



Enhancing of Heritage Awareness and
Sustainability of Built Environment in
Architectural and Urban Design Higher Education

STATEMENTS



for Teaching through Design
for Sustainability of the Built
Environment and Heritage
Awareness



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INTELLECTUAL OUTPUT 3

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Statements for Teaching through Design for Sustainability of the Built Environment and Heritage Awareness

IO3 lead: Vladan Djokić, Ana Nikezić, UBFA

HERSUS Project leader: Vladan Djokić, UBFA

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HOW TO READ HERSUS VADEMECUM STATEMENTS

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ON TERM AND
AUTHORS

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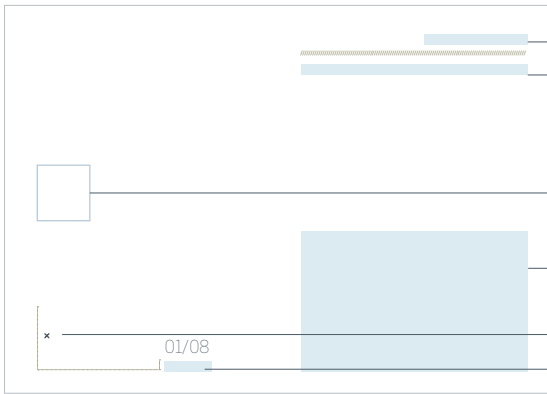
WHAT, HOW, WHY,
BY WHOM TO BE
TOUGHT

3

AT WHAT COURSE
TYPE , WHICH
SCALE AND WHAT
OUTCOMES TO
EXPECT

4

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THEORY AND
PRACTICE

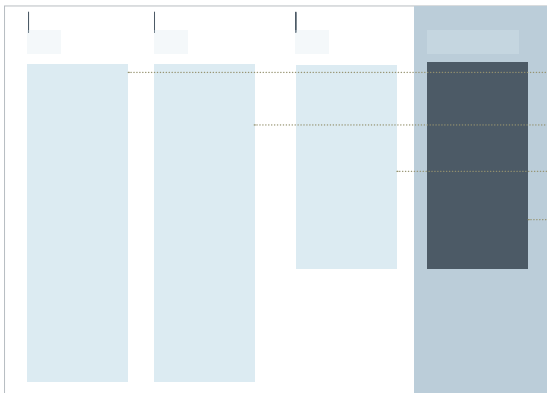


TITLE
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HERSUS PARTNERS LOGO

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AUTHOR/S
TYPE OF TERM

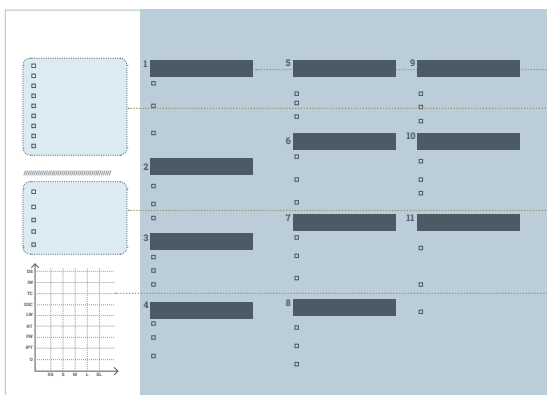


WHAT? CONTENTS

HOW? METHODS

WHY? GOALS

TEACHING COMPETENCES



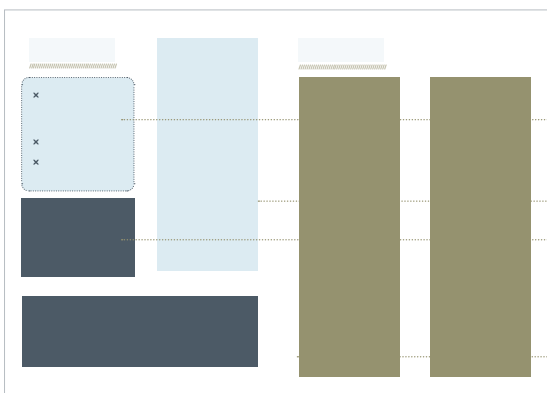
COURSE OUTCOMES

COURSE TYPE

COURSE SCALES

MATRIX - COURSE TYPE IN RELATION TO SCALE

■ □ Checklists



RELEVANT EXAMPLE ID

RELEVANT EXAMPLE EXPLANATION

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KEY REFERENCES

TOOLS

Image Rectification



3D printing



As-Built / As-Found Recording



Space Syntax



Morphogenesis Study



Mapping, Documenting, Cataloguing



Use of GIS Technology



Historic Building Information Modelling - HBIM



Colaborative Cartography



Collaborative workshop - CHARRETTE



Artistic approaches (photography, video, performance)



Heritage Value Matrix



Thermal/Energy Simulation



Lighthing Simulation



(Post)-occupancy evaluation



Petrography Archaeometry



Digitalization of Heritage



Conservation Status Evaluation



UBFA

x

Aleksandra Đorđević

04/19

tools

statements

SPACE SYNTAX



просторна синтакса • *Space Syntax* • Συνακτικό του Χώρου • *Sintaxis del Espacio*

GENERAL DEFINITION/ EXPLANATION



The **Space syntax** emerged in mid 1980s both as a theory of spatial and social systems and method that allows the research of these phenomena offering an understanding of the built environment and social processes. The term refers to the space as a system of syntactic relations, and syntax as a set of rules that determines the way certain elements are composed. It was conceived by Bill Hillier, Julienne Hanson, and members of The Bartlett, University College London. The method is used to decode functionality and structure of the space and to analyze real situations, aiming to answer questions on how and why societies create different spatial organizations / patterns. It enables comparative analysis of buildings and settlements across both space and time, and hence it can be valuable for understanding and demystifying complex layers of historical morphology important for urban design decisions. In education, it offers an evidence-based approach and foundation of the analytical thinking. **Space syntax** method has been used for research in architecture, urban design, urban planning, transport, while recently it becomes relevant as well to archaeology, information technology, urban and human geography, and anthropology.

WHAT?

CONTENT

Having in mind the duality of the **Space Syntax** (a theory and a method), the concept note on the content needs to reflect on three parts:

- (1) Theoretical grounding: Understanding central ideas of the theory of **space syntax** and developing a full theoretical account for how the buildings and settlements we construct are not merely the product of social processes, but also play a role in producing social forms.
- (2) Building specialist ICT skills: applying analytical techniques of spatial modelling and observing human behaviour to construct an evidence-based understanding of the built environment.
- (3) Critical assessing and interpreting the data in the light of other sources and contextual knowledge, providing quantitative and visual descriptions of real case examples.

The course should be concerned with examples of cities/sites/buildings with cultural and historical importance, applying on site and software analysis as a permeating activity during the course, and providing sustainable design solutions based on reflecting thinking.

HOW?

METHODS

The general teaching style should be through action learning and problem based approach. Following previously defined concept note, (1) theoretical grounding should be achieved by critical thinking in a knowledge centered environment (labs, research centers), (2) building specialist ICT skills through the application of **Space syntax** model (fundamental **space syntax** techniques and software, such as convex space analysis, axial or segment-angular spatial network analysis, Visual Graph Analysis (VGA used for the analysis of Integration, Choice and Depth Distance)) but also other complementary technologies such as Geographical Information System (GIS), statistical analysis, behavioural observation techniques and spatio-cognitive analysis, for which interdisciplinary perspective is needed, and (3) analytical phase of the collected data, and providing design solutions and reflections.

The important learning environment should be community centered since the field research needs to be to analyse pedestrian movement at different times of the day and deploy hand-drawing and hand-calculations. Following the IO2 results, the teaching of **Space Syntax** will significantly improve analytical tools and methods that were ranked below average.

WHY?

GOALS

The main goals are concerned with tracing effects of the layout geometry, understanding behaviour and movement patterns in existing heritages cities, sites and buildings, understanding the interdependence between movement and spatial morphology, and providing comprehension of the evolution of settlement morphologies and changes that occurred.

The quantitative descriptions (visual and numerical) of urban street networks derived from **space syntax** analysis, can be used for formulating and testing “hypotheses about patterns of urban movement, encounter and socio-economic activity in the past, that can help in the interpretation of other historical source materials to give an overall account of urban spatial culture (Griffiths, 2020).”

The areas to be tackled while teaching on **space syntax** in relation to heritage and sustainability are urban patterns (Notions), Urban Heritage, Heritage sites, Documentary heritage (Heritage types), Heritage Reprogramming, Design for all in Cultural Heritage (Design approaches), Regeneration (Actions) and Morphogenesis study, Use of GIS Technology (Tools).

TEACHERS' COMPETENCIES



General competences:

- possessing a specialist knowledge of theories of territoriality, territory theory, urban morphology, urban semiology, and **space syntax**
 - participating in professional development and growth activities;
 - developing professional relationships and networks with research labs and institutions
- Pedagogical skills, comprising the following:
- teaching on real life examples, developing critical thinking and problem solving approaches
 - empowering reflective practice approach and individual research to expand their knowledge
 - Inspiring creativity, critical thinking and experimentation.
 - o implementing of new methods and techniques into educational activities;
- Technological skills, comprising the following:
- using and applying **Space Syntax** method by integrating technology into their instruction to maximize student learning. (e.g. DepthmapX software, Qgis - SSx Toolkit)

COURSE TYPE

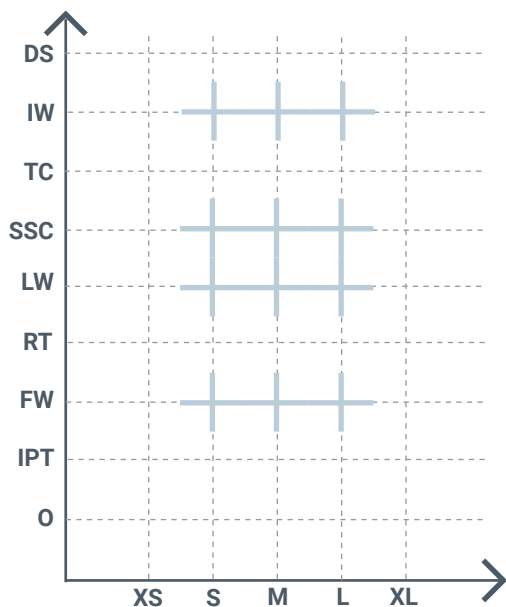


- Design Studio (DS)
- Intensive Workshop (IW)
- Theory Course (TC)
- Seminar (short comprehensive) (SSC)
- Laboratory work (LW)
- Research Thesis (RT)
- Field work (FW)
- Internship Practical training (IPT)
- Other (O)

SCALE



- Construction Detailing and Interior Design Scale (XS)
- Architecture: Buildings Scale (S)
- Urban Design Scale (M)
- Urban and Regional Planning Scale (L)
- Landscape Scale (XL)



LEARNING OUTCOMES

1 Ability to create architectural designs that satisfy both aesthetic and technical requirements. The student could have the ability to:

- prepare and present building design projects of diverse scale, complexity, and type in a variety of contexts, using a range of media, and in response to a brief;
- understand the constructional and structural systems, the environmental strategies and the regulatory requirements that apply to the design and construction of a comprehensive design project;
- develop a conceptual and critical approach to architectural design that integrates and satisfies the aesthetic aspects of a building and the technical requirements of its construction and the needs of the user.

2 Adequate knowledge of the histories and theories of architecture and the related arts, technologies and human sciences. The student will have knowledge of:

- the cultural, social and intellectual histories, theories and technologies that influence the design of buildings;
- the influence of history and theory on the spatial, social, and technological aspects of architecture
- the application of appropriate theoretical concepts to studio design projects, demonstrating a reflective and critical approach.

3 Knowledge of the fine arts as an influence on the quality of architectural design. The student will have knowledge of:

- how the theories, practices and technologies of the arts influence architectural design;
- the creative application of the fine arts and their relevance and impact on architecture;
- the creative application of such work to studio design projects, in terms of their conceptualisation and representation.

4 Adequate knowledge of urban design, planning and the skills involved in the planning process. The student will have knowledge of:

- theories of urban design and the planning of communities;
- the influence of the design and development of cities, past and present on the contemporary built environment;
- current planning policy and development control legislation, including social, environmental and economic aspects, and the relevance of these to design development.

5 Understanding of the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces between them to human needs and scale. The student will have an understanding of:

- the needs and aspirations of building users;
- the impact of buildings on the environment, and the precepts of sustainable design;
- the way in which buildings fit into their local context.

6 Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors. The student will have an understanding of:

- the nature of professionalism and the duties and responsibilities of architects to clients, building users, constructors, co-professionals and the wider society;
- the role of the architect within the design team and construction industry, recognising the importance of current methods and trends in the construction of the built environment;
- the potential impact of building projects on existing and proposed communities.

7 Understanding of the methods of investigation and preparation of the brief for a design project. The student will have an understanding of:

- the need to critically review precedents relevant to the function, organisation and technological strategy of design proposals;
- the need to appraise and prepare building briefs of diverse scales and types, to define client and user requirements and their appropriateness to site and context;
- the contributions of architects and co-professionals to the formulation of the brief, and the methods of investigation used in its preparation.

8 Understanding of the structural design, constructional and engineering problems associated with building design. The student will have an understanding of:

- the investigation, critical appraisal and selection of alternative structural, constructional and material systems relevant to architectural design;
- strategies for building construction, and ability to integrate knowledge of structural principles and construction techniques;
- the physical properties and characteristics of building materials, components and systems, and the environmental impact of specification choices.

9 Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate. The student will have knowledge of:

- principles associated with designing optimum visual, thermal and acoustic environments;
- systems for environmental comfort realised within relevant precepts of sustainable design;
- strategies for building services, and ability to integrate these in a design project.

10 The necessary design skills to meet building users' requirements within the constraints posed by cost factors and building regulations. The student will have the skills to:

- critically examine the financial factors implied in varying building types, constructional systems, and specification
- understand the cost control mechanisms which operate during the development of a project;
- prepare designs that will meet building users' requirements and comply with legislation, appropriate performance standards and health and safety requirements.

11 Adequate knowledge of the industries, organisations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning. The student will have knowledge of:

- the fundamental legal, professional and statutory responsibilities of the architect, and the organisations, regulations and procedures involved in the negotiation and approval of architectural designs, including land law, development control, building regulations and health and safety legislation;
- the professional inter-relationships of individuals and organisations involved in procuring and delivering architectural projects, and how these are defined through contractual and organisational structures;
- the basic management theories and business principles related to running both an architects' practice and architectural projects, recognising current and emerging trends in the construction industry.

RELEVANT LITERATURE / SOURCES FOR FURTHER RESEARCH



- [1] Hillier, B., & Hanson, J. (1984). *The Social Logic of Space*. Cambridge University Press
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BUILT ARCHITECTURAL / URBAN DESIGN PROJECT EXAMPLE - URBAN SCALE



Tool application:

✕ Urban scale: Trafalgar Square

Authors:

✕ Project Director: Tim Stonor, Partners: Foster and Partners, Halcrow Fox, Civic Design Partnership, Davis Langdon and Everest

Year of the application:

✕ 1996-98

Space Syntax was used for the analysis of pedestrian activity patterns (residents and tourists), diagnosing moving problems and providing framework and evidence-based argumentation for design solution. The space syntax approach (spatial accessibility analysis, pedestrian movement traces and stationary activities) provided adequate treatment of the Trafalgar Square and Parliament Squares, marked as places of supreme historical importance that were perceived as unsafe, unpleasant and traffic oriented. Trafalgar Square was completed in 2003, recording the increase of pedestrian movement by thirteen times.

More at: <https://spacesyntax.com/project/trafalgar-square/>

BUILT ARCHITECTURAL /
URBAN DESIGN PROJECT
EXAMPLE - BUILDING SCALE



Tool application:

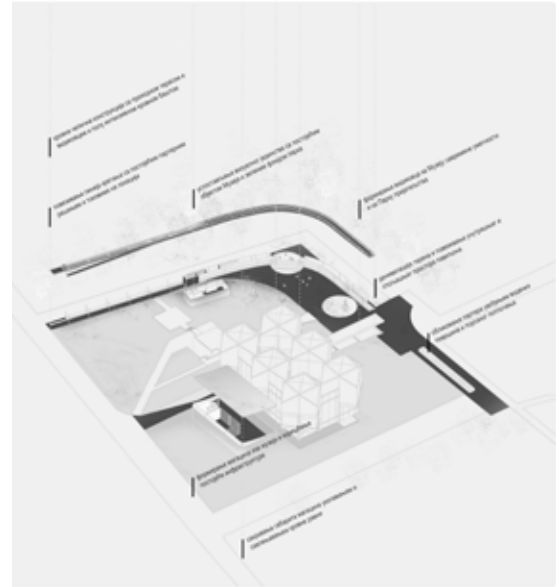
✕ Competition entry: Pavillion of the Museum of Contemporary art in Belgrade, Serbia

Authors:

✕ Petougao (M.Kostić, A.Zorić, A.Đorđević), Dejan Todorović and Irina Živković

Year of the application:

✕ 2021



Space Syntax was used for diagnosing connectivity problems and providing framework and visibility analysis as an evidence-based argumentation for the placement and shape of the pavillion.

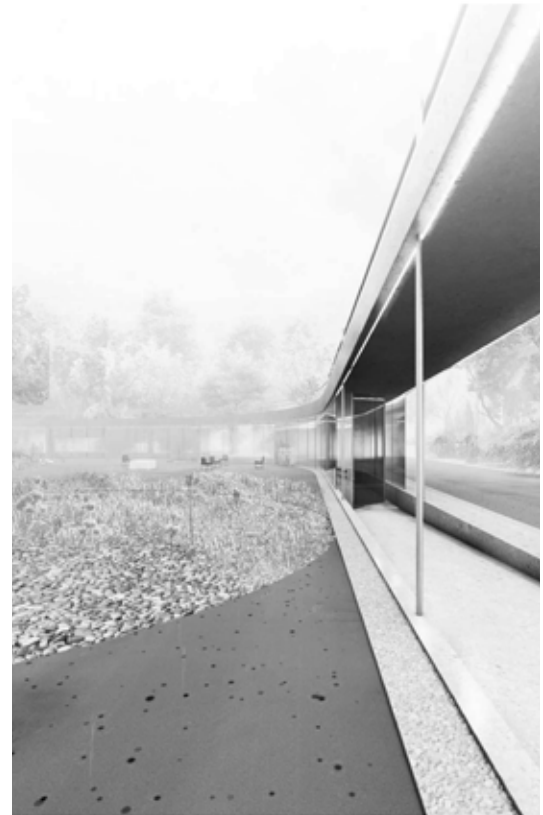


Figure 1. Space Syntax analysis and proposed solution of the Pavillion of the Museum of Contemporary Art, Belgrade
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