**Table 5.1** Course specification to doctoral study programs

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| **Course name: Eco-efficiency of water systems** |
| **Teacher or teachers:** [**Todorović R. Mladen**](../P%209.3%20Knjiga%20Nastavnika%20DOS%20He/45.%20Mladen%20R.%20Todorovic%2C%20redovni%20profesor.xlsx) |
| **Course status:** Elective |
| **Number of ECTS:** 10 |
| **Precondition courses:** None |
| **Educational goal**The course focuses on the eco-efficiency of water systems and uptake of new technologies for the improvement of system performances from economic and environmental point of view.  |
| **Educational outcomes** Capability to design a water supply chain and value mapping of a water system and to analyze its eco-efficiency performance.  |
| **Course content**1) The concept of eco-efficiency and its applicability at different scales. 2) Meso-level eco-efficiency analysis framework and tools. 3) Development of eco-efficiency indicators and technologies assessment. Methods of evaluation (LCA).4) Systemic Environmental Analysis Tool (SEAT) and water supply chain mapping. 5) Economic Evaluation Analysis Tool (EVAT) and value chain mapping.6) Eco-efficiency assessment of irrigation systems. Examples of application. |
| **Literature**1. Muller, K. and A. Sturm (2001). Standardized Eco-efficiency Indicators, Ellipson AG, Basel, Swiss, 72p.2. Samekto, C., A.G. Kendarto, N. Rullihandia, T. Sutedjo (2003). Concept of eco-efficiency for water infrastructure development in Indonesia. Ministry of National Development and Planning, Indonesia, 60p.3. Todorovic, M., D. Assimacopoulos, D. Zaccaria, A. Scardigno (2013), “Assessing the eco-efficiency of the Sinistra Ofanto Irrigation Scheme”, Proc. 8th EWRA Int. Conf., Porto (Portugal), 9p. 4. ECOWATER project (2012), Meso-level eco-efficiency indicators to assess technologies & their uptake in water use sectors, http://environ.chemeng.ntua.gr/ecowater/  |
| **Number of active teaching classes (weekly)** | Lectures: 4 | Study research work: 0 |
| **Teaching methods**Presentation of theoretical concepts and their explanation (theory).Introduction to SEAT and EVAT tools and their capabilities (demonstration)Guided practical work: Water supply and value chain mapping and eco-efficiency assessment of a water system. |
| **Knowledge evaluation (maximum 100 points)****Pre-examination obligations Points Final exam Points**Lecture attendance **10**  Oral part of the exam **30**Colloquium exam **30**Term paper **30**  |