

INTRO to **ARM** Assembly

 3-Day course

COURSE DESCRIPTION

The **Introduction to ARM Assembly** course, students will learn to read, write, and debug assembly code for the ARM EABI used by smart phones and mobile devices. Topics include registers, the ARM and Thumb instruction sets and their encodings, literal pools, the stack, the ARM calling conventions, cross compilation, remote debugging with GDB, GNU inline assembly, reverse engineering pitfalls, and more. Students should have C programming experience. Prior experience with another assembly language is helpful, but not required.

Workstations, Android devices, and all required technical documentation will be provided.

Prerequisites: Students should have C programming experience. Prior experience with another assembly language is helpful, but not required.



Relevant Today

60% of the world's population uses an ARM device daily. ARM processors are found in 99% of the world's smartphones and tablets today.



Inclusive Approach

Exposure to all major platforms components, including major revisions, the Application Binary Interface (ABI), and ARM-specific hardware modules.



Topics Include:

Registers, ARM and Thumb instruction sets and their encodings, literal pools, the stack, the ARM calling conventions, cross compilation, remote debugging with GDB, GNU inline assembly, reverse engineering pitfalls, and more.

AGENDA COURSE CONTENT

DAY 1

- Setup a toolchain for building ARM binaries
- Learn basic adb commands
- Setup gdb to be able to debug applications on an Android device
- Learn about basic instructions such as mov, add, multiply, divide, and shift
- Take first quiz

DAY 2

- Learn about memory addressing and layout
- Learn about the push and pop instructions
- Learn about the stack and it's conventions
- Learn about calling conventions on ARM
- Take second quiz

DAY 3

- Learn about syscalls
- Learn about changing modes (ARM vs Thumb)
- Learn about inline assembly
- Learn about the Neon coprocessor

Exam and certification/completion

**The full course syllabus is available upon request*