Syllabus

1. Information regarding the program

1.1 Higher education institution	**Babeș-Bolyai University**
1.2 Faculty	**Faculty of Mathematics and Computer Science**
1.3 Department	**Department of Computer Science**
1.4 Field of study	**Calculatoare si tehnologia Informatiei**
1.5 Study cycle	**Information Engineering 4 years**
1.6 Study programme / Qualification	**Information Engineering**

2. Information regarding the discipline

2.1 Name of the discipline			**Android Things**				
2.2 Course coordinator			**Lect. Ph.D. Dan Cojocar**				
2.3 Seminar coordinator			**Lect. Ph.D. Dan Cojocar**				
2.4. Year of study	**4**	2.5 Semester	**8**	2.6. Type of evaluation	**C**	2.7 Type of discipline	**Optional DS**
2.8 Code of the discipline							

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	**4**	Of which: 3.2 course	**2**	3.3 seminar/laboratory	**1 LP 2 P**
3.4 Total hours in the curriculum	**70**	Of which: 3.5 course	**28**	3.6 seminar/laboratory	**42**

Time allotment:	hours
Learning using manual, course support, bibliography, course notes	**10**
Additional documentation (in libraries, on electronic platforms, field documentation)	**10**
Preparation for seminars/labs, homework, papers, portfolios and essays	**20**
Tutorship	**10**
Evaluations	**5**
Other activities:	**-**

3.7 Total individual study hours	**55**
3.8 Total hours per semester	**125**
3.9 Number of ECTS credits	**5**

4. Prerequisites (if necessary)

4.1. curriculum	• **Mobile Applications**
4.2. competencies	• **Average programming skills using Android**

5. Conditions (if necessary)

5.1. for the course	• **Course hall with a projector**
5.2. for the seminar /lab activities	• **Laboratory with computers. Android Studio.**

6. Specific competencies acquired

Professional Competencies	**C1.3 Building models for various components of computing systems.** **C1.5 Providing theoretical background for the characteristics of the designed systems.** **C2.5 Implementation of hardware, software, and communication components.** **C6.3 Use of simulation and programming environments to process signals and model solutions to problem classes.**
Transversal Competencies	**CT1 Honorable, responsible, ethical behavior, in the spirit of the law, to ensure a professional reputation.** **CT3 Demonstrating initiative and proactive behavior for updating professional, economical, and organizational culture knowledge.**

7. Objectives of the discipline (the outcome of the acquired competencies)

7.1 General objective of the discipline	• Be able to use the Android Developer Platform. • Improved Android development skills. • Average Android Things programming abilities.
7.2 Specific objective of the discipline	• To understand the key concepts of IoT. • Develop software using the Android Things Developer Platform. • Develop applications using the Android Things Developer Kit.

8. Content

8.1 Course	Teaching methods	Remarks
1. Introduction to IoT/Android Things	Exposure: description, explanation, examples, discussion of case studies	
2. Android Things Developer Kit Platform	Exposure: description, explanation, examples, discussion of case studies	
3. Small/Medium Project Details	Exposure: description, explanation, examples, discussion of case studies	
4. Core application packages	Exposure: description, explanation, examples, discussion of case studies	
5. Peripheral I/O API	Exposure: description, explanation, examples, discussion of case studies	

6. User Driver API	Exposure: description, explanation, examples, discussion of case studies	
7. Google Services - Google Assistant	Exposure: description, explanation, examples, discussion of case studies	
8. Physical Web	Exposure: description, explanation, examples, discussion of case studies	
9. Instant Apps	Exposure: description, explanation, examples, discussion of case studies	
10. Android Wear	Exposure: description, explanation, examples, discussion of case studies	
11. Android TV/Auto	Exposure: description, explanation, examples, discussion of case studies	
12. Project evaluation	Evaluation	
13. Project evaluation	Evaluation	
14. Lecture Wrap Up - Best Projects - Demo	Evaluation	

Bibliography

1. Android Things website: https://developer.android.com/things/index.html
2. Android Things reference: https://developer.android.com/things/reference/index.html
3. Francesco Azzola - Android Things Projects: Efficiently build IoT projects with Android Things, Packt Publishing, 2017

8.2 Laboratory	Teaching methods	Remarks
1. Handout developer kits. a. Create a project plan. b. Discuss the development kit features.	Explanation	The lab is structured as 2 hours classes every second week
2. Present the current ideas to the first-course students. a. Build the teams. b. Discuss the ideas.	Dialogue, case studies, evaluation	
3. Discuss/Evaluate progress.	Dialogue, case studies, evaluation	
4. Discuss/Evaluate progress.	Dialogue, case studies, evaluation	
5. Discuss/Evaluate progress	Dialogue, case studies, evaluation	
6. Paper/Project Demos/Presentations.	Dialogue, evaluation	
7. Paper/Project Demos/Presentations.	Dialogue, evaluation	

Bibliography
1. Android Things website: https://developer.android.com/things/index.html
2. Android Things reference: https://developer.android.com/things/reference/index.html
3. Francesco Azzola - Android Things Projects: Efficiently build IoT projects with Android Things, Packt Publishing, 2017

8.3 Project	Teaching methods	Remarks
S1. Choosing the domain of the problem	Dialogue, case studies	
S2-S13. Analysis, design and implementation	Dialogue, case studies	
S14. Final software system presentation	Evaluation	

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

- The course respects the IEEE and ACM Curricula Recommendations for Computer Science studies;
- The course exists in the studying program of all major universities from abroad;
- The content of the course is considered by software companies as important for advanced programming skills

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.5 Lab activities	Implement a project using Android Things Developer Framework.	Project grading.	100%
10.6 Minimum performance standards			
➢ No more than 2 absences are allowed for the lab activities. ➢ At least grade 5 for the project mark.			

Date	Signature of course coordinator	Signature of seminar coordinator
April 2022	**Lect. Ph.D. Dan Cojocar**	**Lect. Ph.D. Dan Cojocar**

Date of approval	Signature of the head of department
24.05.2022	**Prof. Ph.D. Laura Diosan**