Syllabus

Course Title

Economics of Climate Change: Case Studies and Best Practices in Healthcare

(elective course for the master's level, 90 hours / 3 ECTS credits)

General Information

General description of the required education/training, outlining the main objectives and explaining the necessity of the education/training at the organizational/country/regional level

Climate change is one of the most pressing global challenges of the 21st century, having a complex impact on the economy, public health, and population well-being. The deterioration of weather conditions, an increased frequency of extreme climate events, ecosystem degradation, and threats to food and water security lead to significant economic and social losses.

The need for this course is driven by the requirement to develop in future specialists a systemic understanding of the economic aspects of climate change, the ability to analyse risks, assess the costs and benefits of adaptation and mitigation strategies, and integrate best practices in the field of healthcare.

The course is designed in accordance with international strategies (the Paris Agreement, the UN Sustainable Development Goals), current scientific research, and practical experience from different countries, making it relevant both for Ukraine and in the context of global climate policy.

Audience

The main target audience of the course and any secondary audience, if it may influence decisions regarding the structure or content of the course

Expected level of knowledge and skills of the main audience (current or minimally required), as well as other factors (for example, cultural characteristics, level of technical training, access to the Internet) that should be considered when planning the course, as they may affect the choice of teaching methods, materials, and approaches to interaction with the audience

Primary audience:

• Master’s students in medicine, public health, ecology, and health economics.

• Future specialists in healthcare management, analysts, and employees of state and municipal institutions responsible for implementing climate change adaptation policies.

Secondary audience:

• Representatives of non-governmental organizations, international institutions, researchers, and practitioners in the field of climate policy.

• University lecturers integrating climate-related topics into educational programs.

Expected level of preparation:

• Basic knowledge of ecology, public health, and economics (minimum level — bachelor's degree).

• Understanding of global challenges and the principles of sustainable development.

• Basic skills in working with presentation materials, online resources, and digital learning platforms.

Additional factors:

• Availability of a blended learning format (online and offline).

• Access to the internet and multimedia materials.

• Focus on interactive learning methods: case studies, group work, and discussions.

Competencies

Training needs at the individual or organization/country/regional level, as well as a description of how these needs were identified and recognized as relevant.

Competencies targeted by the training.

Training needs assessment:

Analysis of current research and strategic documents from WHO, the UN, the EU, and national programs of Ukraine has shown that future healthcare professionals often lack sufficient knowledge about the economic consequences of climate change, adaptation mechanisms, and the integration of "green" practices into their professional activities.

Competencies developed:

- **Analytical:** the ability to assess economic risks related to climate change and to forecast impacts on healthcare systems.
- **Project-based:** the ability to develop adaptation strategies and mitigation programs at the level of an organization, community, or state.
- **Interdisciplinary:** integration of knowledge from economics, medicine, ecology, and sociology in addressing climate change challenges.
- **Communication:** the ability to effectively present research results and justify the need for climate initiatives to different stakeholder groups.
- **Professional:** understanding of international agreements, national policies, and financing instruments for adaptation measures.

Learning outcomes and performance criteria

Learning outcomes and performance criteria formulated with regard to the knowledge and skills to be acquired during the training process.

After completing the course, students will be able to:

1. **Explain** the interrelationship between climate change, economic processes, and public health.
2. **Analyse** the economic consequences of climate change at local, national, and global levels.
3. **Identify** vulnerable population groups and regions that are most sensitive to climate risks.
4. **Develop** proposals for adaptation and mitigation measures, taking into account economic efficiency and social impacts.
5. **Evaluate** the potential of "green" technologies and cross-sectoral cooperation in reducing risks.
6. **Integrate** best international practices into local public health strategies.

Effectiveness criteria:

- Completion of practical tasks and case studies based on real scenarios.
- Development of a group project on adaptation/mitigation in a chosen area of public health.
- Successful completion of test assessments for each module.
- Active participation in discussions, debates, and presentations.
- Final presentation of a research or practical project.

Course Content

Provide a content outline that corresponds to the learning objectives and outcomes. This may be a course outline as it will be presented to students, but not necessarily a complete curriculum.

Include a general list of all topics that you consider necessary to cover. If you believe it would help clarify the scope, indicate what will NOT be covered.

The course consists of five thematic modules that logically combine a theoretical foundation, analysis of practical examples, and development of skills for designing economically justified climate strategies in the healthcare sector.

Course structure:

1. Climate change as a global challenge

- Global climate challenges and their economic dimension.
- The link between climate change and the healthcare system.
- International context: Sustainable Development Goals, the Paris Agreement, climate change adaptation.

2. Economic consequences of climate change

- Impact on food and water security.
- Socio-economic consequences and migration processes.
- Case studies of vulnerable regions (Ukraine, African countries, Southeast Asia).

3. Impact of climate change on the healthcare system

- Impact of climate on the development of diseases and pathological conditions.
- Impact of climate on the spread of infectious diseases.
- Global health and climate initiatives.
- Case studies in the economics of climate change in healthcare.

4. Comparative analysis

- Analysis of the economic costs associated with climate change in the healthcare sector across different world regions.
- Examples of successful practices for reducing economic losses in healthcare through climate adaptation (WHO, EU, selected countries).
- Comparative analysis of investments in “green” technologies in medical facilities and their economic feasibility.

5. Best adaptation practices. Successful examples of risk reduction, cross-sectoral cooperation

- Successful cases of risk reduction in the healthcare sector.
- International initiatives and agreements (Paris Agreement, NDCs).
- Strategies for cross-sectoral cooperation and integration of climate policy.

Not covered in the course:

- Advanced technical aspects of climate modeling that require specialized engineering training.
- Purely ecological or purely biological analysis without an economic context.

Learning Solutions and Methods of Implementation

List the learning solutions (teaching methods) that will be used and explain why they were chosen. For example: classroom learning, online learning, blended learning, workplace learning, online resources for self-study, coaching or mentoring, etc.

The course uses **blended learning**, combining online and offline activities to ensure maximum flexibility and accessibility for students:

- **Lectures** — to develop a basic theoretical understanding and structure the learning material.
- **Recorded video lectures** — for independent viewing and revision of key topics.
- **Presentations and infographics** — to visually explain complex economic and climate-related relationships.
- **Practical work** — to consolidate knowledge and develop skills in analysing real case studies.
- **Online resources** (links to international databases, interactive maps, WHO and UN reports) — for independent research.
- **Discussion sessions** — to develop critical thinking and exchange experience.

Rationale for these choices: They allow the course to cover different learning styles—visual, auditory, practical, and interactive—and also ensure access to learning materials at any time.

Learning Strategies

Consider which learning strategies you will use. Provide justification for why you intend to apply them, including reasons why they will help participants achieve the planned learning outcomes.

Combine different learning strategies to create a diverse learning environment that accommodates different learning styles of participants. This will increase the effectiveness of learning and help achieve the planned learning outcomes. This section does not require a detailed description of specific activities.

To achieve the course outcomes, strategies combining **problem-based learning and practical orientation are applied**.

- **Problem-based learning** — students work on real or simulated problems (for example, economic analysis of an adaptation strategy for a specific region).
- **Case studies** — examination of examples from international and Ukrainian practice in climate change adaptation in healthcare.
- **Interactive discussions** — development of argumentation skills and the ability to justify strategic choices.
- **Independent work with sources** — analysis of reports from international organizations, research studies, and statistics.
- **Research-based learning** — students conduct mini-research projects on a chosen topic and present their results.

Rationale for these strategies: They develop not only knowledge but also practical skills in economic analysis and strategic planning, which are critical for working under climate-related challenges.

Learning Activities

Describe the main learning activities that will be included, such as lectures, readings, case studies, discussions, exercises, practical assignments, simulations, role-playing games, etc.
Also describe the roles of instructors and students during these activities.

Key activities:

- **Lectures** — introduction to the topic and systematization of knowledge.
- **Reading recommended literature** — to deepen understanding of the subject.
- **Case studies and group projects** — to develop teamwork skills and apply theory in practice.
- **Discussions and debates** — to foster critical thinking and the ability to defend positions with evidence.
- **Practical exercises** — calculation of economic losses, modeling adaptation scenarios.
- **Simulations and role-playing games** — simulating negotiations between countries on climate policy.

Roles of instructors:

- Learning facilitator — guides discussions and provides expert commentary.
- Mentor — supports individual and group work.
- Source of up-to-date information — integrates new research into the learning process.

Roles of students:

- Active participants in discussions and group projects.
- Analysts — performing calculations and research.
- Presenters — presenting their work results and justifying proposals.

Assessment of Learning

Describe the assessment plan for participants before, during, and/or after the course, including tests, exercises, activities, and projects that will be assessed. Indicate whether self-assessment or peer assessment will be used.

Explain how the assessment is linked to the learning outcomes.

Assessment plan:
Before the course — initial survey to determine participants' level of knowledge on the topic (online questionnaire).
During the course —

- Thematic tests after each module (assessment of understanding of key concepts and terminology).
- Practical tasks — case analysis, calculation of the economic consequences of climate change.
- Mini-presentations of group work results.

After the course —

- Final test (combination of closed and open questions).
- Final project — development of an economically justified adaptation strategy for a selected region or healthcare sector.

Additional forms of assessment:

- **Self-assessment** — short surveys after modules for reflection on individual progress.
- **Peer assessment** — reviewing colleagues' presentations and projects within the group.

Connection to learning outcomes:

- Tests — assessment of knowledge (theoretical component).
- Practical tasks and case studies — development of analytical and strategic skills.
- Final project — integration of theoretical knowledge and practical application in a comprehensive task.

Storyboard of Learning (Learning Storyboard)

Use this to create a visual scenario of your blended learning activity

Stage of learning	Format	Activity	Resources	Expected outcomes
Module 1 – Climate change as a global challenge	Lecture notes + video lecture + presentation + tests + recommended literature	Overview of global climate challenges and their economic dimension, connection with the healthcare system, international context (SDGs, Paris Agreement, adaptation)	Presentations, video materials, lecture notes, tests, UN and WHO documents	Basic understanding of the problem and its international significance
Module 2 – Economic consequences of climate change	Lecture notes + video lecture + presentation + tests + recommended literature	Analysis of impacts on food and water security, socio-economic consequences, and migration processes; case studies (Ukraine, Africa, Southeast Asia)	WHO reports, infographics, interactive maps, lecture notes, tests	Development of analytical thinking and risk assessment
Module 3 – Impact of climate change on the healthcare system	Lecture notes + video lecture + presentation + tests + recommended literature	Impact on disease development and spread, global initiatives in healthcare and climate	Scientific publications, interactive graphics, lecture notes, tests	Understanding of the health impacts of climate change and international approaches

Module 4 – Thematic studies of climate change economics in healthcare	Lecture notes + video lecture + presentation + tests + recommended literature	Analysis of economic costs in the healthcare sector, examples of successful adaptation practices, comparison of investments in "green" technologies	WHO reports, EU studies, analytical articles, lecture notes, tests	Ability to conduct comparative analysis and draw evidence-based conclusions
Module 5 – Best practices in adaptation and cross-sectoral collaboration	Lecture notes + video lecture + presentation + tests + recommended literature + **practical assignment**	Research and presentation of successful risk reduction cases; analysis of international agreements; development of a cross-sectoral strategy	Miro online board, project templates, lecture notes, tests, practical assignment	Development of a comprehensive climate change adaptation solution
Final	Online + offline	Presentation of group projects, final test, feedback	LMS, Zoom, classroom , test materials	Final assessment, certification

Learning resources and tools

List the available resources that will be used for different types of learning activities and recommended to students.

Describe the technologies that will be used to implement learning solutions, including educational technologies and operational equipment (hardware, software, collaboration tools).

Resources

1. PowerPoint presentations with key points and diagrams.
2. Video lectures.
3. Reports and analytical materials from WHO, the UN, and the IPCC.
4. Infographics and interactive maps (Climate Data Portal, WHO Climate Change and Health Tool).
5. Recommended literature:

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4. Global Temperatures. NASA Earth Observatory. URL: https://earthobservatory.nasa.gov/world-of-change/global-temperatures
5. The History of Global Temperature Anomalies (1851-2020). Visual Capitalist. URL: https://www.visualcapitalist.com/global-temperature-graph-1851-2020/
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7. Climate change: Islands that are disappearing due to global warming. USA Today. URL: https://www.usatoday.com/picture-gallery/travel/destinations/2019/11/29/climate-change-endangered-islands-disappearing-fiji-maldives-alaska/40630403/
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9. 9. A Second Scorching Heatwave in Europe. NASA Earth Observatory. URL: https://earthobservatory.nasa.gov/images/145377/a-second-scorching-heatwave-in-europe
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11. Що змінить нова кліматична мета?. Екодія. URL: https://ecoaction.org.ua/shcho- zminyt-nova-klimatychna-meta.html
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23. Home. EU Covenant of Mayors. URL: https://eu-mayors.ec.europa.eu/en/home
24. Про схвалення Стратегії екологічно... Кабінет Міністрів України. URL: https://www.kmu.gov.ua/npas/pro-shvalennya-strategiyi-ekologichno-a1363r
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Technologies and tools:

6. Learning platform: http://re.climed.network/ — for storing materials, tests, and exchanging information.
7. Video conferencing: Zoom, Microsoft Teams — for lectures and discussions.
8. Survey and testing tools: http://re.climed.network/.
9. Technical equipment: laptop, projector, screen, microphone, internet access.