SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	**Babeş 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**

2. Information regarding the discipline

2.1 Name of the discipline	**Mobile Application Programming**						
2.2 Course coordinator	Lect. PhD. Dan Cojocar						
2.3 Seminar coordinator	Lect. PhD. Dan Cojocar						
2.4. Year of study	**3**	2.5 Semester	**5**	2.6. Type of evaluation	**E**	2.7 Type of discipline	**Compulsory**

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

3.1 Hours per week	3	Of which: 3.2 course	2	3.3 seminar/laboratory	1 lab
3.4 Total hours in the curriculum	42	Of which: 3.5 course	28	3.6 seminar/laboratory	14

Time allotment:	hours
Learning using manual, course support, bibliography, course notes	10
Additional documentation (in libraries, on electronic platforms, field documentation)	20
Preparation for seminars/labs, homework, papers, portfolios and essays	15
Tutorship	8
Evaluations	5
Other activities:	-

3.7 Total individual study hours	58
3.8 Total hours per semester	100
3.9 Number of ECTS credits	4

4. Prerequisites (if necessary)

4.1. curriculum	·
4.2. competencies	·

5. Conditions (if necessary)

5.1. for the course	·

5.2. for the seminar /lab activities	·

6. Specific competencies acquired

Professional competencies	**- Base understanding of key concepts on developing mobile applications.** **- Understanding the validation and testing of quality mobile applications.**
Transversal competencies	**- The ability to apply the learned concepts, principles and the techniques in solving real problems.**

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

7.1 General objective of the discipline	· Knowledge of key base concepts for developing mobile applications.
7.2 Specific objective of the discipline	· Learn the Android platform. · Learn JavaScript frameworks for mobile development.

8. Content

8.1 Course	Teaching methods	Remarks
1. Base Android tooling - Android Studio. - Activity/Fragment lifecycle. - User interfaces.	Exposure: description, examples, discussion of case studies, live demo	
2. Lists and rest resources - Views - Background processing - Networking	Exposure: description, examples, discussion of case studies, live demo	
3. Master-details and rest resources - More views: NavigationDrawer - OkHttp, JsonReader, JsonWriter - ContentProviders	Exposure: description, examples, discussion of case studies, live demo	
4. Local persistence - Preferences and Files - Databases: SQLite	Exposure: description, examples, discussion of case studies, live demo	
5. Securing mobile apps - Android security model - Json Web Tokens - OAuth 2.0	Exposure: description, examples, discussion of case studies, live demo	

6. Synchronizing data - WebSockets - Local synchronization services - LoaderManagers	Exposure: description, examples, discussion of case studies, live demo	
7. Reactive programming - Realm - real time database - Rx - reactive programming	Exposure: description, examples, discussion of case studies, live demo	
8. System services and sensors - Services - Processes - Sensors	Exposure: description, examples, discussion of case studies, live demo	
9. Animations - ValueAnimator. - ObjectAnimator. - Transitions framework	Exposure: description, examples, discussion of case studies, live demo	
10. Hybrid mobile applications - Angular 2 - Ionic Framework	Exposure: description, examples, discussion of case studies, live demo	
11. Monetize - Ads - In-app billing - Firebase	Exposure: description, examples, discussion of case studies, live demo	
12. Awareness and nearby - Anticipate and react - Nearby - Physical Web	Exposure: description, examples, discussion of case studies, live demo	
13. Test your app - Junit - Mockito - UI Atomator, Expresso - Firebase test lab - Performance testing	Exposure: description, examples, discussion of case studies, live demo	
14. Exam simulation and discussions - Sample exam requirement - Life exam simulation	Discussion of case studies, live exam simulation	

Bibliography

- Android Development. http://developer.android.com/index.html
- React Native. https://facebook.github.io/react-native/
- Vogella. Android Development Tutorials. http://www.vogella.com/android.html

8.2 Seminar / laboratory	Teaching methods	Remarks

1. Getting Started - Understand the artifacts generated by react-native-cli when creating a new project - Define components using ES6 classes - Explain the lifecycle of components - Use logs to study the behavior of the application - Fetch data using promises (fetch api) - Discuss the L2 assignment	Exposure: description, examples, discussion of case studies, live demo	
2. Assessment Check & ReactNative Demo - Fetching data - Add a pagination mechanism on the REST clients. - Create CRUD user interfaces. - Use dialogs and pickers. - Discuss L3 assignment	Exposure: description, examples, discussion of case studies, live demo. Evaluation.	
3. Online/Offline & Secured App - Evaluate the homework - Transform an (online) master-detail app into an app using a local persistence - Implement the CRUD operations using async storages - Secure mobile applications which consume REST services via JWT	Exposure: description, examples, discussion of case studies, live demo. Evaluation	
4. React-Native - AsyncStorage - Demo app to present the async storage feature - Discuss assignments - Evaluate homework	Exposure: description, examples, discussion of case studies, live demo	
5. React-Native - Networking - Demo app to showcase the Fetch API - Present the final assignment requirements - Evaluate interim progress.	Exposure: description, examples, discussion of case studies, live demo. Evaluation	
6. React-Native - Authentication - Demo app to showcase the jwt, oauth - Discuss how to manage the app state outside the user interface - Submit data using promises - Navigate between views	Exposure: description, examples, discussion of case studies, live demo	
7. Final Laboratory Evaluation - Evaluate the final app	Exposure: description, examples, discussion of case studies, live demo. Evaluation	
Bibliography - Android Development. http://developer.android.com/index.html - React Native. https://facebook.github.io/react-native/ - Vogella. Android Development Tutorials. http://www.vogella.com/android.html		

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 in Romania and abroad. - The content of the course is considered the software companies as important for average programming skills.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	- the basic principle of the domain; - apply the course concepts - problem solving	Practical examination	40 %
10.5 Seminar/lab activities	- be able to implement course concepts and algorithms - apply techniques for different classes of programming languages	- Practical examination during the semester - Portfolio	60 %
10.6 Minimum performance standards			
➢ Attend 90% of lab activities during semester ➢ At least grade 5 (from a scale of 1 to 10) at both the practical exam and laboratory work.			

Date	Signature of course coordinator	Signature of seminar coordinator
14.04.2016	Lect. PhD. Dan Cojocar	Lect. PhD. Dan Cojocar

Date of approval	Signature of the head of department
....	Prof. PhD. Anca Andreica