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| Module title Software reliability and performance | | | | |
| Module code t.b.a. | Level Bachelor (B.Sc.) | Hours per week 4 | ECTS credits 5 | Duration 2 weeks block course + virtual lectures |
| Module instructor Richard Lipka, University of West Bohemia, Plzen, Czech Republic | | Lecture type Lectures with discussion + Guided Lab Sessions | Prerequisite(s) Intermediate Programming Ability | Grading Several Programming Assignment + Final exam |
| Objectives | | | | |
| <p>This course is focused on basic concepts of simulation and modelling of software systems and testing of system reliability, performance and availability. During the course, students will get information about principles of simulation theory, the tools for monitoring software execution and methods of processing and presentation of measured results.</p> <p>On completion of the course the students will be able to:</p> <ul style="list-style-type: none"> - <i>Knowledge & Understanding:</i> Understand the reliability and performance models and their application to real life computer systems. Understand basic principles of simulation in context of performance and reliability testing. - <i>Skills & Abilities:</i> Design a model of existing queueing system and perform its mathematical or situational analysis, interpret the results and use them predict the system behaviour under specified conditions. Measure the performance parameters of existing software or computer system in order to estimate its performance parameters. <p>The course will consist of a series of lectures along with guided laboratories. The lectures will provide basic theoretical background and should also serve to discuss the relevant issues. The laboratories will provide time and space to apply the theoretical principles in several examples, designed to show how to use the mathematical modelling, simulation and performance measurements.</p> <p>Students will be also asked to create one larger work, based preferably on a real life example of their choice and to create its model and perform its performance analysis.</p> | | | | |
| Content | | | | |
| <ul style="list-style-type: none"> • Queuing theory • Markov models, their design and analysis (in context of reliability and performance) • Random and pseudorandom number generators • Simulation, especially discrete events simulation models • Reliability models • Performance testing, benchmarking and application profiling | | | | |
| Textbook/teaching material (for reference purposes) | | | | |
| <ul style="list-style-type: none"> • Performance Modeling and Design of Computer Systems, Mor Harchol-Balter, Cambridge University press, 2013 • Performance Evaluation and Benchmarking, Lizy Kurian John & Lieven Eeckhout, CRC Press 2006 • Markov Chain Monte Carlo in Practice, W.R. Gilks (Editor), S. Richardson (Editor), David Spiegelhalter (Editor), Chapman and Hall/CRC, 1996 | | | | |

Note: this is not the official course descriptor according to the "Studien- und Prüfungsordnung" (SPO)