Design Studio II – Architecture, students will be required to complete the following tasks in this course:

ARCHITECTURAL TECHNOLOGY AND MATERIALS

(10 sessions: 10×3 hours = 30 hours)

1 ANALYSIS (4 sessions: 4×3 hours = 12 hours)

Analyse a characteristic assembly/detail that is central to the architectural design using an existing architectural realisation of a multi-dwelling housing. Select an assembly/detail for later application in the individual project.

Contents of the analysis:

- 1.1 Photographs of the selected example of multi-dwelling housing and characteristic assembly/detail
- 1.2 Catalogue of the analysed materials of the characteristic assembly/detail
- 1.3 Personal representation of the analysed assembly/detail via architectural drawings or sketches

2 DETAILED DESIGN (6 sessions: 6×3 hours = 18 hours)

- 2.1 Technical description (structure, materials, design)
- 2.2 List of layers for external and internal partition components
- 2.3 Preliminary architectural design (smaller scale submissions from Design Studio II – Architecture indicating characteristic sections of the façade and the selected assembly of the building that is elaborated in detail)
- 2.4 Characteristic section of the building through the staircase, scale 1 : 50
- 2.5 Spatial/axonometric representation of the characteristic assembly of the building, scale 1 : 10, with corresponding details, scale 1 : 5

BEARING STRUCTURES

(10 sessions: 10×3 hours = 30 hours)

1 TECHNICAL DESCRIPTION OF THE STRUCTURE

Basic data on dimensions and location.

Basic data on the load-bearing structure of ceilings, vertical load-bearing elements and load transfer.

Basic data on materials and special conditions.

Special requirements related to execution and quality control if the structure is prefabricated, etc.

2 SCHEME OF THE STRUCTURE: floor plans and sections (1 : 100, 1 : 150)

Mark axes and elevations, specify the dimensions of the main structural elements (slabs, walls, beams, columns).

3. 3D MODEL OF THE LOAD-BEARING STRUCTURE

BUILDING INSTALLATIONS

(10 sessions: 10×3 hours = 30 hours)

1. TECHNICAL CALCULATION

1.1 Dimensioned pipes of the water supply network for a typical apartment according to HRN EN 806-1:2000, HRN EN 806-2:2005, and HRN EN 806-3:2007

1.2 Calculation of the total amount of sanitary water in a typical apartment

2 TECHNICAL DESCRIPTION

2.1. Technical description of installations developed as graphic attachments

3. GRAPHIC ATTACHMENTS

3.1 Installation of water supply and sewage systems of a typical apartment (1 : 50)

3.2 Installation of fan-coil heating and cooling systems of a typical apartment (1 : 50)

3.3 Installation of gas and ventilation systems of a typical apartment (1 : 50)

3.4 Vertical sewage system schematic for the typical apartment, including dimensions of structural elements according to calculations

3.5 Vertical water supply system schematic for the typical apartment, including dimensions of structural elements according to calculations

3.6 Vertical ventilation system schematic for the typical apartment

3.7 Catalogue of analysed materials that constitute the mentioned systems

Other forms of teaching and knowledge assessment

Expert lectures, auditory and consultation exercises. Testing knowledge through the project development process and preparation of project technical documentation.

Compulsory literature (please provide detailed information about the publisher and year of publication)**ARCHITECTURAL TECHNOLOGY AND MATERIALS**

- 1 Štulhofer, Veršić: Crtanje arhitektonskih nacрта - pribor i oprema, 1998.
- 2 Ching: Building Construction Illustrated, 2009.
- 3 Deplazes: Constructing Architecture, Materials Processes Structures, 2005.
- 4 Mittag, Baukonstruktionslehre, Vieweg, 2000.
- 5 Tehnička enciklopedija, vol. X – Otvori, Hrvatski leksikografski zavod, Zagreb
- 6 Schittich, Staib, Balkow, Schuler, Sobek: Glasbau Atlas, Institut für Internationale Architektur-Dokumentation GmbH, Munich, 1998.
- 7 Tichelmann, Pfau, Becker: Trockenbau Atlas, Teil I, II, Verlagsgesellschaft Rudolf Müller, Cologne, 2005.

BEARING STRUCTURES

- 1 Vicko Šimić: Otpornost materijala I i II, Školska knjiga, Zagreb 2007 (3rd edition)
- 2 Marta Sulyok-Selimbegović: Čelične konstrukcije u arhitekturi, Golden marketing and Faculty of Architecture, Zagreb, 2008
- 3 Marta Sulyok-Selimbegović : Drvene konstrukcije u arhitekturi, Golden marketing and Faculty of Architecture, Zagreb, 2008
- 4 Nenad Turčić, Hrvoje Vukić and Davor Andrić: Nosive konstrukcije II – Drvene i čelične konstrukcije, script for exercises – Faculty of Architecture, 2019
- 5 Betonske konstrukcije, Josip Galić, University of Zagreb, Faculty of Architecture, Zagreb, 2022.
- 6 Nosive konstrukcije I, Ivo Podhorsky, Golden Marketing – Tehnička knjiga, Zagreb, 2008.
- 7 Nosive konstrukcije II, Ivo Podhorsky, Golden Marketing – Tehnička knjiga, Zagreb, 2008.

BUILDING INSTALLATIONS

- 1 Radonjić, M.: Vodovod i kanalizacija u zgradama, Croatia knjiga, 2004.
- 2 Tušar, B.: Kućna kanalizacija, Građevinski fakultet, 2001.
- 3 Tušar, B.: Ispuštanje i pročišćavanje otpadne vode, Croatia knjiga, 2004.
- 4 Tadić, D.: Kućne instalacije, BGZ, Belgrade, 1963.
- 5 Strelec i suradnici: Plinarski priručnik, Energetika marketing, Zagreb, 2001
- 6 Recknagel; Sprengel; Schramek: Priručnik za grijanje, hlađenje, ventilaciju i klimatizaciju, V. Banja, 2002.
- 7 Labudović et al.: Priručnik za ventilaciju i klimatizaciju, Energetika marketing, Zagreb, 2000.

Additional literature (please provide detailed information about the publisher and the year of issue and ensure that it is as recent as possible)

Current trade journals in the field of architectural structures, structural engineering and building installations.

Requirements for obtaining a signature

Regular class attendance and successful submission of the project and technical documentation.

Type of exam

This practical course is passed with a positive grade of the project and technical documentation required in the assignment (see course curriculum).

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- creatively apply knowledge and methods from technical sciences;
 - integrate various parts of architectural and technical documentation into a cohesive whole;
 - anticipate the appropriate use of materials, technologies, technical, installation and construction solutions with the aim of integrating them into a functionally efficient whole, meeting the basic requirements for buildings and achieving the sustainability of the solution;
 - accurately graphically, textually and by drawing present the assigned parts of project documentation.
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P01, P06, P07, P08, P09, P13, P15

Residential Buildings 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Leo Modrčin
Course associate(s)	Modrčin
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	1
Field Course (days)	0
ECTS credits	1.5

Framework of course content

Housing is one of the most important aspects of the development of urban life. The construction of new housing and the renovation of existing housing units and neighbourhoods are among the most pressing social issues in society. Therefore, the planning and design of residential areas in the city are central to social development. Historical, social and cultural analysis, together with organisational, structural and design analysis of housing in the context of the redistribution of leisure and work, provide insights into the quality of life in the city. From an economic perspective, the strategy for building new and renovating existing housing resources is one of the key factors in housing development. The extension of traditional forms of housing with new ways of living in the city requires continuous research into new housing typologies.

Development of general and specific competences – knowledge and skills:

Familiarising students with the characteristics and specifics of designing multi-dwelling housing units.

Course curriculum

- 1 Characteristics of the housing problem
- 2 Brief historical development of communal housing
- 3 Brief historical overview of the development of multi-dwelling housing in Europe since the beginning of Modernism
- 4 Brief historical overview of the development of multi-dwelling housing in Croatia since the beginning of Modernism
- 5 Characteristics of multi-dwelling housing construction (socio-psychological, biological, economic, technological, cultural)
- 6 Typologies of multi-dwelling housing construction according to urban characteristics and internal features of residential buildings (1, 2, 3, 4, 5 or more apartments per staircase, central corridors and galleries, terraced constructions, towers, etc.)
- 7 Specifics of apartment organisation in multi-dwelling housing
- 8 Basic apartments floor plan (organisation according to functional units, extended communication, circular connections, free floor plans)
- 9 Adaptability/flexibility of living in multi-dwelling housing; flexibility/variability/adaptability in apartment organisation
- 10 Space and movement standards in apartments; common areas in multi-dwelling housing
- 11 Residential environment (communal noise and climate in the city); parameters of economic efficiency
- 12 Analysis of examples of multi-dwelling housing construction based on typological characteristics in Croatia
- 13 Analysis of examples of multi-dwelling housing construction based on typological characteristics abroad (Austria, the Netherlands, Finland, England, etc.)
- 14 New directions in multi-dwelling housing typology; application of multiple forms, transitional forms (terrace construction, carpet construction)
- 15 Designing multi-residential buildings

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 Zdenko Strižić: Architectural Design 1
- 2 Zdenko Strižić: Arhitektonsko projektiranje II (o stanovanju)
- 3 Grozdan Knežević: Višestambene zgrade
- 4 Kristijan Norberg-Šulc: Stanovanje, urbani prostor, kuća
- 5 Kristijan Norberg-Šulc: Egzistencija, prostor i arhitektura
- 6 Bruno Zevi: Kako gledati arhitekturu

Additional literature

- 1 Ivan Rogić: Stanovati i biti
 - 2 Gojko Bežovan: Europske stambene inicijative
 - 3 Liselotte Ungers: Die Suche nach einem neuen Wohnform
 - 4 Manfredo Tafuri: Vienna Rossa
 - 5 E. Franke Herausgeber: Stadt-Klima
 - 6 H. Deilmann; J.C. Kirschenmann; H. Pfeiffer: Wohnungsbau
 - 7 Hugo Potyka: Verdichteter Flachbau
 - 8 R. G. Kandzora; H. Merkel: Flexible Wohnungen
-

Requirements for obtaining a signature

Regular class attendance

Type of exam

Test, seminar paper and oral exam.

Learning outcomes of this course

The project curriculum will enable students to:

- interpret knowledge of programming, dimensioning and organisation of multi-dwelling housing units;
 - recommend a solid and clear authorial concept;
 - apply knowledge of functional, constructive and aesthetic requirements of housing in natural and urban environments in architectural and urban planning projects;
 - interpret context through the unity of the organic and artificial, natural and produced, in architecture that preserves the environment;
 - identify parameters of economic efficiency and sustainability in architectural and urban designs for multi-dwelling housing;
 - recognise the importance of interdisciplinary influences on housing design.
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P2, P3, P4, P5, P8, P10, P11, P14

Environmental Sociology

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Anka Mišetić
Course associate(s)	Mišetić
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

Introducing students to the concept of the environment and its genesis, as well as analysing the environment as a social product, with a focus on the role of architects as a profession that actively shapes the environment. An overview of fundamental theoretical concepts that address the relationship between the environment and society.

Development of general and specific competences – knowledge and skills:

To provide students with an insight into sociological knowledge and theories of the socio-cultural environment, particularly the specific sociological knowledge required for the professions of architecture and urbanism.

Course curriculum

1 The concept of the environment and its genesis. 2 Types of environments. 3 Main types of relationships within the environment. 4 The socio-cultural environment as a social product. 5 Characteristics of the socio-cultural environment. 6 Main processes in shaping the environment. 7 Social communication and the environment. 8 Structure and properties of communication. 9 Media and the social environment. The social environment as a medium. 10 The concept of cultural landscape. 11 Shaping identity. 12 Social identities and the shaping of the environment. 13 Environmental decision-making. 14 The environment and the professional ethics of the architect. 15 The architect and the public. The architect and the client. Urban planning and the public.

Other forms of teaching and knowledge assessment

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Compulsory literature

1 Haralambos, M. 1994. Uvod u sociologiju.

Additional literature

1 Gehlen, A. 1990. Čovjek.

2 Parsons, T. 1991. Društva, (A.Cesarec edition).

3 Atkinson, D., Jackson, P., Sibley, D., Washbourne, N., 2008. Kulturna geografija (chapters: Prostor/Mjesto, Krajolik, Okoliš, Identitet, Privatno/javno), Disput, Zagreb

Requirements for obtaining a signature

Regular class attendance

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Written

Learning outcomes of this course

- 1 Students will analyse and compare different definitions of the environment.
 - 2 Students will be able to recognise elements of the socio-cultural environment.
 - 3 Students will be able to explain the development of the environment as a social product.
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Learning outcomes of the study programme
P01, P02, P06, P15

Landscape Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Tamara Zaninović
Course associate(s)	Zaninović
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

Landscape architecture – composition and history. Landscape architecture embodies the history of behaviour and the composition of space. The history of landscape architecture is necessarily the history of human culture. This history reflects the relationship between the values of time and space, especially as an art of historical realisation through spatial behaviour. The history of landscape architecture aims to show how the art of landscape architecture expresses not only the ideal of beauty, but also a philosophical concept that transforms and shapes nature. It serves as a way of expressing the history of human creativity. As the first course in landscape architecture, this course introduces students to the principles of composition and the fundamentals of landscape design, with a focus on urban landscape spaces (city parks, residential parks, playgrounds, landscaped squares, promenades, themed gardens, landscapes around public, commercial and hotel buildings, and other types of urban landscape architecture). The course provides students with a basic knowledge of the architectural, artistic, natural and biotechnical factors essential to landscape architecture design. Students will apply this knowledge in Design Studio II–IV and the Landscape Design Workshop in the Undergraduate programme, and in architectural, urban and landscape workshops in the Graduate programme. The course is thematically linked to other courses such as Landscape Design and Landscape Planning in the Undergraduate programme and the Graduate courses Contemporary Landscape Architecture, Materials and Structures in Landscape Architecture and Computer-Aided Landscape Design.

Development of general and specific competences – knowledge and skills:

The aim of the course is to provide students with a fundamental knowledge of landscape design and to develop the ability to apply general principles of landscape composition based on a cultural-historical interpretation of the world's most valuable achievements in landscape architecture. Students will apply and demonstrate the acquired knowledge and skills in the Landscape Design Workshop project and in projects within Design Studio I, II, III and IV.

Course curriculum

1 Introduction to the course; landscape architecture terminology 2 Composition and design: allusions and illusions in landscape architecture 3 Urban landscape architecture 4 Landscape architecture in residential areas 5 Landscape architecture for residential houses 6 Water, sculpture, materials, and equipment: the language of landscape architecture 7 20th-century landscape architecture – up to the 1980s 8 Contemporary landscape architecture – from the 1980s 9 Spiritual and meditative – the essence of Chinese and Japanese gardens 10 Dialogue with time – landscape architecture of antiquity, the Middle Ages, and Islamic tradition 11 Architectural landscapes of the Renaissance: Italian and Dubrovnik traditions and composition 12 Rivals of historical landscape architecture – French Baroque rationalism and the English pastoral landscape 13 Landscape architecture builds the city – public urban parks of the 19th and 20th centuries 14 Trees in the city – the virtuality of landscape architecture 15 Landscape architecture through the lens of plant aesthetics and ecological criteria

Other forms of teaching and knowledge assessment

Other than attending lectures, this course does not envisage other forms of teaching.

Compulsory literature

1 Perivojna arhitektura (2011/12.), digital scripts library of the Faculty of Architecture, <http://www.arhitekt.hr/nastava/katedra/urb/lib/Forms/AllItems.aspx> 2. Obad Šćitaroci, Mladen (1997.) Vrtovi, perivoji i parkovi, Tehnička enciklopedija, sv. 13, pp. 566–577, Zagreb: Leksikografski zavod Miroslav Krleža 3. Jellicoe, Geoffrey and Susan (1987) The Landscape of Man, London: Thames and Hudson 4. Bojanić Obad Šćitaroci, Bojana; Obad Šćitaroci, Mladen (2004) Gradski perivoji Hrvatske u 19. stoljeću – javna perivojna arhitektura hrvatskih gradova u europskom kontekstu, Zagreb: «Šćitaroci» and Faculty of Architecture at the University of Zagreb 5. Journals: Topos – European Landscape Magazin (www.topos.de), Landscape Architecture Magazine (www.asla.org)

Additional literature

1 Waymark, Janet (2003) Modern Garden Design, Thames & Hudson 2 Jurković, Sonja (2004) Park ostvarenje sna – teorija vrtnje umjetnosti, Zagreb: Naklada Jurčić and Faculty of Architecture at the University of Zagreb 3 Maruševski, Olga; Jurković, Sonja (1992) Maksimir, Zagreb: Školska knjiga 4 Journals and landscape architecture online: – JoLA – Journal of Landscape Architecture: www.info-jola.de – Projects for Public Spaces: www.pps.org – Virtual Landscape Gallery: 1100 european parks and gardens -www.vilar.com – Garten+Landschaft: <http://garten-landschaft.de> 4 Plants databases: – University of Connecticut plant database _ <http://www.hort.uconn.edu/plants/> – Plant research international _ <http://www.pri.wur.nl/uk/> – Hortiplex gardenweb database _ <http://hortiplex.gardenweb.com/plants/> – Plants for future garden database _ http://www.ibiblio.org/pfaf/D_search.html#NAME , <http://www.comp.leeds.ac.uk/pfaf/index.html>

Requirements for obtaining a signature

Regular class attendance

Type of exam

Written and oral exam.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- 1 Explain the landscape architecture terminology;
 - 2 Evaluate the significance of individual historical periods in the development of modern approaches;
 - 3 Interpret the characteristics and factors that shape the identity of landscape architecture;
 - 4 Assess the importance of landscape architecture within the urban fabric;
 - 5 Creatively apply acquired landscape architecture knowledge in developing landscape-urban-architectural projects.
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Learning outcomes of the study programme

P01, P02, P03, P04, P05, P11

Upon successful completion of this course, the student will be able to:

- 1 – propose the use of technologies, technical, installation, transportation, and safety systems for the technical elaboration of architectural solutions in the main project and detailed design stages;
 - 2 – suggest a construction solution appropriate to the architectural concept;
 - 3 – propose a technically correct solution for building details in line with the architectural concept;
 - 4 – recommend materials suitable for the architectural solution;
 - 5 – critically evaluate the technical aspects in terms of the economic feasibility of the designed architectural solution;
 - 6 – modify the architectural solution according to technical requirements;
 - 7 – produce technically correct drawings and parts of architectural and other technical documentation for the architectural project;
 - 8 – integrate different parts of the documentation into a comprehensive project that describes the technically detailed architectural solution;
 - 9 – justify the choice of technical solutions in the architectural project;
 - 10 – identify the constraints of technical, functional, and formal parameters in the architectural solution.
-

Learning outcomes of the study programme

P01, P02, P03, P06, P07, P08, P11, P12, P13, P14

Physical/Health Education 4

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Dalibor Vračan
Course associate(s)	Vračan
Year of study	Second
Semester of study	Fourth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	0.0
Framework of course content	
Fitness training. Sports games. Swimming. Aerobic. Orientation in nature.	
Development of general and specific competences – knowledge and skills:	
Training programme personalisation.	
Course curriculum	
1 Football – tactics. Volleyball – tactics. 2 Football – tactics. Volleyball – tactics. 3 Football – tactics. Volleyball – tactics. 4 Basketball – tactics. 5 Basketball – tactics. 6 Basketball – tactics. 7 Swimming – racing. 8 Swimming – racing. 9 Swimming – competition preparation. 10 Aerobic. 11 Aerobic. 12 Designing different programmes to develop physical skills. 13 Different training programmes. 14 Running in nature. 15 Movements in nature with orientation.	
Other forms of teaching and knowledge assessment	
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Compulsory literature

- 1 Mišigoj-Duraković M. (1999) Tjelesno vježbanje i zdravlje, Zagreb: Grafos.
- 2 Milanović D. (1996) Priručnik za sportske trenere, Zagreb: Faculty of Kinesiology at the University of Zagreb.

Additional literature

- 1 Trninić S. (1996) Analiza i učenje košarke, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 2 Janković V., Marelić N. (2003) Odbojka za sve, Zagreb: Authors' edition.
- 3 Volčanšek B. (2002) Bit plivanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 4 Šnajder V., Milanović D. (1991) Atletika hodanja i trčanja, Zagreb: Faculty of Kinesiology at the University of Zagreb.
- 5 Serić H. (2004) Osnove boričkih sportova, Zagreb: Faculty of Kinesiology at the University of Zagreb.

Requirements for obtaining a signature

Regular class attendance.

Type of exam

—

The course does not contribute to the achievement of a professional qualification.

The course does not contribute to the achievement of a professional qualification.

FIFTH SEMESTER

Modern and Contemporary World Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	*
Course associate(s)	Mrduljaš
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

The course Modern and Contemporary World Architecture of the 20th Century places the architectural corpus of the 20th century in its social, cultural, technical and historical context. It explains the main directions in the development of architectural creativity, from the onset of the Second Industrial Revolution to the impact of architecture on the phenomenon of environmental sustainability as we move into the third millennium. The course provides an insight into the thoughts, aspirations and guiding principles of key figures in architectural creation.

Development of general and specific competences – knowledge and skills:

The goal of the course is to understand the integrative processes in the technical and artistic achievements of architectural creativity within the corpus of 20th-century architecture and its transition into the third millennium, and especially to provide knowledge of the typology of architectural formats, plans, events and possibilities for designing architectural compositions. Architectural exploration of contemporary issues is carried out through the interaction of this course with complementary courses such as "Office Buildings", "Cultural Buildings", "High-Tech Architecture", "Design Studio IV", "Studies of New and Rare Architectural Types" and "Unique Features of Contemporary Architecture" within the Doctorate study programme in Architecture. This approach integrates the undergraduate, graduate and postgraduate levels of education into a unified pedagogical cluster of related curricula.

Course curriculum

Origins of modern architecture and contemporary trends | Classics and their followers | Otto Wagner | Bauhaus, CIAM, International style, New Brutalism | E. & E. Saarinen, K. Roche & J. Dinkeloo | New York & NY5 - "White and Grey" | Skyscrapers – decades of development | SOM in the Eighties | Transformations of cultural institutions in contemporary architecture | Architecture and corporate communication platforms | Contemporary European architecture – regional accents and metropolitan icons | Paris | Scandinavian architectural experience: functionality, design, and environment | Monuments of Gratitude and Holocaust Memorials | Pritzker Prize 1979–2015: laureates and their works |

Other forms of teaching and knowledge assessment:

–

Compulsory literature (please provide detailed information about the publisher and year of publication)

Curtis, William J. R.:

"Modern Architecture since 1900", Phaidon Press, Third edition, 1996+.

Giedion, Sigfried:

"Space, Time and Architecture - The Growth of a New Tradition", 5th. rev. & enl. ed., Harvard Uni. Press, 2009.*

Frampton Kenneth:

"Modern Architecture - a Critical History", 4th ed., Thames and Hudson, 2007.*

Hertzberger, Herman:

"Space and Learning", 010 Uitgeverij, 2008.

Hitchcock, Henry-Russell & Johnson Philip:

"The International Style", W.W. Norton & Co., 1997.*

Jencks, Charles:

"Modern Movements in Architecture", 2nd ed. Penguin, 1987.*

Pevsner, Nikolaus:

"A History of Building Types", Princeton Uni. Press, 1979.

Venturi, Robert:

"Complexity and Contradiction in Architecture", M.O.M.A., 2nd ed., 2002.*

Watkin, David:

"A History of Western Architecture", 4th ed., Watson-Guptill, 2005.

Zevi, Bruno:

"Povijest moderne arhitekture" I and II, Golden marketing – Tehnička knjiga, Zagreb, 2006, 2010.

*Note: There are earlier editions in Croatian.

Additional literature

Bachelard, Gaston:

"The Poetics of Space", Beacon Press, 1994.*

Fletcher, Sir. Banister:

"A History of Architecture", 20th ed., Architectural Press, 1996.

Hertzberger, Herman:

"Lessons for Students in Architecture", 010 Publishers, 2005.

Hertzberger, Herman:

"Space and the Architect", Lesson in Architecture 2, Galgiani Phillip, 2000.

Kahn, Louis:

"Essential Texts", W.W. Northon & Co., 2003.

Le Corbusier:

"Oeuvre Complete", Birkhäuser Publ., 11th ed., 1999.

Pallasmaa, Juhani:

"The Eyes of the Skin. Architecture and Senses", Academy Press, 2nd ed. 2005.*

Peltason, Ruth (ed.):

"Architect: The Pritzker Prize Laureates in Their Own Words", Black Dog & Leventhal Publ., 2010.

Peter, John:

"The Oral History of Modern Architecture" – Interviews With the Greatest Architects of the Twentieth Century, Harry N. Abrams, 2000.

Pevsner, Nikolaus:

"An Outline of European Architecture", Gibbs Smith, rev. ed., 2009.

Pevsner, Nikolaus:

"Pioneers of Modern Design - from William Morris to Walter Gropius", rev. ed., Yale Uni. Press, 2005.*

Pevsner, Nikolaus:

"The Sources of Modern Architecture and Design", Thames and Hudson, 1985.*

Rowe, Colin & Slutzky, Robert:

"Transparency", Birkhäuser Verlag, 1993.

Stoller, Ezra:

"Modern Architecture", Photographs by Ezra Stoller, Harry N. Abrams, 1999.

Ullmann, H. F.:

"The World of Contemporary Architecture", 1st ed., 2008.

*Note: There are earlier editions in Croatian.

Requirements for obtaining a signature

There are no special requirements.

Type of exam

Seminar paper and oral exam.

Learning outcomes of this course

- 1 Understand the social responsibility of architects.
 - 2 Recognise the principles that shape an idea in architecture.
 - 3 Identify the principles of architecture in the function of shaping a contemporary architectural work.
 - 4 Critically evaluate architectural works.
-

Learning outcomes of the study programme:
P02, P04, P11, P15, P16

Preservation and Rehabilitation of Built Heritage

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Alan Braun
Course associate(s)	Braun
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

Basic knowledge of the protection of built heritage – cultural goods, especially immovable ones. History, theory, doctrines and practice of conservation with special emphasis on contemporary global and Croatian examples.

Development of general and specific competences – knowledge and skills:

Understand the issues involved in the conservation of built heritage, the causes of deterioration and the methods of conservation and restoration of cultural goods The role of the architect in the research, design and restoration of the built heritage. Designing in a historical context.

Course curriculum

- 1 Concepts and terminology
- 2 Methods of conservation and restoration of immovable cultural goods
- 3 Preservation and rehabilitation of ancient heritage during the classical period – beginnings of conservation
- 4 Preservation and rehabilitation of built heritage in the Romantic period
- 5 Stylistic restoration in France
- 6 Stylistic restoration in Italy
- 7 Stylistic restoration in the Austro-Hungarian Empire
- 8 Beginnings of modern conservation and restoration of built heritage
- 9 Preservation and rehabilitation of built heritage in the second half of the 20th century
- 10 Contemporary approaches to heritage rehabilitation
- 11 Rehabilitation of built heritage for use as contemporary exhibition spaces
- 12 Rehabilitation of historical sacred architecture
- 13 Contemporary approaches to the conservation and presentation of archaeological sites
- 14 Interpolations in historical city centres
- 15 Recent achievements in the rehabilitation of built heritage

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 Feilden, B. (2003), Conservation of Historic Buildings, Architectural Press, Oxford
- 2 Jokilehto, J. (2006), A History of Architectural Conservation, Butterworth-Heinemann, Oxford
- 3 Marasović, J. (2005), Prilog metodologiji obrade graditeljskog naslijeđa, Faculty of Architecture, Zagreb
- 4 Špikić, M. (2009), Konzerviranje europskih spomenika od 1800. do 1850, Leykam, Zagreb

Additional literature:

- 1 *** (2001), Konzerviranje i restauriranje: selection of texts, Kolo 1, Zagreb
 - 2 *** (2006.), Anatomija povijesnog spomenika, (Špikić, M., ed.), IPU, Zagreb
 - 3 *** (2007.), Smjernice konzervatorsko-restauratorskog rada, (ed. Vokić, D.), K-R centar, Zagreb
 - 4 *** (2013.), Camillo Boito, Spomenik kao knjiga, Spisi o arhitekturi, kulturi i restauriranju 1861.-1886., (Špikić, M., ed.), Disput, Zagreb
 - 5 trade journals (Godišnjak zaštite spomenika kulture, Peristil)
-

Requirements for obtaining a signature

Regular class attendance.

Type of exam

Seminar paper and oral exam.

Learning outcomes of this course:

Upon successful completion of this course, the student will be able to:

- identify the concepts of built heritage and cultural goods;
 - understand the legal regulations, rules and procedures for protecting cultural goods;
 - distinguish between methods of conservation and restoration of built heritage;
 - understand the historical development of conservation of built heritage;
 - differentiate between appropriate and inappropriate interventions on built heritage;
 - critically evaluate the rehabilitation work carried out on built heritage;
 - assess the rehabilitation work carried out on built heritage;
 - analyse built heritage;
 - assess built heritage;
 - select and propose appropriate methods for the rehabilitation of built heritage.
-

Learning outcomes of the study programme:

P02, P05, P15

Planning and Project Management 1

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Assistant Professor Dubravko Bačić, PhD
Course associate(s)	Bačić; Cvitanović; Jaklenec; Mance
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	3

Framework of course content

Structure and content of bill of quantities, types of bill of quantities. General conditions for works. Measurement systems and bills of quantities. Tendering and selection of contractors. Standardisation, technical regulations, recognised technical rules. Construction works: preparatory works, demolition and dismantling, concrete and reinforced concrete works, masonry, insulation, carpentry and metal structures. Craft work: sheet metal and roofing, flat roof insulation, carpentry and joinery, finishing masonry, drywall, glazing, stonemasonry, tiling, painting and decorating, parquet and flooring, suspended glass and ventilated facades. Landscaping works. Project and equipment bill of quantities. Supervision and control of the execution of building and craft works. Sequence and interdependence of works. Scheduling, Gantt chart.

Development of general and specific competences – knowledge and skills:

The aim of this course is to acquire the basic knowledge and skills necessary for the preparation of detailed project execution documentation and bill of quantities for construction and trade works. The emphasis of the course is on an integrated approach to the preparation of project documentation for the technical and technological realisation of a simple building.

During exercises, students will prepare a bill of quantities for building and craft works, including a bill of quantities, for a family house that they have designed and developed in previous semesters in other courses (on architectural design, architectural structures, load-bearing structures, installations, building physics). At the same time, lectures will provide a theoretical foundation on the characteristics, technology and technical conditions for the execution of all construction and craft works, as well as the properties of building materials, which will be closely linked to individual or team work during the exercises.

Upon successful completion of the course, students will have acquired the theoretical and practical knowledge necessary for the preparation of the bill of quantities for construction and craft works, the development of conditions for the execution of designed works and technical specifications for the materials and products used, as well as skills to prepare calculations and bills of quantities for the designed works, to prepare time schedules and quality control programmes, and to supervise and control the execution of the works on site.

Course curriculum

1. Introduction to the course; general overview of the bill of quantities; standardisation, technical regulations and technical standards
2. Preparatory works; demolition and dismantling; earthworks
3. Concrete and reinforced concrete works
4. Masonry works; insulation works
5. Carpentry structures; metal structures
6. Guided site visit / Guest lecture by a building material and element manufacturer
7. Sheet metal works; roofing works and flat roof systems
8. Carpentry and joinery works
9. Final masonry works; drywall works
10. Glazing works; stonemasonry and tiling works
11. Painting and decorating; parquet and flooring works
12. Suspended glazed and ventilated façades
13. Landscaping works; project and equipment bill of quantities
14. Sequence and interdependence of works. Scheduling, Gantt chart
15. Guided site visit / Guest lecture by a building material and element manufacturer

Other forms of teaching and knowledge assessment

Guided site visits, guest lectures by manufacturers of building materials and elements, discussions, project tasks in exercises using BIM tools, teamwork in groups, individual consultations.

Compulsory literature

1. Bačić, D.; Cvitanović, T.; Jaklenec, T.; Mance, D. (2024). *Troškovnik građevinsko-obrtničkih radova (script)*. Zagreb: Faculty of Architecture at the University of Zagreb
2. Bučar, G. (2003). *Normativi i cijene u graditeljstvu*. Rijeka: Faculty of Civil Engineering
3. Đorđević, D. (2012). *Izvođenje radova u visokogradnji*. Belgrade: Faculty of Architecture
4. Ilić, S. (2003). *Klasični drveni krovovi* (6th edition). Belgrade: Građevinska knjiga
5. Neidhardt, T. (2004). *Građevne konstrukcije: Završni radovi i nosivi sustavi u graditeljstvu*. Zagreb: Omega al
6. Peulić, Đ. (2002). *Konstruktivni elementi zgrada: prvi i drugi dio*. Zagreb: Croatiaknjiga
7. *** (2008). *Normativi i standardi rada u građevinarstvu*. Belgrade: Građevinska knjiga Beograd

Additional literature

1. Beslač, J. (1982). *Materijali u arhitekturi i građevinarstvu*. Zagreb: Školska knjiga
2. Bielefeld, B., ed. (2017). *Basics Building Technology*. Basel: Birkhäuser
3. Deplazes, A., ed. (2005). *Constructing Architecture*. Basel: Birkhäuser
4. Hegger, M.; Auch-Schwelk, V.; Fuchs, M.; et al. (2006). *Construction Material Manual*. Basel: Birkhäuser
5. Zimmermann, A. (2009). *Constructing Landscape*. Basel: Birkhäuser

Requirements for obtaining a signature

Regular class attendance (lectures and exercises) and a submitted project

Type of exam

Positively rated project created on exercises

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

1. Prepare a bill of quantities for designed construction and craft works for a building of low to medium complexity, including a bill of quantities for all details and the preparation of a graphical and arithmetic proof of the bill of quantities.
2. Propose a suitable construction product/material in accordance with the designed technical solution, technical regulations and available technological and financial resources.
3. Develop general and specific conditions for the execution of designed construction and craft works, with technical specifications for selected construction products.
4. Select and correctly apply technical specifications, regulations and standards, as well as recognised technical rules required to ensure the designed quality standard of construction and craft works.
5. Create a work-breakdown structure (WBS) and technological sequence of activities for planning the execution of a project of low to medium complexity.
6. Plan, i.e. develop a dynamic time schedule of low complexity (Gantt chart) and estimate and/or calculate the approximate duration of construction and craft work for low to medium complexity buildings.
7. Prepare a bill of quantities for simple construction and craft work.

Learning outcomes of the study programme

P03, P06, P07, P08, P09, P10, P11, P14

Building Technology

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Marino Šneler
Course associate(s)	Šneler
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Classical construction methods and technologies. Modern construction technologies, new materials and methods, sustainable building practices.

Development of general and specific competences – knowledge and skills:

Comprehensive understanding of modern building technologies. Developing an individual approach to the integration process in design and construction methodology planning.

Course curriculum

The course is based on lectures divided into 15 units.

- 1 Introduction to building technology.
- 2 Classical construction methods. Geotechnical works. Execution and protection of construction pits.
- 3 Classical construction methods. Reinforced concrete structures, modern formwork.
- 4 Classical construction methods. Masonry structures.
- 5 Prefabricated structures. Linear and panel prefabrication.
- 6 Prefabricated structures. Spatial prefabrication.
- 7 Modern concrete structures.
- 8 Modern steel structures.
- 9 Modern timber structures.
- 10 Membrane structures.
- 11 Glass structures.
- 12 Alternative construction technologies.
- 13 New materials in architecture.
- 14 Modern technologies and sustainable building.
- 15 Student-selected topic.

Other forms of teaching and knowledge assessment

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Compulsory literature

Staib, Dorrhofer, Rosenthal (2008) *COMPONENTS AND SYSTEMS*, Birkhauser, Basel ISBN: 978-3-7643-8656-6
Daniels (2003) *ADVANCED BUILDING SYSTEMS*, Birkhauser, Basel ISBN: 3-7643-6723-7
Gonzalo, Habermann (2006) *ENERGY EFFICIENT ARCHITECTURE*, Birkhauser, Basel ISBN: 3-7643-7255-9
Addington, Schodek (2004) *SMART MATERIALS AND TECHNOLOGIES IN ARCHITECTURE*, Architectural Press ISBN: 0-7506-6225-5
David M. Gann (2000) *BUILDING INNOVATION*, Thomas Telford Publishing, London ISBN: 0-7277-2596-3

Additional literature

Bennett (1997) *EXPLORING CONCRETE ARCHITECTURE*, Birkhauser, Basel ISBN: 3-7643-6271-5
Le Cuyer (1999) *STEEL AND BEYOND*, Birkhauser, Basel ISBN: 3-7643-6494-7
Weber, Steiger, Hugues (2004) *TIMBER CONSTRUCTION*, Birkhauser, Basel ISBN: 3-7643-7032-7

Requirements for obtaining a signature

Regular class attendance and an approved seminar paper topic.

Type of exam

Seminar paper and oral presentation.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- 1 Demonstrate adequate technical knowledge and application of classical methods and construction technologies.
- 2 Demonstrate adequate technical knowledge and application of modern construction technologies.
- 3 Propose new materials and construction methodologies.
- 4 Adequately understand and justify the development of an individual approach to the integration process in design and construction methodology planning.

Learning outcomes of the study programme

P08, P09, P10, P14

Design Studio III – Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Vanja Rister
Course associate(s)	Rister; Bertina; Glasinović; Latin; Martinis; Mišković; Roth Čerina
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	8
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	10.0

Development of general and specific competences – knowledge and skills:

The design studio serves as the backbone of the study programme, linking architectural design with urban conditions and the technical requirements of construction. Through studio work, students are introduced to the design process where spaces and buildings are developed through context, form, function, technology and material.

The project developed during the Design Studio integrates knowledge from a range of professional disciplines. The studio provides a framework in which students are required to go through the entire architectural design process, ensuring that all essential requirements for the building are met. In addition to knowledge integration, this course encourages a creative and individualised approach to problem solving for each student. Design Studio III also develops problem analysis, research and the use of traditional and modern technologies.

In the process, they gain an understanding of the relationship between engineers and society, professional ethics, environmental sustainability, project management and effective communication.

Course curriculum

The Design Studio III course is based on an intensive and individualised approach to practical work. It also includes site visits, focused seminars, joint presentations and discussions throughout the semester, culminating in a final project presentation, exhibition and defence.

The Design Studio requires intensive use of both modern and traditional tools.

The schedule of the Design Studio enables the student to successfully master many aspects of the design process.

Successful mastering of the project task implies regular attendance and active participation in the lectures of the related course (Buildings for Educational Purposes).

Other forms of teaching and knowledge assessment

Teaching methods include project assignments, seminar paper, fieldwork, working presentations, exhibitions and a final project defence.

Compulsory literature

- 1 Roth, A., Das neue Schulhaus, Zurich: Verlag fur Architektur (Artemis), 1966.
- 2 Auf-Franić, H. et al., Upute za programiranje, planiranje i projektiranje dječjih jaslica i vrtića / Zlatko Karač (ed.). Zagreb: Acta Architectonica, 2003.
- 3 Auf-Franić, H. et al., Osnove škole: programiranje, planiranje i projektiranje / Zlatko Karač (ed.). Zagreb : Golden marketing – Tehnička knjiga, 2004.
- 4 School buildings, The state of affairs, The Swiss Contribution in an International Context, Birkhäuser, 2004.
- 5 Hertzberger, H., Space and Learning, Lessons in Architecture 3, Rotterdam: 010 Publishers, 2008.

Additional literature

- 1 Bajbutović, Z.: Arhitektura školske zgrade, Sarajevo: Svjetlost, 1981.
 - 2 Hertzberger, H., Lessons for Students in Architecture, Rotterdam: 010 Publishers, 1993.
 - 3 Hertzberger, H., Space and the Architect, Lessons in Architecture 2, Rotterdam: 010 Publishers, 2000.
 - 4 Dudek, M., Architecture of schools: the new learning environments, Boston: Architectural Press, 2000.
 - 5 Matijević, M., Alternativne škole, Zagreb: Tipex, 2001.
 - 6 Complex Buildings Learning Systems, a+t 50, a+t architecture publishers, 2018.
 - 7 Schools: Concept, Detail 9/2018.
 - 8 Deplazes, A., Constructing architecture, materials processes structures a handbook, Basel, Birkhäuser, 2008.
-

Requirements for obtaining a signature

Regular class attendance and successful defence of the design solution.

Type of exam

Students' knowledge is assessed through successfully completed practical assignments.

Learning outcomes of this course

- 1 A student who completes this course will be able to apply and critically interpret the design programme and other elements essential for the development of an architectural project.
 - 2 A student who completes this course will be able to demonstrate knowledge of spatial and functional typologies of schools.
 - 3 A student who completes this course will be able to independently design a preliminary urban-architectural design for a building for educational purposes according to a moderately complex project programme.
 - 4 A student who completes this course will be able to apply materials, technologies, technical and structural solutions that support the spatial concept and integrate into the whole.
 - 5 A student who completes this course will be able to present (verbally, graphically and textually) their own project developed according to a moderately complex project programme.
 - 6 A student who completes this course will be able to objectively evaluate the success of executed examples of buildings for education.
-

P01, P02, P03, P04, P06, P07, P08, P09, P11, P12, P13, P14, P15, P16

Design Studio III – Landscape Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Sanja Gašparović
Course associate(s)	Duić; Ivanković; Krajnik; Rukavina; Sopina; Zaninović
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	4
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	5.0

Framework of course content

The course covers methods for analysing, evaluating and designing public urban spaces/urban landscapes (such as parks, garden squares, linear garden squares, etc.) Through practical work in exercises, students learn the different stages of landscape design methodology, from concept to detailed design. They explore different conceptual approaches to solving complex urban and spatial problems, taking into account the value and sensitivity of space and landscape. The course aims to develop students' ability to evaluate context, interpret the relationship between scale and function and use vegetation and architectural elements as building materials for space.

Development of general and specific competences – knowledge and skills:

Through practical exercises, students apply their knowledge of the importance of public landscape spaces in achieving urban transformation, urban aesthetics and quality of life in the contemporary city. Individual work helps to develop skills and techniques for:

- analysing and identifying urban and landscape contexts;
- evaluating and conserving existing landscape and urban elements;
- using contemporary design language to address landscape issues;
- presenting (graphically interpreting) landscape spaces.

Course curriculum

Other forms of teaching and knowledge assessment

Regular class attendance, analysis of selected examples of landscape architecture projects, booklet and poster showing the urban-landscape-architectural solution.

Compulsory literature

Recent reviews in the field of architecture and urban planning (journals and monographs).

Additional literature

Literature listed in the courses that thematically accompany the work in the Design Studio course.

Requirements for obtaining a signature

Regular class attendance and successful defence of the design solution.

Type of exam

Students' knowledge is assessed through successfully completed practical assignments.

Learning outcomes of this course

Upon successful completion of the course, students will be able to:

- apply urban-landscape-architectural and other methods of spatial analysis in the context of development and changes in urban landscapes;
 - apply knowledge of the historical development of landscape architecture to the design of urban landscapes;
 - present an analysis of the spatial development and changes in the studied area;
 - identify the factors of spatial identity;
 - evaluate the studied space;
 - design an integrated spatial-programme solution for landscape architecture.
-

P02, P05, P06, P07, P11, P12, P13

Design Studio III – Architectural Structures

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Marin Binički
Course associate(s)	Biluš; Binički; Jaklenec; Mrinjek Kliska; Muraj; Ostojić; Pavlović; Protić; Šneler; Užarević Andrić; Galić; Medić; Turčić Abrashi; Prodan Abramović; Rengel
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	2
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Development of a preliminary design for a building with a functionally simple purpose, which has a wider-span load-bearing structure. Introduction to relevant literature on the assignment. Analysis of examples from literature or existing buildings of the specified type. Identification of the selected building of similar use by its elements and subsystems. Development of the conceptual solution (construction method, structure, installations) together with the preliminary design (spatial-functional solution, structural design with approximate dimensions, design concept – materials, cladding, etc., energy principles).

Development of general and specific competences – knowledge and skills:

Students are guided through the design process from initial assignment to preliminary design. Students develop a project for a functionally simple building with a wide span structure. Group work, with 3–5 students per project, aims to familiarise students with teamwork and collaborative decision making. Research into practical and literature-based approaches. Definition of a project assignment. Understanding the complexity of the relationship between spatial, design, construction and technical-technological solutions and the selection of materials and the application of basic sustainability settings within a clear project concept and a legible solution of the load-bearing structure, fulfilling all prescribed basic requirements for the building. Based on the acquired knowledge, students define and analyse applicable technical subsystems and elements, leading to the selection and approximate sizing of individual subsystem components. After selecting the subsystems and elements, students present their decisions at the preliminary design level.

Course curriculum

1 Introductory lecture / introduction to the assignment / instructions on splitting into groups / plot visit. 2 – 3 Working on the preliminary design (one group / several potential solutions) / urban planning analysis, data collection / creating a common basis for working models / reviewing relevant literature (web, books, journals, manuals, Neufert, etc.) / analysing examples from the literature. 4 – 7 Lecture: Building installations – basic thermal engineering systems for heating, cooling and forced ventilation. Working on the preliminary design / discussions on the given topic / development of analyses and proposals / study of the project (functional grouping of individual spaces, determination of the priority approach and position of the building, determination of the essential objective criteria for the development of a further concept, reflection on the social, natural and built context...) / spatial solution with emphasis on the solution of the spatial concept visible through the installation of the supporting structure, the definition of the constructive system, the fulfilment of the given programme, the assumptions of the installation systems. 8 Presentation and critique of the preliminary design at group level / selection of the preliminary design with a clear concept, compliance with the required programme, clearly defined structural system / spatial concept visible in the structural layout, proposed installation systems. 9 – 14 Working on the preliminary design/ development through all stages (architectural concept, structural concept, installation concept). 15 Submission of the complete preliminary design dossier for all stages (architectural concept, structural concept, installation concept) / one group – one project / students submit in A4/A3 format and upload to Google Drive / presentation of the preliminary design within two groups.

Other forms of teaching and knowledge assessment

Regular class attendance, successfully presented and defended project.

Monitoring student work through project assignments.

Knowledge is assessed on the basis of the project from the Engineering Studio and final examination encompassing all courses from the Technical Module that contribute to this course.

Compulsory literature

Recent reviews in the field of architecture and urban planning (journals and monographs).

Additional literature

Literature listed in the courses that thematically accompany the work in the Design Studio course.

- 1 Siegel: Detail Buch, Band 1, Deutsche Verlag-Anstalt GmbH, Stuttgart, 1999.
- 2 Siegel, Linsler: Detail Buch, Band 2, Deutsche Verlag-Anstalt GmbH, Stuttgart, 2002.
- 3 Herzog, Kripner, Lang: Facade Construction Manual, Edition Detail, Munich, 2004.
- 4 Deplazes, Architektur konstruieren: Vom Rohmaterial zum Bauwerk. Ein Handbuch, 2. Auflage, Birkhauser, Basel, 2005.
- 5 Braun, Birk, Heilmeyer: Detail Buch, Band 3, Konradin Medien GmbH, Stuttgart, 2005
- 6 Schittich, Staib, Balkow, Schuler, Sobek, Glass Construction Manual, 2nd edition, Birkhauser, Basel, 2007.
- 7 Phillips, Yamashita: Detail in Contemporary Concrete Architecture, Laurence King Publishing, London, 2012.
- 8 McLeod: Detail in Contemporary Timber Architecture, Laurence King Publishing, London, 2015.
- 9 Detail magazine, Institut für Internationale Architektur-Dokumentation GmbH, Munich
- 10 DBZ magazine, Verlag und Herausgeber; Bauverlag BV GmbH, Gütersloh
- 11 Bauwelt magazine, Verlag und Herausgeber; Bauverlag BV GmbH, Gütersloh

Requirements for obtaining a signature

Regular class attendance and successful defence of the design solution.

Type of exam

Regular class attendance, successfully presented and defended preliminary design.

Monitoring student work through project assignments.

Knowledge will be assessed on the basis of the monitoring of engagement in the development of the preliminary design and the final exam in the presentation of this preliminary design.

Learning outcomes of this course

DSIII-AS1 – Development of a preliminary architectural design considering other technical requirements and solutions.

DSIII-AS2 – Proposal for the application of technologies, technical, installation, transport, and safety systems at the preliminary design stage.

DSIII-AS3 – Suggesting a construction solution appropriate to the architectural concept.

DSIII-AS4 – Identification of the constraints of technical, functional and formal parameters in the architectural solution.

P1, P2, P7

Buildings for Educational Purposes

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Mia Roth Čerina; Vanja Rister
Course associate(s)	Roth Čerina; Vanja Rister
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Planning, programming and design of buildings for educational purposes: nurseries, kindergartens and primary schools.

Development of general and specific competences – knowledge and skills:

The course focuses on social standard buildings and spaces, with particular emphasis on educational environments (pre-school, school and higher education). It begins with an overview of pre-school and primary education systems, both internationally and in Croatia. The course analyses the elements of planning, programming, designing and equipping institutions for pre-school and primary education. It covers the spatial-functional characteristics of nursery and kindergarten layouts, the spaces designed for children, the coordination of teaching activities and the management of facilities. Special attention is given to the organisation and design of outdoor spaces. Examples of design from around the world and in Croatia are presented. Children in nurseries, kindergartens and schools gain their first spatial experiences in navigating and using public spaces, as well as in arranging personal spaces for play and creative work. These experiences determine the conditions for the organisation and design of spaces in nursery and primary schools. Schools are analysed from the overall structure, through spatial-functional units, down to the elementary school space – a classroom. Spatial-functional conditions for the arrangement of spaces for class-based teaching, subject-based teaching, coordination activities, facilities management and sports halls are established. Pedagogical and spatial standards for the dimensioning, organisation and design of school spaces are analysed, along with technical and hygienic requirements such as lighting, heating, ventilation, acoustics and their impact on school architecture. Different types of schools worldwide and locally are presented, taking into account spatial organisation and communication systems. The historical development, types and spatial-functional units for higher education (campuses) are also examined.

Course curriculum

1 Course introduction.

Urban parameters for selecting locations for nurseries and kindergartens. Classification of nurseries and kindergartens according to the organisation of childcare facilities. Physical layout of nurseries and kindergartens.

2 Spatial-functional characteristics of nursery and kindergarten layouts, group units of nurseries and kindergartens, analysis of examples.

3 Overview of significant historical and contemporary examples of nurseries and kindergartens worldwide.

4 Overview of significant historical and contemporary examples of nurseries and kindergartens in Croatia.

5 Urban parameters for selecting locations for primary schools. Pedagogical programmes and their impact on spatial programmes. Spatial-functional characteristics of school buildings and their layouts, analysis of examples.

6 Class-based teaching and associated spaces, typologies, analysis of examples.

7 and 8 Subject-based teaching: language and arts, natural sciences and mathematics, social sciences, elective courses, analysis of examples.

9 Sports hall: single, double, and triple halls with associated spaces and outdoor playgrounds, analysis of examples.

10 Social spaces in schools – integration with the local community, analysis of examples.

11 Other spaces: spaces for work organisation and coordination, facilities management, communication areas, sanitary facilities, analysis of examples.

12 Technical and hygienic requirements: lighting, ventilation, acoustics, heating, fire protection.

13 Overview of significant historical and contemporary examples of schools worldwide.

14 Overview of significant historical and contemporary examples of schools in Croatia.

15 Conclusion, discussion.

Other forms of teaching and knowledge assessment

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Compulsory literature

1 Roth, A., Das neue Schulhaus, Zurich: Verlag fur Architektur (Artemis), 1966.

2 Auf-Franić, H. et al., Upute za programiranje, planiranje i projektiranje dječjih jaslaca i vrtića / Zlatko Karač (ed.). Zagreb: Acta Architectonica, 2003.

3 Auf-Franić, H. et al., Osnovne škole: programiranje, planiranje i projektiranje / Zlatko Karač (ed.). Zagreb : Golden marketing – Tehnička knjiga, 2004.

4 School buildings, The state of affairs, The Swiss Contribution in an International Context, Birkhäuser, 2004.

5 Hertzberger, H., Space and Learning, Lessons in Architecture 3, Rotterdam: 010 Publishers, 2008.

Additional literature

1 Bajbutović, Z.: Arhitektura školske zgrade, Sarajevo: Svjetlost, 1981.

2 Hertzberger, H., Lessons for Students in Architecture, Rotterdam: 010 Publishers, 1993.

3 Hertzberger, H., Space and the Architect, Lessons in Architecture 2, Rotterdam: 010 Publishers, 2000.

4 Dudek, M., Architecture of schools: the new learning environments, Boston: Architectural Press, 2000.

5 Matijević, M., Alternativne škole, Zagreb: Tipex, 2001.

6 Complex Buildings Learning Systems, a+t 50, a+t architecture publishers, 2018.

7 Schools: Concept, Detail 9/2018.

Requirements for obtaining a signature

Regular class attendance.

Type of exam: Written and oral exam.

Learning outcomes of this course

1 Students who complete this course will be able to critically assess the relationship between a social standard architectural structure and the urban or natural surroundings, as well as its social influence.

2 Students who complete this course will be able to develop a programme for a social-purpose architectural structure.

3 Students who complete this course will be able to provide an in-depth explanation of an architectural project using conceptual and technical representations and illustrations, both in writing and orally.

4 Students who complete this course will be able to objectively assess examples of buildings that meet social standards.

Learning outcomes of the study programme

P03, P04, P06, P07, P11, P15

Sustainable Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Alenka Delić
Course associate(s)	Delić
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	1
Field Course (days)	0
ECTS credits	1.0

Framework of course content

Introduction to the fundamental concepts and principles of energy-efficient and ecological approaches to architecture and urban planning, their application in architectural design and the presentation and analysis of recent national and global projects and achievements. The course places particular emphasis on architectural concepts and design.

Development of general and specific competences – knowledge and skills:

The aim of the course is to acquire the necessary knowledge to enable its application in the implementation of professional and research projects in sustainable architecture with high energy efficiency in new construction and renovation, using innovative nanotechnology and natural materials, meeting the requirements of energy self-sufficiency, accessibility, safety and a circular, zero-emission economy in accordance with the requirements of the European Union and the global sustainable development goals of the United Nations by 2030. It also emphasises adaptability to climate change as a basis for preserving the environment and improving sustainability.

Course curriculum

1 ENERGY SOURCES

Global situation and development strategies. Conventional and renewable energy sources and their impact on the protection and improvement of the environment; the concept of sustainable development.

2 ENERGY AND THE ENVIRONMENT

As a starting point and framework within which energy is relevant to architectural and urban design and physical planning.

3 HISTORICAL DEVELOPMENT AND MODERN TECHNOLOGIES

Use of solar energy (both passive and active methods), technology, contemporary achievements, etc.

4 ACTIVE (installation) systems, photovoltaic cells, hybrid

and PASSIVE solar architectural elements and systems, fuel cells (hydrogen technology). From theory of operation to construction and architectural details.

5 BIOCLIMATIC approach to spatial planning, urban planning and architecture PRECONDITIONS: climate, microclimate, geographical features, solar exposure, topographical and other natural and artificial factors. **Architectural physics of buildings – new construction and reconstruction, etc.**

6 ENERGY-RATIONAL, LOW-ENERGY AND ENERGY-EFFICIENT ARCHITECTURE

Definitions, development, indicators, Croatian and EU standards, energy standard of passive houses, etc.

7 PASSIVE SOLAR ARCHITECTURE (PSA)

Specific types; geo-solar, energy-independent, intelligent houses, etc.

8 NATURAL LIGHT – DAYLIGHT

Passive use of solar energy, bioclimatic systems, accumulations, sun protection, etc.

9 CALCULATION, DIMENSIONING, DESIGN AND SIMULATIONS

(manual and CAD simulations). Energy and ecological refurbishment of modern and historical architecture, etc. (computer exercises – seminar)

10 ARCHITECTURE AND ECOLOGY

Ecological approach, permaculture, conventions, protocols, etc.

11 HEALTHY BUILDING

Building biology, material hygiene, invisible environmental influences, etc.

12 NATURE HOUSE

Nature house, wooden architecture (traditional, contemporary), energy efficiency and the environment, etc.

13 MATERIALS

Production of passive solar construction and architectural elements and systems, etc.

14 PREFABRICATION. PSA DESIGN. SOLAR ART

Historical development, style, design of energy-efficient components, trends, etc. (exercises – seminar).

15 HIGH-TECH AND INTELLIGENT ARCHITECTURE

Systems of energy production and self-sufficiency, design, sustainability, etc.

Other forms of teaching and knowledge assessment

Seminar paper

Expert tour of relevant architectural achievements and energy plants

Compulsory literature

1 Sustainable Architecture and Urbanism, D.Gauzin-Müller, Birkhäuser, 2002.

2 Energy in Architecture, The European Passive Solar Handbook, J.R.Goulding, J.O.Lewis, T.Steemers, ECSC-EEC-EAEC, Brussels, Batsford, 1992.

3 Energy Conscious Design, ECSC-EEC-EAEC, Brussels, Batsford, 1992.

4 CEPHEUS - Living Comfort without Heating, H.Krapmeier, E.Drössler, Springer-Verlag, 2001.

5 Solar Energy in Architecture and Urban Planning, T.Herzog, Prestel, 1996.

Additional literature

1 Solar Architecture in Detail, Ch.Schittich (Ed.), Birkhäuser, 2003.

2 Ecologic Architecture, R.L.Crowther, Butterworth Architecture, 1992.

3 Photovoltaics in Architecture, O.Humm, P.Toggweiler, Birkhäuser, 1993.

4 NEP - Nacionalni energetska programi za obnovljive izvore energije (vol I & II), EIHP, Zagreb, 1998–2001

5 Obnovljivi izvori energije, B.Labudović i suradnici, Energetika marketing, d.o.o., Zagreb, 2002.

6 www.arhitekt.hr – permanent Internet exhibition of projects and achievements of course coordinators with bibliography (since 2001)

Requirements for obtaining a signature

Regular class attendance.

Type of exam

Seminar paper

Learning outcomes of this course:

Upon successful completion of this course, the student will be able to:

1 Interpret the concept of sustainability within the discipline of architecture and urban planning;

- 2 Identify the impact of global sustainable development goals and adaptability to climate change in architecture and urban planning;
 - 3 Apply principles of sustainability and energy efficiency through architectural concepts and design;
 - 4 Select innovative technologies, materials, and systems aimed at achieving sustainable architecture with high energy efficiency in new construction and refurbishment;
 - 5 Evaluate architectural solutions in terms of sustainability and energy efficiency standards;
 - 6 Argue architectural concepts based on principles of sustainability and energy efficiency.
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Learning outcomes of the study programme:

P1, P2, P8, P11

Urban Planning 3

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Sanja Gašparović
Course associate(s)	Gašparović
Year of study	Third
Semester of study	Fifth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

General planning ((General) Urban Development Plan) as an instrument of strategic control over the spatial development process of an urban area – Criteria for assessing optimal land use and space utilisation – Elements of urban spatial planning: communication systems, urban environment and city image – Land use plans as instruments for implementing and controlling planning measures and managing urban space.

Development of general and specific competences – knowledge and skills:

The aim is to:

- develop a comprehensive understanding of urban spatial organisation issues;
- develop individual skills in an interdisciplinary planning process;
- learn how to work in urban planning teams;
- to learn from experience in the organisation of urban spatial units.

Course curriculum

- 1 INTRODUCTION – overview of topics, definition of the city, purpose and methods of planning, instruments for protection and spatial development.
- 2 Overview of the development of post-industrial cities through examples of planning in the 20th century and the transition to the new millennium.
- 3 Zagreb – changes in the 19th and 20th centuries – the emergence and growth of the metropolis
- 4 Zoning as a method of urban planning, zoning by land use, zoning by type of intervention.
- 5 Criteria for determining optimal land use – standards for spatial dimensioning.
- 6 Urban rules and regulations – normative urban planning at the service of spatial control.
- 7 Strategic planning and urban management.
- 8 Public and private domains – ownership issues and access regimes.
- 9 Housing and residential forms – densities, housing typologies, social topography, models of organisation and hierarchy.
- 10 Street system as the basis of urban design – networks and traffic hierarchy, parking.
- 11 Integrated systems of public transport organisation.
- 12 Municipal and infrastructure systems – network systems, public spaces, municipal maintenance.
- 13 Urban form as a premise and outcome of the planning process, urban image – perceptual aspects.
- 14 City skyline – emanations of high and low, solitary and clustered buildings – semantics of "landmark" architecture.
- 15 Final lecture – summary.

Other forms of teaching and knowledge assessment

In addition to lectures, students are encouraged to actively monitor urban spatial developments (magazines and daily newspapers) and to read essays about the city. Students are expected to interpret the material they have read by using examples from their own environment. Surveys/tests will be included in the timetable in order to verify the acquisition of the subject.

Compulsory literature

- 1 Prinz, Dieter (2006) *Urbanizam, vol. 1 – Urbanističko planiranje*, Golden marketing, Tehnička knjiga and the Faculty of Architecture, Zagreb, 953-212-216-8., ISBN 953-212-216-8 6.
- 2 Marinović-Uzelac, Ante (1989) *Teorija namjene površina u urbanizmu*, Tehnička knjiga, Zagreb, ISBN 86-7059-036-0
- 3 Vresk, Milan (2002) *Grad i urbanizacija*, Školska knjiga, Zagreb, ISBN 953-0-30865-5
- 4 Lehnerer, Alex (2009) *Grand Urban Rules*, 010 Publishers, Rotterdam, ISBN 978-90-6450-660-6
- 5 Uytengaak, Rudy (2008) *Cities Full of Space – Qualities of Density*, 010 Publishers, Rotterdam, ISBN 978-90-6450-674-1

Additional literature

- 1 Hauptman D. (2001) *Cities in Transition*, 010 Publishers, Rotterdam, ISBN 90-6450-415-6
- 2 Marinović-Uzelac Ante, (2001) *Prostorno planiranje*, Dom i svijet, Zagreb, ISBN 953-6491-49-4
- 3 Oswald, F.; Baccini, P. (2003) *Netzstadt, Designing the Urban*, Birkhauser-Publishers for Architecture, Basel, Boston, Berlin, ISBN 3-7643-6963-9
- 4 Gates, Stout (1997) *The City Reader*, Routledge, London, ISBN 0-415-11900-6
- 5 Knežević, Snješka (2003) *Zagreb u središtu*, Barbat, Zagreb, ISBN 953-181-049-4
- 6 Nan, Elien (2002) *Postmoderni urbanizam*, Orion art, Bakar, Bor, ISBN 96-83305-05-8

Requirements for obtaining a signature

Regular class attendance, submitted tests/surveys.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Written and oral exam.

Learning outcomes of this course

- 1 To identify the social, technical, artistic and economic conditions of the discipline of architecture and urban planning;
- 2 To identify the human, personal and collective state as the fundamental condition of the architectural discipline;
- 3 To critically evaluate the designed or performed architectural and urbanistic solution;
- 4 To be eligible for enrolment in a graduate study programme in the field of architecture and urban planning;
- 5 To support the system of values and ethical principles and to contribute to global civil awareness through a responsible and public architectural act.

Learning outcomes of the study programme P02, P04, P10, P11, P15

SIXTH SEMESTER

Modern and Contemporary Croatian Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	
Course associate(s)	Čavlović; Smode Cvitanović
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

Overview, analysis and interpretation of Croatian architecture of the 20th century.

The lecture system is based on a chronological presentation of anthological works and specific thematic units of Croatian architecture in the 20th century. The lectures provide a factual yet problematised view of the phenomenon of Croatian architecture. Stylistic and expressive peculiarities and thematic areas of architecture will be examined within the socio-political context of the respective time and space, as well as broader European or global aspirations.

Development of general and specific competences – knowledge and skills:

In addition to objective knowledge, students are introduced to the creative initial level of architectural discourse, which is a prerequisite for the development of an authorial creative personality. Architectural works are therefore considered within their initial spatial concepts and realised physical manifestations in a classical synthesis: structure-form-function. The starting points of architectural analysis include not only architectural aspects, but also broader spatial, topographical or urban contexts, stylistic and artistic contexts of the time, indigenous particularities and the position of individual works within the developmental arc of each author.

The acquired material serves as basic knowledge and becomes an architect's reference memory of the Croatian architectural and cultural space.

In this way, architectural works construct a complex picture of contemporary Croatian architecture as a segment of unlimited cultural communication in the discipline of architecture.

The content of the graded seminar paper establishes a link between the teaching process and the scientific project "Atlas of 20th Century Croatian Architecture" through the students' contributions to the creation of a database.

Course curriculum

LECTURES

- 1 Introduction: on the phenomenon of Croatian architecture
- 2 Chronological overview of 20th century Croatian architecture: 1901–1910
- 3 Chronological overview of 20th century Croatian architecture: 1911–1920
- 4 Chronological overview of 20th century Croatian architecture: 1921–1930
- 5 Chronological overview of 20th century Croatian architecture: 1931–1940
- 6 Chronological overview of 20th century Croatian architecture: 1941–1950
- 7 Chronological overview of 20th century Croatian architecture: 1951–1960
- 8 Chronological overview of 20th century Croatian architecture: 1961–1970
- 9 Chronological overview of 20th century Croatian architecture: 1971–1980
- 10 Chronological overview of 20th century Croatian architecture: 1981–1990
- 11 Chronological overview of 20th century Croatian architecture: 1991–2000
- 12 Chronological overview of 20th century Croatian architecture: 2001–2010
- 13 Awareness of the times: current issues, recent debates, exhibitions, awards, field visits, etc.
- 14 Resources; literature; insight into the scientific project "Atlas of 20th Century Croatian Architecture"
- 15 About the exam and the seminar paper

Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 Mimica V., Mrduljaš M., Rusan A (2007), *Suvremena hrvatska arhitektura – testiranje stvarnosti - Contemporary Croatian Architecture – Testing Reality*, Arhitekst, Zagreb
- 2 Odak, T. (2006), *Hrvatska arhitektura dvadesetog stoljeća – neostvoreni projekti*, Studio forma urbis, UPI-2M Plus, Zagreb
- 3 Premerl, T. (1989), *Hrvatska moderna arhitektura između dva rata*, Nakladni zavod Matice hrvatske, Zagreb
- 4 Šegvić, N. (1950), *Stvaralačke komponente arhitekture FNRJ, Urbanizam i arhitektura*, IV (5-6): 5–40, Zagreb
- 5 Uchytel, A., Barišić Marenčić, Z., Kahrović, E. (2009), *Leksikon arhitekata Atlasa hrvatske arhitekture XX. stoljeća*, Arhitektonski fakultet Sveučilišta u Zagrebu, Zagreb
- 6 *** (1976), *Arhitektura*, XXX (156-157), Zagreb
- Domljan, Žarko: *Hrvatska arhitektura na prijelazu stoljeća*, pp. 5–11
- Premerl, Tomislav: *Hrvatska moderna arhitektura između dva rata*, pp. 12–40
- Premerl, Tomislav: *Pobjeda moderne*, pp. 41–54
- Čorak, Željka: *Odlomci o genezi modernizma*, pp. 55–64
- Kečkemet, Duško: *Moderna arhitektura u Dalmaciji*, pp. 65–79
- Kolacio, Zdenko: *Međuratna arhitektura Rijeke i Sušaka*, pp. 80–84
- Venturini, Darko: *Zvezdane godine stambene izgradnje*, pp. 85–95
- Salopek, Davor: *Kontinuitet zavičajnog prostora*, pp. 96–99
- Maroević, Ivo: *Odnos zagrebačke moderne arhitekture prema naslijeđenom prostoru*, pp. 108–115
- ... *Razgovor s protagonistima moderne*, pp. 116–128
- 7 *** (1986), *Arhitektura – ARHITEKTURA U HRVATSKOJ 1945-1985*, XXXIX (196-199), Zagreb
- Mikac, N. (1986), *Prema „novoj figuraciji“ u hrvatskoj arhitekturi, „Arhitektura“ – Arhitektura u Hrvatskoj 1945-1985*, XXXIX (196-199): 22-26, Zagreb
- Magaš, Boris: *Saznanja i mogućnosti teorijske misli*, pp. 27–30
- Odak, Tomislav: *Hrvatska arhitektonska alternativa 1945-1985*, pp. 31–101
- Šegvić, Neven: *Stanje stvari – jedno viđenje, 1945-1985*, pp. 118–280
- 8 *** (1998), *Arhitektura – ARHITEKTURA 1947-1997*, LI (214), Zagreb
- Miščević, Radovan: *Prema antologiji hrvatskog urbanizma i prostornog planiranja*, pp. 8–22
- Ivanišin, Krunoslav: *O nekim teoretskim postavkama iznesenim na stranicama časopisa Arhitektura od 1947. do danas*, pp. 23–32
- Polak, Nikola: *Strogost moderniteta*, pp. 33–46
- Maroević, Ivo: *Arhitektura sedamdesetih u Hrvatskoj*, pp. 47–51
- Polak, Nikola: *Hrvatska arhitektura osamdesetih*, pp. 52–65
- Špirić, Emil; Ivanišin, Krunoslav: *Forme, matrice, ljudi*, pp. 82–151
- Rogina, Krešimir: *Nabori hrvatske arhitektonske misli*, pp. 178–181
- 9 *** (2009), *Smjernice za studiranje hrvatske arhitekture 20. stoljeća*, HA 20 Kronološki pregled 1901.-2000., repository-library

Additional literature

- 1 *** (2009), *Smjernice za studiranje hrvatske arhitekture 20. stoljeća*, Arhitekti, repository-library
- 2 *** (2009), *Smjernice za studiranje hrvatske arhitekture 20. stoljeća*, Literatura, repository-library

Requirements for obtaining a signature

Regular class attendance.

Type of exam:

Oral exam and seminar paper. / Registration for the exam in the Lecturers' Office No 409. Exams are usually held every week.

Learning outcomes of this course

- 1 Evaluate the achievements of the discipline of architecture within the wider cultural, social and political context of their origins.
- 2 Identify the principles of architectural activity within the corpus of Croatian modern and contemporary architecture.
- 3 Analyse instructive examples of architectural production with the aim of identifying and understanding their essential determinants and conditions of creation.
- 4 Demonstrate and apply the identified essential determinants and architectural procedures in one's own architectural activity.
- 5 Explain and understand the architectural settings of Croatian modern and contemporary architecture in the international context.
- 6 Select prominent architectural examples from the corpus of Croatian architecture that are important for contemporary architectural practice.
- 7 Collect, research and interpret data for the evaluation of architectural work.

Learning outcomes of the study programme P02, P03, P04, P05, P11, P13, P15

Introduction to the Theory of Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Karin Šerman
Course associate(s)	Šerman
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

This course presents a set of elements and parameters that govern, condition and guide architectural action and thought. It examines the inherent and deeply specific tools, principles, methods, strategies, modes of thought and operations of the architectural discipline, while also highlighting its necessary relationships and interactions with other spheres of cultural production. This theme is explored through a selection of examples.

Topics covered include the relationship between architecture and art (the relationship between artistic and utilitarian objects, along with related issues of self-sufficiency and utility); the laws governing artistic works; the complexity of the relationship between function, construction and form; the relationship between tectonics and stereotomy; themes of material, type, place, ornament and proportion; the problem of perception and experience; spatial laws and authorities; theories of composition; and more.

Development of general and specific competences – knowledge and skills:

The aim of this course is to familiarise students with the multifaceted complexity of the discipline of architecture and to master and appropriately re-evaluate its deeply specific principles, tools, strategies, ways of thinking and working. This approach allows for an understanding of architecture as an autonomous, unique spatial discipline that is at the same time necessarily linked to a number of key external determinants and influences that together open the way to its true understanding and practice.

Course curriculum:

- 1 On architectural theory: theory as mediation practice
 - 2 Architecture and the socio-historical context 1: Modernism and the shock of modernity. Example: Mies van der Rohe, glass skyscraper project in Friedrichstrasse, Berlin, 1922
 - 3 Architecture and the socio-historical context 2: Architecture as comfort, illusion, myth? Example: P. Behrens, AEG Turbine Factory, Berlin, 1909, and the ideological foundation of Deutscher Werkbund
 - 4 Architecture and the socio-historical context 3: Abstraction vs. rhetoric in architecture. Example: G. Terragni, Casa del Fascio, Como, 1932–36
 - 5 Architecture and the socio-historical context 4: The problem of systematising architectural language, the problem of reference. Example: G. Terragni, the Danteum Project, Rome, 1938
 - 6 Architecture and the socio-historical context 5: The structuring of architectural language as a disciplinary, operational and socially cohesive apparatus; the theme of type and typology; the theme of symbols. Example: Le Corbusier and the Villa Savoye, Poissy, 1928–29
 - 7 Architecture and the socio-historical context 6: "Architecture or revolution" – the question of architecture's potential as an adequate means of social engagement. Example: Le Corbusier and Towards a New Architecture, 1923
 - 8 Architecture and art 1: Architecture within the broader context of artistic creation. Example: Debate between Le Corbusier and Hannes Meyer and the positions of Neue Sachlichkeit
 - 9 Architecture and art 2: Discussion on positions, tasks, and roles of art: I. Kant, A. Schopenhauer, S. Kierkegaard, L. Tolstoy, W. Benjamin, M. Heidegger
 - 10 Architecture and art 3: The task and role of art: L. Wittgenstein and language analysis, and the consequences of these insights for understanding the role and task of art. Tractatus Logico-Philosophicus, 1919, and the house at Kundmannsgasse 19, Vienna, 1929
 - 11 Architecture and art 4: A. Loos and the critique of ornament and the problem of the idea of "applied art".
 - 12 Architecture and art 5: Architecture as a model of truth. Example: "Loos' Deconstruction" – Architecture as a "frame of life" and the logic of structuring Loos' spatial system.
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Other forms of teaching and knowledge assessment

Regular attendance at lectures and engagement with supplementary literature, active participation in discussions.

Compulsory literature

- 1 Kenneth Frampton, Moderna arhitektura: kritička povijest, Zagreb: Globus, 1992, selected chapters.
 - 2 Bruno Zevi, Povijest moderne arhitekture I i II, Zagreb, Golden marketing & Faculty of Architecture at the University of Zagreb, Zagreb, 2006 and 2010, selected chapters.
 - 3 Le Corbusier, K pravoj arhitekturi (Vers une Architecture, 1923), Građevinska knjiga, Belgrade.
 - 4 Adolf Loos, Ornament i zločin, Meandar, Zagreb, 2003
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Additional literature

- 1 Terry Eagleton, The Significance of Theory (Oxford: Blackwell, 1990).
 - 2 K. Michael Hays, "Critical Architecture: Between Culture and Form", Perspecta 21 (Cambridge: MIT Press, 1984).
 - 3 Georg Simmel, "The Metropolis and Mental Life", u The Sociology of Georg Simmel, New York, 1950.
 - 4 Thomas L. Schumacher, Terragni e il Danteum (Officina Edizioni, Rome, 1983).
 - 5 Manfredo Tafuri, "Giuseppe Terragni: Subject and the Mask", Oppositions 11 (winter 1977).
-

Requirements for obtaining a signature:

Regular attendance at lectures and proficiency in the prescribed literature.

Type of exam

Oral.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- differentiate the fundamental ideas and movements in the theory of architecture;
 - identify the elements that condition and direct architectural thought;
 - identify the conditioning of architecture by a range of external determinants and influences;
 - demonstrate the common grounds of architecture and art;
 - identify the specificities of the architectural discipline in relation to artistic action;
 - justify architectural solutions from the perspective of architectural theory.
-

Learning outcomes of the study programme

P03, P04, P11, P14, P15

Architecture in Croatian Regions – Istria

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Alan Braun
Course associate(s)	Braun; Bačić; Husnjak; Latin; Tadej
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	3
ECTS credits	1.0

Framework of course content

Field trip to Istria and historical Liburnia to familiarise students with a specific cultural area formed at the intersection of the Mediterranean and Central Europe. Students will be introduced on site to the urban and architectural heritage of Istria and Kvarner, as well as contemporary issues related to planning and construction in tourism.

Development of general and specific competences – knowledge and skills:

The field course as an educational method enables direct observation of cities and buildings in their actual environment. Students will explore the phenomenon of the Istrian and coastal region from the perspective of spatial-historical development, architectural and cultural heritage and contemporary planning and construction. The course includes the study of the peculiarities of the protection and restoration of the architectural heritage.

Course curriculum

Introductory lectures

1 Spatial-Historical Development of Istria and Liburnia (Kvarner)

2 Architectural Heritage of Istria and Kvarner

3 Tourist Development and Land Use in Istria and Kvarner

4 Contemporary Construction in Istria and Kvarner

Guided Tour

Day 1: Trsat – Rijeka – Motovun – Novigrad

Day 2: Poreč – Sveti Lovreč Pazenatički – Dvigrad – Rovinj – Bale

Day 3: Pula – Svetvinčenat – Beram – Pazin – Gračišće – Raša – Labin – Mošćenice

Other forms of teaching and knowledge assessment

Students who take part in the field course during the tour make notes and drawings which they hand in at the end of the guided tour. Students who do not take part in the field course will prepare a seminar paper on a topic agreed with the course coordinator.

Compulsory literature

- 1 Braun, A., Vidović, T. (2016), Hrvatski prostor i arhitektura – Istra, vodič za terensku nastavu, Faculty of Architecture, Zagreb
- 2 *** (1995), Enciklopedija hrvatske umjetnosti, 1-2, LZ «Miroslav Krleža», Zagreb (selected chapters)
- 3 *** (2005), Istarska enciklopedija, LZ «Miroslav Krleža», Zagreb (selected chapters)

Additional literature

- 1 Marković, V. (2004), Crkve 17. i 18. stoljeća u Istri – tipologija i stil, Institute of Art History, Zagreb
 - 2 Mohorovičić, A. (2004.), Istarski limes, 1-2, (ed. A. Mutnjaković), Čakavski sabor, Žminj
 - 3 Travirka, A. (2001), Istra, Forum, Zadar
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Requirements for obtaining a signature

Students who take part in the field course: regular class attendance and submitted review – an essay with a field diary.

Students who do not take part in the field course: submitted seminar paper.

Type of exam (written and/or oral / seminar paper / passed test, etc.)

Seminar paper

Learning outcomes of this course:

A student completing this course will be able to:

- 1 List and describe the most important historical and modern architectural achievements in Istria;
 - 2 Understand the genesis of the visited historical and contemporary architectural achievements;
 - 3 Present the basic spatial qualities of the visited historical and contemporary architectural works;
 - 4 Draw/sketch basic spatial features of the architectural works visited.
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Learning outcomes of the study programme

P02, P05, P11, P13

Planning and Project Management 2

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Dubravko Bačić
Course associate(s)	Bačić
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1

Framework of course content

Investing, designing, building. Project life cycle. History of the architectural profession. Practice and management of an architectural office. Participants in building. Project documentation and building regulations. Contractual relations in building. Project management and organisation. Plans and planning levels. Methods of planning the building process. Time and network schedules. Development of working techniques and technologies. Characteristics and principles of construction production. Construction site – characteristics, organisation, regulations, work execution, occupational health and safety. Cost structure in high-rise building construction. Construction costs.

Development of general and specific competences – knowledge and skills:

The objective of this course is to acquire the fundamental knowledge and skills in the field of construction planning and organisation. The course covers the scope of work and responsibilities of those involved in construction, the preparation of project technical documentation and obtaining building permits, methods of estimating, calculating and controlling costs, the preparation of time and network plans, site organisation, as well as the supervision and control of execution. Students will acquire the basic knowledge necessary to manage a project as an individual, non-routine, unique and non-repetitive endeavour in changing and/or unpredictable circumstances. The course emphasises an integrated approach to project preparation and the technical-technological realisation of buildings.

Course curriculum

16. Project – meaning and definitions of the term. Project life cycle.
17. History of the profession: from master builders to architect managers.
18. Architect and business practice.
19. Participants in construction (according to the Construction Act).
20. Construction regulations (types and content of projects, obtaining building permits).
21. Contractual relations in building.
22. Project management.
23. Scheduling.
24. History and organisation of work.
25. Techniques and technologies in construction.
26. Construction site (1)– characteristics, organisation, regulations, occupational health and safety.
27. Construction site (2) – work execution.
28. Cost structure in high-rise building construction.
29. Construction costs.
30. Guided visit to a construction site.

Other forms of teaching and knowledge assessment

Guided visit to a construction site, discussion, written and oral exam.

Compulsory literature

8. Bačić, D. (2024). *Planiranje i organizacija građenja (script)*. Zagreb: Faculty of Architecture
9. Bielefeld, B., ed. (2013). *Basics Project Management Architecture*. Basel: Birkhäuser
10. Orešković, M.; Bandić, M. (2015). *Projektni menadžment u graditeljstvu*. Zagreb: Hrvatska sveučilišna naklada; Zagreb University of Applied Sciences
11. Radujković, M. et al. (2015). *Organizacija građenja*. Zagreb: Faculty of Civil Engineering
12. *Posebne uzance o građenju*. Narodne novine 137/2021

Additional literature

6. Allinson, K. (1997). *Getting There by Design: An Architect's Guide to Design and Project Management*. London: Routledge
7. Becker, P. (2019). *Basics Project Control*. Basel: Birkhäuser
8. Bielefeld, B., ed. (2018). *Basics Building Contract*. Basel: Birkhäuser
9. Kieran, S.; Timberlake, J. (2003). *Refabricating Architecture: How Manufacturing Methodologies are Poised to Transform Building Construction*. New York: McGraw Hill
10. Menz, S., ed. (2014). *Drei Bücher über den Bauprozess*. Zürich: vdf Hochschulvlg
11. Wellner, K.; Scholz, S., ed. (2023). *Architekturpraxis Bauökonomie: Grundlagenwissen für die Planungs-, Bau- und Nutzungsphase sowie Wirtschaftlichkeit im Planungsbüro* (3rd edition). Wiesbaden: Springer Vieweg
12. *** (2021). *The Standard for Project Management and a Guide to the Project Management Body of Knowledge – PMBOK guide* (7th edition). Newtown Square: Project Management Institute

Requirements for obtaining a signature

Regular class attendance

Type of exam

Written and oral exam.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

1. Break down all phases of the project life cycle.
2. Categorise the key factors and stakeholders that influence the project cycle and distinguish their responsibilities and interrelationships.
3. Assess the specificity of a project in a given context (social, technological, legislative, procedural, business, organisational, economic, cultural, etc.).
4. Apply construction regulation provisions to successfully organise and implement a project as an endeavour.
5. Analyse, evaluate, and propose appropriate project planning tools and techniques.
6. Differentiate and interpret types of plans: static vs. dynamic; linear (Gantt chart, histogram, cycle chart, orthogonal) vs. network (arrow, node).
7. Create a schedule (Gantt chart) for a construction project of low to medium complexity and estimate the duration of execution.
8. Categorise, evaluate and analyse the total construction costs for a project of low to medium complexity.
9. Calculate the costs of project-technical documentation by types and levels (phases) of elaboration (especially the value of the architectural project) for a project of low to medium complexity.
10. Estimate construction costs (execution of construction and craft works) for a project of low to medium complexity.

Learning outcomes of the study programme

P03, P06, P07, P08, P10, P14, P16

Design Studio IV – Architecture

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Vesna Mikić
Course associate(s)	Mikić; Filep; Franić; Geng; Ivanišin; Kostrenčić; Plavec; Porto; Prpić; Turato; Vulin Ileković
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	11
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	10.0

Framework of course content

The content of Design Studio IV focuses on an office, commercial or multifunctional building within a smaller urban whole.

Development of general and specific competences – knowledge and skills:

Design Studio IV – Architecture integrates the knowledge acquired during the undergraduate programme. Its core is the project itself – the architecture of the building in its immediate physical environment.

Design Studio IV – Architecture places methodological emphasis on the phases of design, from programming and functional organisation, typological analysis, analysis of technological processes, application of ergonomic principles, enhancement of visual, aesthetic and sensory qualities in the urban and natural environment, to spatial composition and materialisation of the work, public or mixed-use building project. Moving from the general to the specific, it simulates a complete architectural design process within a design office, alongside exercises in navigating the regulatory environment. Students are introduced to issues of place and space, form and volume, technology and materials, to integrate acquired skills and knowledge from the pragmatic to the theoretical, while developing an attitude towards professional ethics and the social purpose of architecture.

Course curriculum:

Other forms of teaching and knowledge assessment:

Project assignments, seminar papers, field work, presentations, project defence.

Compulsory literature

Recent reviews in the field of architecture and urban planning (journals and monographs).

Additional literature

Literature listed in the courses that thematically accompany the work in the Design Studio course.

Requirements for obtaining a signature:

Regular class attendance and successful defence of the design solution.

Type of exam: Students' knowledge is assessed through successfully completed practical assignments.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- explore the assigned design assignment;
- select information and criteria essential for development of the work, public and mixed-use project;
- based on research results, propose an urban architectural preliminary design according to the given project programme, meeting technical and aesthetic requirements, with a medium level of complexity in the specified context;
- apply the knowledge gained from related courses;
- express their visual and technical culture through the use of tools for presenting work, public and mixed-use architectural and planning project;
- present the project graphically, textually, and verbally;
- design an architectural and urban preliminary design of medium complexity;
- integrate urban, architectural and technical elements into the integrity of the project through design.

Learning outcomes of the study programme

P1, P2, P3, P4, P5, P6, P7, P8, P12, P13, P16

Design Studio IV – Physical Planning

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Sanja Gašparović
Course associate(s)	Gašparović; Ivanković; Karač; Mravunac Sužnjević; Mrđa; Rukavina; Zaninović; Žunić
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	4
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	4.0

Framework of course content

The content of this course involves a systematic and comprehensive study of the factors influencing spatial development within a city or settlement. Emphasis is placed on understanding the multidisciplinary planning process, which requires the integration of spatial data from different disciplines (professions), its spatial representation (mapping), evaluation of its significance for future development and creative interpretation.

The focus is on urban research into potential development scenarios for larger, unconsolidated (fringe) parts of the city/settlement that are expected to undergo significant change. The task is to assess the possibilities for their development while preserving the distinctiveness of the space and maintaining environmental quality and to propose a concept for future development. The work for this course can be divided into three main stages: analysis; problem synthesis and conceptual programme (in a scale of 1 : 10 000).

Development of general and specific competences – knowledge and skills:

The course encourages viewing urban/physical planning design as a complex interdisciplinary process.

It develops methods and techniques necessary for understanding large-scale spaces (the city/settlement as a whole) – their functioning and the interrelationships between individual parts.

Students deepen their knowledge of urban space management, planning procedures and controlled development measures.

Students will be trained to collect, systematise, analyse and evaluate spatial data of different types and categories.

They will master methods of systematic (scientific) research.

Students will be able to interpret spatial data logically and creatively, to draw conclusions about the limitations and opportunities of spatial development and to propose scenarios for future development.

Course curriculum

1 Introductory explanation of the assignment, division into subgroups and individual assignments 2. Analysis of reference examples as a method for developing one's own assignment and setting goals 3. Analysis of the current state and historical plans 4. Analysis of physical planning documentation 5. Individual work with consultations 6. Presentation of the results of urban analyses at the group level – creation of a joint Reader 7. Instructions for continuing with the assignment and division of responsibilities for individual continuation 8. Individual work with consultations 9. Individual work with consultations 9. Presentation of the concept – individual solutions 11. Verification of urban planning assumptions on site – fieldwork 12. Individual work with consultations 13. Individual work with consultations 14. Presentation of selected seminar papers at the generation level 15. Public presentation of selected works

Other forms of teaching and knowledge assessment

Exercise work includes field visits, field surveys, field tests, etc. As part of the curriculum, guest lectures or round tables with experts familiar with the topic of the assignment or experts in the field are planned.

Compulsory literature

Trade journals (articles and projects related to the assignment in question). Archival documentation relevant to the specific assignment. Physical planning documents. Laws and regulations.

Additional literature

Trade journals (articles and projects related to the assignment in question), archival documentation relevant to the specific assignment

Requirements for obtaining a signature

Regular class attendance, participation in presentations and submission and oral elaboration of the program at the end of the semester.

Type of exam

The programme is graded on the basis of the sum of the grades of the work during the semester, the quality of the submitted study and the persuasiveness of the oral presentation.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- differentiate between various levels of spatial planning documentation (by content and application);
- apply knowledge of relevant codes, regulations and standards in planning;
- select spatial information and criteria essential for determining the starting points of spatial development (possibilities and limitations);
- demonstrate proficiency in using GIS and other tools necessary for developing urban solutions;
- propose a scenario/programme for the spatial development of the specified area;
- create elements of spatial planning documentation at the level of physical plans and general urban plans.

Learning outcomes of the study programme

P03, P07, P12

Design Studio IV – Architectural Structures

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Coordinator: Marin Binički
Course associate(s)	Binički; Cvitanović; Duplančić; Mandić; Mrinjek Kliska; Muraj; Ostojić; Pavlović; Protić; Šneler; Užarević Andrić; Galić; Turčić; Stepinac; Vukić Abrashi; Prodan Abramović; Rengel
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	0
Exercises (hours per week)	6
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	6.0

Framework of course content

This course involves the elaboration of a preliminary design (developed in the third semester: Design Studio III – Architectural Structures and the preparation of the main project and detailed design for a functionally simple building. It includes the definition and elaboration of the load-bearing structure, building elements, building components and installation equipment. It also focuses on determining the thermal insulation properties of components and the energy performance of the building.

Development of general and specific competences – knowledge and skills:

Students will be familiarised with the process of developing a preliminary design from the main project to the detailed design. After confirming the correctness of the selected subsystems (Design Studio III – Architectural Structures – Preliminary Design), students will elaborate the application of the selected subsystems in their own projects and produce a final calculation for the selected system components. The course provides an understanding of the complexities involved in project development, preparation of project documentation and construction using their own project as an example.

Students will present their projects (in phases), explaining any changes that have occurred in the application of the selected subsystems from the preliminary to the detailed design phase. Teamwork will be emphasised, with groups of 3 to 5 students.

Course curriculum

1 Definition of technical solutions for the building / determination of layers of external and partitioning components, verification of u-values / determination of specific building details to be worked out / final definition of the static system of the structure / definition of ventilation methods for individual spaces / estimation of dimensions for forced ventilation elements. 2 Determination of specific building details for elaboration / preliminary calculation of energy consumption / analysis of loads on roofs and ceilings per m² and how these are transferred to linear elements / basic proofing and sizing of primary structural elements. 3 Final calculations of energy consumption in EnCert3 and defined areas for photovoltaic systems / lecture on installation concept: Elements of thermo-technical installations in interiors / Definition of parameters necessary for installations. 4 Detailing of all specific details (sketches) / sketches of specific details of the load-bearing structure / selection of elements for thermo-technical systems in the interior / water supply and drainage. 5 Main project + detailed design / drawing all detailed plans with corrections according to specific layers of structures and defined dimensions of construction elements / fire protection measures / formwork plan / main load-bearing structure with dimensions and all measures / lighting. 6 – 8 Drawing of all detailed plans / harmonisation of architectural, structural and installation elements / representation of thermal and cooling equipment, air-conditioning machines. 8 – 13 Main project + detailed design / drawing and finishing of all architectural, structural and installation projects. 14 Submission and presentation of the project. 15 Preparation of projects for exhibition / exhibition setup.

Other forms of teaching and knowledge assessment

Regular class attendance, successfully presented and defended project.

Monitoring student work through project assignments.

Knowledge is assessed on the basis of the project from the Engineering Studio and final examination encompassing all courses from the Technical Module that contribute to this course.

Compulsory literature

Recent reviews in the field of architecture and urban planning (journals and monographs).

Additional literature

Literature listed in the courses that thematically accompany the work in the Design Studio course.

- 1 Siegel: Detail Buch, Band 1, Deutsche Verlag-Anstalt GmbH, Stuttgart, 1999.
- 2 Siegel, Linsler: Detail Buch, Band 2, Deutsche Verlag-Anstalt GmbH, Stuttgart, 2002.
- 3 Herzog, Kripner, Lang: Facade Construction Manual, Edition Detail, Munich, 2004.
- 4 Deplazes, Architektur konstruieren: Vom Rohmaterial zum Bauwerk. Ein Handbuch, 2. Auflage, Birkhauser, Basel, 2005.
- 5 Braun, Birk, Heilmeyer: Detail Buch, Band 3, Konradin Medien GmbH, Stuttgart, 2005
- 6 Schittich, Staib, Balkow, Schuler, Sobek, Glass Construction Manual, 2nd edition, Birkhauser, Basel, 2007.
- 7 Phillips, Yamashita: Detail in Contemporary Concrete Architecture, Laurence King Publishing, London, 2012.
- 8 McLeod: Detail in Contemporary Timber Architecture, Laurence King Publishing, London, 2015.
- 9 Detail magazine, Institut für Internationale Architektur-Dokumentation GmbH, Munich
- 10 DBZ magazine, Verlag und Herausgeber; Bauverlag BV GmbH, Gütersloh
- 11 Bauwelt magazine, Verlag und Herausgeber; Bauverlag BV GmbH, Gütersloh

Requirements for obtaining a signature

Regular class attendance and successful defence of the design solution.

Type of exam

Regular class attendance, successfully presented and defended preliminary design.

Monitoring student work through project assignments.

Knowledge will be assessed on the basis of the monitoring of engagement in the development of the preliminary design and the final exam in the presentation of this preliminary design.

Learning outcomes of this course

DS4-AC1 – Propose the use of technologies, technical, installation, transportation, and safety systems for the technical elaboration of architectural solutions in the main project and detailed design stages.

DS4-AC3 – Propose a technically correct solution for building details in line with the architectural concept.

DS4-AC4 – Recommend materials suitable for the architectural solution.

DS4-AC5 – Critically evaluate the technical aspects in terms of the economic feasibility of the designed architectural solution.

DS4-AC6 – Modify architectural solutions according to technical requirements.

DS4-AC7 – Produce technically correct drawings and parts of architectural and other technical documentation for the architectural project.

DS4-AC8 – Integrate different parts of the documentation into a comprehensive project that describes the technically detailed architectural solution.

DS4-AC9 – Justify the choice of technical solutions in the architectural project.

P08, P09, P10

Office and Commercial Buildings

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Vesna Mikić
Course associate(s)	Mikić
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	2
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	2.0

Framework of course content

This course provides specific knowledge and skills in the design of working environments, including office, administrative, retail and multi-functional buildings and centres. The course differentiates the buildings within its scope according to their programme, analyses technological processes and procedures and places the user at the centre of the working environment.

Development of general and specific competences – knowledge and skills:

Students will explore the social, economic, scientific and technological factors that influence the organisation and design of workspaces in administrative and industrial buildings, department stores, retail and multi-functional centres. The course will involve the analysis of workplaces and workspaces in different work processes. Attention will be given to satisfying the visual and aesthetic components alongside the complex physical conditions in the design of the human environment in the working atmosphere and workplace. Definition of a spatial programme. The responsibilities and roles of architects in programming, planning and designing buildings office and commercial buildings. Spatial organisational and structural factors. Scientific, technological, economic and socio-anthropological elements. Modular structuring of space and architectural design patterns. The standards for minimum values and conditions in the design of cellular and large workspaces. The organisational subdivision of office space. Contemporary trends in the planning and design of office buildings. Retail spaces (department stores, shopping and service centres, specialist shops, supermarkets and markets) and their relationship with other functions in multifunctional centres. The development of trade and its impact on the structuring of retail space. Functional space programmes and modern concepts of retail space design. Shopping atmosphere, stimuli and the accumulation of attractiveness. Sales systems. Relationship between the flow of goods and customers and the spatial-functional division of retail space.

The information acquired in the lectures will be applied by the students in their design work in the fifth semester and, according to their choice, in the Project Studio III course, where they will tackle relevant architectural tasks (office building, department store, shopping centre, multifunctional building, urban multifunctional ensemble, etc.).

Course curriculum:

- 1 Historical overview – technological development – factories – innovations – development of structures – iron framework
 - 2 Development of stock exchanges and banks – architecture of world exhibitions – large spans – new aesthetics of structures
 - 3 Futurism – industrialisation – Werkbund – 20th century – sources of new architecture.
 - 4 Modern architecture of business complexes – large systems – megastructures – metabolism – hanging structures – pneumatic architecture – urban expansion – new environments – symbolism and identity of business architecture
 - 5 Workflow schemes in office spaces – durability of structures – workplace elements – development of spatial organisation: cellular – large-space – combined system
 - 6 Zoning of office spaces – positioning cores of communication and installations – examples of spatial organisation
 - 7 New trends in workplace development – new company organisations – territorial office – satellite office – free address workspace – hotel principle – constant changes – telecommunication work – surplus office space in metropolises – architectural challenges
 - 8 Development of business building architecture – integral systems – installation network – management – building intelligence – flexibility – durability – adaptability – intelligent façades
 - 9 Workplace ecology – necessary systems and standard conditions – basic schemes for organising business buildings
 - 10 Universality of structural grids – module – parking and garage spaces
 - 11 Architectural examples – multifunctional complex urban buildings – blocks
 - 12 Generic forms of atrium buildings
 - 13 Development of trade architecture – commerce in urban functions – retail premises – specialised shops – department stores – department stores in urban fabric – parking building issues
 - 14 Urban shopping passages and the development of shopping centres – large regional shopping centres – location theory – planning principles
 - 15 Spatial organisation schemes – architectural examples and characteristics of large shopping centres
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Other forms of teaching and knowledge assessment

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Compulsory literature

- 1 Pevsner, N., A history of building types, Princeton University Press, 1976.
 - 2 Duffy, F., Cave, C., Worthington, J., (editors), Planning office space, The architectural press, London, 1977.
 - 3 Sieverts, E., Bürohaus- und Verwaltungsbau, Kohlhammer, Stuttgart, 1980.
 - 4 Becker, F., Steele, F., Workplace by design, Jossey-Bass Publishers, San Francisco, 1994.
 - 5 Becker, F., The total workplace-facilities management and the elastic organization, Van Nostrand Reinhold, New York, 1990.
 - 6 Architecture for the retail trade - Department stores, Shopping Centers, Arcades, History and Current Tendencies, with a Work Report of RKW Architects, with a contributions by Wolfgang Hocquel et al., Birkhaeuser, Basel, 1996.
 - 7 Project on the city 2, The Harvard Design School, Guide to Shopping, Taschen GmbH, Köln, 2001.
 - 8 Coleman, P., Shopping Environments, Evolution, Planning and Design, Elsevier - Architectural Press, 2006.
 - 9 Van Uffelen, C., Offices, Braun publishing AG, 2010, ISBN 13
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Additional literature

- 1 Frampton, K., Moderna arhitektura - kritička povijest, Globus, Zagreb, 1992.
 - 2 Orlandi, F., Spazio ufficio - Architettura e ambiente di lavoro, Kappa, Roma, 1985.
 - 3 Bedarida, M., Milatović, M., Uffici, Tecniche nuove, Milano, 1992.
 - 4 Cerruti, C., Ambienti e tecnologie, L'Arcaedizioni, 1992.
 - 5 Guglielmi, G., Gli uffici - Il progetto architettonico, La Nuova Italia Scientifica, Roma, 1994.
 - 6 Compagno, A., Intelligent glass facades, Birkhaeuser, Basel, 1995.
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Requirements for obtaining a signature:

Regular class attendance.

Type of exam: Written and oral exam.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- analyse the historical development of functional types;
 - differentiate between types, morphology, and organisation of office and commercial buildings;
 - evaluate significant historical examples of functional types in relation to contemporary architectural solutions;
 - demonstrate an acceptable system of criteria in the preparation of a preliminary urban architectural design for an office and commercial building;
 - critically assess an executed or designed solution for an office/commercial building.
 - produce a preliminary urban architectural design for an office and commercial building;
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Learning outcomes of the study programme

P03, P04, P10, P11, P13

Introduction to Physical Planning

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Damir Krajnik
Course associate(s)	Krajnik
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

Students will become familiar with the types of cartographic bases used in the preparation of different levels of physical planning documents, the methods for carrying out analyses and evaluating the values of the observed and immediate environment/area. Students will gain insight into the types of mandatory steps involved in the preparation of physical planning documents (PPD), as well as the procedures for their adoption and subsequent application. At the end of the lectures, students will be introduced to data processing methods and the values of specific spaces through a short video presentation.

Development of general and specific competences – knowledge and skills:

The aim of this course is to familiarise students with the processes and steps involved in the preparation of physical planning documents, as well as the procedures for collecting factors relevant to the recognition of the observed area, assessing their importance and impact on the environment and the process applied in developing the most appropriate spatial arrangement.

Course curriculum

PHYSICAL PLANNING (lecture topics):

1. SPACE AND PLACE: Elements of the identity of the natural, cultivated and cultural environment.
2. PHYSICAL PLANNING – What is it?
3. PHYSICAL PLANNING DOCUMENTS.
4. PROFESSIONAL METHODOLOGY FOR PREPARING A PHYSICAL PLAN OF A CITY OR MUNICIPALITY – part I.
5. PROFESSIONAL METHODOLOGY FOR PREPARING A PHYSICAL PLAN OF A CITY OR MUNICIPALITY – part II.
6. FILM (AutoCAD Map 2012)

Other forms of teaching and knowledge assessment

The written exam is designed to test knowledge of the first part of the course – LEGISLATION, while the oral exam is designed to test knowledge of PHYSICAL PLANNING and the application of the legislation.

Compulsory literature

University handbook: **UVOD u zakonodavstvo prostornog uređenja**, PPT lectures, film

Additional literature

The full text of the laws and regulations mentioned in the course that can be found on the Official Gazette website (www.nn.hr).

Requirements for obtaining a signature

Regular class attendance.

Type of exam

Written exam in legislation and oral exam in physical planning.

Learning outcomes of this course:

- Identify the type of physical planning documentation.
 - Connect different levels and types of physical planning documents and UNDERSTAND their interrelationships.
 - Apply procedures and steps in the preparation of physical planning documents.
 - Utilize acquired knowledge in writing provisions for implementation as the operational part of the adopted PPD.
 - Differentiate between types and scales of various physical planning documents.
 - Identify potential procedures in the preparation of specific PPDs in relation to the broader area where the plan's scope is located.
 - Critically evaluate the natural and cultural environment as the basis for the preparation of PPDs.
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Learning outcomes of the study programme:

P10, P15, P16

Architecture and Urban Planning Legislation

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Damir Krajnik
Course associate(s)	Krajnik
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

This course presents specific parts of relevant legislative documents and the possibilities and necessities of their interconnection in the preparation of architectural or urban planning solutions.

Development of general and specific competences – knowledge and skills:

The aim of this course is to familiarise students with the basic legislative documents that are essential for the preparation of legally required architectural, urban and spatial planning documentation. By becoming familiar with the individual legislative documents, students will be able to identify which architectural or urban planning document falls under a particular legislative framework.

Course curriculum

LEGISLATION (legislative acts/documents):

- 01 Construction Act;
- 02 Act on Physical Planning and Building Tasks and Activities;
- 03 Act on the Chamber of Architects and Chambers of Engineers in Construction and Physical Planning;
- 04 Ordinance on professional examination of persons performing construction and physical planning tasks;
- 05 Ordinance on the Mandatory Content and Format of Construction Work Designs;
- 06 Ordinance on Simple Construction Works and Works;
- 07 Ordinance on the Manner of Performing Building Surveillance;
- 08 Ordinance on the Final Inspection of Construction Works;
- 09 Fire Protection Act;
- 10 Ordinance on the Classification of Construction Works into Groups according to the Complexity of Fire Protection Measures;
- 11 Ordinance on Requirements for Fire Access;
- 12 Ordinance on Fire Resistance and Other Requirements that Buildings Must Meet in Case of Fire;
- 13 Ordinance on Ensuring Access to Construction Works for Disabled Persons and to Persons with Reduced Mobility;
- 14 Act on Property and Other Real Rights;
- 15 Water Act;
- 16 Roads Act;
- 17 Maritime Code;
- 18 Maritime Domain and Seaports Act;
- 19 Ordinance on Classification and Categorization of Nautical Tourism Ports;
- 20 Regulation on Types of Seaside Beaches;
- 21 Act on Cemeteries;
- 22 Ordinance on Cemeteries;
- 23 Nature Protection Act;
- 23 Act on Protection and Preservation of Cultural Goods.

Other forms of teaching and knowledge assessment

Test, written and oral exam.

Compulsory literature

University handbook *UVOD u zakonodavstvo prostornog uređenja*, PPT lectures, film

Additional literature

The full text of the relevant laws and regulations that can be found on the Official Gazette website (www.nn.hr).

Requirements for obtaining a signature

Regular class attendance.

Type of exam

Written and oral exam.

Learning outcomes of this course:

- recognise the legislative conditions and the necessary level of preparation for architectural or urban planning solutions;
 - identify the impact of specific legislative regulations on architectural and/or urban planning solutions;
 - evaluate the provisions of individual legislative documents in relation to the project programme;
 - select laws for further study concerning the type of architectural or urban planning solution.
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Learning outcomes of the study programme:

P10, P15, P16

Landscape Planning

Course status (compulsory / elective)	Compulsory
Course lecturer(s)	Sanja Gašparović
Course associate(s)	Gašparović
Year of study	Third
Semester of study	Sixth
Teaching mode	
Lectures (hours per week)	1
Exercises (hours per week)	0
Seminars (hours per week)	0
Field Course (days)	0
ECTS credits	1.0

Framework of course content

This course examines landscape from four fundamental perspectives: recognition, planning, protection and design.

By exploring the basic definition of landscape, its meaning and role in contemporary society and methods of use and management, students will gain insight into the complexities of landscape planning.

By analysing the morphological components of landscapes, indigenous and introduced features and natural and anthropogenic influences on landscape spaces, the course will present the basic methods for analysing landscapes, determining their values and establishing their identities.

An overview of European and Croatian landscape types and an introduction to the objectives of the European Landscape Convention will emphasise the importance of preserving and highlighting landscape diversity in Europe. Contemporary examples of landscape planning will illustrate the importance and role of landscapes in urban and spatial planning, while landscape protection will be addressed through examples of Croatia's most valuable landscape areas (national and nature parks) and by examining the objectives of the Nature Protection Act and the Environmental Protection Act.

The course also covers large-scale interventions in the landscape, such as hydrotechnical works (shoreline management, riverbed modifications, navigable channels, etc.), infrastructure transport routes (motorways, railways), abandoned mineral extraction sites (quarries, pits, coal mines, etc.) or converted industrial areas.

Students will explore contemporary projects at the intersection of landscape, architecture and art, becoming familiar with the concepts of large-scale Land Art interventions that demonstrate the power of artistic design and the possibilities of creating new landscape features or identities within cultural/anthropogenic landscapes.

This course is thematically related to undergraduate courses such as Fundamentals of Physical Planning, Landscape Architecture and Design of Public Urban Spaces, as well as graduate courses such as Physical Planning, Contemporary Landscape Architecture, Application of Materials and Structures in Garden Architecture, Design and Management of Special Landscape Areas, Landscape Recognition and Analysis, History of Landscape Architecture, Protection and Restoration of Historic Gardens, Introduction to Dendrology, Introduction to Phytosociology, Introduction to Ecology and Computer-Aided Landscape Design.

Development of general and specific competences – knowledge and skills:

This course develops knowledge of the value and importance of landscape as one of the key aspects of space and the specific field of landscape planning within the architecture and planning professions. Through lectures, students will develop skills in observing, analysing, evaluating and planning large-scale landscape spaces. They will learn about landscape planning in the context of spatial and urban planning, as well as nature and environmental conservation. Through this course, students will gain an insight into the development of landscape planning and the forms and methods of contemporary design in landscape interventions.

Course curriculum:

- 1 Course introduction
 - 2 Landscape – defining meaning and roles
 - 3 Landscapes and their morphological physiognomy
 - 4 Methods for recognising and analysing landscape features
 - 5 Changes in river landscapes
 - 6 Designing landscapes of large hydrotechnical interventions
 - 7 Designing post-industrial landscapes
 - 8 Designing post-mining landscapes
 - 9 Design landscapes of large infrastructure areas
 - 10 Large parks planning
 - 11 Land Art
 - 12 The role of landscape in urban planning
 - 13 The role of landscape in physical planning
 - 14 Environmental impact studies
 - 15 Protection of natural values
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Other forms of teaching and knowledge assessment

Other than attending lectures, this course does not envisage other forms of teaching.

Compulsory literature

- 1 Bell, Simon (2004) Elements of visual design in the landscape, Spon Press, London, ISBN 978-0-415-32518-9
 - 2 Lorzing, Han (2001) The Nature of Landscape – A Personal Quest, 010 Publischer, Rotterdam, ISBN 90-6450-408-3
 - 3 Marinović-Uzelac, Ante (2001) Prostorno planiranje, Dom i svijet, Zagreb
 - 4 Marsh, William M. (2005) Landscape Planning: Environmental Applications, Univ. of British Columbia, ISBN 0471485837
 - 5 McHarg, Ian (1969) Design with Nature, Natural History Press, New York, ISBN 0-471-11460-X
 - 6 Furlan Zimmermann, Nataša; Salaj, Matija (ed.), (1999) Krajolik: sadržajna i metodska podloga krajobrazne osnove Hrvatske, Ministry of Physical Planning, Construction, and State Assets, Department of Physical Planning, Zagreb, ISBN 953-97403-2-0
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Additional literature

- 1 Baal-Teshuva, Jakob (1995) Christo & Jeanne – Claude, Taschen, New York, ISBN 3-8228-8884-2
 - 2 Higuchi, Tadahiko (1983), The Visual and Spatial Structures of Landscapes, MIT Press, Cambridge, ISBN-10 0-262-58094-2
 - 3 Pedroli, Baas (2007.) Europe's living landscapes, KNNV Publishing, ISBN-13 9789050112581
 - 4 Rosell, Quim (2001) Afterwards, Gustavo Gili, Barcelona, ISBN-10 8425218136
 - 5 Selman, Paul H. (2006) Planning at the Landscape Scale, Routledge, ISBN 9780415351416
 - 6 Tress, Bärbel (2006) From landscape research to landscape planning: Aspects of integration, education & application, UR Frontis series, Wageningen, ISBN 1402039794
 - 7 Turner, Tom (1998) Landscape planning and environmental impact design, UCL, ISBN 978-1-85728-322-8
 - 8 Weilacher, Udo (1999) Between Landscape Architecture and Land Art, Birkhäuser
 9. *** (1999) Pregled stanja biološke i krajobrazne raznolikosti Hrvatske sa strategijom i akcijskim planovima zaštite, State Institute for Nature and Environmental Protection, Zagreb
- Journals: Topos - European Landscape Magazin (www.topos.de), JoLA – Journal of Landscape Architecture (www.info-jola.de),
Landscape and Urban Planning – An International Journal of Landscape Ecology, Planning and Design
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Requirements for obtaining a signature

Regular class attendance.

Type of exam

Written and/or oral exam.

Learning outcomes of this course

Upon successful completion of this course, the student will be able to:

- 1 define the meaning and role of landscapes;
 - 2 distinguish the origin, morphology and characteristics of landscapes;
 - 3 evaluate landscape solutions;
 - 4 explain the purpose and procedures for conducting an environmental impact study;
 - 5 explain the role of landscapes in physical and urban planning.
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Learning outcomes of the study programme

P02, P05, P06, P07, P12, P13