

# Terms of references for the development of INTENSE curricula

The objectives of INTENSE curriculum development are the following:

- 30ECTS of courses in e-learning modules by M23 and 60ECTS by M36 (mostly transferring existing course materials to e-format) – specialised courses focusing on specific research methods, introducing research fields and problems etc.
- 20 ECTS of generic skills courses by M19 (mostly developing new contents, and transferring to e-format existing ones, where relevant), e.g. academic writing publishing, strategies for successful research career, presenting skills, fundraising, research communications, introduction to research methodology, methods of statistics etc.
- 4MOOCs by M30

The proposed distribution of curriculum development workload between partner institutions, in terms of ECTS (subject to available budget and own capacity; we can discuss the options of exchanging ECTS load between research and skill courses, subject to the overall balance):

**Table 1. Course development assignment, per partner**

Partner institution	Research courses, 30 ECTS by M23 / 60ECTS by M36 *	Generic skills courses, 20 ECTS by M19 **
P5 Odessa State Environmental University	5 / 10	4
P6 V. N. Karazin Kharkiv National University	5 / 10	3
P7 The National Academy of Sciences of Ukraine	2 / 4	2
P8 National University of Mongolia	5 / 10	3
P9 Khovd State University	3 / 6	2
P10 Hanoi University of Science and Technology	5 / 10	3
P11 Ho Chi Minh Uni. of Natural Resources and Environment	5 / 10	3

\*each partners submits revision proposals for the courses worth at least their allocated ECTS + 20-30%; a pool of 30 / 60 ECTS will be chosen to avoid overlaps

\*\* each partners submits course development proposals for the ECTS at least 30% than suggested in this distribution; a pool of 20 ECTS will be chosen to avoid overlaps

## Course themes:

Research courses: any issues that constitute the area of your internationally recognisable research expertise

Generic skills courses: any methodology tools or skills training, which are generic by its nature and develop overall research methodology skills (e.g. statistics, GIS, specific software applications, observation and/or measurement techniques etc etc) or other skills important in research careers

(academic writing, presenting, media communications, fundraising, teaching & curriculum development etc)

**Table 2. Research courses: curriculum development and accreditations contexts and requirements – an overview**

Partner	Title of the course	No. of ECTS	Researcher / faculty member in charge	The institutional level of the accreditation (department, university, national etc)	Approximate lengths of the accreditation procedure, month	Comments (existing or to be developed; specific forms of classwork etc)
P5 Odessa State Env. University	Water Erosion of Soils	3	Anatolii Polovyi Liudmyla Bozhko	Department and University		
	Environmental Policy in Ukraine	2	Inessa Loyeva, Olha Sapko	Department and University		
	Agricultural and Environmental Effects of Atmospheric Pollution	3	Anatolii Polovyi Liudmyla Bozhko	Department and University		
	Pollution of Ecosystems with Mineral Fertilizers	3	Anatolii Polovyi Liudmyla Bozhko	Department and University		
	<b>TOTAL</b>	<b>11</b>				
P6 V. N. Karazin Kharkiv National University	Sustainable Development	3	Utkina Kateryna	Department and University		
	Philosophy of Science	3	Nadiya Maksymenko	Department and University		
	Environmental Management Practices	3	Kateryna Utkina	Department and University		
	Science Methodology	2	Nadiya Maksymenko	Department and University		
	<b>TOTAL</b>	<b>11</b>				
P7 The National Academy of Sciences of Ukraine	Scientific principles of biodiversity conservation	4	Oksana Maryshevych	University		
	Current issues of modern ecology	4	Iryna Shpakivska	University		
	<b>TOTAL</b>	<b>8</b>				
P8 National Uni. of Mongolia	Atmospheric dynamic process – air	6	Byambaa Batdelger	Department and University		

	pollution risk assessment					
	Urban water management - The city blueprint approach	3	Ochir Altansukh Munkhsuld Enkh-Uur	Department and University		
	Soil contamination and remediation technology	3	Davaasuren Davaadorj	Department and University		
	Environmental risk assessment and management	6	Battsengel Enkhchimeg	Department and University		
	Protected areas (PA) and its sustainability	3	Namsrai Oyunchimeg	Department and University		
	<b>TOTAL</b>	<b>21</b>				
P9 Khovd State University	Biochemistry of plant	2	Auyrzana Amarjargal	Department and University		
	Glaciology and Climatology	2	Demberel Otgonbayar	Department and University		
	Land Use and Pasture Land Management	2	B.Bayarkhuu, E,Amarjatgal	Department and University		
	<b>TOTAL</b>	<b>6</b>				
P10 Hanoi University of Sci. & Technology	Integrated Air Quality Management	3	Nghiem Trung Dung	Department and University		
	Trans-Boundary Water Management	3	Hoang Thi Thu Huong	Department and University	To be piloted in 2022-2023	
	Energy governance and management	3	Nguyen Thi Anh Tuyet	Department and University	To be piloted in 2022-2023	
	Climate change and mitigation challenge in developing countries	1,5	Ly Bich Thuy	Department and University	To be piloted in 2022-2023	
	<b>TOTAL</b>	<b>10,5</b>				
P11 Ho Chi Minh Uni. of Natural Resources & Env.	Natural Resources and Environmental Economic	3	Nguyen Thi Van Ha	Department and University		
	Solid Waste and Hazardous Waste Treatment Engineering	3	Nguyen Thi Van Ha	Department and University		

	Ecological Engineering	2	Nguyen Thi Van Ha	Department and University		
	Strategic Environmental Assessment –	3	Nguyen Thi Van Ha	Department and University		
	<b>TOTAL</b>	<b>11</b>				

**Table 3. Generic skills courses: curriculum development and accreditations contexts and requirements – an overview**

Partner	Title of the course	No. of ECTS	Researcher / faculty member in charge	The institutional level of the accreditation (department, university, national etc)	Approximate lengths of the accreditation procedure, month	Comments (existing or to be developed; specific forms of classwork etc)
P5 Odessa State Env. University	Optimization of Environmental Management	1	Tamerlan Safranov, Alla Kolisnyk	Department and University		
	Geomatics and Modelling (a part)	1	Andrii Achasov Anatolii Polevoy	Department and University		
	Academic Writing and Presentation (in English)	2	Oleg Shabliy, Izabella Pianova	Department and University		
	Assessment of the Radioactive Pollution of Agroecosystem	3	Anatolii Polovyi Liudmyla Bozhko	Department and University		
	<b>TOTAL</b>	<b>7</b>				
P6 V. N. Karazin Kharkiv National University	Environmental Projects Development and Management	3	Kucher Anatolii, Chernikova Olena	Department and University		
	Practice Learning in University Teaching	3	Alla Nekos	Department and University		
	Models for Environmental Risk Assessment	3	Alla Nekos Inna Bodak	Department and University		
	<b>TOTAL</b>	<b>9</b>				
P7 The National Academy of Sciences of Ukraine	Forest ecology	2	Iryna Shpakivska	University		
	<b>TOTAL</b>	<b>2</b>				

P8 National Uni. of Mongolia	Environmental science	3	Ochir Altansukh	Department and University		
	Sustainability & Water – Ecohydrological Processes	3	Dorjsuren Batsuren	Department and University		
	<b>TOTAL</b>	<b>6</b>				
P9 Khovd State University	Research methodology of science	3	Unurnasan D. A.Amarjargal, B.Bayarkhuu	Department and University		
	<b>TOTAL</b>	<b>3</b>				
P10 Hanoi University of Sci. & Technology	Indoor air pollution control	3	Nghiem Trung Dung	Department and University		
	Research Design: Theory and Practice	1,5	Van Dieu Anh	Department and University	To be piloted in 2022-2023	
	<b>TOTAL</b>	<b>4,5</b>				
P11 Ho Chi Minh Uni. of Natural Resources & Env.	Wastewater Treatment Engineering	3	Nguyen Thi Van Ha	Department and University		
	<b>TOTAL</b>	<b>3</b>				

### Template for course proposals:

#### P5 Odessa State Env. University

Title of the course: Introduction to agricultural ecology

Total ECTS: 1.5 ECTS

Title and accreditation level of the main program using the course, number of students involved:

PhD in geography (specialisation in agroclimatology) (5 students)

Other programs that can use the course or its modules with numbers of students: PhD in geography

(constructive geography) (5 students)

Authors of the course and their affiliations:

Course objectives:

Key competences to be addressed:

Examples of key employers, whose needs are addressed:

Course topics:

Distribution of the coursework between various activities, academic hours (e.g. lectures, seminars, workshops, independent/moderated group work, debates, exams (tests, oral, written, take home), reading of course literature, course research, development of a course paper/essay, preparation to exams etc):

**Procedure for the course development and revision:**

- Submission of the expression of interest for the development and/or revision of courses (i.e. filling in Table 2) – by **June 20, 2018**
- Evaluation of the submitted proposals in terms of relevance and overlaps; conclusions will be circulated to partners by **July 15, 2018**
- Submission of full course revision and development proposals (see the templates above) by **September 1, 2018**
- Evaluation of the proposed course relevance and/or sufficiency of the course revision (e.g. at least 30% of course contents (in terms of academic hours) are modified) by the subcontracted expert; draft ToRs based on course proposals, end-user survey and review of institutional capacities and constraints will be developed by **September 15, 2018**
- Development and review of course syllabi (syllabi templates provided by the subcontracted expert); the revised courses need to be implemented starting the **winter semester of the academic year 2018/19**
- Course piloting and evaluation; new courses need to be started not later than the **fall semester of the academic year 2019/20**.
- Collection and development of course materials in the INTENSE e-learning; the first versions of course materials need to be uploaded by **October 2019**
- Review of course materials (institutional review, if applicable, and peer-review arranged by the external QA officer)
- Revision of syllabi and/or course materials following up the feedback

**Reporting:**

- Course syllabi according to national requirements and the INTENSE common template
- Course materials uploaded to the INTENSE e-learning
- A short summary on how reviewers' comments were addressed
- Student evaluation reports

**MOOCs:**

4 MOOCs – exact topics

Format and parameters of MOOCs

Distributions of tasks – who is doing what

4 MOOCs (M20-30) addressing cross-cutting environmental issues that have to do with (1) water management and policies under the growing uncertainties in biophysical and socioeconomic systems, (2) the precautionary principle and governance of innovations, (3) policy and management of biodiversity conservation and spatial planning, and (4) energy security and environment

WATER MANAGEMENT AND POLICIES UNDER THE GROWING UNCERTAINTIES IN BIOPHYSICAL AND SOCIOECONOMIC SYSTEMS

(1) Overall Introduction of the Water MOOC

(2) Water management at different scales

- (3) Land use and climate change impacts on water resources (specific aspects in the partner countries)
- (4) Wetlands, ecohydrology and ecosystem services
- (5) Water pollution in river systems (Huang, Vietnam)
- (6) Water pollution in lakes and coastal zones (Ukraine)
- (7) Physical water management structures
- (8) Integrated water management strategy
- (9) Urban water management – The city blueprint approach
- (10) Integrated transboundary water management (Huang, Vietnam)
- (11) Experiences with implementation of EU water directives in Ukraine
- (12) Integrated coastal zone management of the Azov-Black Sea basin
- (13) Uncertainty, Risk and Sustainability in water resources management
- (14) Water management in agriculture
- (15) Reservoir management for the protection and sustainable use of water and biological resources: An integrated approach

## THE PRECAUTIONARY PRINCIPLE AND SUSTAINABILITY TRANSITION

### Module 1 – Sustainability concept and precautionary principle

- 01 – Early warnings and the precautionary principle
- 02 – IT tools – Geoinformation technologies in planning sustainable development of territories
- 03 – Sustainable land management and climate change
- 04 – Sustainability indicators

### Module 2 – Sustainable consumption and production

- 01 – Special protected area management and its sustainability
- 02 – Sustainable agriculture
- 03 – Sustainable Fisheries
- 04 – Sustainable transport
- 05 – Delta challenges
- 06 – Social conflicts during econetwork creation and development

## NATURE-BASED SOLUTIONS AND GREEN-BLUE URBAN INFRASTRUCTURE

### Module 1: Key concepts and international trends of protected areas

## Module 2: Ecosystem and NbS

Ecosystem services and ecosystem based adaptation

Mangrove Forest vs. Climate Changes

Nature Based Solutions to Climate Change Adaptation in Urban Areas

## Module 3: Green-Blue infrastructure

Green infrastructure for water management in post-Soviet Union countries, case study in Kharkiv

Peri-urban-areas-and-case-study

Rehabilitation of a former river: A case study of Vienna, Austria

## INTEGRATIVE SOLUTIONS FOR SUSTAINABLE ENERGY DEVELOPMENT

(1) Energy Development Plan

(2) Energy development and current policies in developing countries

(3) Science-Policy Interactions over the Governance of nuclear disaster

(4) Green energy development and climate changes resilience

(5) Hydropower

(6) Waste to energy

(7) Solar energy

(8) Fuel Cell

(9) Energy Efficiency for Buildings

(10) Energy Efficiency for Industries