

### General Information:

Name of Course:

# HYDROLOGY AND HYDRAULICS

**Course Code:** PMTKGNB400CA  
**Semester:** 3<sup>rd</sup>  
**Number of Credits:** 4  
**Allotment of Hours per Week:** 2 Lectures, 2 Practices  
**Evaluation:** Exam (with grade)  
**Prerequisites:** None

**Instructor:** **Dr. Judit PÁL-SCHREINER**  
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### Introduction, General Course Description:

This course exposes students to an expansive suite of topics and methods within the field of water resources engineering, emphasizes engineering applications of hydrology and hydraulics.

### Learning Objectives:

Hydrology and hydraulics concepts are explored using fundamental conservation laws and ecologically-based design theory. Concepts include the properties of water, the water cycle, precipitation, runoff, flood, infiltration, groundwater flow, evaporation, hydrostatics, fundamental concepts of fluid flow, pressurized flow in pipe and open-channel flow.

### Methodology:

- **Lectures:** Lectures will give an introduction to the basic knowledge of the hydrology and hydraulics.
- **Practical class:** Students will be able to practice the basic calculations and design through sample examples.
- **Exams:** Accumulated knowledge is tested in two midterm exams.
- **Practical test:** Accumulated practice in basic calculations is tested in two midterm practical tests.

### Schedule:

Week	Topic of lecture
Week 1	Course description; Orientation
Week 2	The properties of water; The water cycle, Water in motion
Week 3	The process of precipitation (forms, types, measuring), Snow
Week 4	The runoff cycle, Factors affecting runoff, Measurement of runoff, The stream channel, Floods, Surface water <b>1<sup>st</sup> Homework</b>
Week 5	<b>1<sup>st</sup> Practical test</b> (Precipitation, Runoff)
Week 6	Infiltration, Zones of subsurface water, Soil water, Ground water reservoir, Aquifers, Aquifers as reservoirs, The process of evaporation, Measuring evaporation, The process of condensation, Measurement of condensation
Week 7	<b>Midterm exam</b> (Hydrology)

Week 8	Hydrostatics (fluid pressure, atmospheric pressure, manometers, stability of dams)
Week 9	<i>Fall Break – no classes</i>
Week 10	Fundamental Concepts of Fluid Flow (classification of flow, continuity, energy and the Bernoulli equation, Venture meters, Pitot tube, Siphons)
Week 11	Pipe Flow ( laminar- and turbulent flow in pipes, losses) <b>2<sup>nd</sup> Homework</b>
Week 12	<b>2<sup>nd</sup> Practical test</b> (Hydrostatics, Pipes)
Week 13	Open-Channel Flow (rapidly varied flow, critical depth-general case, hydraulic jump)
Week 14	<b>Final exam</b> (Hydraulics)
Week 15	<b>Retake exams, retake practical tests</b> ( if required)

**Attendance:**

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

**Grading:**

Grading will follow the course structure with the following weight

- 10% - Class attendance, class activity
  - 5% - 5% Homeworks
  - 20% - 20% Practical tests
  - 20% - 20% Exams
- A minimum of 55% is required to pass the exam

Offered exam grade

Numeric grade:	5	4	3	2	1
Evaluation in percents:	89%-100%	77%-88%	66%-76%	55%-65%	0-54%

**Students with Special Needs:**

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

**Readings and Reference Materials:**

- John C. Manning: Applied Principles of Hydrology 3rd Edition ISBN-13: 978-0135655320; ISBN-10: 0135655323
- Ernest Brater, Horace King, James Lindell, C. Wei: Handbook of Hydraulics 7th Edition ISBN-13: 978-0070072473; ISBN-10: 0070072477