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

|  |  |  |
| --- | --- | --- |
| **Course name: Physically based hydro technical modeling** | | |
| **Teacher or teachers:** [**Karamarković P. Jugoslav**](../P%209.3%20Knjiga%20Nastavnika%20DOS%20He/12.%20Jugoslav%20P.%20Karamarkovic,%20redovni%20profesor.xlsx)**,** [**Maluckov A. Aleksandra**](../P%209.3%20Knjiga%20Nastavnika%20DOS%20He/46.%20Aleksandra%20A.%20Maluckov,%20redovni%20profesor.xlsx)**,** [**Đorić Veljković M. Snežana**](../P%209.3%20Knjiga%20Nastavnika%20DOS%20He/40.%20Snezana%20M.%20Djoric-Veljkovic,%20vanredni%20profesor.xlsx) | | |
| **Course status:** Elective | | |
| **Number of ECTS:** 10 | | |
| **Precondition courses:** None | | |
| **Educational goal**  Acquisition of necessary knowledge building capacity for solution of certain design tasks from various areas of physically based modeling in the area of hydro-technics. | | |
| **Educational outcomes**  Building capacity for the independent scientific-research work in the field of physically based modeling in hydro-technics. | | |
| **Course content**  Modeling and simulation. Physical and mathematical modeling. Types of models: deterministic and stochastic, discrete and distributed, linear and nonlinear, analytical and numerical. Transport models. Non-linear dynamics and introduction to chaos theory. Fractals, Incidental systems, Fourier’s analysis. | | |
| **Literature**  1. N.J. Giordano, H. Nakanishi, Computational Physics, Pearson Education, Inc. 2006.  2. R.L. Liboff, Kinetic Theory, John Willey and Sons Inc. 1998  3. D. G. Duffy, Solutions of partial differential equations, TAB Professional and Reference Books, 1986  4. S.H. Strogatz, Nonlinear Dynamics and Chaos, Perseus Books Group, 2001  5. A A. J. Lichtenberg and M. A. Lieberman, Regular and Chaotic Dynamics, 2nd ed., Applied Mathematical Sciences, Vol. 38, New York, NY: Springer-Verlag, 1992. | | |
| **Number of active teaching classes (weekly)** | Lectures: 4 | Study research work: 0 |
| **Teaching methods**  Theoretical instruction is conducted through lectures and consultations related to the term paper production | | |
| **Knowledge evaluation (maximum 100 points)**  **Pre-examination obligations Points Final exam Points**  Term paper **50** Оral part of the exam **50** | | |