EPFL

EE-490(g)   **Lab on app development for tablets and smartphones**

Atienza Alonso David

Cursus	Sem.	Type
Data and Internet of Things minor	H	Opt.
Electrical and Electronical Engineering	MA1, MA3	Opt.
Microtechnics	MA1, MA3	Opt.
Mineur STAS Chine	H	Opt.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
TP	4 weekly
Number of positions	

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

Summary

This course introduces mobile application programming and system-level power management for Android OS. The students learn to develop low-power Apps on mobile platforms (in tablets, smartphones and smartwatches). Students receive a tablet and a smartwatch, and can use their smartphones if desired.

Content

- Introduction to system-level architectures of tablets, smartphones and smartwatches.
- Basics of Java programming.
- Introduction to Android and Android Architecture overview• Setup of Android Development environment.
- Android Application Fundamentals and Android components (Activities, Services, etc.).
- Apps User Interface and main Building Blocks.
- Hardware resources, local data storage and cloud storage.
- Interacting with other IoT devices (e-health monitors).
- Efficient battery use and low-power management.
- Deployment to Market and "monetization".

Keywords

Embedded systems, IoT, mobile platforms, smartphones, smartwatches, Android, system-level design, advanced programming, App.

Learning Prerequisites

Recommended courses

- Microprogrammed Embedded Systems (EE-310).
- Lab on Digital Systems Design (EE-390(a)).

Learning Outcomes

- Analyze requirements of Apps to be designed.
- Assess / Evaluate complexity of a certain App design.
- Choose the right set of technologies to include an App design.

- Optimize o optimize an App design to improve performance and reduce power consumption.
- Implement the required services and modules to design Android Apps.
- Test the final App design.
- Discuss the possible bugs and defects found in the App.
- Select appropriately techniquest to correct those bugs.

Transversal skills

- Assess progress against the plan, and adapt the plan as appropriate.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Access and evaluate appropriate sources of information.
- Assess one's own level of skill acquisition, and plan their on-going learning goals.
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Continue to work through difficulties or initial failure to find optimal solutions.
- Use both general and domain specific IT resources and tools

Teaching methods

The course will include a combination of lectures and practical exercises in the laboratory to understand the baseline technologies and design aspects required in the development of Apps in Android-based. Then, in the last part of the course, it will be developed a project on a topic defined by the students team or the teacher to evaluate the learned technologies in real-life setups.

Expected student activities

Individual exercises in Android-based platforms, interact in the course, develop a complete project in the laboratory working in a team.

Assessment methods

The evaluation will be based on a mid-term and a 2- or 3-person project done in the last part of the semester.

Resources

Bibliography

List of references provided in class, cf. on the Moodle page of the course.
Support material: lecture slides, lab handouts, code snippets, example applications, solutions to the labs will be available through the Moodle page.

Websites

- https://developer.android.com/courses/fundamentals-training/overview-v2

Moodle Link

- https://moodle.epfl.ch/course/view.php?id=14012