



UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Projekt razvoja spletne programske rešitve
Course title:	Web application development project

Izobraževalni program in stopnja Educational programme and level	Študijska smer Study field	Akademsko leto Academic year
NOO projekt piloti: Naprednejša računalniška znanja (nivo: visokošolski strokovni študijski program)	Programiranje in razvoj aplikacij	2022/23
RRP pilot project: Advanced computer skills (level: first cycle professional study programme)	Programming and application development	2022/23

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

NOO-PRA-VS-PRSPR-2022-23

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	45	-	-	105	6

Nosilec predmeta / Lecturer:

prof. dr. Srđan Škrbić

Jeziki / Languages:

Predavanja / Lectures:

Slovenski / Slovenian, Angleški / English

Vaje / Tutorial:

Slovenski / Slovenian, Angleški / English

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Študent/-ka lahko pristopi k ustemu izpitu, ko zaključi projektno nalogo.

Prerequisites:

Student can take part in the oral exam after he/she completes his/her project.

Vsebina:

Content (Syllabus outline):



- Arhitektura modernih spletnih aplikacij
- Aktualne tehnologije za razvoj zalednega dela spletne aplikacije
- Razvoj zalednega dela spletne aplikacije z enim od aktualnih ogrodij, vključujoč:
 - Povezovanje s sistemom za upravljanje z relacijsko podatkovno bazo in objektno-relacijske preslikave
 - Razvoj RESTFUL API-ja in povezovanje uporabniškega in zalednega dela
 - Varnostni vidiki in namestitvev spletne aplikacije
- Študija primera: Neodvisen razvoj celotne spletne aplikacije z uporabo izbranih ogrodij.

- Architecture of modern web applications.
- State-of-the-art technologies for web application backend development.
- Development of web application backend based on state-of-the-art framework including:
 - connecting to a relational database management system and object-relational mapping
 - development of RESTful API and connecting frontend and backend through the RESTful API
 - security issues and deployment of web application.
- Case study: independent development of a complete web application using adopted frontend and backend frameworks.

Temeljni literatura in viri / Readings:

- Heckler, M. (2021) *Spring Boot: Up and Running*. O'Reilly Media.
- Walls, C. (2015). *Spring Boot in Action*. Manning.
- Juneau, J. (2018). *Java EE 8 Recipes: A Problem-Solution Approach*. Apress.
- Heffelfinger, D. R. (2017). *Java EE 8 Application Development*. Packt Publishing.
- Noback, M. (2020). *Advanced Web Application Architecture*. Leanpub.

Cilji in kompetence:

Učna enota prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:

Splošne kompetence:

- usposobljenost za izvajanje vseh faz razvoja spletnih in mobilnih aplikacij: načrtovanje, razvoj, zagon, prodaja, vzdrževanje
- zmožnost skupinskega dela v vseh fazah razvoja spletnih in mobilnih rešitev
- obvladovanje postopkov zagotavljanja varnega in stabilnega delovanja spletnih in mobilnih aplikacij in sprotnega odpravljanja napak

Predmetno-specifične kompetence:

Objectives and competencies:

The instructional unit contributes to the development of the following general and subject-specific competencies:

General competencies:

- competence to carry out all phases in the development of web and mobile applications: planning, development, start-up, sales, maintenance
- ability to operate within a team during all phases of development of web and mobile solutions
- mastering procedures for ensuring the safe and stable functioning of the web and mobile applications, and the elimination of errors



- poznavanje spletnih tehnologij za razvoj zalednega dela spletne aplikacije, objektno relacijskih preslikav in razvoja RESTful API-jev
- sposobnost samostojnega razvoja modernih spletnih aplikacij

- Subject-specific competences:*
- Knowledge of server-side web technologies, object-relational mapping, and developing RESTful APIs
 - Capability of independent development of modern web application

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/študentka:

- razume različne tipe arhitektur modernih spletnih aplikacij ter njihove prednosti in slabosti
- pridobi operativno znanje aktualnih ogrodij za razvoj zalednega dela spletnih aplikacij
- je sposoben neodvisnega razvoja modernih spletnih aplikacij

Intended learning outcomes:

Knowledge and understanding:

The student:

- understands various types of modern web application architectures, their advantages and disadvantages
- gains operative knowledge of a state-of-the-art web applications backend development framework
- is capable of independent development of modern web applications

Metode poučevanja in učenja:

- predavanja z aktivno udeležbo študentov (*razlaga, diskusija, vprašanja, primeri, reševanje problemov*)
- vaje, kjer bodo študentje na konkretnih problemih ponovili, utrdili in dodatno osvetlili pojme in metode, spoznane na predavanjih
- seminarska naloga bo študente naučila samostojnega reševanja praktičnih problemov z uporabo standardnih podatkovnih struktur in algoritmov

Learning and teaching methods:

- *lectures with active student participation (explanation, discussion, questions, examples, problem-solving)*
- *lab work, during which the students will use practical problems to repeat and strengthen the topics and methods presented at the lectures*
- *student project will prepare the students to autonomously solve practical problems in modern web application backend development*

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):

- Ustni izpit
- Projektna naloga

Delež (v %) /

Weight (in %)

Assessment:

Type (examination, oral, coursework, project):

- Oral exam
- Project assignment

Reference nosilca / Lecturer's references:



- Fodor, L., Jakovetić, D., Boberić Krstičev, D. *et al.* A parallel ADMM-based convex clustering method. *EURASIP J. Adv. Signal Process.* 2022, 108 (2022). <https://doi.org/10.1186/s13634-022-00942-8>
- Lidija Fodor, Dusan Jakovetic, Natasa Krejic, Natasa Krklec Jerinkic, Srdan Skrbic: Performance evaluation and analysis of distributed multi-agent optimization algorithms with sparsified directed communication. *EURASIP J. Adv. Signal Process.* 2021(1): 25 (2021)
- Milos Savic, Milan Lukic, Dragan Danilovic, Zarko Bodroski, Dragana Bajovic, Ivan Mezei, Dejan Vukobratovic, Srdjan Skrbic, Dusan Jakovetic: Deep Learning Anomaly Detection for Cellular IoT With Applications in Smart Logistics. *IEEE Access* 9: 59406-59419 (2021)
- Pannipa Sae-Ueng, Srdjan Skrbic: Priority fuzzy database management system implementation based on extensions to the XQuery language. *J. Intell. Fuzzy Syst.* 38(4): 4107-4118 (2020)
- Zarko Bodroski, Nenad Vukmirovic, Srdjan Skrbic: Gaussian basis implementation of the charge patching method. *Journal of Computational Physics*, Volume 368, 2018, Pages 196-209
- Vladimir Loncar, Luis E. Young-S., Srdjan Skrbic, Paulsamy Muruganandam, Sadhan K. Adhikari, Antun Balaz: OpenMP, OpenMP/MPI, and CUDA/MPI C programs for solving the time-dependent dipolar Gross-Pitaevskii equation. *Computer Physics Communications* 209: 190-196 (2016)
- Loncar Vladimir, Balaz Antun, Bogojevic Aleksandar, Skrbic Srdjan, Muruganandam Paulsamy, Adhikari Sadhan: CUDA programs for solving the time-dependent dipolar Gross-Pitaevskii equation in an anisotropic trap, *Computer Physics Communications*, No. 200, pp. 406-410, 2016.
- Loncar Vladimir, Skrbic Srdjan, Balaz Antun: Parallelization of Minimum Spanning Tree Algorithms Using Distributed Memory Architectures, *Transactions on Engineering Technologies*, pp. 543-554, 2014.
- Loncar Vladimir, Skrbic Srdjan, Balaz Antun: Distributed Memory Parallel Algorithms for Minimum Spanning Trees, *Proceedings of the World Congress on Engineering 2013*, Vol II, pp. 1271-1275, 2013.
- Panic Goran, Rackovic Milos, Skrbic Srdjan: Fuzzy XML and prioritized fuzzy XQuery with implementation, *Journal of Intelligent and Fuzzy Systems*, Vol. 26, No. 1, pp. 303-316, 2014.
- Skrbic Srdjan, Rackovic Milos, Takaci Aleksandar: Prioritized fuzzy logic based information processing in relational databases, *Knowledge-based Systems*, Vol. 38, pp. 62-73, 2013.
- Skrbic Srdjan, Rackovic Milos, Takaci Aleksandar: Towards the Methodology for Development of Fuzzy Relational Database Applications, *Computer Science and Information Systems*, Vol 8, No 1, pp. 27-40, 2011.