

ELEC-C7430



Students

Student	Status / Preferences	Project
Nursalim Aldiyarov	L2, Python program, Disgital System – Scrum master	1
Ali Amaan	L2, Digital systems, web development	1
Paloma Balmori Elosegui	L1, L2 (BSc exchange, Automation, programming JAVA, C, Python) -	1
Thong Cam	L1,L2 (SW engineeting, IoT, robotics, automation) – Remotely	1
Nhut Cao	L1, L2 (Digital system, programming Python,C)	1
Philipp Giersfeld	L1,L2 (Security protocols/programming)	1
Adilet Beketov	L2 Digital System, Python, C/C++	1

Students

Student	Status Preferences	Project
Tuan Nguyen Cong	L1, L2 (Web backend) – Scrum master	2
Yerzhan Zhamashev	L2, Digital Systems, Web development, ML	2
Minh Le	L1,L2 (Digital system, programming C,Python, SW development) – Remotely	2
Huy Le	L1, L2 (Integrated systems, industrial, micro-controllers, data structure)	2
Márton Mester	L1, L2 (programming mobile apps, ML/AI)	2
Campbell Aaron	L2, Programming JAVA, Python, Interested in VR	2

Students

Student	Status Preferences	Project
Bekzhan Aitenov	L2, Programming C, Python. – Scrum Master	3
Sahar Shaban	L1,L2 (Programming, SW development Python,C)	3
Hao Wu		
Chao Yang	L1 (Electronics, Digital Twin)	3
Damilya Zhaugasheva	L1 (Business studies, Digital systems) -Remotely	3
Aditya Kilaru	L2	3
Ngoc Nguyen	L1, L2 (Digital system, programming web development, JAVA, Python)	3
Haibi Peng	X (Comm engineering, SW development and ML) – Course drop	
Anna Rannuste		
Anthony Reineck	L2 Digital system, Python programming, Linux	
Carlos Santos		

Learning outcomes

- After finishing the course, students are able to plan and complete an R&D project following development and management processes used currently in industry. Students will further learn the tools to follow up R&D projects e.g. Atlassian JIRA, Github and Agile project development. The student will be in charge of small SW development projects related to 4G/5G mobile networks. This projects include setup and development of SW modules associated with mobile base station and mobile packet core configuration and operations

~~Tue 12.15-14.00 R037/TU7~~

- Content

Atlassian JIRA project management tool Github SW repository Agile Sprint based R&D development C and Python programming

- Assessment Methods and Criteria

3cu (6 contact hours, 75 hours individual work)

Successful completion of R&D SW development project

Agile/Scrum

Scrum is an agile management procedure for handling complex projects with rapidly changing requirements.

Scrum based development handles a project through continuous iterations named **Sprint**.

The Sprint duration is 1-4 weeks where pre-defined number of stories are handled.

Small teams are small 6-10 people if the project is big then preferable to divide into small projects to be handled by individual small teams.

Agile/Scrum

Daily Scrum: 30' beginning of each day where all the team review the progress and possible obstacles, the standard questions to be addressed are:

What did they do in their tasks since last meeting?

What are they planning to do before next daily scrum meeting?

Is there anything that is preventing them to do what they planned?

Agile/Scrum

Sprint Review and Retrospective: At the end of the sprint the achievement are reviewed and demonstrated.

In retrospective, check what were the problems found and brainstorm how to resolve them if appear in following sprints.

How to improve the work for the next sprint and make the next sprint more productive. Team members share their ideas so that next sprint could be more productive.

Burn down chart: Team's effort and progress are denoted in a graphical manner, which shows where we are in the sprint.

Agile/Scrum

Product Owner: Represents the customer for the project deliverable from a business perspective and creates a prioritized wish list of the user stories called a product backlog. Product owner defines the “To Do” list where all the specifications for a product are listed.

Scrum Master: Arrange all scrum meetings, planning, daily scrum, review, etc. Scrum master ensures that every team member has an appropriate task to do.

Scrum Team Members: Team members work on the given tasks and decide when they are “Done”

Project

- **Mobile network installation**
 - Install the mobile packet core in Linux server
 - Configure and connect base station to packet core
 - Write SIM cards and test connectivity

Sprint grooming

- **Identify the tasks**
- **Evaluate the effort per task**
- **Group the tasks per sprint**

Weekly sprint review

- Review the progress of the tasks

Project 1: electric bulb

The product consists of application that through mobile network connectivity an electric bulb will be controlled i.e. switch on/off

The system requires C or Python program running in a PC that has connected a light bulb through USB interface. This PC has a 4G/5G modem to establish connection with remote program running in another PC where the mobile packet core is running. The program in the packet core will establish a connection with the PC that has the light bulb to be able to send continuous commands to keep the light bulb connected.

Project 2: water pump

The product consists of application that through mobile network connectivity an water pump will be controlled i.e. switch on/off

The system requires C or Python program running in a PC that has connected a water pump through USB interface. This PC has a 4G/5G modem to establish connection with remote program running in anothe PC where the mobile packet core is running. The program in the packet core will establish a connection with the PC that has the water pump to be able to send continous commands to keep the water pump connected.

Project 2: wind mill

The product consists of application that through mobile network connectivity a fan will be controlled i.e. switch on/off

The system requires C or Python program running in a PC that has connected a fan through USB interface. This PC has a 4G/5G modem to establish connection with remote program running in another PC where the mobile packet core is running. The program in the packet core will establish a connection with the PC that has the fan to be able to send continuous commands to keep the fan connected.

Projects components

All the projects will be deployed in a real mobile network infrastructure based on 2.6Ghz base station and mobile packet core running in linux server. The mobile device will consists of small PC with mobile modem connected as shown in following pictures.

The system will be installed and run in laboratory at Otakaari 7B. The students participating remotely will work together with on-site students for the installation.

