

Area: Hydraulic, Water Resources and Environmental Engineering
Level: Undergraduate (BSc)
Course title: Water (River) Monitoring
Lecturer: M. Spasojevic
<p>Course objective: Gain knowledge and practical experience in the area of water monitoring, including monitoring of unsteady flow parameters, sediment and morphodynamics parameters, and water-quality parameters.</p>
<p>Course outline:</p> <p><i>Course topics</i></p> <p>Unsteady flow parameters. Flow discharges, velocities, velocity gradients, pressure and free-surface elevations, turbulent flow velocity distributions and friction laws, turbulent-flow diffusion.</p> <p>Sediment and morphodynamic parameters. Suspended-sediment transport, suspended-sediment concentration distributions, bed-sediment transport, bed evolution – sediment erosion and deposition.</p> <p>Water quality parameters. Coloids, suspended and diluted water constituents. Physical, physico-chemical, chemical, and biological content of natural waters (surface, atmospheric, and groundwaters). Water pollutants and their influence on water characteristics (metals, inorganic and organic pollutants, microbiological aspects, radioactivity).</p> <p>Monitoring of unsteady flow parameters. ADCP flow-discharge measurements versus traditional techniques. ADCP methodology for velocity measurements. GPS positioning. Instrumentation and techniques for free-surface elevation measurements.</p> <p>Monitoring of sediment and morphodynamic parameters. Bathymetry surveys – instrumentation and procedures. Collection of suspended- and bed-sediment samples. Processing of suspended- and bed-sediment samples to obtain suspended-sediment concentrations and size-class distributions, and bed-material size-class distributions.</p> <p>Monitoring of water-quality parameters. Collection and processing of water-quality samples. Measurements of air and water temperature, pH, conductivity, dissolved oxygen, saturated oxygen. Processing of samples to obtain selected chemical and biological parameters, such as NO₂-N, NO₃-N, NH₄-N, PO₄-P, COD cr, chlorophyll-A, BOD 5, algae number, etc.</p> <p>Simultaneous monitoring of all parameters – planning and design of field-data campaigns.</p> <p><i>Assignments and term projects</i></p> <p>Course topics are accompanied by assignments and term projects, requiring individual work under teacher's guidance and supervision.</p>
<p>Recommended literature:</p> <ol style="list-style-type: none"> 1. B. Skenderovic, Dj. Selesi: <i>Water Chemistry and Biology</i>, University of Novi Sad, Civil Engineering Faculty Subotica, 1986. 2. S. Jovanovic, O. Bonaci, and M. Andjelic: <i>Hydrometry</i>, Civil Engineering Faculty Belgrade, 1997, in Serbian. 3. M. Garcia., ed: <i>Sedimentation Engineering: Theories, Measurements, Modeling, and Practice</i>, ASCE Manuals and Reports of Engineering Practice No. 110, American Society of Civil Engineers, 2007.