

Hands-On Training
for
Android and iOS
Software Developers

C O G E N T
L O G I C

Hands-On Training Conquers the Learning Curve

Your mobile development projects are important. We give you the knowledge and skills to get started and to move ahead through advanced technologies and development techniques. From UI to cryptography, from robust, service-based apps to JNI, we provide the breadth and depth to get you up to speed quickly.

Our training courses are produced by professional software developers. We've put in the years of hard work mastering Android and iOS, discovering best practices and solving problems ... so you don't need to!

Cryptography Training from Cogent Logic

Our three-day hands-on course *Cryptography for Java Developers* targets pure Java and Android-based systems and comprises:

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|-----------------------------------|--|
| 1 Introduction to Cryptography | 8 Digital Certificates (X.509) |
| 2 Cryptographic Service Providers | 9 Public Key Infrastructure |
| 3 Symmetric Key Cryptography | 10 Key Stores and Trust Stores |
| 4 Cryptography for Android Apps | 11 SSL and TLS (JSSE) |
| 5 Asymmetric Key Cryptography | 12 Accessing LDAP Servers with JNDI |
| 6 Digital Signatures | 13 Certificate Revocation Lists and OCSP |
| 7 Authenticated Encryption | 14 Privilege Management Infrastructure |

Appendix: How to Achieve Absolute Security: one-time pads and isolated systems!

We added the appendix recently. It covers the current climate of back-door attacks and systemic compromise of hitherto secure computer systems. You *can* achieve absolute security if you want it. In practice, you will most likely make a determination as to what is sufficient security for your needs!

This course is for Java developers. No prior knowledge of cryptography is assumed. Course fee: £1800 (inc. VAT).

Almost all other courses are of five days duration and cost £2500 (inc. VAT).

Delegates are provided with lunch, snacks and drinks.

Delegates bring their own laptop (Windows, Mac or Linux for Android; Mac of iOS).

Starting Android App Development

If you are new to Android, we can get you up to speed quickly with our five-day starter course. There are around 70 worksheets on this course. It's thorough and you'll enjoy it!

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|--|---|
| 1 Introduction to Android and Mobile Devices | 22 Electronic Mail |
| 2 Development Environment Setup | 23 Permissions and File I/O |
| 3 Eclipse and Emulators | 24 Preferences |
| 4 Application Architecture and Lifecycle | 25 Camera and Gallery |
| 5 XML, the Manifest and Resources | 26 Relational Databases and SQLite |
| 6 Resources and R.java | 27 Data Binding |
| 7 Activities and Intents - Alerts and Logging | 28 Encapsulating Data Access |
| 8 Declarative/Programmatic User Interface Design | 29 Lint |
| 9 The Action Bar | 30 Assertions and Unit Testing with JUnit |
| 10 Standard Dialogs | 31 Test Driven Development with JUnit |
| 11 Debugging and the Android Debug Bridge | 32 Content Providers and SMS |
| 12 Common Controls and Colours | 33 Audio and Video |
| 13 Layout Managers | 34 Acceptance Testing |
| 14 AQuery | 35 Robotium |
| 15 Screen Orientation, Form Factors and Features | 36 Robolectric |
| 16 Smartphones and Tablets in the Same App | 37 2-D Animation and Touches |
| 17 Adapters | 38 Fragments (compatibility libraries) |
| 18 Menus | 39 Localization |
| 19 Managed Dialogs | 40 Supporting Multiple API Levels |
| 20 List Views | 41 Submitting Apps to Google Play |
| 21 Interoperability Between Multiple Activities | |

Software Development with Java

If you don't yet know Java or want a refresher, we have a five-day course that covers everything Java and comprises:

Building, Running and Debugging Java Applications, Control and Data Constructs, Encapsulation, Inheritance, Polymorphism, Exception Handling, The Eclipse IDE, Class Diagrams, Packages and Java Archives, Annotations, Assertions and Unit Testing, Event Listeners, The Collections Framework, Recursion and Memoization, Generics and Autoboxing.

In common with all Cogent Logic courses, emphasis is placed on hands-on work. You will write a lot of software! That's how to assimilate knowledge and develop skills that enable you to hit the ground running when you return to your job.

Android UI Development

This course builds on *Starting Android App Development* by covering UI-specific software in detail. You will get a great deal of hands-on work that comprises:

- 1 Activities, Layouts and Intents
- 2 Declarative Versus Programmatic UI Implementation
- 3 AQuery
- 4 Resources Across Multiple Device Types
- 5 Dimensions
- 6 Colours, Images and Drawables
- 7 Controls
- 8 Overlays (FrameLayout)
- 9 View Flipper
- 10 View Pager
- 11 Space and GridLayout
- 12 Custom Components (controls)
- 13 Multitouch and Gesture Input
- 14 Accessibility
- 15 Localization
- 16 Persisting UI State
- 17 Dialogs
- 18 Drag and Drop
- 19 Styles and Themes
- 20 Fragments (Master/Detail)
- 21 Fragment Lifecycle
- 22 Fragment Transactions
- 23 Action Bars
- 24 Overflow Menus
- 25 Drawers
- 26 App Widgets
- 27 UI Animations



This course lasts four days and costs £2,000 (inc. VAT).

Custom On-Site Courses

We can deliver training courses at your offices for up to 10 delegates for a fully-inclusive price of £9,500 (inc. VAT).

Most customers prefer to take one or more of our standard courses but we are always happy to customise courses to fit your requirements. Typically, let us know what modules you want from the full range of courses!

Advanced Android App Development

If you are an experienced Android developer who needs to tackle more demanding projects, this course is for you! Straight off the bat, we'll let you into a little-known secret: most Android apps are brittle. They contain business logic in all the wrong places and those that make use of database access typically do so at the wrong time! In fact, most Android developers do not know how to build robust apps that stand up to hundreds of thousands of users hitting edge cases. Most apps don't scale: after a while there are too many activities and fragments linked by fragile references.

So, in module 7 we show you how to write apps that are clean, robust, easy to maintain and something to build a reputation upon. Then we proceed to cover a wealth of advanced topics.

You will root a device on this course. That way, you can access the entire filing system and perform network protocol analysis. You need a rooted device for good Android development so a Nexus 7 is provided and it's yours to take away for use back at work.

- 1 Handling Multiple API Levels – Drag and Drop
- 2 WebKit (WebView and Javascript)
- 3 Broadcast Receivers and System Broadcasts
- 4 Notifications
- 5 Threading and AsyncTasks
- 6 Services
- 7 Building Robust Apps
- 8 Foreground Services
- 9 Library Projects
- 10 Timers
- 11 Implementing Content Providers
- 12 RESTful Web Services and JSON (Geocoding)
- 13 OAuth
- 14 Wakelocks
- 15 Sensors
- 16 Location Services and Maps
- 17 Rooting Devices for Debugging
- 18 File System Access
- 19 Network Protocol Analysis
- 20 Managing Network Connectivity (Airplane Mode and Network State Changes)
- 21 Near Field Communication (NFC)
- 22 Bluetooth
- 23 OpenGL ES
- 24 Google Cloud Messaging for Android (GCM)
- 25 Implementing Reliable Settings—Database Access
- 26 Automated Testing on Hundreds of Devices
- 27 Reducing Support Tickets: Self-Monitoring and Reporting Apps

Android Development with JNI-NDK

This is an advanced course for developers with both C/C++ *and* Java experience and some knowledge of Android development. The course is for those needing to develop their own C and/or C++ libraries or to use C/C++ libraries from other sources using the Java Native Interface and the Native Development Kit.

Because the course covers rooting and installation of a userDebug build we provide a Nexus 7 for use on the course and to take back to work.

As the module list below shows, there is a great deal of in-depth material that comes from our real-world experience of developing JNI-based software full-time. We know how to make this stuff work and we'll show you how to make it work too!

- 1 What Is JNI and Why Use It?
- 2 Compiling C-C++ Programs
- 3 Writing C Functions and C++ Methods Callable From Java
- 4 Compiling C-C++ Programs with Eclipse
- 5 Mapping Strings and Other Data Types
- 6 Accessing Java from C-C++
- 7 Exception Handling
- 8 SWIG
- 9 Using Standard C Libraries and Open Source Libraries
- 10 JNI with Android--NDK
- 11 Using Native APIs
- 12 Debugging Native Code in Eclipse
- 13 Logging
- 14 Rooting Android Devices
- 15 Recovering and Interpreting Tombstone Files
- 16 Network Monitoring
- 17 Threading
- 18 Callbacks (C-C++ to Java)
- 19 Asynchronous Processing
- 20 TCP/IP Sockets
- 21 Android userDebug Build
- 22 Troubleshooting Memory Errors with Valgrind
- 23 Native Graphics
- 24 OpenGL ES
- 25 Native Sound (OpenSL ES)
- 26 NDK Profiler
- 27 Java Services
- 28 Java Notifications and Broadcast Receivers
- 29 Building Robust Apps with JNI

Developing Mobile Applications with iOS

This course assumes you have Objective-C experience but little or no iOS knowledge and comprises:

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|--|---------------------------------------|
| 1 Introduction to iOS and Mobile Devices | 19 Core Audio |
| 2 iOS Developer Registration | 20 Relational Databases and SQLite |
| 3 iOS Development Tools (Xcode, Interface Builder) | 21 Core Data |
| 4 Device Provisioning | 22 Protecting User Data |
| 5 View-Based Applications and Interface Builder | 23 Split Views |
| 6 Keyboards | 24 Documents |
| 7 Debugging | 25 Electronic Mail |
| 8 iPhone (iPod Touch) Versus iPad | 26 Multi-Touch and Gestures |
| 9 Display Orientation, Icons and Images | 27 Movie Player |
| 10 Application Architecture and Life Cycle | 28 Performance Tuning |
| 11 Delegation Design Pattern and Accelerometer | 29 Two-Dimensional Animation |
| 12 Model-View-Controller Design Pattern | 30 Web Access |
| 13 Table Views and Navigation-Based Applications | 31 Core Location and Map Kit |
| 14 Tab Bar Controllers | 32 Web Services (XML) |
| 15 GUI Controls | 33 Custom Web Services (JSON) |
| 16 Dialog Boxes and Popovers | 34 Social Networks |
| 17 File I/O | 35 Local and Push Notifications |
| 18 Preferences and Settings | 36 Submitting an App to the App Store |

Software Development with Objective-C

If you do not have Objective-C experience, we can get you up to speed with this comprehensive course, comprising:

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|--|--|
| 1 Introduction to Objective-C 2.0 | 16 Static Variables, Class Methods |
| 2 Simple Objective-C Programs (printf) | 17 The Foundation Framework |
| 3 Numbers and Text | 18 Numbers and Strings |
| 4 Variables, Data Types, Constants, Casting | 19 Logging |
| 5 Pointers | 20 Collections |
| 6 Console Input (scanf), Data Processing | 21 Polymorphism, Categories and Protocols |
| 7 The Xcode IDE | 22 Exception Handling |
| 8 Decisions | 23 Memory Management |
| 9 Loops | 24 Assertions and Unit Testing with OCUnit |
| 10 Arrays and Strings | 25 Test Driven Development with OCUnit |
| 11 Debugging | 26 Revision Control with Git |
| 12 Foundation Framework Projects | 27 Recursion and Memoization |
| 13 Classes and Objects | 28 Callbacks, Delegates and Blocks |
| 14 Encapsulation, Properties, Accessors, Scope | 29 File I/O |
| 15 Inheritance and Class Diagrams | 30 Interoperability with C and C++ |

2014 Schedule

The following training events will be held in London (Barbican) during 2014:

- 7 July *Starting Android App Development*
- 14 July *Advanced Android App Development*
- 21 July *Android Development with JNI-NDK*
- 28 July *Cryptography for Java Developers*
- 1 September *Software Development with Java*
- 8 September *Software Development with Objective-C*
- 15 September *Starting Android App Development*
- 22 September *Developing Mobile Applications with iOS*
- 29 September *Android UI Development*
- 6 October *Advanced Android App Development*
- 13 October *Android Development with JNI-NDK*
- 20 October *Cryptography for Java Developers*

All courses are of five days duration and cost £2500 except for *Android UI Development* which is four days at £2000 and *Cryptography for Java Developers* which is three days at £1800.

For further details:

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