JCC23: Software Architectures Analysis and Design

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The goal of this course is to extend the knowledge that FOI and UNIVAQ students are getting in the courses of Software Analyses and Design, and Software Architectures, respectively. The two courses are disjunctive but complementary and thus enable students from both universities to theoretically and practically extend the knowledge from the mutually supplemental topics.

Planned ECTS: 2

Number of learners: 10

Mode of delivery: Blended

Status: COMPLETED

Course public access: Public

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Course learning outcome	Level	Weight
Examine the current trends related to architecting and development of software products	Analysing	5
Model system overall software architecture and design the mobile app	Applying	20
Make use of SCRUM agile development process practices and principles	Applying	10
Determine appropriate SOLID software design concepts to be used in the project	Evaluating	10
Assess technical debt of the implemented software project	Evaluating	10
Examine DevOps tools and practices	Analysing	10
Develop the mobile application and backend services	Applying	20
Construct documentation for architectural design and prototyped product	Applying	15
		Total weight: 100

Topic / Unit name	Workload	Learning type	Mode of delivery			Groups	Collaboration	Feedback	Mandatory activity	Assessment		
										Points	Type	Providers
Motivation to architecting and development of software products												
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Trends and market analysis (Zlatko S.)	45 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	Peer	No	No		
Motivation for softver architecture design (Henry M.)	45 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	Peer	No	No		
Discussion	30 min	Discussion	Hybrid	Synchronous	Teacher present	No	No	Teacher, Peer	No	No		
Total unit workload	2h											
Introduction to Software Architectures and Mobile Application Design												
Software Architectures and Mobile Application Design												
Introduction to Software Architecture (Henry M.)	60 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	No	No	No		
Introduction to Mobile Application Design (Zlatko S.)	60 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	No	No	No		

Architectural and mobile design exercise Homework Papers published at conferences about architecting mobile application and becoming familliar with the state-of-the-art.	240 min	Investigation	Hybrid	Asynchronous	Teacher not present	Yes	Yes	Peer, Other	No	No		
Quiz Formative assessment of knowledge acquisition without final score. Homework will be evaluated as well.	30 min	Assessment	Online	Asynchronous	Teacher not present	No	No	No	No	5	Formative	Automated, Self
Total unit workload	6.5h											

Launching the JCC Software Project

Launching the JCC project

Discussion on projects assignment Teachers will present the project topics and discuss them with students.	60 min	Discussion	Hybrid	Synchronous	Teacher present	No	No	Teacher, Peer	No	No		
Lectures on scrum process (Introduction to jIRA and Confluence) Zlatko S. - Scrum process will be used in JCC teams when working on project.	60 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	No	No	No		
JIRA setup and iteration plan	240 min	Practice	Hybrid	Asynchronous	Teacher not present	Yes	Yes	Peer	No	No		
First project evaluation	60 min	Assessment	Hybrid	Synchronous	Teacher present	No	No	No	No	15	Summative	Teacher, Peer, Self
Total unit workload	7h											

SOLID Software Design

SOLID Software Design

Software Design Lectures Architecture? - 60 minutes SOLID - 60 minutes	120 min	Acquisition	Hybrid	Asynchronous	Teacher present	No	No	No	No	No		
Investigate implementation of SOLID in mobile application architecture	120 min	Investigation	Hybrid	Asynchronous	Teacher not present	Yes	Yes	No	No	No		
Implement SOLID in mobile application architecture Part of the project	240 min	Practice	Hybrid	Asynchronous	Teacher not present	Yes	Yes	No	No	No		
Quiz	30 min	Assessment	Online	Asynchronous	Teacher not present	No	No	No	No	5	Formative	Automated, Self
Total unit workload	8.5h											

Technical debt in Software Design

Technical debt in Software Design

Lectures on Technical Dept Henry M. Zlatko S. - 15-20 minutes on practical aspects of calculating t.d. by tools (e.g SonarCube)	90 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	No	No	No		
Discussion on Technical debt	30 min	Discussion	Hybrid	Synchronous	Teacher present	No	No	Teacher, Peer	No	No		
Calculate Technical Debt of the project Employ tools (eg. SonarQube) to calculate technical debt of the implemented mobile project.	60 min	Practice	Hybrid	Asynchronous	Teacher not present	Yes	Yes	Automated	No	No		
Quiz	30 min	Assessment	Online	Asynchronous	Teacher not present	No	No	No	No	5	Formative	Automated, Self
Total unit workload	3.5h											

DevOps in Software Analysis and Design

DevOps in Software Analysis and Design

Introduction to DevOps Common lecture (Henry and Zlatko)	60 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	No	No	No		
DevOps Tools Include the topic on DevOps tools (Zlatko - move it from laboratory to lectures)	60 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	No	No	No		
Implement CI in project	60 min	Investigation	Hybrid	Asynchronous	Teacher not present	Yes	Yes	No	No	No		
Implement CI in project	60 min	Practice	Hybrid	Asynchronous	Teacher not present	Yes	Yes	No	No	No		
Quiz	30 min	Assessment	Online	Asynchronous	Teacher not present	No	No	No	No	5	Formative	Automated, Self
Total unit workload	4.5h											
Implementing the JCC Software Project												
Software project plan												
Software process planning and tools	60 min	Acquisition	Hybrid	Synchronous	Teacher present	No	No	No	No	No		

JIRA and project setup Creating account, defining project and team.	30 min	Practice	Hybrid	Asynchronous	Teacher present	Yes	Yes	No	No	No
Planning a software product in JIRA Defining roadmap, epics, iterations and backlog items	240 min	Practice	Hybrid	Asynchronous	Teacher not present	Yes	Yes	No	No	No
Total unit workload	5.5h									
Architectural design										
Definition of common interfaces Interfaces between mobile component and the rest of the system.	120 min	Investigation	Hybrid	Asynchronous	Teacher not present	Yes	Yes	No	No	No
Integration and testing of the infrastructure Integrating the mobile component with the rest of the system.	300 min	Practice	Hybrid	Asynchronous	Teacher not present	Yes	Yes	Peer	No	No

Total unit workload	7h											
Technical documentation												
Document mobile-system interfaces Includes the definition of common interfaces as well as the results of integration of components and prototype testing.	300 min	Production	Hybrid	Asynchronous	Teacher not present	Yes	Yes	Peer	No	No		
First evaluation of architectural design	60 min	Assessment	Hybrid	Asynchronous	Teacher present	No	No	No	No	15	Summative	Teacher
Total unit workload	6h											
Project result presentation												
Prepare project presentation	180 min	Production	Hybrid	Asynchronous	Teacher not present	Yes	Yes	Peer	No	No		
Final project assessment Presentation, discussion, defense of results and evaluation with feedback.	60 min	Assessment	Hybrid	Synchronous	Teacher present	No	No	Teacher, Peer	No	25	Summative	Teacher

Total unit workload	4h											
Sumative Assessment of Theory												
Sumative assessment of theory												
Preparation for the exam	300 min	Acquisition	Hybrid	Asynchronous	Teacher not present	No	No	No	No	No		
Final exam of theory Written/Oral exam	60 min	Assessment	Hybrid	Synchronous	Teacher present	No	No	No	No	25	Summative	Teacher
Total unit workload	6h											
Total course workload	**60.5h**											