

Program: Hydraulic, Water Resources and Environmental Engineering	
Level: Master studies	
Course title: OPEN-CHANNEL FLOW AND TRANSPORT PROCESSES	
Teacher: Miodrag P. Spasojevic	
Course status: Core	Credits: 6
<p>Course objective To gain theoretical background and practical experience in application of mathematical models in the area of 1-, 2- and 3-D open-channel flow and transport processes.</p>	
<p>Course outline</p> <p><i>Lectures (2 hours/week)</i> General 3-D flow equations Integral form of equations Differential form of equations Reynolds-averaged equations General 3-D transport equation i.e. advection-diffusion equation Integral form of equation Differential form of equation Reynolds-averaged equation Overview of numerical methods for equations of mathematical physics Trajectory (characteristics) methods Finite difference methods (consistency, convergence, stability) Method of characteristics for 1-D advection Finite-difference methods for 1-D diffusion Fractional-step method for complete advection-diffusion equation Flow and transport equations for 1-D models Solution techniques for 1-D equations 2-D (depth-averaged) flow and transport equations Solution techniques for 2-D equations</p> <p><i>Assignments and term projects (2 hours/week)</i> Lectures are accompanied by assignments and term projects, requiring individual work under teacher's guidance and supervision.</p>	
<p>Recommended texts:</p> <ol style="list-style-type: none"> 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. Subotica, 1996, in Serbian. 5. M. Jovanovic: <i>Principles of 2D open-channel flow numerical modeling</i>, Civil Engineering Faculty Belgrade, 1998, In Serbian 	