

Course Guidelines

REVERSE ENGINEERING

deti universidade de aveiro
departamento de eletrónica,
telecomunicações e informática

João Paulo Barraca, José Luis Azevedo

Faculty

- João Paulo Barraca – jpbarraca@ua.pt
 - IT – Telecommunications and Networks - Aveiro

- José Luis Azevedo - jl@ua.pt
 - IEETA - Intelligent Robotics and Systems

Operational aspects

- Lectures in place
- Contents: everything available in the Discord Channel
- Languages:
 - Classes will be lectured in Portuguese.
 - Contents will be available in English
- Communication:
 - Announcements will be made through Teams (and or elearning)
 - Direct communication through the Discord Channel.
 - Email if required: jpbarraca@ua.pt, ila@ua.pt

Objectives

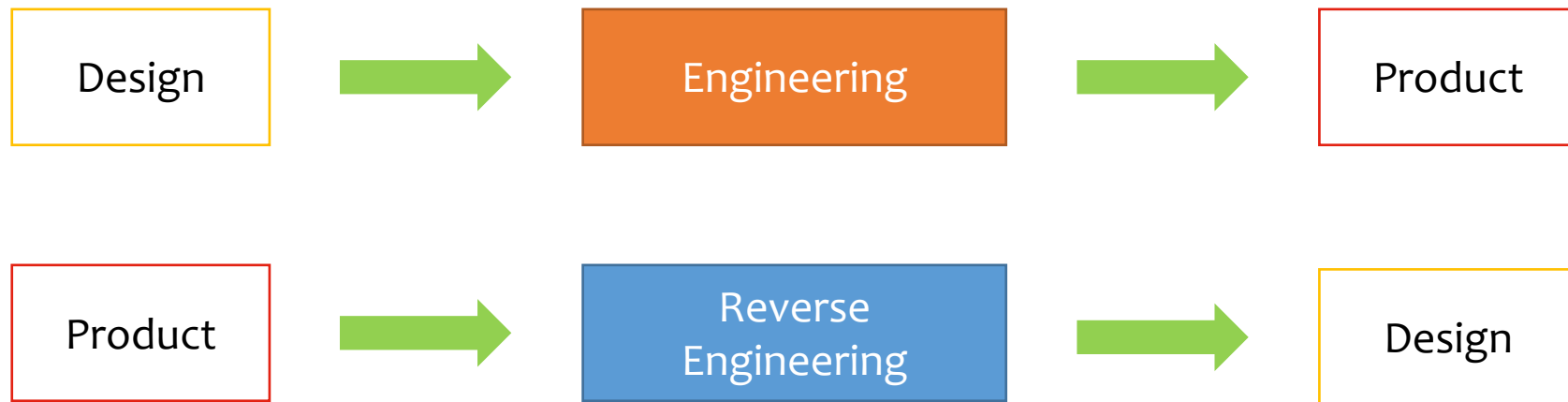
- Know the techniques to **identify the components of a system**
- Know the techniques to **observe the behavior** of systems and components
- Know the **methodologies for reverse engineering**
- Know the relevant protocols and technologies **to build systems, applications and devices**
- Understand the techniques, processes and tools for **decomposition of applications**

Objectives

- Understand the techniques, processes and tools for **decomposition of devices and systems**
- Understand the techniques, processes and tools for **decomposition of mobile applications**
- Capability to **perform tasks of reverse engineering**
- Capability of **documenting the process of reversing engineering**
- Capability to **replicate components** analyzed through reverse engineering

Objectives

- This will not be a course about hacking, malware analysis, or cracking
- This will be a course about reconstructing software/systems from products



Syllabus

Intro, plus 3 main modules

0. Introduction and formats: 2 weeks
1. Mobile Applications: 3 weeks
2. Binary Applications: 4 weeks
3. Hardware Devices: 4 weeks

Evaluation

- 3 assignments, to be implemented by groups of 3 students:
 - Android – 20%
 - Applications – 25%
 - Devices – 25%
 - Assignments should be returned 1-2 weeks after the last lecture on the topic
- 1 final exam – 30%
- Some variations may be required

Bibliography

- Will be provided in every lecture:
 - Books, papers, reports, videos
- Available on the O'Reilly library:
 - A. P. David, Ghidra Software Reverse Engineering for Beginners, Packt Publishing, 2021, ISBN: 9781800207974
 - Bruce Dang, Alexandre Gazet, Elias Bachaalany, Practical Reverse Engineering: x86, x64, ARM, Windows Kernel, Reversing Tools, and Obfuscation, 2014, ISBN: 9781118787311
 - Philip Polstra, Reverse Engineering and Exploit Development, Infinite Skills 2015 (Video)
 - Eldad Eilam, Reversing: Secrets of Reverse Engineering, Willey, 2005, 9780764574818
 - Dennis Andriess, Practical Binary Analysis, ISBN-13: 9781593279127, 2018
 - Fotios Chantzis, Ioannis Stais, Paulino Calderon, Evangelos Deirmentzoglou, Beau Woods, "Practical IoT Hacking", No Starch Press, 2021
- Relevant website (links): <https://beginners.re/main.html>