

MODULE	JAVA3- Java Concurrency											
SEMESTER	4	CREDITS (ECTS)	5	VALID AS OF	2018-01-31							
LECTURES / WEEK	2	PRACTICAL HOURS / WEEK	3	TOTAL EFFORT	140 hours							
AUTHORS	P. van den Hombergh/R. van den Ham											
CREDENTIALS	Based on previous versions by Pieter van den Hombergh.											
INTRODUCTION AND MOTIVATION												
<p>Our course in Software Engineering starts with objects first, then moves towards analysis and modelling using UML and stresses testing during implementation. Our focus is to teach our students programming in the large in stead of programming in the small, by teaching them to understand the benefits and consequences of large application programming interfaces. To strengthen this understanding we introduce Design Patterns in semester three as a predecessor module to this module.</p> <p>A natural consequence of teaching software engineering in the above way is that we put less focus on the traditional concurrency problem examples but instead focus on the proper use of parallel programming \cite{CPIJ99} and libraries in the Java world. The Java world provides complete and well understood programming memory models and APIs as building blocks for applications with predictable concurrent behaviour. The book Java Concurrency in Practice provides just the right \textit{practical} approach using modern APIs \cite{JCIP06}.</p>												
LEARNING GOALS: THE STUDENT IS ABLE TO ...												
LG 1	Explain concurrency, its advantages and its hazards.											
LG 2	Develop thread safe classes and applications											
LG 3	Design and implement proper mechanisms to start and stop the application and tune the application.											
CONTRIBUTION TO FINAL COMPETENCE PROFILE (SEE OER)												
al Go ing am Le	<i>Architectural Layers (X)</i>					<i>Activities (1..3)</i>					<i>Behaviour Professional</i>	<i>Research Skills</i>
	<i>User Interface</i>	<i>Business Processes</i>	<i>Infra-structure</i>	<i>Software</i>	<i>Hardware Interfacing</i>	<i>Manage</i>	<i>Analyse</i>	<i>Advice</i>	<i>Design</i>	<i>Realise</i>		
LG 1				X			1					
LG 2				X			1		1	1		
LG 3				X					1	1		
MODULE ASSESSMENT												
<i>Go ing Lear</i>	<i>Type of Assessment</i>					<i>Grade for</i>		<i>gradFina% of e l</i>				
	<i>Written Exam</i>	<i>Oral Exam</i>	<i>Performance Assessment</i>	<i>Presentation incl Defense</i>	<i>Report</i>	<i>Individual</i>	<i>Group</i>					
LG 1	X					X		20				
LG 2	X	X				X		40				
LG 3	X	X				X		40				
TEACHING MATERIAL												
<ul style="list-style-type: none"> - Java Concurrency in practice by Brian Goetz et al. - website java3 via sharepoint - slides to course - oracle and ibm tutorials and papers for several topics 												

- exercises from on the java3 web site

PRIOR KNOWLEDGE

Java1, Java2, MOD1, MOD2, ALDA.

GRADING

All learning goals are assessed in the theoretical exam. LG2 and 3 (Design and implement) are also practised in lab exercises.

JAVA3T = Minimal grade to pass: 5.5, 3 Credits

JAVA3P = Minimal grade to pass: 5.5, 2 Credits