Tárgytematika / Course Description
Blue-green infrastructure

EKNM_KETA094

Tárgyfelelős neve / Teacher's name: dr. Bene Katalin Julia
Félév / Semester: 2026/27/1
Beszámolási forma / Assesment: Folyamatos számonkérés
Tárgy heti óraszáma / Teaching hours(week): 2/1/0
Tárgy féléves óraszáma / Teaching hours(sem.):

OKTATÁS CÉLJA / AIM OF THE COURSE

During the course, students learn about the negative effects of climate change, especi-ally their effects on the hydrological processes. The ongoing changes in the water cycle and their effects on the water sources (water supply) are presented, as well as their expected social and economic effects. Students can learn about sustainable infrastructure, water management, nature-based solutions, and blue-green infrastructures. Applications and good engineering practices of various civil infrastructure and water retention meas-ures and their mitigating effects of negative climate impacts are presented. The traditio-nal engineering design approach is expanded, and projects are examined holistically. Li-fe cycle assessment is carried out along horizontal and vertical dimensions through sample projects. The independent project assignment during the semester and its presentation also serve to practice this holistic approach.

TANTÁRGY TARTALMA / DESCRIPTION

1.hét	Introduction: climate change, sustainability, water cycle
2.hét	Nature-based solutions, gray vs blue-green infrastructures (climate effects)
3.hét	Water management, stormwater-management, urban water demand and resoures
4.hét	Precipitation retention/infiltration vs drainage (engineering approach)
5.hét	Rainwater retention/infiltration vs drainage (social, economic approach)
6.hét	Water sensitive settlements, water sensitive urban design (WSUD)
7.hét	Midterm, blue-green infrastructure and ecosystems/biological diversity
8.hét	Fundamentals of NBS design, methodology (national and international)
9.hét	Best practices (national and international) and applications
10.hét	Introductions of life cycle assessment (LCA)
11.hét	Bevezetés az élettartam tervezésbe (LCA)
12.hét	Introductions of life cycle assessment (LCA)
13.hét	Implementation of blue-green infrastructure developments
14.hét	Presentation of project assignment

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

1 midterm + 2project assignment with presentation

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

EVALUATING THE IMPACT OF NATURE-BASED SOLUTIONS A Hand-book for Practitioners Adina Dumitru and Laura Wendling, Eds. 2021 Directora-te-General for Research and Innovation Healthy Planet - Climate and Planetary Boundaries

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL

• A guide to support the selection, design and implementation of Natural Water Retention Measures in Europe EUROPEAN COMMISSION Directorate-General for Environment Directorate C — Quality of Life, Water & Air Unit C1 — Water

• Guide to Hydrological Practices Volume II Management of Water Resources and Application of Hydrological PracticesWorld Meteorological Organization, 2009

• HANDBOOK ON SUSTAINABLE URBAN DRAINAGE SYSTEMS The handbook is prepared within Estonia-Latvia cross-border cooperation programme 2007-2013 project

• Urban Storm Drainage Criteria Manual Volume 3, Best Management Practices Updated November 2010

• Improving the Resilience of Best Management Practices in a Changing Environment: Urban Stormwater Modeling Studies EPA/600/R-17/469F May, 2018 www.epa.gov/research

• Raven, J., Stone, B., Mills, G., Towers, J., Katzschner, L., Leone, M., Gabo-rit, P., Georgescu, M., and Hariri, M. (2018). Urban planning and design. In Ro-senzweig, C., W. Solecki, P. Romero-Lankao, S. Mehrotra, S. Dhakal, and S. Ali Ibrahim (eds.), Climate Change and Cities: Second Assessment Report of the Ur-ban Climate Change Research Network. Cambridge University Press. New York. 139–172

• Planning a Green-Blue City Department of Environment, Land, Water and Planning February 2017