Course title: Software Evolution (ID101)

Lecturer(s): Zoran D. Budimac, Miloš M. Radovanović

Status: elective

ECTS: 7

Requirements: none

Learning objectives

With the emergence of new architectures, need for representing new functionality, improvements in project development techniques and/or changes in goals and business processes, there exists a stron urge for existing software systems to evolve, preserving the continuity of use. Such evolution demands different techniques for what is known as `*re-engineering*'. With re-engineering, we assume the viewpoint of exploring, understanding and changing the system with the aim of redesigning and implementing it in a new form.

The course goal is acquaintance with all aspects of the aforementioned process, and recognising the functionalities of existing code.

Learning outcome

A successful student will be able to:

- Critically assess existing basis for software evolution
- Critically assess re-engineering techniques for software migration and abstraction
- Critically assess approaches to software evolution life cycles
- Apply research methods in software evolution

Syllabus

Theoretical instruction

Overview of the state of research in the field: evolution within software life cycles, laws of evolution, software transformation, transformation theory and its implementation, software abstraction. Contemporary areas of research in the field, e.g., software quality preservation, unified software platform for evolution, model evolution, formal basis of software evolution, support for multi-language systems, evolution as language construct, etc.

Practical instruction

Recommended literature

1. H. Yang, M. Ward. *Successful Evolution of Software Systems*. Artech House, 2003
2. M. Fowler. *Refactoring: Improving the Design of Existing Programs*. Addison-Wesley, 1999
3. S. Demeyer, S. Ducasse, O. Nierstrasz. *Object-Oriented Reengineering Patterns*. Morgan-Kaufmann, 2002

Weekly teaching load	Lectures: 3	Student research: 0

Teaching methodology

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.

Grading method (maximal number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
seminars	60	seminar paper	40