Semester guide

Semester 3 - ICT & Software Engineering

Course-based learning

Version: June 2020

Author

Tim Kurvers

Date

05/06/2020

Content

Eekhout,Michel M.M.I.M. van

Digitaal ondertekend door Eekhout,Michel M.M.I.M. van
Datum: 2020.07.13 00:09:53 +02'00'

1 Introduction

Welcome to Software Semester 3 in the Course based learning style! In this semester you will create an awesome Java application that contains all that you need to know to be a (junior) software engineer at a company. You will learn all the skills needed for this during workshops, group work and self-study assignment.

You will work as a team on a real assignment for an actual company (when available). It will not get more like the actual thing (in a school situation).

You will be assessed on the actual work you create, both weekly during feedback sessions, and at the end of every sprint. Use all that you have learned in semester 2, hard work and your investigative mentality and wow us with the results.

Good luck and have fun this period!

2 Content

The focus of this semester is on expending your knowledge related to the field of ICT & Software engineering. In doing so, you will also develop professional skills that are relevant to all ICT professionals. During this semester you will participate in two modules:

1. The Individual track software (ITS).
2. The Group project software (GPS).

The emphasis of this semester is on creating a full stack (both front and back-end) application the quality of which has been validated by means of tests and other methods using Agile methodology.

2.1 Semester overview

The semester is illustrated in Figure 1:

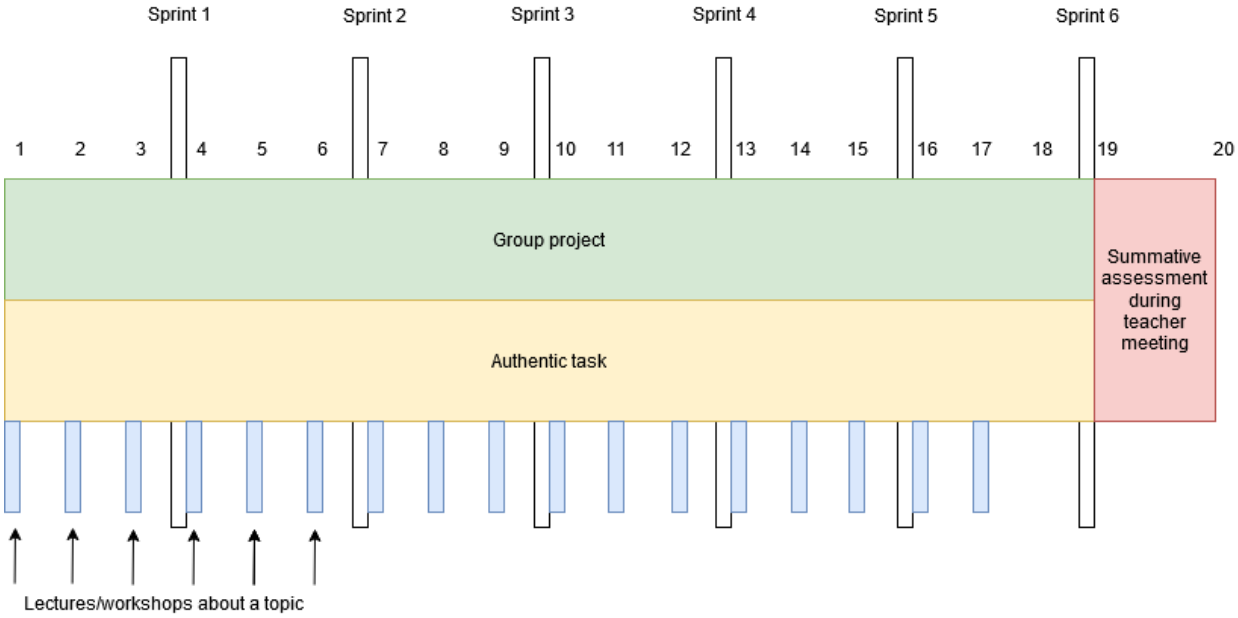

Figure 1: Semester setup

In the group project you will work as a group to create an assignment for a Partner in Education. This partner will also play the role of Product owner in this project. The group will work in an iterative way, using the Agile Scrum methodology. Sprints will be 3 weeks long and the project will last the entire semester. Focus is on product quality and Professional skills. The assignment can differ both in technical skills and approach to that which you know and learn in the Individual track, so a pro-active attitude, good communication skills with fellow students and stakeholders and an investigative mindset is required to successfully complete the project goals.

The Individual track is largely made up of the Authentic task. This is a large semester spanning assignment where you create your own full stack application, complete with front end, back end, testing, and continuous integration & deployment. You will be able to learn these topics during the Individual track in a set order.

1. The Topic is explained by a teacher during a Lecture or Workshop.
2. Teacher gives a demo (when applicable) about the Topic.
3. You do small exercises about the Topic with the help of the Teacher and/or classmates.
4. You do larger and more complicated exercises by yourself during (guided) self-study time.
5. You actively ask and receive feedback on your exercises during guided self-study time.

6. You apply the knowledge gained about the Topic in your Authentic task.

Every week one or two new Topics will be discussed.

2.2 Learning outcomes

Learning outcome 1:

You design and build **user-friendly**, **full-stack** web applications**.**

User friendly	You apply basic User experience testing and development techniques.
Full-stack	You design and build a full stack application using commonly accepted front end (Javascript-based framework) and back end techniques (e.g., Object Relational Mapping) choosing and implementing relevant communication protocols and addressing asynchronous communication issues.

Learning outcome 2:

You use software **tooling and methodology** that continuously monitors and improve the software quality during software development.

Tooling and methodology	Carry out, monitor and report on unit integration, regression and system tests, with attention for security and performance aspects, as well as applying static code analysis and code reviews.

Learning outcome 3:
You **choose** and implement the most suitable agile software development method for your software project.

Choose	You are aware of the most popular agile methods and their underlying agile principles. Your choice of a method is motivated and based on well-defined selection criteria and context analyses.

Learning outcome 4:
You **design and implement** a (semi)automated software release process that matches the needs of the project context.

Design and implement	You design a release process and implement a continuous integration and deployment solution (using e.g. Gitlab CI and Docker).

Learning outcome 5:

You **recognize** and **take into account** cultural differences between project stakeholders and ethical aspects in software development.

Recognize	Recognition is based on theoretically substantiated awareness of cultural differences and ethical aspects in software engineering.
Take into account	Adapt your communication, working, and behavior styles to reflect project stakeholders from different cultures; Address one of the standard Programming Ethical Guidelines (e.g., ACM Code of Ethics and Professional Conduct) in your work.

Learning outcome 6:
You analyze (non-functional) requirements, elaborate (architectural) designs and validate them using **multiple types of test techniques**.

Multiple types of test techniques	You apply user acceptance testing and stakeholder feedback to validate the quality of the requirements. You evaluate the quality of the design (e.g., by testing or prototyping) taking into account the formulated quality properties like security and performance.

Learning outcome 7:
You analyze and describe **simple** business processes that are **related** to your project.

Simple	Involving stakeholders, predominantly sequential processes with one or two alternative paths.
Related	Business processes during which the software that you are developing will be used (business processes that the software must support by fully or partially automating them). or Business processes needed for the success of your software development project (e.g., product release, market release, financial assurance).

Learning outcome 8:
You act in a **professional manner** during software development and learning.

Professional manner	You actively ask and apply feedback from stakeholders and advise them on the most optimal technical and design (architectural) solutions. You choose and substantiate solutions for a given problem.

3 Assessment

3.1 Formative assessment

The assessment will be student centered, based on set formative assessment moments after every sprint in both the individual and group project. Input is provided by the non-scheduled moments during sprints, where the students actively ask feedback, feedup and feedforward using Feedpulse as a feedback tool. The student is responsible recording the feedback in Feedpulse. Every sprint also has a hand-in of individual and group products the student has made up to that point. The content and quality of these products are also used as input for the formative assessments.

In the formative assessment the teachers use a development scale to decide the progress or status of all the learning outcomes. This scale looks like this: Undefined, Orienting, Beginning, Proficient, Outstanding. If a student scores poorly he can improve in his next formative assessment. Students should show progress during the 6 assessment moments where the 6th and last will be final opportunity to score well on the learning outcomes.

Table 1: How formative assessment moments are scheduled

Every sprint	Week 19
Formative assessment on development scale at the end of this sprint	Teachers assessment meeting, summative assessment
Feedback on exercises and process using feedpulse during these weeks.	Teachers decide on summative grade based on the combination of formative assessments of Individual and Group work.
Completed parts of the authentic task handed in this sprint used in the formative assessment. Feedback is given in Canvas.	
Group work assessed using feedpulse focusing on professional development.	

Table 2: Development scale

Valuation	**Explanation**
Undefined	You have not yet undertaken activities to demonstrate the learning outcomes.
Orienting	You have made a start and explored the possibilities to demonstrate the learning outcome.
Beginning	You have taken the first steps and carried them out which contribute to demonstrating the learning outcome.
Proficient	You have shown several times that you have created a basis to demonstrate the learning outcome. You have demonstrated the learning outcome at a sufficient level.
Advanced	You have shown several times that you have been working on this learning outcome with good results. You have performed above expectations and are focused on continuous improvement.

3.2 Summative assessment

Based on the formative assessments of the learning outcomes, your final assessment will be decided using the following guidelines. If the assessors deviate from these guidelines they will explain why they deviate from this.

Assessment guidelines
A student with any outcome graded below *Proficient* will obtain *Unsatisfactory (U).*
A student with all outcomes graded *Proficient* will obtain *Satisfactory (S)* or *Good (G)*.
A student with one or more outcomes graded *Advanced* will obtain Good (G) or Outstanding (O).

The student creates a portfolio which improves in quality and quantity during the semester. All formative assessment moments are used as input for the summative assessment during the Teachers assessment meeting in week 19, when the summative assessment takes place.

3.3 Permitted tools and aids

Not applicable.

3.4 Retakes or repair

Since the Group project and Individual track are part of a practice-related test, there is no opportunity to retake within the semester. During the semester, the progress will be continuous so that you are always aware of your study status.

3.5 How is the assessment determined?

During the assessor meeting in week 19, the summative, integral semester assessment is expressed as: Outstanding (O), Good (G), Satisfactory (S), or Unsatisfactory (U). Outstanding (O), Good (G), and Satisfactory (S) result in the assigning of 30 EC and admittance to semester 4 of the chosen Specialization profile. Unsatisfactory (U) results in doing a retake semester. You receive 0 EC and are not admitted to semester 4.

Appeal to Examboard

In case the grading procedure was not followed correctly or invalid criteria have been used to determine the grade, you can appeal to the Exam Board. In such case, you need to be explicit about which part of the procedure was not followed, or what criteria were used for grading. Simply disagreeing with the examiner is not a valid reason to appeal. You can contact your mentor for more information about appeals.

4 Organisation

4.1 Planning

In semester 3, there are at least 18 teaching hours for each class with a teacher every week. The rest of the time you are expected to work and study independently. So be aware that for a successful completion of the semester you will have to invest time in your studies every week on your own initiative.

The semester coordinator is responsible for the organization and implementation (content and didactics) of the units of study for the semester. A semester coordinator can always be addressed about questions in this area. Questions related to the course material or study progress and planning can be addressed to the scheduled teachers. Furthermore, you can ask your semester coach for help on all kinds of topics.

4.2 Location

Education will take place at an Onderwijs Innovatie Lab (OIL, Education Innovation lab) in the new build R10. Lectures and workshops will take place in the special workshop rooms. As it is unsure how Corona will affect education it could be that some or most education will take place online using Microsoft Teams.

4.3 Educational material

Canvas contains the course planning, course guides, exercises, rosters and all other required learning material.

4.4 Orientation on Specialization

You will be informed about the different specialization routes you can choose from to do in Semester 4.

4.5 Huge leap week (week 20)

During the last week of the semester you can participate in workshops and other sessions organised by your fellow students (and perhaps by you too). These sessions can be on all kinds of topics that can be relevant to the IT profession. You will get to meet and discuss with students from all years, teachers, and our Partners in Education (companies that we collaborate with in our education).

5 Quality assurance

Every semester we evaluate our education to continually improve it, and we will organize sessions with you during the semester for this. Your feedback and suggestions are invaluable. We would therefore greatly appreciate you giving us an insight into your experiences while studying with us. You can always give your feedback to your semester coach or your individual track teacher. In addition, feel very welcome to share your thoughts and experiences with the semester 3 ICT & Software Engineering coordinator (Tim Kurvers – t.kurvers@fontys.nl).