## IXX1410 „Tarkvara projekt“ – 3EAP

**Projekti teema valik:**

**Arduino Uno projekt (Tarkvara + Riistvara):**

* **Ilmajaam**
* **Äratuskell**
* **Töötundide loendur RF ID**

**Projekti hinne:**

**Koondtulemus = H1+ H2 + H3**

**H1 = 20% = 5+5+10**

**esitluse tase (projekti esitlus, vahekaitsmine, lõppkaitsmine)**

**H2 = 20% = 2\*8 + 4(bonus)**

**osavõtt õppetööst (Arduino ja oma projekti täitmine)**

**H3 = 60% lahenduse tase (oma projekti keerukus, funktionaalsus, projekti aruanne)**

**Projekti kaitsmine:**

**Projektide kaitsmine toimub avalikult õppesemestri viimastel nädalatel (01.05, 08.05, 15.05) teiste antud eriala üliõpilaste osalusel**

**Praktikumide läbiviimine:**

**ICT-507C?,** Paaritu nädal 14:00 – 17:00?

Õppejõud: **Marina Brik, Sergei Kostin**

**Tarkvara – Arduino IDE (**[**https://www.arduino.cc/en/Main/Software**](https://www.arduino.cc/en/Main/Software)**)**

**Riistvara – Arduino UNO**

**(**[**https://store.arduino.cc/arduino-uno-rev3**](https://store.arduino.cc/arduino-uno-rev3)**)**

**Kuidas kasutada Arduino mikrokontrollerit ja komponente -** [**https://www.arduino.cc/en/Guide/HomePage**](https://www.arduino.cc/en/Guide/HomePage)

**Arduino projektid -** [**https://store.arduino.cc/genuino-starter-kit**](https://store.arduino.cc/genuino-starter-kit)

**Praktikumid:**

**14.02**

* Introduction to “The Arduino Starter Kit” (**30 min**)
* **Project 1: Get to know your tools:** switches, LED, resistor (**30 min**)
  + discover: basic electrical theory, how a breadboard works, components in serial and parallel
* **Project 2: Spaceship interface:** (**45 min**)
  + discover: digital input and output, your first program, variables
* **Project 3: Love-o-meter**: LED, resistor, temperature sensor (**45 min**)
  + discover: analog input, using serial monitor
* **Project 6: Light Theremin**: Piezo, photoresistor, resistor (**45 min**)
  + discover: making sound with the tone() function
* **Project 7: Keyboard instrument**: Piezo, switch, resistor (**45 min**)
  + discover: resistor ladders, arrays

## Aine registreerimine ja materjalide kättesaadavus:

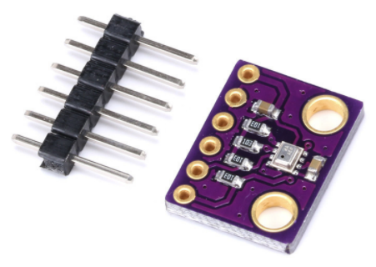
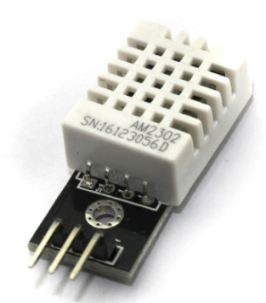
[**https://edu.pld.ttu.ee**](https://edu.pld.ttu.ee)

**Modules & Sensors:**

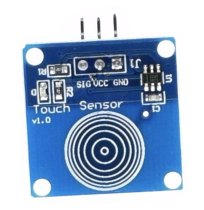
**via I2C (A4-SDA (serial data), A5-SCK or SCL(serial clock), VDD, GND)**

* OLED 0.96 inch display 128x64: Adafruit\_SSD1306 (~ 2 eur)
* add **Adafruit\_SSD1306-master** and **Adafruit-GFX-Library-master** libraries
* In **Adafruit\_SSD1306.h** and your sketch check the display address, it must be **0x3C**
* In **Adafruit\_SSD1306.h** uncomment line

**#define SSD1306\_128\_64** and comment line #define SSD1306\_128\_32

* DS3231 precise clock module: (~1 eur)
* Add library **RTClib-master**
* BMP280 pressure & amplitude & temperature sensor: (~0.9 eur)
* Add library **Adafruit\_BMP280\_Library-master**
* In **Adafruit\_BMP280.h**: #define BMP280\_ADDRESS (0x76) not 0x77
* DHT22 temperature & humidity sensor: (~1.4 eur)
* Add library **arduino-DHT-master**
* RC522 RFID module (~1.5 eur)
* Add library **MFRC522-1.2.1**
* http://educ8s.tv/arduino-rfid-tutorial/
* https://www.youtube.com/watch?v=So83sH6-jwM

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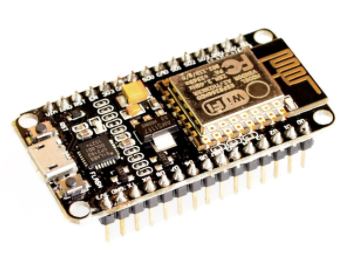
* TTP223B puuteandur touch sensor (~0.4 eur)
* ESP8266 WIFI module (~2.5 eur) on **Node MCU 1.0 board**
* **Install CP210x USB to UART Bridge VCP Driver**

<https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

* **Install the ESP8266 Board**

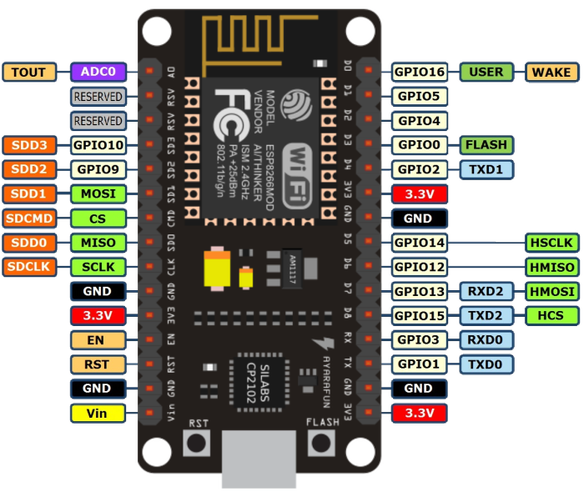
<https://randomnerdtutorials.com/how-to-install-esp8266-board-arduino-ide/>

* **Select board** 🡪 **Node MCU 1.0 (ESP-12E Module)**

****<https://bennthomsen.wordpress.com/iot/iot-things/esp8266-wifi-soc/esp8266-getting-started-with-arduino-ide/>

* Attach Adafruit SSD1306 OLED display to following pins:

(display)SDA -> D2 and (display)SCL->D1

**NB! DO NOT USE PINS D3, D4 and D8 since they are used to upload your program to the device**