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Ollscoil Teicneolaíochta an Oirdheiscirt

South East Technological University

Module Descriptor

Mobile Application Development - ICT (Computing and Mathematics)

Mobile Application Development - ICT (A14168)

Short Title: Mobile App Development - ICT
Department: Computing and Mathematics
Credits: 10   **Level:**   Advanced

Description of Module / Aims

Design, build and deploy a multi-screen mobile application incorporating an intuitive and efficient navigation mechanism. Structure the implementation using accepted best-practice with respect to patterns, frameworks and tools. Incorporate localised persistence models + simple access to remote services. Introduce context services such as location/camera and/or other sensor access. Evolve a multi-screen mobile application into a networked, message driven, context aware application. Incorporate in the application two-way access to remote REST (Representational State Transfer) and Messaging services. Integrate on-device context including camera, location, motion, climate and other sensors to deliver a rich user experience. Incorporate 3rd party components to deliver personalized mapping, media and general information services.

Programmes

	stage/semester/status
COMP-0523 Higher Diploma in Science in Computer Science (WD_KCOSC_G)	1 / 2 / E

Indicative Content

- Application Structure: Components; Resources; Security; General Assets
- User Experience: UX (User Experience) Principles, Navigation, Imagery, Fonts
- Simple User Interaction Patterns
- Essential Application Structure Patterns: Appropriate Variations on Model/View/Controller (MVVM (Model–view–viewmodel), MVP (Model–view–presenter) etc.)
- Resource access and management; Clean separation of concerns
- Application Life-cycle: Startup/shutdown; Foreground/background
- UI (User Interface) State Preservation and Restoration; Concurrency
- Advanced application architectural patterns
- The build, test & deploy lifecycle
- Accessing Platform Services: Persistence; Sensors / Subsystems (e.g. Location, camera, movement etc.)
- Accessing External Services: Access Patterns (e.g. REST); Third Party Applications & Components
- Build Processes: Dependency Management; Build Scripts (e.g. Gradle)
- Wireless Subsystem APIs (Application Programming Interface)
- App Store interaction, including key management

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Decompose an application into its constituent parts, including but not limited to: core application components, user experience resources, packaging.
2. Design a coherent User Experience - using appropriate tools, practices and guidelines - for a moderately sized application.
3. Produce a medium sized application, based on a limited set of design patterns.
4. Manage the application lifecycle.
5. Structure persistent storage on a device and reliably save and restore application state.
6. Select the appropriate design patterns and tools in the development of complex mobile apps.
7. Comment on the chosen mobile app framework and the underlying hardware components.
8. Design and develop complex multi-screen mobile apps from concept through to completion using best practices and guidelines.
9. Set up the interaction of an application with internal sensors and physical subsystems.
10. Integrate a remote service API within an application, perhaps based on REST principles, to deliver aspects of its core features set. For example: Maps/GIS (Geographic Information Systems), Media Sharing, Social Networking.

Learning and Teaching Methods

- Lectures will introduce the general context of the curriculum, and explore specific topics in depth.
- Supervised, guided and scripted practicals will lead the student through the construction of an application designed to illustrate key concepts covered in the lectures.
- The focus is on learning by doing in a studio environment. Each practical will propose a set of exercises – to be solved in a subsequent practical.
- Assignment One will focus ensuring the student can construct a new application equivalent in style and structure to the guided practical.
- Assessment Two will invite the student to analyse, design and implement a new application.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	48	
Practical	48	
Independent Learning	174	

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Assignment	40%	1,2,3,4
Assignment	60%	5,6,7,8,9,10

Assessment Criteria

<40%: Unable to implement a basic application. Cannot grasp fundamentals of the application lifecycle or operate an appropriate IDE (Integrated Development Environment).

40%–49%: Be able to implement at simple application, with 2-3 separate views/activities.

50%–59%: Understand the basic of the application lifecycle and operate an IDE at a basic level. Ability to model and implement an application of moderate complexity – including > 3 views + a simple persistence mechanism.

60%–69%: Be able to use an IDE competently and degug applications. Be able to implement a reasonably sophisticated application with multiple view / navigation mechanisms. The application will have local persistent storage and be able to interact with a remote service as a basic level (read only say).

70%–100%: All the above to an excellent level. Be able to build an application that can access on device sensors / subsystems (e.g. location or camera).

Essential Material(s)

- "Android Developer Resources." http://developer.android.com
- "Apple Developer Resources." http://developer.apple.com/ios
- "Cordova Developer Resources." https://cordova.apache.org

Supplementary Material(s)

- Camden, R. *Apache Cordova in Action*. New York: Manning, 2015.
- Neuburg, M. *iOS 9 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics*. New York: O'Rielly, 2015.
- Phillips, B. *Android Programming: The Big Nerd Ranch Guide*. New York: Pearson, 2015.

Requested Resources

- Computer Lab: BYOD Lab