Course Unit Descriptor

Study Programme: Ph.D. in Computer Science	
Course Unit Title: System Modeling	
Course Unit Code: ID011	
Name of Lecturer(s): Miloš Racković, Mirjana Ivanović, Srđan Škrbić	
Type and Level of Studies: Doctoral Academic Degree	
Course Status (compulsory/elective): Elective	
Semester (winter/summer): Winter	
Language of instruction: Serbian (primary), English (secondary)	
Mode of course unit delivery (face-to-face/distance learning): Face-to-face	
Number of ECTS Allocated: 7	

Prerequisites: None

Course Aims:

The aim of the course is a synthesis and taxonomy of many software systems modeling techniques - from formal to structural. Methodological aspects of modeling will be discussed within the techniques: architecture (styles, models and views), forms, methods of design, and so on.

Learning Outcomes:

At the end of the course it is expected from a successful student to be able to:
- critically asses and research key concepts in modeling, architecture, design and patterns.
- critically asses alternatives in modeling, dependant on the requirements
- recognize and create an adequate model
- apply research methods in the field of modeling and software architectures

Syllabus:

Review of research in the field: theoretical foundations, elements, styles and patterns, languages and description notations, the methodological procedures for system modeling, system modeling with unified modeling language (UML). Current trends in the research area, for example. models driven development (Model-Driven Architecture MDA), computer independent models, platform-independent and dependent models, formal models, relationship of formal models and of the final system performance, the formalization of UML, ...

Required Reading:

1. Bass L., Kazman R., Clements P., Software Architecture in Practice, Addison Wesley, second edition.
2. Shaw M. and Garlan D., Software Architecture. Prentice Hall 1996
3. Gamma E., Helm R., Johnson R., Vlissides J. M., Design Patterns: Elements of Reusable Object-Oriented Software, Addison Wesley.
4. Rumbaugh H., Blaha M, Premarlani W., Eddy F., Lorensen W.: Object-Oriented Modelling and Design, Prentice-Hall
5. Booch G.: Object-Oriented Analysis and Design with Applications, Addison-Wesley, 1994 (2nd ed.)
6. UML 2.1.1, http://www.omg.org/technology/documents/formal/uml.htm

Weekly Contact Hours: 2	**Lectures:** 2	**Practical work:** 0

Teaching Methods:

Lectures are organized using classic teaching methods with use of a projector. Students independently explore various research topics, present and discuss results with other students and the lecturer.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation		written exam	
Practical work		oral exam	40
Preliminary exam(s)		…….	
Seminar(s)	60		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.