

## Reformation of the Curricula on Built Environment in the Eastern Neighbouring Area (CENEAST)

### MODULE SPECIFICATION

Module Title: Environmentally sustainable cities development			University module code:	
Level <sup>i</sup> : <b>MSc</b>	Credit Value <sup>ii</sup> :	ECTS Value <sup>iii</sup> : <b>3</b> (in Ukraine 1 ECTS equals to 36,0 hours of work load)	Length (in Semesters) <sup>iv</sup> <b>1</b>	Semester(s) in which to be offered:
Existing/new module <sup>v</sup> :	Title of Module being replaced ( <i>if any</i> ):		With effect from <sup>vi</sup> :	
Originating School: <b>NTU "KhPI", NTUU "KPI", VGTU, MSIU</b>		Module Co-ordinator(s): <b>NTU "KhPI",</b>		
Programme(s) in which to be offered:				
Pre-requisites ( <i>between levels</i> ):			Co-requisites ( <i>within a level</i> ):	
Indicative learning hours:		Percentage taught by School(s) other than originating School <sup>vii</sup> :		
<p><b>Aims of Module:</b></p> <ul style="list-style-type: none"> <li>• To create at students strong belief about need of environmentally steady cities creation, and also to give knowledge of concepts, tasks, strategies and problems upon transition to environmentally sustainable development of the cities.</li> <li>• To consider a condition of a planet's major resources and to provide students with the knowledge about sustainable resources' consumption from the point of view of their use reduction, environmental pollution, and also simultaneous expansion of the utilized resources consumption and greening of residents needs.</li> <li>• To develop at students deep understanding of an essence of system greening (biopositivity) of equipment and the technologies, necessary for sustainable development in the city of such sectors as the industry, power, transport, construction, and besides, agriculture in suburbs.</li> <li>• To give knowledge about design and construction connection with ecologically reasonable quality of the environment providing restoration of the nature's elements and maintenance of ecological equilibrium in the built environment.</li> <li>• To provide students with knowledge of: rational water resources usage in the city, reduction of water objects pollution and an assessment of their condition; about sources of atmospheric air pollution in the city, modern actions for the ambient air protection and of its quality control; about the household and industrial wastes management taking into account the ways of its improvement.</li> <li>• To create at students concept about environmentally sustainable city with the preserved valuable landscapes, flora and fauna and to give knowledge of the measures necessary for providing and maintenance of an sustainable cities' ecosystems.</li> <li>• To acquire knowledge of a planning essence on creation of and their components, transition programs to them, and also to acquaint being trained with the examples showing successful implementation of such projects in the countries of the world.</li> </ul>				

## Intended Learning Outcomes

### Knowledge and Understanding

On successful completion of this module, a student will be able to:

- To prove need of transition to environmentally sustainable development of the cities, to describe the purposes, strategies, the fundamental principles and problems of environmentally sustainable cities functioning.
- To study and analyse the major natural resources condition, possibilities of use of secondary material and energy resources, the strategy of sustainable resources consumption, and also greening of city residents needs .
- To understand the need of environmental technologies and equipment application for the ecosustainable city, to apply theoretical and practical knowledge of biopositive technologies and equipment used in the industry, transport, a city building and construction, and also in agricultural sector.
- To characterize design and construction in the cities from the point of view of ensuring life quality, environment protection, minimization of ecological damage to natural systems, optimum use of natural resources. To apply the received knowledge at design and building of nature protection objects practically (treatment facilities, landfills and so forth). To explain an essence and development ways of "green construction" and "green technologies", "green designs". To define the ecological status of predesign and design solutions of construction objects, to estimate environmental friendliness of structures qualitatively.
- To study and analyse the modern ways for rational use of water resources, reduction of water objects pollution and their quality control in the city; to define the sources of harmful emissions formation, to study ways of their decreasing, and also to characterize monitoring of atmospheric air quality in the cities. To study ways for minimization of municipal waste accumulation in the city, methods of their utilization and rational placement on the city's landfills.
- To carry out quality estimation of city flora and fauna condition, to define requirements to preservation and restoration of landscapes, city flora and fauna.
- To apply theoretical and practical knowledge about models and the indicators used at planning of transition to ecologically sustainable development in the cities, to study and analyze examples of ecocity elements creation (passive houses, "smart buildings").

### Transferable/Key Skills and other attributes

On completion of the module a student will have had the opportunity to:

- to analyze, compare the ecological environment of the city and to draw conclusions about its condition independently
- to think logically and predict the remote possible consequences of anthropogenic load on city environment
- to participate in development of perspective and carrying out of progressive sustainable actions on nature protection in the city
- to take part in educational work on knowledge acquisition in the field of an ecosustainable development of the cities
- to participate in group discussions and presentations throw Internet on ecosustainable development of the cities and their components questions

Module mark calculation:<sup>viii</sup>

Assessment components (in chronological order of submission/examination date)				
Type of assessment <sup>ix</sup>	Weighting%	Duration (if exam)	Word count (if essay/dissertation):	Component pass required <sup>x</sup>
<b>Assessment of the degree of interaction and participation of the students</b> (50% mark attributed to soft skills)	20%		n/a	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>Final assessment Component</b> Abstract	20%		5000	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Module tests	60%			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p>Learning and teaching strategies<sup>xi</sup>:</p> <p>Module is a complete part of a material accompanied by control of knowledge and skills. The academic load of the module consists of classroom and independent activity. Classroom activity includes lectures and practical classes. Independent activity of students is a preparation for classroom occupations and individual tasks, and also preparation for module delivery, contact hours.</p> <p>Preparation for the current classroom activity represents the analysis of literature, Internet materials on subjects, lectures and practical training, preparation for tests. The Internet – resources include databases on monitoring of the biosphere elements, scientific publications, electronic library and so forth.</p> <p>Contact hours assume individual consultations and students' control in on-line regime. The individual task assumes abstract writing on the most important subjects of the module, including summarizing of scientific and periodicals issues.</p> <p>For more information about an ecosustainable development of the cities and justifications of the students point of view they are offered to take part in online discussions, expert estimations and other group debatable activity.</p>				
<p>Syllabus outline:</p> <ul style="list-style-type: none"> <li>• Theoretical fundamentals of environmentally sustainable development of the cities</li> <li>• Sustainable consumption of resources.</li> <li>• Environmentally sustainable activity in the industrial, power and transport sectors of the city</li> <li>• Design and construction greening.</li> <li>• Water and air environment of the city. Household and industrial wastes in ecocity.</li> <li>• City's flora and fauna.</li> <li>• Environmentally sustainable cities development: plans and programs for its implementation.</li> </ul>				
<p>Indicative texts and/or other learning materials/resources:</p> <p><i>Core text</i></p> <p>Tetior A.N. Sustainable development of city.1999. M.: Committee in telecommunications and mass media. Moscow Government, 173 pp.</p> <p>Kucheravy V.P. 2001. Urboecology. Lviv: Svit, 440 pp.</p> <p>Samoilenko N.N. 2013. Resources and environmental protection. Chernivtsy: Prut, 294 pp.</p>				

Tim Dixon. 2011. Sustainable Urban Development to 2050: Complex Transitions in the Built Environment of Cities. Oxford Institute for Sustainable Development, Oxford Brookes University: <http://www.retrofit2050.org.uk/sites/default/files/resources/WP20115.pdf>

Raymond Cote and Jill Grant, Aliza Weller, Yuting Zhu and Corey Toews. April 13, 2006. Industrial ecology and the sustainability of Canadian cities: [http://eco-efficiency.management.dal.ca/Files/Industrial\\_ecology\\_and\\_Canadian\\_cities.pdf](http://eco-efficiency.management.dal.ca/Files/Industrial_ecology_and_Canadian_cities.pdf)

*Recommended text:*

Sarah Jenkin. 2009. Rethinking our built environments: Towards a sustainable future. URS New Zealand Limited and Maibritt Pedersen Zari, Victoria University <http://www.mfe.govt.nz/publications/sus-dev/rethinking-our-built-environment/rethinking-our-built-environment.pdf>

Adriana Allen. Sustainable cities or sustainable urbanization?: <http://www.ucl.ac.uk/sustainable-cities/results/gcsc-reports/allen.pdf>

Razjapov A.Z. Ecological monitoring of urban territories. Environment protection and natural resources problems, №8, 2011, p. 54 – 78.

*Journals:*

Engineering Ecology: [http://www.engineeringecology.de/ru/RU\\_2008\\_03.html](http://www.engineeringecology.de/ru/RU_2008_03.html)

Green Buildings.: <http://www.tallbuildings.ru/greenbuildings/>

*On-line resources:*

UNESCO official site, sustainable development materials: <http://www.un.org/russian>

UNO and sustainable development: <http://www.un.org/ru/development/sustainable>

Cite «sustainable development». Library on sustainable development: <http://www.ustoichivo.ru/biblio/view/167.html>

EuroCities: [www.eurocities.eu](http://www.eurocities.eu)

Date of completion of this version of Module Specification .....

Date of approval by the Faculty Programme Approval and Review Sub-committee: .....

- i indicate level (e.g. first, second or third cycle; sub-level if applicable). All qualifications in the European Higher Education Area are located within three cycles - undergraduate; graduate and doctoral studies*
- ii permissible credit values as set out in Institution's Academic Regulations*
- iii European Credit Transfer System*
- iv indicate 0.5, 1, 1.5 or 2*
- v delete as applicable*
- vi insert month and year of first/next delivery of module*
- vii identify all participating Schools other than Originating School*
- viii To be defined*
- ix please indicate, in chronological order of submission date, each assessment component by type, e.g. examination, oral, coursework, project, dissertation*
- x indicate Yes to specify the assessment component(s) to be passed in order to pass the module*
- xi please note the requirement to give full consideration to issues of equality, diversity and accessibility*