

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Computing and Informatics		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Development of Web and Multiplatform Applications		
<b>Lecturer (for lectures)</b>		Petković M. Ivan		
<b>Lecturer/associate (for exercises)</b>		Petković M. Ivan		
<b>Lecturer/associate (for OFE)</b>		Petković M. Ivan		
<b>Number of ECTS</b>	5	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>	Web programming			
<b>Course objectives</b>	Introduction to design and development of Web applications with multiple data sources (databases, XML documents, Web services) and with large-scale user base, including mobile clients.			
<b>Course outcomes</b>	Candidate should learn theoretical and practical skills to design and develop complex Web apps with multi platform support			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Introduction to ECMAScript. Concept of classes in prototype based language. Lambda functions. ES Modules. Basics of functional programming. Asynchronous programming in ES. Basics of reactive programming. Domain driven design. Design patterns in enterprise Web apps. Principles of Progressive Web apps (PWA). PWA and mobile Web apps. Web assembly.			
<b>Practical teaching (exercises, OFE, study and research work)</b>	Package managers. Module bundlers. Basic concepts of functional programming. Array functions in ECMAScript (ES). Code transpilation. Asynchronous programming in ES: callback functions and Promises. API for asynchronous communication. Reactive programming and RxJS. Observables and observable operators. Single Page App frameworks (Angular and React). Flux architecture and Redux as its implementation for state management. Support for native features of the mobile apps (Apache Cordova). Web Mobile apps development frameworks (React Native, Ionic).			
<b>Textbooks/references</b>				
1	E.Evans: Domain-Driven Design, Addison-Wesley Professional, 2004			
2	E. Scott: SPA Design and Architecture: Understanding Single Page Web Applications, Manning Publications, 2015			
3	J. Galloway, P. Haack, B. Wilson, K. Scott Allen: Professional ASP.NET MVC 4, John Wiley and Sons, 2012, ISBN: 978-1-118-34846-8			
4	T. Ater: Building Progressive Web Apps: Bringing the Power of Native to the Browser, O'Reilly Media, 2017			
5	S. Blackheath, A. Jones: Functional Reactive Programming, Manning Publications, 2016			
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
2	2	1	0	0
<b>Teaching methods</b>	Lectures, demonstration practice and independent practice in computer lab			
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>	<b>Points</b>	<b>Final exam</b>		<b>Points</b>
<b>Activity during lectures</b>	5	<b>Written exam</b>		
<b>Exercises</b>	25	<b>Oral exam</b>		30
<b>Colloquia</b>				
<b>Projects</b>	40			