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| Course: | ***Hydraulics*** |
| Course id: ЗOUV6025 |
| Number of ECTS: 5 |
| Teacher: | Prof. Atila Salvai, Ph.D. |
| Course status | Mandatory |
| Number of active teaching classes (weekly) |
| Lectures: 45 | Practical classes: 45 | Other teaching types: | Study research work: | Other classes: |
| Precondition courses | None |
| 1. Educational goal

 Introducing students to the basics of hydraulics and application in water management. |
| 1. Educational outcomes

 Ability of students to apply the fundamentals of hydraulics in water management. |
| 1. Course content
* FLUID FLOW IN PIPES (Energy principle. Laminar flow. Critical velocity. Reynolds number. Turbulent flow. Shearing stress at pipe wall. Velocity distribution. Loss of head for laminar flow. Darcy-Weisbach formula. Other losses of head).
* EQUIVALENT, COMPOUND, LOOPING AND BRANCHING PIPES (Piping systems and Hardy Cross method. Equivalent pipes. Compound, looping and branching pipes. Methods of solution. Hazen-Williams formula).
* MEASUREMENT OF FLOW OF FLUIDS (Introduction to velocity and quantity measurements. Pitot tube. Coefficients of velocity and discharge. Coefficient of contraction. Lost head. Weirs. Dams as weirs. Time to empty tanks).
* FLOW IN OPEN CHANNELS (Open channel. Steady, uniform flow. Non-uniform or varied flow. Chezy formula. Manning formula. Lost head. Specific energy. Critical depth. Maximum unit flow. Non-uniform flow and backwater flow. Broad-crested weirs. Hydraulic jump).
* FORCES DEVELOPED BY MOVING FLUIDS (Impulse-Momentum principle. Total drag force. Drag coefficients. Lift coefficients. Mach number. Boundary layer theory. Water hammer).
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| 1. Teaching methods

 Practice, Consultations. |
| Knowledge evaluation (maximum 100 points) |
| Pre-examination obligations | Mandatory | Points | Final exam | Mandatory | Points |
| Lecture attendance | No |  | Oral part of the exam | Yes | 40 |
| Exercise attendance | No |  |  |
| Term paper | Yes | 60 |
| Literature  |
| Ord. | Author | Title | Publisher | Year |
|  | Salvai, A. | Hydraulics | Script (in Serbian) | 2014. |
|  | Ranald V. Giles | Theory and Problems of Fluid Mechanics and Hydraulics | McGrow-Hill book Company | 1962. |
|  | Victor, L., Streetar, E., Benjamin, W. | Fluid Mechanics | McGrow-Hill book Company | 1985. |
|  | Ven Te Chow | Open-Channel Hydraulics | McGraw-Hill book Company | 1959. |

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| Znak univerziteta | UNIVERSITY OF NOVI SADFACULTY OF AGRICULTURE 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 8 | Znak fakulteta2 |
| Study Programme AccreditationUNDERGRADUATE ACADEMIC STUDIES WATER MANAGEMENT |
| Table 5.2 Course specification |