



**(ISSAEK) INTERNATIONAL SUMMER SCHOOL of ARCHITECTURE & ENGINEERING
KAZAN 2016**






URBAN DEVELOPMENT and INTEGRATED DESIGN: Challenges and Solutions For SUSTAINABILITY

July 11-20, 2016

Programme Overview	<p>(ISSAK) International Summer School of Architecture & Engineering Kazan 2016 “URBAN DEVELOPMENT and INTEGRATED DESIGN: Challenges and Solutions for Sustainability” offers an intensive 10-days programme of architectural & engineering education engaging students in experience to explore architectural theory and practice in Urban Development, Architectural Design and Engineering.</p> <p>The full time course provides challenging brief and an international advanced programme of methodological training, lecture sessions, master classes, excursions, workshop including group discussions and presentations. Students attending the programme will gain (1) understanding of the both “architecture” and “engineering” aspects addressing the theory, practice / design of engineering structures, architectural complexes, urban and building environment, (2) practical knowledge of integrated design approach & projects, representative aspects in design.</p>
Location	<p>(KSUAE) Kazan State University of Architecture and Engineering Zelenaya 1 – 420043 Kazan, Russia</p>
Dates	<p>11-20 July, 2016</p>
Programme Leader	<p>Architecture Section: Arch. Sophia Agisheva, Department of Building Design, KSUAE e-mail: agisheva@mail.ru Engineering Section: Dr. Linur Gimranov, Department of Steel Structures, KSUAE e-mail: leenur@mail.ru</p>
Lecturers & Tutors	<p>Architecture Section: Dr. Inessa Fakhrutdinova, Department of Theory and Practice in Architecture, KSUAE Dr. Anna Akatyeva, Department of Theory and Practice in Architecture, KSUAE Arch. Elza Bashirova, Department of Theory and Practice in Architecture, KSUAE Arch. Sophia Agisheva, Department of Building Design, KSUAE Arch. Egor Orlov, Department of Design of Architectural Environment, MARCHI</p> <p>Engineering Section: Dr. Nailya Pakhimova, Department of Building Materials, KSUAE Dr. Oleg Radaykin, Department of Reinforced concrete and stone structures, KSUAE Dr. Adel Fakhrutdinov, Department of Steel Structures, KSUAE Dr. Marat Salakhutdinov, Department of Steel Structures, KSUAE Dr. Nikolay Morozov, Department of Structural materials, KSUAE Dr. Linur Gimranov, Department of Steel Structures, KSUAE</p>



Introduction

General Objectives	<ol style="list-style-type: none">(1) Development of the design skills using contemporary processes of production and representative aspects in design;(2) Development of the hand drawing and modeling skills in pre-design and design phases;(3) Understanding the challenge between cultural heritage protection and development of contemporary architecture within the historic urban environment;(4) Enhancement of the knowledge about the both “architecture” and “engineering” aspects addressing the theory, practice / design of engineering structures, architectural complexes, urban and building environment;(5) Progress in practical knowledge to elaborate integrated design projects;(6) Cultural and design approach exchange.
Target group	Mixed Undergraduate & Postgraduate students in Architecture, Urban Design, Landscape Architecture, Building Design, Engineering
Organizer	 (KSUAE) Kazan State University of Architecture and Engineering, Russia www.kgasu.ru
Participants	 (CIC) Canadian International College, Egypt www.cic-cairo.com  (BJTU) Beijing Jiaotong University, China www.en.njtu.edu.cn
Language	English
Credits	6 ECTS
Duration	Full-time, 10 days
Support & Promotion	Olga Poroshenko , Head of the International Department, KSUAE e-mail: interksaba@mail.ru Lilia Gilmeeva , International Department, KSUAE e-mail: interksaba@mail.ru



(ISSAEK) INTERNATIONAL SUMMER SCHOOL of ARCHITECTURE & ENGINEERING KAZAN 2016
“URBAN DEVELOPMENT and INTEGRATED DESIGN: Challenges and Solutions for Sustainability”
PROGRAMME STRUCTURE & TIMETABLE

N	Sunday 10 July	Monday 11 July	Tuesday 12 July	Wednesday 13 July	Thursday 14 July	Friday 15 July	Saturday 16 July	Sunday 17 July	Monday 18 July	Tuesday 19 July	Wednesday 20 July
10-11				LECTURE SESSION 5 <i>Arch + En</i>	MASTER CLASS 01 <i>Arch + En</i>	MASTER CLASS 01 <i>Arch + En</i>	MASTER CLASS 01 <i>Arch + En</i>	MASTER CLASS 01 <i>Arch + En</i>		EXCURSION Bolgar <i>Arch + En</i>	VISIT to Construational Ironworks Factory
11-12		INTRODUC TION Official meetings, Excursion at KSUAE's campus	LECTURE SESSION 1 <i>En</i>	LECTURE SESSION 5 <i>Arch + En</i>					WORKSHOP <i>Work in groups Arch / En</i>		
12-13			LECTURE SESSION 2 <i>En</i>	LECTURE SESSION 6 <i>Arch + En</i>	WORKSHOP <i>Work in groups Arch / En</i>	WORKSHOP <i>Work in groups Arch / En</i>	WORKSHOP <i>Work in groups Arch + En</i>	WORKSHOP <i>Work in groups Arch + En</i>			
13-14		lunch	lunch	lunch					lunch		
14-15	Arrival Students ARRIVAL	Meetings with Academic Staff of KGASU	LECTURE SESSION 3 Intro	LECTURE SESSION 7 <i>Arch + En</i>	WORKSHOP <i>Work in groups Arch / En</i>	WORKSHOP <i>Work in groups Arch / En</i>	MASTER CLASS 02 <i>Arch + En</i>	Preparation of the FINAL Presentation <i>Work in groups Arch + En</i>	FINAL Presentation	EXCURSION Bolgar <i>Arch + En</i>	Free time
15-16			LECTURE SESSION 4 <i>Arch + En</i>	LECTURE SESSION 8 <i>Arch + En</i>					WORKSHOP <i>Task & Site visit Arch + En</i>		
16-17		EXCURSION Kazan Kremlin & city <i>EN</i>	EXCURSION Kazan city <i>Arch + En</i>	FOOTBALL MATCH <i>Arch + En</i>	Free time	FINAL REVIEW <i>Arch + En</i>	Free time				

Legend: En – lectures for engineers | Arch + En – integrated lectures, workshop & , master classes for architects & engineers | Arch / En – separate study process



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“URBAN DEVELOPMENT and INTEGRATED DESIGN: Challenges and Solutions for Sustainability”
PROGRAMME STRUCTURE / STUDY PROCESS

N	Date	Time	Room	Lecture Sessions: Thematic Areas & Topics	Lecturers & Speakers	Group
1	12 July	11:00-11:30	4-410	LS 1 Thematic area: Comparison of Russian Codes in Design & Construction and Euro Codes L1: Russian Codes in Design and Construction comparatively to Euro Codes	Lecture Session 1 L1: Dr. O. Radaykin	En
2	12 July	11:40-12:20 12:25-13:00	4-410 4-410	LS 2 Thematic area: Concrete and Masonry structures L1: Calculation of a load bearing capacity L2: Basis for design of statically indeterminate reinforced concrete structures	Lecture Session 2 L1: Dr. O. Radaykin L2: Dr. O. Radaykin	En En
3	12 July	14:00-15:00	4-410	LS 3 Thematic area: (ISSAEK) International Summer School of Architecture & Engineering L1: Urban Development and Integrated Design: Challenges and Solutions for Sustainability	Lecture Session 3 L1: Arch. S. Agisheva	Arch + En
4	12 July	15:10-16:30	CMLab	LS 4 Thematic area: Contemporary materials in Building Design L1: Contemporary materials and trends in Building Design	Lecture Session 4 L1: Dr. N.R. Rakhimova	Arch + En
5	13 July	10:00-11:00 11:10-12:00	4-410 4-410	LS 5 Thematic area: Steel structures L1: Introduction to the steel structures L2: Designing of long-span steel structures	Lecture Session 5 L1: Dr. A. Fakhrutdinov L2: Dr. M. Sallahutdinov	Arch + En Arch + En
6	13 July	12:00-12:30 12:30-13:00	4-410 4-410	LS 6 Thematic area: High Strength Sand Concrete L1: Review of a High Strength Sand Concrete L2: Composition of High Strength Sand Concrete	Lecture Session 6 L1: Dr. L. Gimranov L2: Dr. L. Gimranov	Arch + En Arch + En
7	13 July	14:00-14:30 14:30-15:00	4-410 4-410	LS 7 Thematic area: Integrated approaches and concepts in Urban Design L1: Contemporary Trends and Approaches of Public Urban Spaces' Design L2: Issues of Identity and Diversity in Contemporary Architecture	Lecture Session 7 L1: Prof. I. Fakhrutdinova L2: Arch. E. Bashirova	Arch + En Arch + En
8	13 July	15:00-16:00	4-410	LS 8 Thematic area: Professional Communications and Representation Methods L1: Communicating Achitectoral Ideas	Lecture Session 8 L1: Dr. A. Akatyeva	Arch + En
N	Date	Time	Room	Master classes: Thematic Areas	Tutors	Group
9	14-17 July 16 July	10:00-11:30 14:00-16:00	ExhHall ExhHall	Master class 1 Speculative utopia. Future shapes Master class 2 Graphical and Oral Presentation	M1: Arch. E. Orlov M2: Dr. A. Akatyeva	Arch+ En Arch+En
N	Date	Time	Room	Workshop	Tutors	Group
10	14 July	11:30-17:00 11:30-17:00	3-406 ExhHall	Workshop En Introduction to Design of Building Structures Workshop Arch Concept ideas for sustainable urban development & building design	Tutors of En Section Tutors of Arch Section	En / Arch
11	15 July	11:30-16:00 11:30-16:00	3-406 ExhHall	Workshop En Calculation & verification of concept ideas for building design proposals Workshop Arch Landscape design	Tutors of En Section Tutors of Arch Section	En / Arch
12	16 July	11:30-13:00	ExhHall	Workshop Arch + En Integration of architectural & engineering concepts	Tutors Arch + En	Arch + En
13	17 July	11:30-17:00	ExhHall	Workshop Arch+ En Postproduction process	Tutors Arch + En	Arch + En

Legend: En – lectures for engineers | Arch + En – integrated lectures, workshop & master classes for architects & engineers | Arch / En – separate study process |
 LS – Lecture Session | CMLab – Laboratory of Construction Materials | ExhHall – Exhibition Hall





Dr. Oleg Radaykin, engineer, PhD in Building Structures and Edifices
(IE) Institute of Engineering, KSUAE

current position: (a) Associate Professor at the Department of Reinforced concrete and stone structures, KSUAE
(b) Module Leader, Double Degree Programme at KSUAE in collaboration with (UEL) University of East London (UK),

experience: lecturer - "Reinforced concrete and stone structures", "Dynamic analysis of buildings and structures", "Methods for solving scientific and technical problems in construction" and etc.

research interest: reinforced concrete, survey of building structures, methodology of scientific research

e-mail: olegxxii@mail.ru



VS



LECTURE SESSION 1| Thematic area: **Comparison of Russian Codes in Design & Construction and Euro Codes**

L1: Russian Codes in Design and Construction comparatively to Euro Codes

The whole amount of Codes (Russian or Euro Codes) regulating the design and construction of structures are adopted into the law on the state level. However there are some differences in Codes of European countries. A building code / building control or building regulations, is a set of rules that specify the minimum standards for constructed objects such as buildings and nonbuilding structures. The main purpose of building codes are to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures.

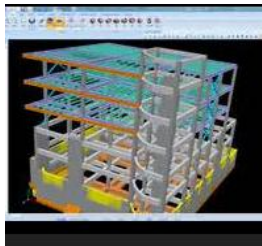
LECTURE SESSION 2| Thematic area: **Concrete and Masonry structures**

L1: Calculation of a load bearing capacity

Knowing the load-bearing capacity of a concrete structure is essential to make sure that what architect and engineer plan to have supported by the wall or slab will not be too heavy and cause it to crack and break. Therefore, (a) strength calculation and design of reinforced concrete flexural elements, (b) strength calculation and design of eccentrically compressed and sketched concrete elements, and (c) calculation of reinforced concrete structures to II-nd group limit state should be considered while calculating a load bearing capacity.

L2: Basis for design of statically indeterminate reinforced concrete structures

In general, most studies on optimization of reinforced concrete (RC) structures, whether based on discrete- or continuous-valued searches, have found success with RC structures using reduced structural models. Also, in an effort to reduce the sizes, costs and safety, engineer should pay attention to (1) basics for design of statically indeterminate reinforced concrete structures based on redistribution of stresses due to inelastic deformation, (2) concept of plastic hinge and limit equilibrium method, (3) alignment of the bending moments, (4) economic efficiency of the design, (5) calculation of reinforced concrete elements on the local effect of load and etc.



2



Arch. Sophia Agisheva, architect, researcher
(IAD) Institute of Architecture and Design, KSUAE

current position: (a) Teaching Assistant at the Department of Building Design, KSUAE
(b) Programme Leader in Architecture for Double Degree Programme at KSUAE in collaboration with (UEL) University of East London (UK), (c) PhD student in Theory and History of Architecture
experience: internship at (EEA) Erick van Egeraat Association Architects, NL; internship at (INIFI) University of Florence, IT; organizer of the international exhibitions, workshops & summer schools (Russia, Italy, United Kingdom)
research interest: cultural heritage, contemporary architecture, sustainable urban development, historic urban landscapes
e-mail: agisheva@mail.ru



LECTURE SESSION 3 | Thematic area: (ISSAEK) International Summer School of Architecture & Engineering

L1: Urban Development and Integrated Design: Challenges and Solutions for Sustainability

A successful project development strategy must pro-actively integrate design and planning processes while responding to changing market and investment conditions. Urban development integrates urban design, development planning, resource management and architectural and landscape design. It relies on an understanding of the complex relationships between: *human needs, buildings and public open spaces, people and public spaces, new development and the natural environment, feasibility and funding, strategy and implementation.* Urban development should be considered in light of approach on *sustainable development (social, cultural, ecological and economical aspects).*

3



Dr. Nailya Pakhimova, engineer, PhD in Engineering
(IBTEES) Institute of Building Technologies, Engineering and Environmental Systems, KSUAE

current position: (a) Associate Professor at the Department of Building Materials, KSUAE
(b) Module Leader, Double Degree Programme at KSUAE in collaboration with (UEL) University of East London (UK), (b) Supervisor of PhD candidates
experience: Research on modeling of building materials (RU)
research interest: innovations in building materials & structures
e-mail: rahimova.07@list.ru



LECTURE SESSION 4 | Thematic area: Contemporary materials in Building Design

L1: Contemporary materials and trends in Building Design

In history there are trends in building materials from being: natural to becoming more man-made and composite; biodegradable to imperishable; indigenous (local) to being transported globally; repairable to disposable; and chosen for increased levels of fire-safety. The choice of building materials depends on contemporary trends of materials used for effective construction process and exploitation affected to design style and engineering requirements.



4



Dr. Adel Fakhrutdinov, engineer, PhD in Building Structures and Edifices
(IE) Institute of Engineering, KSUAE

current position: Signor Lecturer at the Department of Steel Structures, KSUAE

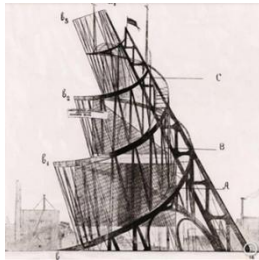
experience: research on Construction of light arch buildings based on principles of 'open' type;
internship at (UEL) University of East London, UK

research interest: experimental design of steel structures, methodology of scientific research, light steel structures
e-mail: faxrutdinoff@yandex.ru

LECTURE SESSION 5 | Thematic area: **Steel structures**

L1: Introduction to the steel structures

Steel exhibits desirable physical properties that makes it one of the most versatile structural material in use. Its great strength, uniformity, light weight, ease of use, and many other desirable properties makes it the material of choice for numerous structures such as steel bridges, high rise buildings, towers, and other structures. Steel frame is a building technique with a 'skeleton frame' which adds advantages and limitations of steel, physical and mechanical properties., and develop load and resistance factors design conception. It forms the exterior 'skin' of the building using a variety of construction techniques and following a huge variety of architectural styles.



5



Dr. Marat Salakhutdinov, engineer, PhD in Building Structures and Edifices
(IE) Institute of Engineering, KSUAE

current position: Signor Lecturer at the Department of Steel Structures, KSUAE

experience: lecturer in "Steel structures", "Timber structures", "Metrology, Standardization and Certification",
"Inspection and testing of buildings and structures", "Modern architectural design", "Building constructions"

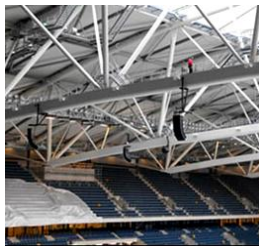
research interest: experimental design of steel structures

e-mail: lider-kazan@mail.ru

LECTURE SESSION 5 | Thematic area: **Steel structures**

L2: Designing of long-span steel structures

The choice of the structural arrangement between alternative possible arrangements of long-span steel structures depends on the choice of the spacing of the frames. Balance between well-designed building concept and engineering requirements should be considered in light of safety and sustainability with ecological and economical aspects.



6



Dr. Linur Gimranov, engineer, PhD in Building Structures and Edifices
(IE) Institute of Engineering, KSUAE

current position: Signor Lecturer at the Department of Steel Structures, KSUAE

experience: lecturer in "Steel structures", "Timber structures", "Metrology, Standardization and Certification", "Inspection and testing of buildings and structures", "Modern architectural design", "Building constructions"

research interest: Bearing capacity of composite steel roof, hinged facade systems and strengthening of wooden beams

e-mail: leenur@mail.ru



LECTURE SESSION 6 | Thematic area: High Strength Sand Concrete

L1: Review of a High Strength Sand Concrete

Considerations in producing high strength concrete (HSC) based on sand as a mixture of fine aggregate. Some of the basic concepts that need to be understood for high strength sand concrete will be covered by lecture.

L2: Composition of High Strength Sand Concrete

Optimum concrete mixture design results from selecting locally available materials that make the concrete to ensure the strength development and other desired properties of hardened concrete as specified by the designer.

7



Dr. Inessa Fakhрутdinova, architect, PhD in Architecture
(IAD) Institute of Architecture and Design, KSUAE

current position: (a) Associate Professor at the Department of Theory and Practice of Architecture, KSUAE

(b) Programme Leader in Architecture for Double Degree Programme at KSUAE in collaboration with (UEL) University of East London (UK), (c) Supervisor of PhD candidates

experience: Organizer & Curator of the international competitions, seminars (RU)

research interest: cultural heritage, aesthetics, architectural graphics

e-mail: fahinessa@mail.ru



LECTURE SESSION 7 | Thematic area: Integrated approaches and concepts in Urban Design

L1: Contemporary Trends and Approaches of Public Urban Spaces' Design

Project for Public Spaces (PPS) is the central hub of the global *Placemaking movement*, connecting people to ideas, expertise, and partners who share a passion for creating vital places. Contemporary perception of public space is considered roads, squares, embankments and other urban structure as distinctive "symbolic forms". Strategies and concepts for Transforming Cities and Public Spaces through 'Placemaking' method have become an element of master plans and sustainable urban development.



8



Elza Bashirova, architect
(IAD) Institute of Architecture and Design, KSUAE

current position: Associate Professor at the Department of Theory and Practice of Architecture, KSUAE
experience: Organizer & Curator of the international competitions, seminars (RU)
research interest: architecture, ecology, aesthetics, aesthetics of architecture, environmental aesthetics, non-formal advanced architectural education
e-mail: e.nugmanova@gmail.com

LECTURE SESSION 7 | Thematic area: Integrated approaches and concepts in Urban Design

L2: Issues of Identity and Diversity in Contemporary Architecture

The lecture touched upon the issues of identity and diversity of modern cities. It becomes very relevant under the conditions of globalization and the dominance of international style. Increasing the identity of the modern city is considered as the basic condition for improving the quality of urban environment and the citizens' life level. A modern design method based on the associative use of traditional architecture images is described.



9



Anna Akatyeva, architect, PhD in Architecture
SUE Territorial Design and Survey Production Company "Tatinvestgrazdanproject", Kazan

membership: Union of Architects of Russia, Association of Designers of Russia
current position: (a) Senior Architect at the Scientific Design Lab, SUE "Tatinvestgrazdanproject", Kazan;
 (b) Module Leader, Double Degree Programme at KSUAE in collaboration with (UEL) University of East London (UK); (c) Visiting professor at the Department of Theory and Practice of Architecture, KSUAE
experience: research & design projects in Russia, architectural completions, international collaboration
research interest: professional language of an architect, integration of architectural theory & practice, mega projects
e-mail: akatyeva@gmail.com

LECTURE SESSION 8 | Thematic area: Professional Communications and Representation Methods

L1: Communicating Architectural Ideas

The lecture sets the basic components of representative methods for design, survey and concept projects, and considerations for effective professional communication in integrated Architecture & Engineering process. It explains wide range methods for various types of professional communication: written, oral / professional dialogue, graphic, digital presentations within workplace context. Professional communications focus on the study of information and the ways it is created, managed distributed and consumed.



1



Egor Orlov, architect

(MACHI) Moscow Institute of Architecture

current position: (a) Teaching Assistant at the Department of Design of Architectural Environment, MARCHI

(b) Research fellow of the Scientific Design Lab at AI-Architects, Moscow

experience: winner of several international architectural completions; participant of international conferences and exhibitions in Russia, Spain, USA, China; nomination in Archiprix International 2015; publications of architectural works and drawings in Achiru, ArchDaily, Domus, Archspeech, TATLIN NEWS.

research interest: cybertopia, speculative architecture on the edge of design, fiction and futurology

e-mail: Egororlovrus@gmail.com



MASTER CLASS 1 | Thematic area: **Speculative utopia. Future shapes**

Today the architect is no longer working in the conflict of “truth” & “fiction”. The era of truth in architecture has been completed. First of all, *Utopian projects* are carried out in the speculative genre (from Latin language “Speculatio” - stalking, snooping) to answer the question “what if?”. Master class is focused on (1) simulation of hypothetical organisms in the cities of the future, residents of urban ecosystems, (2) reflection of functioning of the new habitat and citizens on public spaces, (3) arrangement fictional urban fabric. Master Class format consists of three study-cases (Future Lab, Open Crits Lab and Final Open Crits Lab) focusing on a specific type and nature of the experiment in the process of prototyping hypothetical future cities.

2



Anna Akatyeva, architect, PhD in Architecture

SUE Territorial Design and Survey Production Company “Tatinvestgrazdanproject”, Kazan

membership: Union of Architects of Russia, Association of Designers of Russia

current position: (a) Senior Architect at the Scientific Design Lab, SUE “Tatinvestgrazdanproject”, Kazan;

(b) Module Leader, Double Degree Programme at KSUAE in collaboration with (UEL) University of East London (UK); (c) Visiting professor at the Department of Theory and Practice of Architecture, KSUAE

experience: research & design projects in Russia, architectural completions, international collaboration

research interest: professional language of an architect, integration of architectural theory & practice, mega projects

e-mail: akatyeva@gmail.com



MASTER CLASS 2 | Thematic area: **Graphical and Oral Presentation**

Master class is a practical part based on the theoretical aspects which were given in the Lecture Session 8.

It will include a discussion session as an element of professional communication and perceptual exchange to create a final concept for the project presentations. The students will discuss the postproduction process of the workshop including the learning outcomes and integrated design concepts, and create a strategy for representation and structure of the project materials.

Master class is aimed to give a practical knowledge to students about professional communications in specific architecture& engineering area of activity.



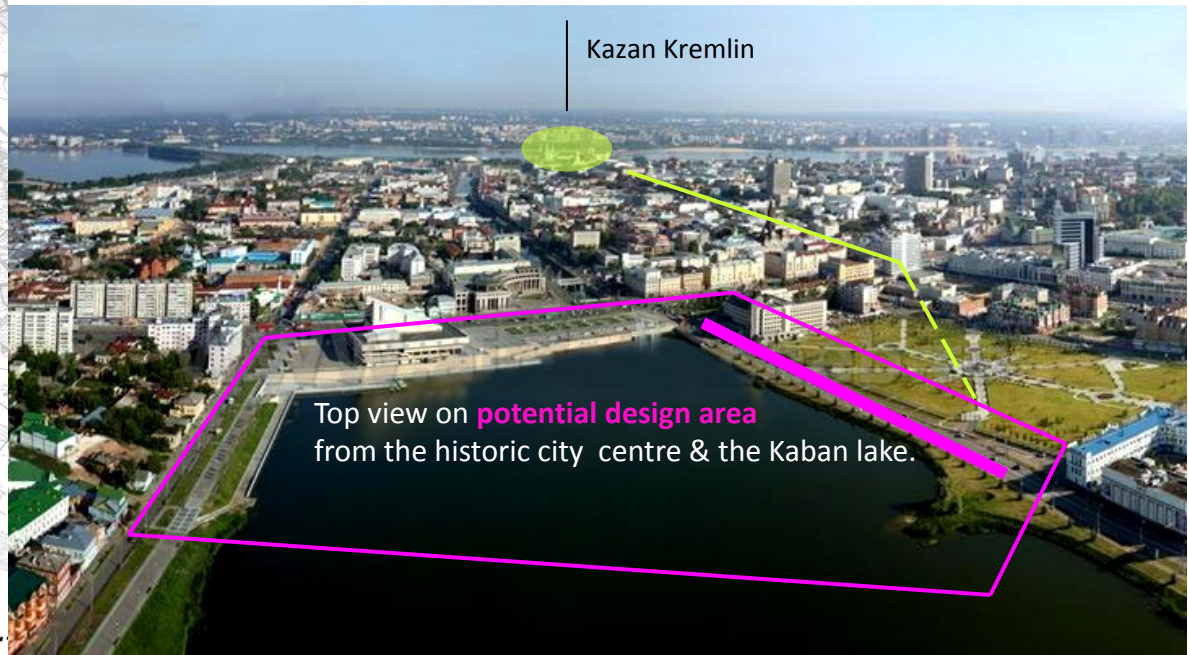
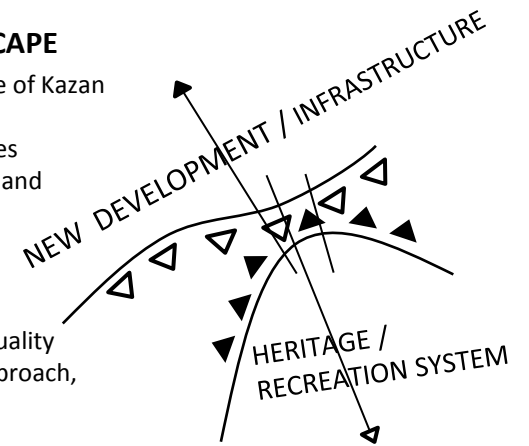


RENOVATION OF THE HISTORIC URBAN LANDSCAPE

Potential design area is located in the historic city centre of Kazan and it has a visual access to the park and the lake Kaban, but it is physically limited with the general infrastructures showing a confrontation between architectural heritage and new development.

Students (both **architects & engineers**) will be asked to develop concepts on renovation of the part of the historic urban landscape to achieve balanced and high quality urban environment on the base of integrated design approach, sustainable urban development.

Concepts of new public space on the Kaban Lake embankment may include landscape design, temporary / regular buildings and structures.





Sites inscribed on the UNESCO World Heritage List:

- △ **Bolgar Historical and Archaeological Complex,**
The Republic of Tatarstan
- ◁ **Historic and Architectural Complex of
the Kazan Kremlin, Kazan City**



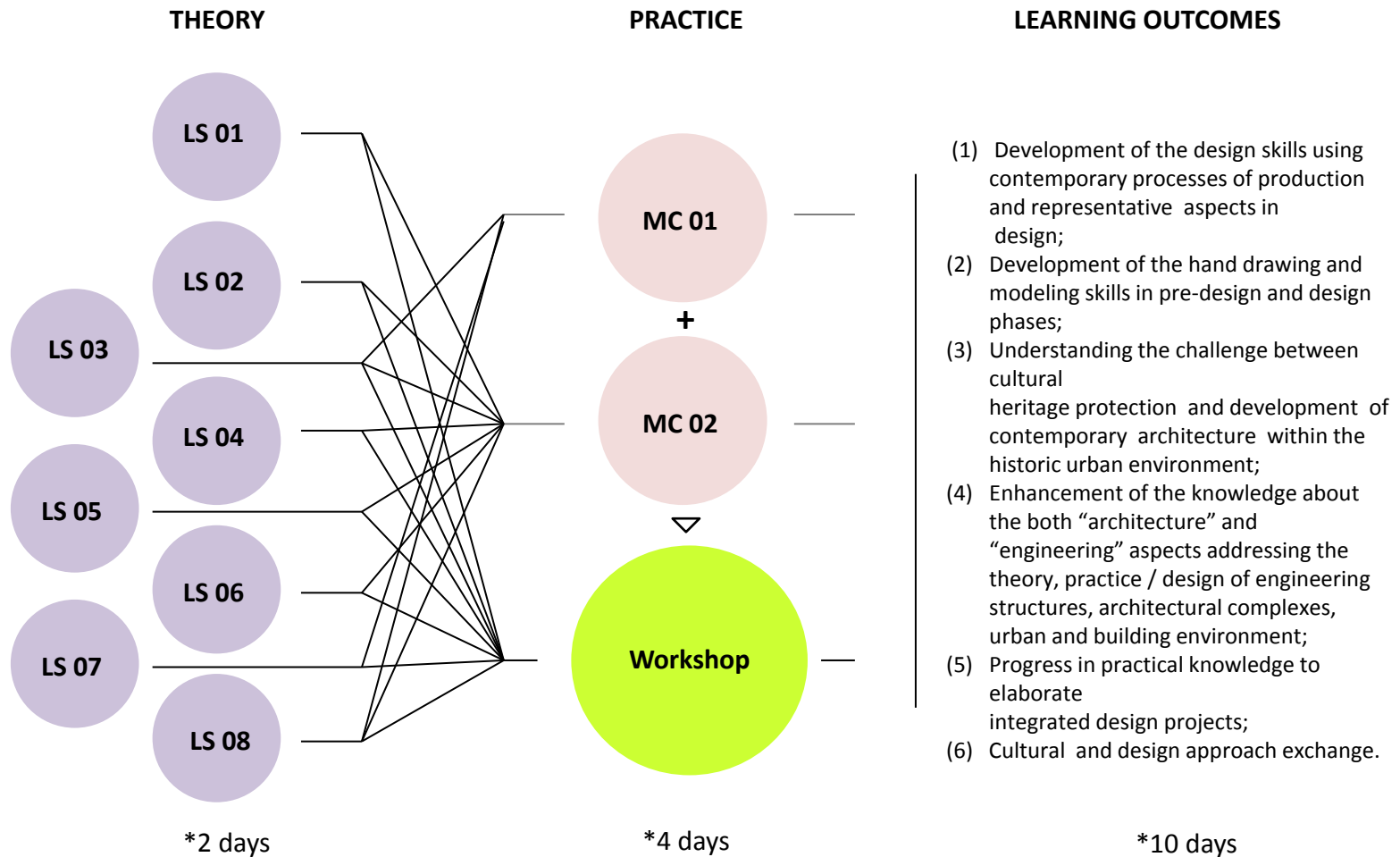
United Nations
Educational, Scientific and
Cultural Organization



World
Heritage
Convention



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PROGRAMME BENIFITS



- (1) Development of the design skills using contemporary processes of production and representative aspects in design;
- (2) Development of the hand drawing and modeling skills in pre-design and design phases;
- (3) Understanding the challenge between cultural heritage protection and development of contemporary architecture within the historic urban environment;
- (4) Enhancement of the knowledge about the both “architecture” and “engineering” aspects addressing the theory, practice / design of engineering structures, architectural complexes, urban and building environment;
- (5) Progress in practical knowledge to elaborate integrated design projects;
- (6) Cultural and design approach exchange.





NEW

OLD

NEW / OLD