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

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| **Course name: Hydroinformatics: concept, methods and tools** | | |
| **Teacher or teachers:** [**Kisi S. Ozgur**](../P%209.3%20Knjiga%20Nastavnika%20DOS%20He/13.%20Ozgur%20S.%20Kisi,%20redovni%20profesor.xlsx)**,** [**Gocić Lј. Milan**](../P%209.3%20Knjiga%20Nastavnika%20DOS%20He/53.%20Milan%20Lj.%20Gocic,%20docent.xlsx)**,** [**Todorović T. Branimir**](../P%209.3%20Knjiga%20Nastavnika%20DOS%20He/44.%20Branimir%20T.%20Todorovic,%20vanredni%20profesor.xlsx) | | |
| **Course status:** Elective | | |
| **Number of ECTS:** 10 | | |
| **Precondition courses:** None | | |
| **Educational goal**  Students will acquire knowledge that can be used in professional subjects and practical work. | | |
| **Educational outcomes**  Students will have been competent enough to develop and solve hydrological problems in further professional education. They will learn the usage of different types of modelling (physically-based, data-driven, agent based) and corresponding tools. | | |
| **Course content**  Introduction. Modelling and applications of models. Physically-based simulation modeling and tools. Data-driven modeling and computational intelligence tools. Techniques for connectionist modeling: artificial neural  networks, nearest neighbor, fuzzy rule based systems, genetic programming, support vector machines. Agent based model. Examples of using modeling in water-related issues. Systems analysis, decision support and multi-objective optimization. Information theory and optimization. Sources of uncertainty in modeling. Monte Carlo simulation of parametric uncertainty. Integration of data, models and people. Integration of hydroinformatics systems and decision making. | | |
| **Literature**  1. M. B. Abbott, *Hydroinformatics: Information technology and the aquatic environment*,Avebury Technical, Aldershot, UK, 1991  2. P. Kumar, J. Alameda, P. Bajcsy, M. Folk, M. Markus, *Hydroinformatics: data integrative approaches in computation, analysis, and modeling*, Taylor & Francis Group, 2005 | | |
| **Number of active teaching classes (weekly)** | Lectures: 4 | Study research work: 0 |
| **Teaching methods**  Lectures. Consultations and interactive work with the students. Lectures are organized in combined form. The presentation of the theoretical part is followed by the corresponding examples. | | |
| **Knowledge evaluation (maximum 100 points)**  **Pre-examination obligations Points Final exam Points**  Lecture attendance **10**  Oral part of the exam **30**  Colloquium exam **30**  Project task **30** | | |