ICH2124 HYDRAULIC ANALYSIS AND DESIGN

Credits and contact hours: 10 UC credits. 3 h. Lectures / 1,5 h. Assistanship / 5,5 h. Independent learning experiences

Instructor's name: Rodrigo Cienfuegos

Course coordinator's name Rodrigo Cienfuegos

Textbook: Sturm T. W. 2001. Open Channel Hydraulics. Mc Graw Hill, NY.
Chaudry, M.H. 2014. Applied Hydraulic Transients. Third Edition, Springer.
Robertson, J.A., Cassidy, J.J., Chaudhry, M.H. 1998. Hydraulic Engineering. Houghton Millin Company.

Course Catalog Description: Application of hydraulic principles to engineering design of pressurized pipe systems and networks, and to open channel flows. Analysis of the operation under transient conditions, including water hammer surge for closed conduits, and flood progation in open channels.

Prerequisite Courses: ICH 2114 HYDRAULIC ENGINEERING

Co-requisite Courses: None

Status in the Curriculum: Requiered

Course Learning Outcomes: 1. Use hydraulic principles to analyze and design open channel flows in steady state.
2. Use hydraulic principles to analyze and design piping systems and networks.
3. Understand, model, and compute flood propagation in open channels using appropriate models.
4. Perform water hammer analysis in closed conduits including surge protection systems.
5. Perform economic analysis and selection of the most convenient design.

Relation of Course to ABET Criteria: a. Knowledge of mathematics, science and engineering
b. Design and conduct experiments: analyze and interpret data
c. Design a system, component, or process
d. Multidisciplinary teams
e. Identify, formulate, and solve engineering problems
k. Techniques, skills, and modern tools for engineering practice.

Topics covered:

1. Review of fluid mechanic principles for hydraulic design.
2. Pipe distribution systems.
3. Analysis of pressurized networks including pumps and water tanks.
4. Unsteady flows in closed conduits, water hammer analysis and surge protection.
5. Open channel analysis and design under steady conditions.
6. Unsteady flows in open channels and flood propagation