# EE414 Embedded Systems
## Fall 2017 Course Description


**Professor:** Byung Kook Kim 042-350-3435, bkkim@kaist.ac.kr, 1225 E3
**TA :** Tae Hyung Kim 042-350-5435, thkim@rtcl.kaist.ac.kr, 1230 E3


**Course Description**

In this lecture, various hardware and software components and system implementation aspects of embedded system are covered. Covered topics include expandable ARM processor-based single board computer, open-source embedded Linux operating system, PC-based software development environment on Linux, digital and analog interface techniques, and various I/O devices. Hands-on design experiments are performed to enhance firm understanding. (Prerequisite: EE303 Digital Systems, C language)

| Week | Lecture | Experiment: Design a Metronome |
|---|---|---|
| 1 | Introduction to embedded systems | |
| 2 | Custom single-purpose processors | |
| 3 | General-purpose processors | |
| 4 | Linux development environment | 1. Development environment |
| 5 | Standard single-purpose processor: Peripheral 1 | |
| 6 | Peripheral 2 | 2. Parallel interface: LED visual display |
| 7 | Peripheral 3 | |
| 8 | *Midterm exam* | |
| 9 | Memory | |
| 10 | Interfacing | 3. Serial interface: User input/output |
| 11 | Interrupt and timer | |
| 12 | Network interface | 4. Interrupt and Timer: Interrupt service |
| 13 | Analog interface and codec | |
| 14 | Finite state machine | 5. Network interface |
| 15 | Operating system | |
| 16 | *Final exam* | |

**Textbook:**

Frank Vahid, "Embedded system design: A unified hardware/software introduction", John Wiley & Sons, 2002.

**Lecture:** Mon & Wed 10:30 – 11:45 AM, EE2217, in English
**Office hour:** Mon & Thu 1 – 2 PM

**Lab. Experiments:**

Hands-on experiments are prepared to improve understanding: A simple embedded system design of Metronome using Beaglebone. Lab with development PCs is open. Grouping with two students is required

**Grading:**

| | | | |
|---|---|---|---|
| Midterm exam | | 100 | |
| Final exam | | 100 | |
| Lab report | 20 x 5 = | 100 | (Late report: -20%/week) |
| Attendance | 5 x 28 = | 140 | |
| Total | | 440 | |

**Web page**: http://rtcl.kaist.ac.kr/~bkkim/lecture/embedded