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Android with Hardware Training Syllabus

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- **Android With Hardware**
- Embedded Android Development Process
- Architectural Overview
- ARM SoC Development Kit Overview
- GNU Toolchain
- Kernel Build Configuration
 - How to Build U-Boot
 - How to Build the Linux Kernel
- Android Development Workstation Setup
 - Downloading AOSP
 - Version Control (Git and Repo)
 - How to Build Android
- Installing / Booting Android
 - ADB (Android Debug Bridge)
- **Linux Kernel**
- Architecture
- Introduction to Software Frameworks
- Linux Kernel Architecture
 - ARM Linux Boot Process
 - ARM Linux Machine-Specific Initializations
- Introduction to Platform Bus Devices
- Debugging the Linux Kernel
- **Linux Kernel Modules**
- Introduction to Kernel Modules
 - Kernel Module Framework and Lifecycle
 - GNU Makefiles
- Building a Loadable Kernel Module (LKM) Out-Of-Tree
- Installing a Loadable Kernel Module (LKM) Using ADB
- **Linux Drivers**
- Linux Device Model
- Sysfs Attributes
 - Bus Devices and Frameworks
 - Bus Device Drivers
 - Class Devices and Frameworks
 - File Operations
- Kernel Memory Allocation
 - Passing Data Between Kernel and User-Space
 - Accessing MMIO
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- **Android Architecture**
- Multi-User Security
- Android Init Process



- Android Boot Scripts
- AOSP Directory Structure
- AOSP Device Configuration
- AOSP Build System
- AOSP Makefile Templates o Logcat and Android Debugging
- **Java and JNI**
- Java for C Programmers
- Java Implementation and Evolution on Android
- Zygote o Bionic o Shared Libraries
- JNI Introduction o Android NDK Overview
- Adding Components o Debugging AOSP Using Logger
- **Android System Server**
- System Server Architecture
- Android HAL
- Binder
- Adding Custom System Services
- Modifying Android Application
- **Frameworks**
- Exposing Unique Hardware to Android Apps
- Reaching the Kernel from Android Apps
- Pros and Cons of Different Approaches
- **Android Security**
- Application Security Issues
- Obfuscation
- Best Practices
- SE Android Overview