Мій Erasmus досвід

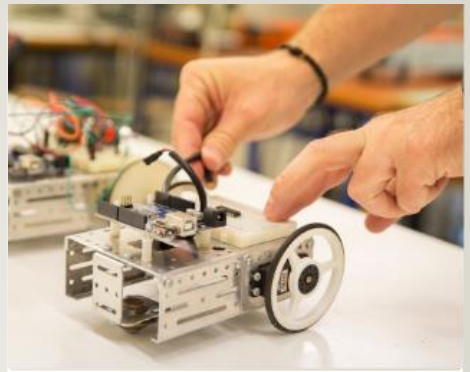
Перше враження

Інфраструктура університету

Факультет громадського здоров’я

Факультет

харчових наук



Факультет

інженерії

Факультет наук здоров’я та догляду

Факультет адміністративних, економічних та соціальних наук

Факультет прикладного мистецтва та культури

URBAN PLANNING

GREEN INFRASTRUCTURE AS AN ESSENTIAL COMPONENT OF THE URBAN ENVIRONMENT

Course project

GREEN INFRASTRUCTURE AS AN ESSENTIAL COMPONENT OF THE URBAN ENVIRONMENT

Anastasiia sapun: anastasya18082016@gmail.com (+380958929361)

Introduction: Due to the rapid development of urban areas, the environment is undergoing significant changes. Man deforms the appearance of the natural environment, adapts to himself, constantly bringing in more and more architectural structures and elements. However, addressing urban infrastructure has exacerbated environmental comfort issues. Therefore, there is a need to create and improve the green infrastructure itself. Green infrastructure is a complex equipment that allows solving urban and climatic problems, and the implementation of the principle of "building with nature" is a prerequisite.

Keywords: green infrastructure, urban space, landscaping, greening the infrastructure.

Materials and Methods In this work were used: textbooks and manuals, cartographic materials and materials of scientific articles. When writing this work, an analysis of literary sources.

TABLE OF CONTENTS

The most common method is facade tiles and modules. The method is interesting in that it allows you to organize in-line production, replace tiles, use them as in certain structures of ventilated facades. Aesthetic effect is achieved due to Aesthetic effect is achieved due to plants. This technology of planting modules in pots can be used in different seasons. In winter, you can remove this design, and in the summer to plant any plants. Such designs allow you to ventilate the facade of the building (Litovchenko, Lapshina, 2018, pp. 128-142).

Biotecture "Living Green Wall"

Fig.1.1.Biotecture Living Green Wall Specification (Biotecture, 2020)
1. Pressure compensated Dripline. 2. Waterproof Backing Board. 3. Rear drainage layer. 4. Growing medium. 5. Rail carrier system, dripline, and coverstrips.

Pro Wall Panel System

The Pro Wall is a pre-grown modular system, fully irrigated, automated, and designed for exterior installations. The Pro Wall panel system is meant to accommodate artistic flair with a fullness of design, and it is engineered to withstand challenging exterior environments. The process involves the design of the wall, pre-growth of the panels in a nursery, and finally placement of the panels on the wall (Pro Wall®, 2020).

Fig.1.2. Pro Wall Panel System.

This system can be installed on any open surface, in any climate, as it is resistant to strong winds, rains, and even earthquakes. It can be attached to existing walls, has drip irrigation integrated in a vertical system, ideal for landscaping large open spaces. Therefore, the ProWall panel system can be applied in a comprehensive manner, namely, in landscaping not only the building facades but also all kinds of architectural surfaces, which will increase the aesthetic and environmental potential of the environment as a whole. The

ENERGY AND ENVIRONMENT

THE IMPACT OF UKRAINIAN ENERGY ON THE ENVIRONMENT

Review

THE IMPACT OF UKRAINE'S ENERGY ON THE ENVIRONMENT

Anastasiia Sapun: anastasya18082016@gmail.com (+380958929361)

Abstract: The purpose of the study is to analyze the impact of different types of energy of Ukraine on the environment. The publication presents the results of the study of the main directions of the energy of Ukraine. The environmental impact of TPPs, hydropower plants, and NPPs is analyzed. Ways to minimize the impact of energy as a sector of the economy are proposed. The analysis of alternative energy sources and the profitability of their use in the territory of Ukraine is presented.

Keywords: electric power industry, environment, thermal power plant, hydroelectric power station, nuclear power plant, alternative energy sources.

Introduction: Electric power industry is the main branch of the country's economy because it provides not only the needs of the population but also is the basis for the industrial complex of the state. However, satisfying the huge demand for electricity, this industry has a tremendous impact on all environmental components. Therefore, it is now a very pressing issue to find a compromise between the economy and the environment, in order to support the economic development of the country and minimize environmental impact. So, this issue is no less urgent for Ukraine, as its power complex has a number of significant problems and needs modernization.

Materials and Methods In this work were used: technical documentation of electric power companies of Ukraine, National reports on the state of the environment, textbooks, and manuals, cartographic materials, and materials of scientific articles. The following methods were used when writing the work: statistical, analytical, cartographic, and comparative.

TABLE OF CONTENTS

SECTION 1

ENVIRONMENTAL ASPECTS OF FUNCTIONING OF ELECTRIC POWER INDUSTRY

1.1. The main trends in the development of energy in the world.

Climate change may be considered one of the most pressing problems that the world is facing. The use of fossil fuel for power generation releases greenhouse gases and, consequently, has caused many negative effects on the environment. Rising temperature and rising sea-level are just some of the environmental phenomena attributed to our reliance on fossil fuel. Another problem associated with climate change is the depletion of fossil fuel. Over-usage of fossil fuel, albeit for useful and necessary purposes, not only leads to our current environmental predicament but also to the depletion of scarce fossil resources that may be extracted from the core of the earth.

Electricity is at the heart of modern economies and it is providing a rising share of energy services. Demand for electricity is set to increase further (Fig.1.1.) as a result of rising household incomes, with the electrification of transport and heat, and growing demand for digitally connected devices and air conditioning [2].

Driven by higher energy demand in 2018, global energy-related CO_2 emissions rose 1.7% to a historic high of 33.1 Gt CO_2. While emissions from all fossil fuels increased, the power sector accounted for nearly two-thirds of emissions growth. Coal use in power alone surpassed 10 Gt CO_2, mostly in Asia. China, India, and the United States accounted for 85% of the net increase in emissions, while emissions declined for Germany, Japan, Mexico, France, and the United Kingdom.

Rising electricity demand was one of the key reasons why global CO_2 emissions from the power sector reached a record high in 2018, yet the commercial availability of a diverse suite of low emissions generation technologies also puts electricity at the vanguard of efforts to combat climate change and pollution. Decarbonised electricity, in addition, could provide a platform for reducing CO_2 emissions in other sectors through electricity-based fuels such as hydrogen or synthetic liquid fuels. Renewable energy also has a major role to play in providing access to electricity for all [3].

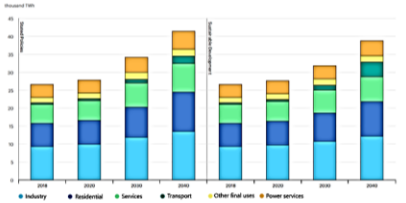


Fig.1.1. Electricity demand by sector and scenario, 2018-2040 [4].

In the Stated Policies Scenario, global electricity demand grows at 2.1% per year to 2040, twice the rate of primary energy demand. This raises electricity's share in total final energy consumption from 19% in 2018 to 24% in 2040. Electricity demand growth is set to be particularly strong in developing economies. Government policies, market conditions, and available technologies collectively set a course for electricity supply to shift towards low-carbon sources, with their share increasing from 36% today to 52% in 2040 in the Stated Policies Scenario.

In the Sustainable Development Scenario electricity plays an even larger role, reaching 31% of final energy consumption. In the Sustainable Development Scenario, electricity is one of the few energy

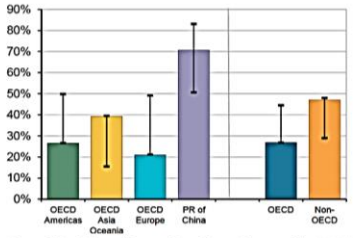


Fig.1.2. Share of electricity and heat produced from primary coal in 2017 (%) [5].

Assuming that there were no changes in efficiency in 2018 relative to the previous year, coal inputs in OECD countries for electricity and heat generation fell to 994.1 Mtce – a potential decrease of 45.2 Mtce (4.6 %). Coal is also essential for the iron and steel industry and its use has increased substantially during the last 40 years, driven primarily by increased production in China. The share of non-OECD countries is 82.6% of the total global iron and steel consumption, or 988 Mt [5].

1.2. The main energy complex of Ukraine.

Electricity is the basic branch of Ukraine's economy. It is one of the oldest in the country. Electricity production is based on the combustion of coal, fuel oil, natural gas, peat, the use of nuclear energy, wind, water, solar and geothermal energy.

The largest thermal power plants are located in the Donetsk region Uglehirska, Starobeshivska, Myronivska, Kurakhivska, etc.), in the Dnieper region (Prydniprovska, Kryvyi Rih), in Kharkiv (Zmiivska), Kyiv (Trypillya), Ivano-Frankivsk (Burshtynska), Lviv (Lviv) regions. areas, in Zaporizhia, Odessa, etc. Most of these power plants also produce heat (CHP) [6, 7].

Fig.1.3. Thermal power plants of Ukraine [8].

In the development of hydroenergetics, it is especially significant in the 20th century. In the development of hydropower special importance in the twentieth century. played a cascade of hydropower plants on the Dnieper: Dniproges, Kakhovka, Kremenchuk, Kyiv, Kaniv, Middle Dnieper. HPPs were built on the Dniester (Dniester), in the Transcarpathian region (Tereble-Ritska). The Pivdennobuz'kyy cascade of hydroelectric power stations has been partially implemented.

THEMATIC CARTOGRAPHY

CARTOGRAPHIC APPROACH OF CORONAVIRUS PANDEMIC ON THE INTERNET

SECTION 2

USING CARTOGRAPHIC APPROACH OF CORONAVIRUS PANDEMIC ON THE INTERNET

2.1. Online services for displaying Covid-19 information.

Very quickly, the theme of coronavirus became very much in demand. People are increasingly using various methods to assess the situation in real-time (mobile applications, websites). Below are examples of services with publicly available cartographic information on this topic.

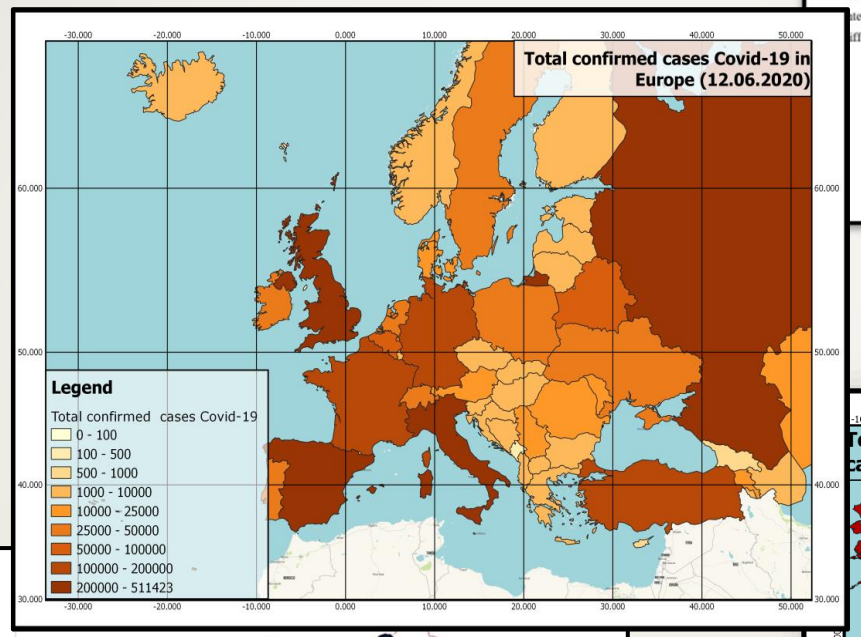
NextStrain

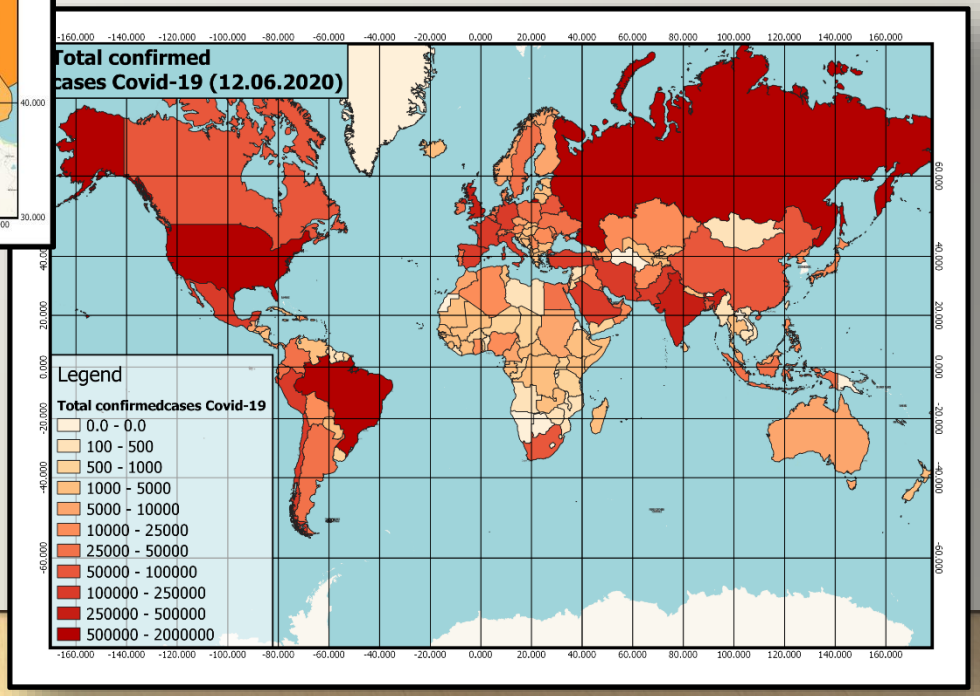
NextStrain develops epidemic visualization tools primarily for professionals - virologists, epidemiologists, healthcare providers, and scientists. Here you can choose time intervals, data display options, change the type of graphs and customize animations in different ways.

Fig. 2.1. NextStrain service [8].

A distinctive feature of this service is the ability to observe the chronology of events, also distribution paths of Covid-19

Fig. 2.2. NextStrain service, map of the pathways of the virus [8].





SECTION 3

CREATION OF CARTOGRAPHIC MATERIALS THAT DISPLAY COVID-19 INFORMATION

3.1. Various options for creating maps (for example, the incidence map of China)

The visualization of information has always had a greater impact on a person than text. Therefore, the correct approach to mapping is very important. You need to understand how maps can help in generating information, and as concerns grow, how to display data responsibly.

The first job when making any map is to determine what projection you're going to use. The region is China, and the data is thematic. For ANY map of population data to work the map has to use an equal-area projection. A good choice for China is Albers equal area. Web Mercator does not support the map's purpose because distortions lead to people over- or under-estimating the size of areas relative to one another. And that has the effect of propagating people's impressions of less and more because of the over- or under-exaggeration of parts of the map due simply to the projection. Projection Wizard is a great tool to help you work out a good projection for your data (Fig.3.1).

Fig.3.1. Comparison of how the map looks at a scale of 1:30 million for Albers equal area and Web Mercator.

So we've identified an appropriate projection, all the maps now get mapped that way for consistency. This supports not only comparisons within each map but between maps.

The default thematic mapping technique, the go-to technique, the technique most people are familiar with is the choropleth (graduated color) map. It's a great technique when used properly. But when used poorly it has the capability to misguide people. Here's a reasonable 'looking' choropleth map of the coronavirus data as of 24th February 2020 (Fig.3.2). This is the date we'll use for all of the maps. Spoiler alert – this is how not to make the map.

WATER RESOURCES MANAGEMENT

METHODS FOR ESTIMATING THE ENVIRONMENTAL FLOW

1.1. Description of the method used.

The hydraulic methods (or the method of hydraulic indices, also known in the literature as the habitat retention method or the hydraulic geometry method) are office methods, based on relationships between the hydraulic parameters P, e.g., wetted perimeter or depth, and the value of flow in the river. The relationship can be described by the function $P = aQ^b$ where: Q—flow; a, b—equation constants, as found empirically for each catchment or as obtained from the graph P = f(Q) (Fig. 1.1). The reason why the hydraulic method is used for the assessment of environmental flow is the relationship between the hydraulic parameters of watercourses and the quality of the aquatic environment, depending on the requirements of the respective species living in the aquatic ecosystems (mainly ichthyofauna is taken into account in the case of the hydraulic methods) or the direct or indirect connection between the ecological function of the river (Table 1.1) (Książek, Woś, and Florek, 2019, p. 254).

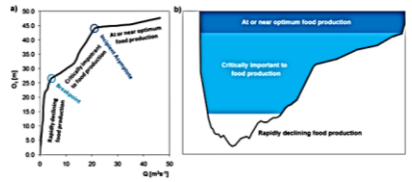


Fig. 1.1. Relationship between hydraulic parameters and invertebrate habitat conditions. a Wetted perimeter vs. flow according to WPM. b Riverbed filling (Książek, Woś, and Florek, 2019, p. 254).

Table 1.1

Habitat requirements of flow hydraulics for brown trout (Książek, Woś, and Florek, 2019, p. 254).

Spawning		Migration
Depth (m) $d_{spaw.min.}$ - $d_{spaw.max}$	Velocity (m s^{-1}) $v_{spaw.min.}$ - $v_{spaw.max}$	Depth (m) $d_{migr.min}$

The wetted perimeter method (WPM) is the most popular of all hydraulic methods. It is based on the relationship between the wetted perimeter for a given cross-section of the river and the value of flow with reference to biological requirements. The method is based on the assumption that food availability to fish species is the decisive factor of their existence and condition. Aquatic invertebrates, which breed mainly on riffles, are the essential food for ichthyofauna. Riffles as habitats are especially sensitive to changes in flow, responding in changed depths, velocities, and surfaces. The minimum flow which guarantees the appropriate size of a riffle—which is the shallowest habitat in the riverbed—is deemed to be suitable for the entire riverbed including other habitats: pools run. Riffles are also habitats with the least desirable conditions for the passage of fish species, where the depths are low and the forces generated by the motion of water are considerable. Therefore, the reference cross-section for defining the wetted perimeter was selected after the hydromorphological analysis of the riverbed at the highest point of the riffle, where the flow is wide and shallow. The wetted perimeter is defined as the length of the contact path between the cross-section and the water (a cross-sectional area perimeter that is "wet" because of the contact with water). Indirectly, this feature defines the habitat surface that is available to the aquatic organisms. Minimum environmental flows are found from the wetted perimeter flow curve, by defining what is called breakpoints. These are the points at which the curvature is the maximum or the slope of the curve changes noticeably; most typically, they are found visually in the graph. The same effect can be obtained by calculating the curve and tangent slope equation. The breakpoint corresponds to a flow below which the aquatic invertebrate habitat conditions will soon become undesirable as the habitat area decreases. The incipient asymptote defines a flow above which the habitat conditions are optimum. Hence, the first inflection point defines critical conditions and the second one does the optimum habitat conditions relative to environmental flow.

The critical riffle analysis, which is a modified WPM, examines the details of migration conditions in riffles. Its result is the suitable depth for a species and the minimum cross-sectional width with the set depth, which is required to enable free passage. A hydraulic method which is based on detailed ichthyofauna habitat requirements, concerning flow hydraulics and similar to the critical riffle analysis. Based on the assumption of the WPM, that riffles having nearly rectangular cross-sections were measured, the mean cross-sectional depth may be analyzed as being representative, without taking into account the width of the belt which provides a suitable depth. We consider the conditions during the spawning period and the minimum conditions for the migration corridor when designing fishing routes, as those that are also required in natural conditions. The standard, in this case, is brown trout (Salmo trutta fario), which is one of the indicator types of good quality water in gravel-bottomed rivers. Habitat conditions define the values of depth and flow velocity which is required in the ichthyofauna spawning and migration seasons. The habitat suitability criteria for brown trout during spawning were applied on the base of the MesoHabsim model of the Wisłoka river. 0.4 m depth of migration corridor of brown trout was used as the minimum value during the migration period.

Flow values which satisfy these requirements have been obtained by finding the required depths from the depth-velocity relationship and then, for the given depths, determining flow values from the depth-flow curve (Fig. 1.2). This has resulted in the spawning flow range and the minimum migration flow (Książek, Woś, and Florek, 2019, p. 254).

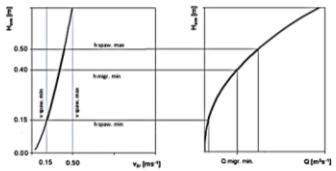


Fig. 1.2. a) Flow depth—velocity curve with habitat hydraulic requirements for spawning and migration. b) Depth-discharge curve for determining environmental flow values (Książek, Woś, and Florek, 2019, p. 254).

1.2. The results of the study of the Wisloka River.

The Wisłoka is a right-hand tributary of the Vistula river, with a length of about 160 km and a catchment area of more than 4.1 thousand km^2. It starts in the Beskid Niski mountain range in the Małopolska province.

The Wisłoka is one of the rivers where desirable spawning conditions exist for rheophilous diadromous fish species (gravel bottom and water with a suitable oxygen content).

The environmental objective of a surface water body is to maintain its good chemical and environmental status and to make the watercourse passable to the aquatic organisms. There is no threat to the attainment of the environmental objectives.

AIR POLLUTION - AIR POLLUTION ABATEMENT TECHNOLOGIES

THE IMPACT ON HUMAN LIFE AND THE NATURE FROM THE SYNERGY OF CLIMATE CHANGE AND AIR POLLUTION

Course project

THE IMPACT ON HUMAN LIFE AND THE NATURE FROM THE SYNERGY OF CLIMATE CHANGE AND AIR POLLUTION

Anastasiia Sapun: anastasya18082016@gmail.com (+380958929361)

Abstract: This paper presents an analysis of the problem of air pollution, climate change, and their synergy. The main sources and components of air pollution are described. The main causes of these problems and their impact on human health and the environment are analyzed. Possible ways to minimize the negative impact are provided.

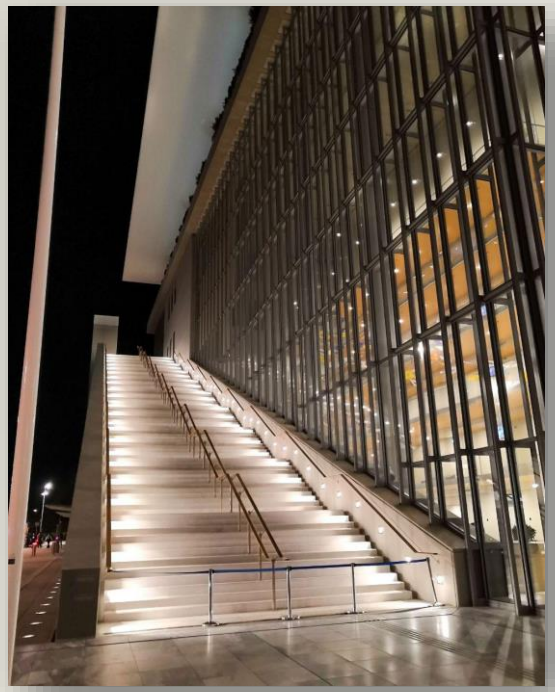
Keywords: air pollution, climate change, global warming, greenhouse effect, environment, human health.

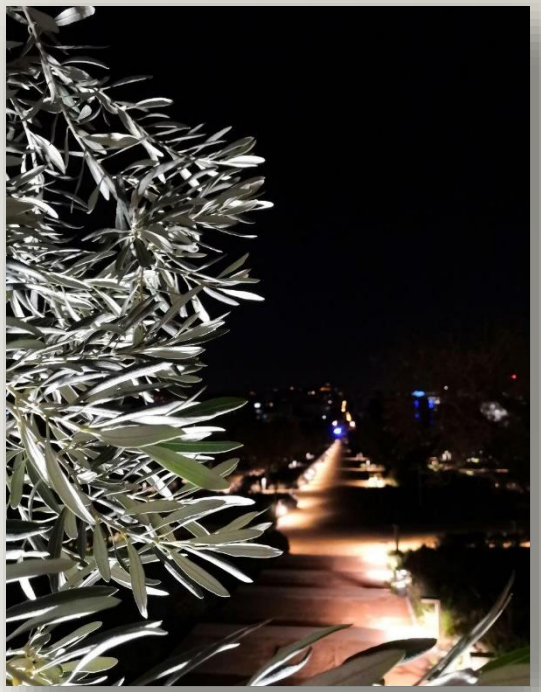
Materials and Methods: In this work were used: textbooks and manuals and materials of scientific articles. When writing this work, an analysis of literary sources.

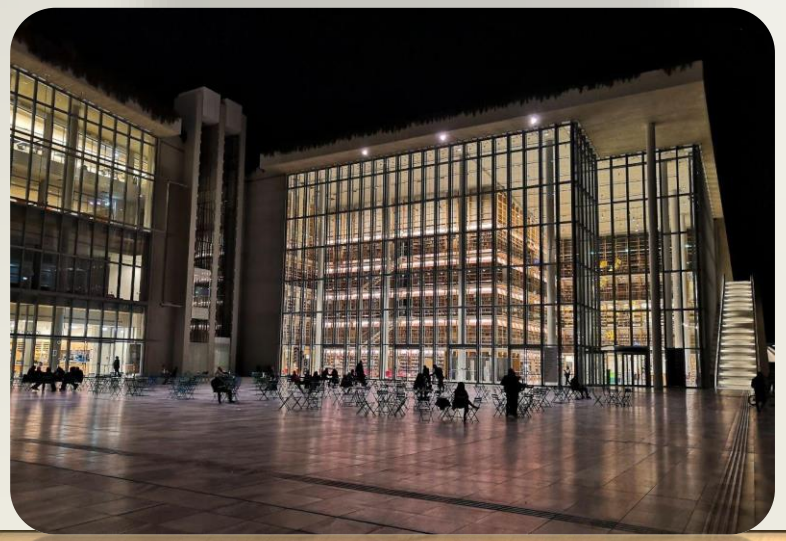
TABLE OF CONTENTS

Студентське ком’юніті

Знайомство з містом







Знайомство з культурою

Подорож на Санторіні

Дякую за увагу!!!