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	**Computer Science**
1.5 Study cycle	**Bachelor**
1.6 Study Programme / Qualification	**Computer Science – English Section**

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	**3**	2.5 Semester	**6**	2.6. Type of evaluation	**C**	2.7 Type of discipline **Optional**
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 lab +2 pr**
3.4 Total hours in the curriculum	**60**	Of which: 3.5 course	**24**	3.6 seminar/laboratory	**36**
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					**15**
Additional documentation (in libraries, on electronic platforms, field documentation)					**20**
Preparation for seminars/labs, homework, papers, portfolios, and essays					**20**
Tutorship					**5**
Evaluations					**5**
Other activities:					**-**

3.7 Total individual study hours	**65**
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.** · **Interactive whiteboard. IoT development boards.**

6. Specific competencies acquired

Professional Competencies	**C1.3 Elaboration of adequate source codes and unitary testing of some components in a known programming language, based on given design specifications.** **C1.5 Development of program units and elaboration of the corresponding documentation.** **C2.4 Collaborating through digital technologies.** **C2.5 Development of specific software systems.** **C3.4 Programming.** **C5.1 Appropriate use of the operating principles of electronic devices and circuits and methods of measuring electrical quantities.** **C6.3 Techniques for installation, configuration, and administration of systems and computer networks.**
Transversal Competencies	**CT1 Application of efficient and organized work rules, of responsible attitudes towards the didactic-scientific domain, to creatively value one's own potential, with respect towards the principles and norms of professional etic.** **CT3 Use of efficient methods and techniques to learn, inform, research, and develop the abilities to value the knowledge, to adapt to the requirements of a dynamic society, and to communicate in the Romanian language and in a language of international circulation.**

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 Hardware Platform Presentation - the IoT platform used at the laboratories.	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.	Lecture Wrap Up - Best Projects - Demo	Exposure: description, explanation, examples, discussion of case studies	

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.	Hand out developer kits.	Explanation	The lab is structured as 2 hours classes every second week
a.	Create a project plan.		
b.	Discuss the development kit features.		
c.	IoT Laboratory Platform Component Presentation.		
2.	Present the current ideas to the first-course students.	Dialogue, case studies, evaluation	
a.	Build the teams.		
b.	Discuss the ideas.		

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	

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3. Francesco Azzola - Android Things Projects: Efficiently build IoT projects with Android Things, Packt Publishing, 2017

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;   · Software companies consider the content of the course as necessary 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
➢ At most 2 absences are allowed for lab activities.   ➢ At least grade 5 for the project mark.

Date	Signature of course coordinator	Signature of seminar coordinator
June 2023	**Lect. Ph.D. Dan Cojocar**	**Lect. Ph.D. Dan Cojocar**

Date of approval   Signature of the head of the department

Prof. Ph.D. Laura Silvia Diosan