UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
COMP-528	Mobile Platforms and Software Development	10
Prerequisites	**Department**	**Semester**
COMP-525	Computer Science	Fall, Spring
Type of Course	**Field**	**Language of Instruction**
Required	Computer Science	English
Level of Course	**Lecturer(s)**	**Year of Study**
2nd Cycle	Prof. Constandinos Mavromoustakis	2nd
Mode of Delivery	**Work Placement**	**Corequisites**
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- explore the basic Mobile Platforms and related Technologies (Wearable and Sensing Computing etc.) and explore the basic concepts of the development process for mobile applications hosted on different mobile devices
- thoroughly discuss and explore the basic concepts and develop skills in mobile application development, programming, graphic interface design and interaction design
- explore the basic concepts of mobile software development through fundamental programming principles with a focus on the mobile environment and the supported platforms
- design and implement applications on a mobile device using the model-view-controller design pattern and make students aware of the mobile software development using native and non-native Object Oriented libraries of the supported platforms
- design and develop applications using specifications by utilizing local and global abstraction features of the mobile platform (e.g. mobile devices or sensors) and quantify and design the effects of different software design decisions on mobile device restrictions and the impact of Cloud-oriented process offloading
- design and implement reusable user interface elements, that meet or exceed the design criteria of existing industry standard user interface libraries
- critically assess the limitations throughout developing mobile applications and applying software optimization methodologies for a certain case-application
- build, test, and deploy mobile solutions using appropriate technologies and collaborate in a group-based mobile development project

Learning Outcomes:

After completion of the course students are expected to be able to:

1. provide students with deep knowledge of the different types of application models/architectures used to develop mobile software applications
2. acquire deep knowledge of the components and structure of a mobile development frameworks and design and develop reusable user interface elements on a mobile device using the model-view-controller design pattern
3. design and develop applications with special features (local and global dependencies i.e. location-aware diversities, Cloud-oriented platform-dependent processes i.e. process offloading etc.) and apply the different types of application models/architectures used to develop native and non-native Object Oriented libraries
4. design and develop device-specific, native software and middleware mechanisms using specifications by utilizing local and global abstraction features of the mobile platform
5. research and apply various Software Development Kits (SDKs), frameworks and toolkits supporting specified mobile platforms
6. collaborate in a group for the development of Mobile Application project

Course Content:

1. Introduction to mobile programming, best practices and the mobile standards W3C Mobile group and the Open Mobile Alliance/ Open Handset Alliance.
2. Mobile platforms, their properties and execution environments (AppFurnace, Application Craft, appMobi, iOS, Android, HTML5 Web Apps, HTML5 Hybrid Apps, BlackBerry Dev., Convertigo mob., etc.).
3. Cross-Platform Development Tools and Native Development Tools (Android SDK and Eclipse Android Development Tools (ADT)/C# environment and needed components Objective-C language syntax).
4. Language syntax and memory management, Static and dynamic code analysis/Native and non-native/custom classes/Designing for code re-use. Limitations and requirements.
5. Different Mobile application life-cycles and source code management (Git/SDK). Source code migration and outsourcing capabilities. Compatibility issues.
6. Building Cross Platform Applications: best practices for developing mobile applications with Xamarin-existing Layouts to develop essential process-oriented widgets.
7. Manipulating software design principles: mobile apps design with the HTML 5 container, Java and other compatible language features.
8. Next generation services: REST Web Services, AsyncTask, HttpUrlConnection, Processing JSON Responses, JSONObject and JSONArray, platforms/open source and

open-module cross-platforms paradigms/ Trade-off between paradigms for different scenarios using the existing platforms.

9. Social apps and orientation: Data Stores, Network Services, and supportive cross platform APIs, Managing and Accessing Local and Remote Databases, Leveraging Java and C# Libraries, Communicating via the Internet.
10. Model-View-Controller design patterns, Handling Activity Lifecycle Events, Handling user generated actions and passive ones. Threads' handling and Rooting.
11. Web service integration and Services according to user-interface and interaction patterns/Alerting users via notifications. Requesting and Requiring Permissions, Accessing Location-Based Services Mapping with MapView and MapActivity, Handling interruptions (Telephone Calls) and parallel external actions.
12. Hardware module interactions and power diversities as a first-order design constraint/ Development of integrated *Mobile/Tablet/Sensor* project.

Learning Activities and Teaching Methods:

Lectures, Lab Presentations, Lab Tutorials, Theoretical Exercises and Assignments.

Assessment Methods:

Mid-term and Final Examinations
Projects (Programming Individual and Simulation or Emulation Individual)
Assignments, Quizzes

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Android™ 6 for programmers an app-driven approach	Paul Deitel, Harvey Deitel, Alexander Wald	Addison-Wesley Professional	2016	ISBN-13: 978-0-13-428936-6, ISBN-10: 0-13-428936-6
PhoneGap Essentials: Building Cross-Platform Mobile Applications	John M. Wargo	Addison-Wesley Professional	2015	ISBN-10: 0321814290 • ISBN-13: 9780321814296

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Android Wireless Application Development, 2/E Shane Conder Lauren Darcey	Shane Conder Lauren Darcey	Addison-Wesley Professional	2016	ISBN-10: 0321743016 ISBN-13: 9780321743015
Professional Cross-Platform Mobile Development in C#	Scott Olson, John Hunter, Ben Horgen, Kenny Goers	Wiley	2016	ISBN: 978-1-1181-5770-1
Loke, Seng	Crowd-Powered Mobile Computing and Smart Things	Springer International Publishing AG	2017	ISBN 978-3-319-54436-6