Subject code: M.2(1)	**Subject name:** Mobile Application Programming Basics		
Study load: 4 ECTS	**Load of contact hours:** 60	**Study semester:** Autumn	**Assessment:** Exam
Objectives:	The purpose of the course is to introduce students with mobile application software development on the example of Android platform. Students would be familiarized with Android platform architecture and peculiarities, get experience with common components and integrations.		
Course outline:	Topics covered: 1. Android platform history and overview 2. Integrated development environments 3. Version control systems 4. Java language basics 5. Gradle as build tool 6. Emulators for Android application development 7. Application lifecycle 8. Permissions system 9. Activities 10. Graphical user interface: views, widgets, layouts 11. Intents usage 12. Fragments 13. Android services 14. Network connectivity 15. Data storage 16. Animation and transitions 17. SqLite database 18. Common Android libraries 19. Overview of other tools for mobile application development: Kotlin language, Xamarine platform		
Learning outcomes:	By the end of the course the students will acquire theoretical knowledge of Android platform architecture and its utilization during application development. They would be able to: 1. Analyze a problem to be implemented in the form of an Android application; 2. Select the most appropriate toolset for app development; 3. Develop the application and maintain it over time.		
Assessment methods:	Assessment is split in two parts: individual tasks and group projects.		

<table>
<tr><td><b>Teacher(s):</b></td><td></td></tr>
<tr><td><b>Prerequisite subject(s):</b></td><td>None</td></tr>
<tr><td><b>Compulsory literature:</b></td><td>Reto Meier. Professional Android Application Development. Wiley Publishing, Inc., 2014, 434 p.
Bill Phillips et al. Android Programming: The Big Nerd Ranch Guide. 4th. Pearson Technology Group, 2019, 657 p.</td></tr>
<tr><td><b>Replacement literature:</b></td><td>Joseph Annuzzi Jr., et al. Introduction to Android Application Development: Android Essentials, 5th, 2015, 704 p.
John Horton. Android Programming for Beginners, 2nd Edition, 2018, 766 p.</td></tr>
<tr><td><b>Participation requirements:</b></td><td>Lower limit of lectures attendance is 70%, each individual task and group project must be presented by end of the course.</td></tr>
<tr><td><b>Independent work:</b></td><td>1. Setup a project under version control
2. HelloWorld application with arbitrary permission requests
3. Application with several screens and navigation
4. Implement application with REST API integration
5. Group project: develop application with custom animation
6. Group project: extend previous application with REST API integration and persistent data storage</td></tr>
<tr><td><b>Grading criteria scale or the minimal level necessary for passing the subject:</b></td><td><b>Criteria:</b>
<table>
<tr><td>Failed</td><td>< 49 points</td></tr>
<tr><td>Passed, grade 3</td><td>50 - 69 points</td></tr>
<tr><td>Passed, grade 4</td><td>70 -89 points</td></tr>
<tr><td>Passed, grade 5</td><td>>=90 points</td></tr>
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<b>Points distribution:</b>
Individual tasks - 15 points max for each
Group task - 20 points max for each
Final exam – 50 points max.</td></tr>
<tr><td><b>Information about the course:</b></td><td>Room ___, on ___ at ___</td></tr>
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1) Date 1	**Lecture 1:** Classroom presentation: Android platform history and overview
2) Date 2	**Lecture 2:** Classroom presentation: Integrated development environments Classroom presentation: Version control systems
3) Date 3	**Practical class 1:** Classroom task: Setting up IDE, settings and capabilities overview
4) Date 4	**Practical class 2:** Classroom task: Setting up repository, configuration of IDE and VCS integration
5) Date 5	**Lecture 3:** Classroom presentation: Java language basics Homework: read about Java types and generics system
6) Date 6	**Practical class 3:** Classroom task: Hello World application on Java
7) Date 7	**Practical class 4:** Classroom task: Java application with OOP paradigm usage
8) Date 8	**Lecture 4:** Classroom presentation: Gradle as build tool Homework: read about Gradle syntax
9) Date 9	**Practical class 5:** Classroom task: Simple build scripts with Gradle
10) Date 10	**Practical class 6:** Classroom task: Configure IDE with Gradle build tools
11) Date 11	**Lecture 5:** Classroom presentation: Emulators for Android application development
12) Date 12	**Practical class 7:** Classroom task: Setup chosen emulator, configure devices with different Android OS versions
13) Date 13	**Practical class 8:** Classroom task: Configure IDE to use emulators

14) Date 14	**Lecture 6:** Classroom presentation: Application lifecycle. Permissions system.
15) Date 15	**Practical class 9:** Classroom task: Implement a simple Android application to become familiar with the lifecycle system.
16) Date 16	**Practical class 10:** Classroom task: Configure application to request permissions from the user
17) Date 17	**Lecture 7:** Classroom presentation: Activities and user interface. Intents. Fragments. Homework: read about interaction between application components in Android OS
18) Date 18	**Practical class 11:** Classroom task: Create an application with two activities and ability to switch between them.
19) Date 19	**Practical class 12:** Classroom task: Add fragments to the application
20) Date 20	**Lecture 8:** Classroom presentation: Android services. Network connectivity. Homework: read about standard Android services.
21) Date 21	**Practical class 13:** Classroom task: Create an application that uses arbitrary Android service.
22) Date 22	**Practical class 14:** Classroom task: Extend application to interact with external REST API.
23) Date 23	**Lecture 9:** Classroom presentation: Data storage. SqLite database. Homework: read about persistence in Android OS.
24) Date 24	**Practical class 15:** Classroom task: Create an application that saves data on the device
25) Date 25	**Practical class 16:** Classroom task: Change the application above to store data in sqlite database

26) Date 26	**Lecture 10:** Classroom presentation: Common Android libraries. Overview of other tools for mobile application development: Kotlin language, Xamarine platform
27) Date 27	**Practical class 17:** Classroom task: Split into teams for group projects and discuss themes.
28) Date 28	**Practical class 18:** Classroom task in groups : Implement application with custom animation
29) Date 29	**Practical class 19:** Classroom task: Extend application to communicate with external REST API and present data to the user
30) Date 30	**Practical class 20:** Classroom task: Extend application to store the data fetched from API and use then when network is not available