FACULTY OF CIVIL ENGINEERING

River Regulation

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Introduction

NAME OF THE SUBJECT:
Groundwater Hydraulics

LECTURER:
Sreten Tomovi , PhD in Civil Engineering

METHODS:
Lectures, exercises,lab exercises, tests, colloquiums.

Introduction

WORKLOAD:

3.0 credits x 40/30 = 4 hours

Total workload for the Subject 3.0 x 30 = 90 hours

EXAMINATION METDODS:

- Attendance to lectures and exercises: max 4 pt;
- Graphic works: max 4 pt;
- Seminary Essays: max 10 pt;
- Tests: max 12 pt;
- Colloquiums: max 40 pt;
- Final exam: max 30 pt;
- Pass requires minimum 50 pt.

Topics
Week 1

- Introduction.
- Motives of watercourse regulation, general concepts,
- hydrological characteristics of watercourses,
- water levels and flows.

Topics

Week 2

- Elements of boundary layer theory,
- distribution of tangential stresses and
- distribution of velocities by cross section.

Topics

Week 3

- Linear resistances in a bed with a fixed bottom,
- empirical expressions for frictional resistances,
- coefficient of resistance of the section.
- Laboratory exercises.

Topics

Week 4

- Sedimentary formations and alluvial resistances, types of alluvial formations, assessment of alluvial formations

Week 5

- Unsteady flow in natural watercourses

Week 6

- Steady flow in natural watercourses, hydraulic division, steady flow equation, geometric elements of cross section, normal and critical depth in the bed of complex cross section. Laboratory exercises.

Topics

Week 7

- Secondary currents. Flow in curves, flow in the zone of bridge pillars and other types of secondary flow. Laboratory exercises..
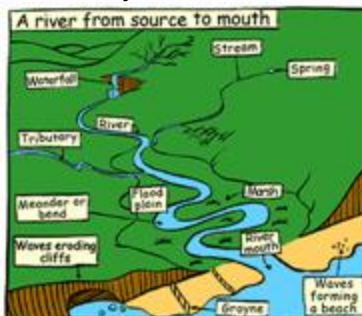
First Testing Week
## Week 8

- COLLOQUIUM I

Topics
Week 9

- River morphology.
- Geometric variables, dynamics of alluvial watercourses,
- application of regime theory,
- statistical and morphological analysis.

Topics

Week 10

- River sediment.
- Origin and division, physical properties of river sediment.
- Initiation of drawn sediment, deterministic and stochastic principle of initiation of drawn sediment,
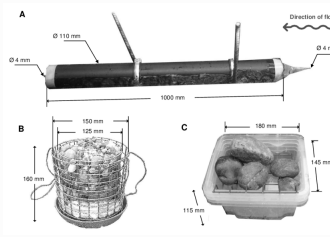- formation of suspended sediment.
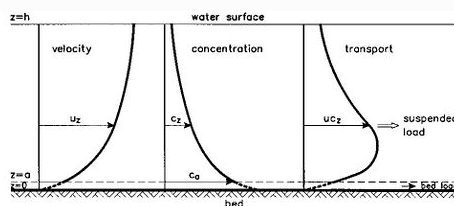
Topics

Week 11

- Methods of measuring the transport of drawn and suspended sediment.

Week 12

- Physical hydraulic models, models with movable and fixed bottom. Laboratory exercises.

Topics

Week 13

- Control and regulation works buildings, dimensioning of regulatory structures, construction materials and methods of construction regulatory structures.

Week 14

- Watercourse development projects, substrates and research works, types of projects, content of individual projects.

Second Testing Week

Week 15

- II COLLOQUIUM

Learning outcomes

After having passed the exam, students will be able to:

1. Hydraulically calculate the water mirror line for the probabilities of occurrence and duration;
2. Determine the diagrams of general deformation of the river section and local changes in regulatory structures;
3. Development of Preliminary design of watercourse regulation.

References for the subject

D. Muskatirovic: River Regulation, Faculty of Civil Engineering, Belgrade, 1991.

D.Muškatirovi , M. Jovanovi : Test tasks from the subject of regulation of rivers, Civil Engineering, Belgrade, 1977.

LJ.Jefti : Arrangement of torrents (Chapter 4 Technicians 6, Belgrade, 1989)