Study program : Informatics

Type and level of studies: Undergraduate academic studies

Course unit: Computer simulations

Teacher in charge : Boban Stojanovic

Language of instruction (*English or other foreign language*) English

ECTS: 6

Prerequisites: Object-oriented programming, Mathematical analysis, Physics (basic)

Semester *(Winter Semester or Summer Semester)* Summer

Course unit objective

Learning state of the art computer simulation and methods, as well as their application in solving real-world problems.

Learning outcomes of Course unit

Student is able to develop models of real-world systems, to perform simulations of their behavior under various conditions, and to analyze obtained results.

Course unit contents

Theoretical classes

Introduction in system modeling: System specification formalisms, Levels of system knowledge, Introduction to the hierarchy of system specifications, The specification levels, System specification morphisms. **Framework for modeling and simulation:** Entiteti okvira, Primary relations among entities, Other important relationships. **Modeling Formalisms and Their Simulators:** Introduction, Discrete time models and their simulators, Differential equation models and their simulators, Discrete event models and their simulators. **Introduction to discrete event system specifications (DEVS):** Introduction, Classic DEVS system specification, Parallel DEVS system specification, Hierarchical models, Object-oriented implementations of DEVS.

Practical classes

Practical classes consist of application of the acquired theoretical knowledge in solving real-world problems in various fields, such as informatics, telecommunications, mechanics, hydrology, bioengineering, economy, etc.

Literature

1. Bernard P. Zeigler, Tag Gon Kim, Herbert Praehofer, *Theory of Modeling and Simulation*, Academic Press, A Harcourt Science and Technology Company, San Diego, 2000.
2. Gabriel A. Wainer. Discrete-event Modeling and Simulation. A Practioner's Approach. Taylor & Francis Group, 2009.

Number of active teaching hours				**Other classes**
Lectures:	Practice:	Other forms of classes:	Independent work:	
0	0	1	4	**0**

Teaching methods

Consultations, Independent work

Examination methods (maximum 100 points)

Exam prerequisites	**No. of points:**	**Final exam**	**No. of points:**
Student's activity during lectures		oral examination	
practical classes/tests		written examination	
Seminars/homework	**30**	.....	
Project	**70**		
Other			

Grading system

Grade	**No. of points**	**Description**
10	**91-100**	Excellent
9	**81-90**	Exceptionally good
8	**71-80**	Very good
7	**61-70**	Good

6	**51-60**	Passing
5	**0-50**	Failing

(Table 5.2) Course unit description