

Tárgytematika / Course Description

Hydraulic engineering

EKNM_KETA038

Tárgyfelelős neve /

Teacher's name: dr. Bene Katalin

Félév / Semester: 2022/23/2

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/1/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

The goal of this class to expand our hydraulic engineering knowledge in topics that road and railroad engineers and geotechnical engineeres are likely to encounter.

TANTÁRGY TARTALMA / DESCRIPTION

Session

Topics and Tools

- 1 Introduction
- 2 Hydrology **Introduction to Highway Hydraulics(Ch2), Urban Drainage (Ch3)**
- 3 Fundamental hydraulic concepts-Open Channel Flow **1. Introduction to Highway Hydraulics(Ch3, Ch4), Urban Drainage**
- 4 Fundamental hydraulic concepts-Open Channel Flow **2. Introduction to Highway Hydraulics(Ch3, Ch4), Urban Drainage**
- Midterm exam 1.**
- 5 Design of drainagesystems**Introduction to Highway Hydraulics (Ch5), Urban Drainage (Ch5)**

- 6 Street gutters-roadside median channels **Introduction to Highway Hydraulics (Ch6) Stormwater-collection systems-**
- 7 Rural drainage-Stable channel design-subsurface drainage
- 8 Storm drain design, drainage system construction, maintenance **Introduction to Highway Hydraulics (Ch8), Urban Drainage (Ch7)**
- 9 *Numerical modelling –Storm drains, gutter, inlet design-Toolbox*

Midterm exam 2.

- 10 Detention ponds **Introduction to Highway Hydraulics (Ch9,10), Urban Drainage (Ch8)**
- 11 *Numerical modelling -Detention ponds Toolbox, Excel*
- 12 *Numerical modelling SWMM*
- Hydraulic structures Culverts
- 13 *Numerical modelling –Culverts-HY8*
- Hydraulic Structures (Ch1,2, 3) Dams and reservoirs (presentations)**
- 14 Dam appurtenances (spillways, overflow spillways, terminal structures),

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Homework

Culvert design 10%
 Storm drain system design 10%
 SWMM modelling 15%

Presentation

Presentation of selected topic

Grading

Presentation 10%
 Homework 35%
 Midterms (I,II) 30%

Final Exam 25%

5 = 90 – 100%

4 = 80 – 90%

3 = 70- 80%

2 = 60-70%

1 = 0- 60%

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Hydraulic Structures Fourth Edition

P. Novak, A.I.B. Moffat and C. Nalluri
School of Civil Engineering and Geosciences,
University of Newcastle upon Tyne, UK
and

R. Narayanan
Formerly Department of Civil and Structural Engineering, UMIST,
University of Manchester, UK

Hydraulic Design Series No. 4 Introduction to Highway Hydraulics FHWA-NHI-08-090 (HDS-4)

Design of Small dams United states department of the interior Bureau of reclamation: the third edition

Urban Drainage Design Manual the third edition of HEC-22

Hydraulic Design of Highway Culverts Third edition FHWA-HIF-12-026 HDS 5

Hydraulic Design of Energy Dissipators for Culverts and Channels, third edition of HEC-14

Design of Roadside Channels with Flexible Linings the third edition of HEC-15