

<b>Area:</b> Hydraulic, Water Resources and Environmental Engineering
<b>Level:</b> PhD
<b>Course title:</b> Computational Hydraulics - 1D Open-Channel Flows and Transport
<b>Lecturer:</b> M. Spasojevic
<p><b>Course objective</b> Gain theoretical background and practical experience in development and application of mathematical models in the area of 1D open-channel flow and transport processes.</p>
<p><b>Course outline</b></p> <p><i>Course topics</i> General review of numerical methods      Finite-element method      Method of characteristics      Finite-difference method      Consistency, stability, convergence  One-dimensional constituent transport      Mass-conservation equation      Advection part          Finite-difference methods          Trajectory methods      Diffusion part      Hybrid methods, Fractional-step methods  One-dimensional unsteady open-channel flow      Integral flow equations      Differential flow equations      Finite-difference methods      Preissmann's scheme          Derivation          Single channel          Boundary conditions          Branched channels          „Internal“ boundary conditions</p> <p><i>Assignments and term projects</i> Course topics are accompanied by assignments and term projects, requiring individual work under teacher's guidance and supervision.</p>
<p><b>Recommended literature:</b>  1. J. A. Cunge, F. M. Holly and A. Verwey: <i>Practical Aspects of Computational River Hydraulics</i>, Pitman Publishing Co., 1980.  2. M. B. Abbott: <i>Computational Hydraulics</i>, Pitman Publishing Co. 1979.  3. K. Mahmood and V. Yevjevich: <i>Unsteady Flow in Open Channels</i>, Water Resources Publications, Forth Collins, Colorado, U.S.A., 1975.  4. M. Spasojevic: <i>Computational Hydraulics – Open-Channel Flow</i>, Civil Engineering Faculty Subotica, 1996, in Serbian.</p>