**Android App Development Specialization Topics**

Course 1: Java for Android:

1. Android Studio Intro
2. Debugging with Logcat
3. Main Components in a Computing System
4. Variable & Types
5. Expressions
6. Fundamental components
7. Creating and calling (static) methods
8. Intro to Control Flow
9. Conditional statements: if/else
10. Counting loops: for loops
11. Indefinite loops: while loops and dowhile loops
12. Random numbers
13. Builtin arrays
14. Foreach loops
15. Introduction to the Java Collections Framework
16. ArrayLists
17. HashMaps
18. Interfaces
19. Overriding methods to improve your class; making code more readable
20. Using new objects in old places arrays and parameter passing
21. Java Generics
22. Class Inheritance
23. Exception Handling
24. Abstraction
25. Dynamic binding

Course 2: Android App Components

1. Harware & OS Kernel
2. Middleware Infrastructure
3. Application Framework & Apps
4. Git Basics
5. Working with Remote Repositories
6. Git Branching
7. Android Components (Intents, Services, Content Providers, Activities, broadcast Recievers)
8. Mutator & Accesor Methods
9. Threading
10. Concurrent Programming with Android Intents
11. IntentService
12. Asynchronous
13. HaMeR Framework
14. Async Framework
15. Intent Filtering & Intent Resolution in Detail
16. Intent Handlers
17. Elements of an Android Intent
18. Late Runtime Binding
19. Managing Multiple Activities & Tasks
20. Back Stack
21. Hook Methods
22. Activity Framework
23. Activity Lifecycle Operations

Course 3: Services, Local IPC, and Content Providers

1. Layered Architectures
2. Computer networking protocol stacks
3. Layers Architectural Pattern
4. The Android Linux Kernel Primary & Secondary Storage Mechanisms
5. memory hierarchy, CPU access latency, etc
6. Linux system call interface
7. Linux’s virtual memory manager
8. Virtual File System
9. The Android Linux Kernel: Core Kernel IPC & Processing Mechanisms
10. Android Linux Kernel: Processes & Threads
11. Android Linux Kernel: Local & Remote IPC
12. Android Common Services & Apps: Service Frameworks & Packaged Apps
13. System Services in Application Framework Layer
14. Android Common Services & Apps: Overview of ObjectOriented Frameworks
15. inversion of control
16. Infrastructure Middleware: Android Runtime Core & Native Libraries
17. Android Linux Extensions: Memory Management
18. Android Linux Extensions: Power Management & Local IPC
19. Infrastructure Middleware: Android Runtime Execution Environment
20. ART & Dalvik
21. Infrastructure Middleware: Hardware Abstraction Layer (HAL)
22. Android Services
23. Binder Framework
24. Types of Android Services
25. Service Lifecycle Operations
26. Starting an Android Service
27. Methods Used to Start an Android Service
28. Integrating a Service Into an App
29. Concurrent Programming with Services: The IntentService Framework
30. IntentService Usage
31. Programming Bound Services with Messengers
32. The Protocol for Bound Service Interactions in Detail (Launching, Initializing, Connecting, Interacting, stopping)
33. The Android Concurrent Service Stopping Idiom
34. Service & Activity Communication Via Messengers
35. Activity to Bound Service Communication via Messengers
36. Android Handlers
37. Overview of Android Local InterProcess Communication (IPC) Mechanisms
38. Communicating from Activities to Services & Vice Versa
39. Overview of Android Local InterProcess Communication (IPC) Mechanisms
40. How to create a Content Provider
41. Programming with SQLite
42. Operations on Content Resolvers

Course 4: Engineering Maintainable Android Apps

1. Unit Testing
2. Importance of Test Automation
3. Code Coverage
4. Styles of Testing
5. Functional & Nonfunctional properties
6. refactoring & regression testing
7. integration testing with Android Studio
8. UI Testing with Espresso in Android Studio
9. Security & Sustainability
10. Economy of Mechanism
11. Least Privilege
12. Complete Mediation
13. Secure Defaults
14. Traditional App Accounts vs Mobile App Accounts
15. App Account Mapping to Linux Users
16. Apps Lies & Steal
17. How Android Protects and does not protect
18. the challenge of secure coding
19. security vulnerability walkthrough
20. Privilege Escalation

Course 5: Capstone Project (unknown)