SYNTAX
שפה מייצרת חשיבה

Android Uno (Intro) Course

This document outlines the contents and curriculum for a One-Day Android Introduction Course that will be conducted by Eran Katsav, the CEO and founder of Syntax College, at the premises of the aforementioned company.

About Syntax College (and its CEO, Eran Katsav)

Syntax College provides a range of Android operating system courses to private corporations and government entities, as well as online courses available to the general public. Noteworthy clients include General Motors™, Carlson Wagonlit Travel™, among others, who have provided letters of recommendation (attached for your reference). These courses are personally delivered by Eran Katsav, the CEO, and founder of Syntax College. Eran holds a Bachelor of Science degree in Computer Science from the Hebrew University in Jerusalem and a master's degree with honors from Tel Aviv University.

Eran has been actively engaged in teaching and training for over two decades and currently holds positions at Reichman University (IDC, International School) and the Holon Institute of Technology (HIT). He serves as both a lecturer in the Department of Computer Science, specializing in Native Android courses (Kotlin and Java), and as the head and founder of the mobile lab within the Department of Digital Medical Technologies (in HIT). Simultaneously, Eran has been an independent developer in the mobile field for the past ten years. Among his accomplishments is the creation of the first Hebrew voice assistant app, "Bip it," which is now available in various white-label versions, including integration into all Suzuki™ vehicles distributed in Israel.

Course Overview

The primary objective of this course is to provide a technological introduction to the world's leading operating system, Android, developed by Google. Throughout the

course, we will offer a comprehensive overview of Android as an open-source system, exploring its implications for both developers and users. Topics covered will include an in-depth examination of the various layers of the operating system, security mechanisms, user isolation, the file system, and more.

Furthermore, the course will delve into a comparative analysis of third-party applications developed for Android versus the system's native applications. Participants will learn to identify and investigate suspicious or potentially harmful applications, enabling them to make informed decisions about safe user behavior.

Throughout the training program, particular emphasis will be placed on highlighting the distinctions between the Android operating system and its Apple counterpart, iOS. By the conclusion of the course, participants will be equipped with insights into the strengths and weaknesses of the operating system, along with the underlying structural factors. This knowledge will empower them to leverage Android's capabilities to their advantage and to protect themselves as users.

A notable highlight of this course is the exploration of a "Spy App" specifically developed for instructional purposes. This application, although appearing to be harmful, operates discreetly and collects highly sensitive personal data, including everything we say. This module will offer a unique perspective on how hackers can exploit the open-source nature of the Android OS, illustrating the evolving challenges in mitigating such threats.

Course Structure

The course will be conducted over the span of one day, commencing at 9:00 a.m. and concluding at 5:30 p.m.

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Course Syllabus

Part 1 - Theory - 9:00 - 12:30

Android Operating System

- Definitions: Software & Hardware, Operating system, OS Kernel, API & SDK
- Mobile Operating Systems & Applications – History, Data & Considerations.
- iOS (Apple) vs Android (Google)
- Android Open Source Project (AOSP) & Google Play services
- Android Platform Architecture
- Android Security: Linux Kernel, User accounts & Root user, Sandbox & SELinux
- Android Boot process with focus on Zygote
- Android File System (System Apps & /data /sdcard partitions)
- Android Versions Main features & SDK changes with focus on Security

Part 2 - Theory + Practical 13:30 – 16:30

Android Application

- App Components (Activity, Service, Broadcast Receiver & Provider)
- App states (Foreground, Background, idle)
- Intents and Intent Filter - communication between processes
- App Manifest File
- App Security & Permissions
- **Practical** – Exploring custom manifest and activating components and services manually through manifest and ADB.
- **Practical** - Non-Contacts WhatsApp App - Demonstration on how reverse engineering can help us use unpublished WhatsApp features.

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Part 3 - Conclusions & Hidden App 16:30 - 17:30

Hidden Recognition App

In this part we will see how to create very malicious app that qualify for the Google Play Store and overcome Android OS limitations. Limitations that throughout time become harder and harder to overcome.

The original app – The HIT clock test
Android Permissions Weak spots
Creating background voice recognition service
Receiving Android Screen states and Boot Completed broadcasts
Changing phone Audio settings
Back to iOS – is it even remotely possible?