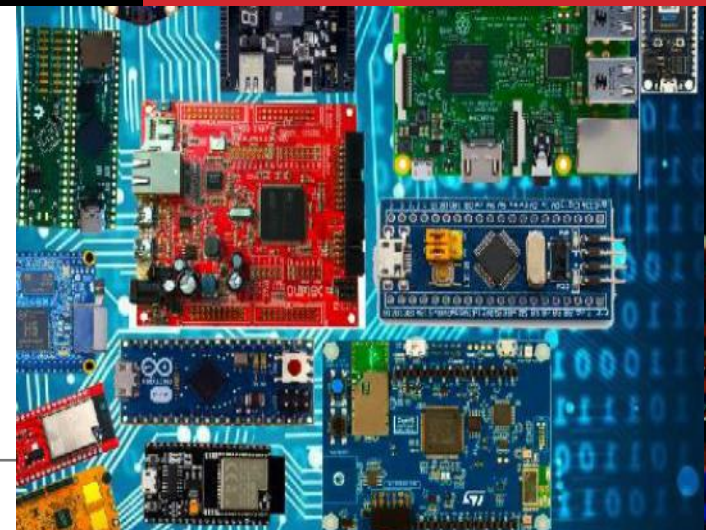


Microprocessor System & Interfacing

INTRODUCTION

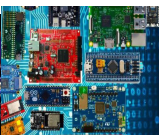
Dennis A. N. Gookyi





CONTENTS

❖ Course Organization and Syllabus

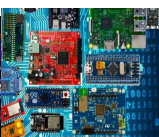




INSTRUCTOR

❖ Instructor

- ❑ Name: Dennis Agyemanh Nana Gookyi
- ❑ Email: dennisgookyi@gmail.com
- ❑ Phone: 0203493435
- ❑ Research Portals:
 - <https://www.researchgate.net/profile/Dennis-Gookyi>
 - <https://sites.google.com/view/eisedlab>





INSTRUCTOR

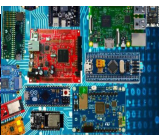
❖ Instructor

Education

- Ph.D. in Information and Communication Engineering, Hanbat National University, South Korea, 2021.
- M.Eng. in Information and Communication Engineering, Hanbat National University, South Korea, 2017.
- B.Sc. in Computer Engineering, Kwame Nkrumah University of Science and Technology, Ghana, 2009.

Employment

- Research Scientist, CSIR-INSTI, Ghana, 2022 – Present.
- Researcher, Korea Electronics Technology Institute (KETI), South Korea, 2021 – 2022.
- Research and Teaching Assistant, SoC Design Lab, Hanbat National University, South Korea, 2014 – 2021.
- RTL Design Engineer, Future Systems, South Korea, 2015 – 2016.
- Teaching Assistant, Computer Engineering Department, Kwame Nkrumah University of Science and Technology, Ghana, 2013 – 2014.

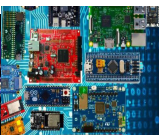




LEARNING OUTCOMES

❖ Expected Learning Outcomes

- ❑ Learn how to select development boards and toolchains for application prototyping
- ❑ Program MCU and SoC to read sensor data and control actuators
- ❑ Analyze sensor data and interface peripherals to microprocessors
- ❑ Identify components of a microprocessor
- ❑ Understand the schematic of a RISC-V microprocessor





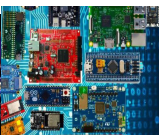
PREREQUISITES AND GRADING

❖ Prerequisite

- ☐ Inclination toward computer programming
- ☐ Inclination towards Digital Systems Design
- ☐ Engineering mindset
- ☐ Inquisitive about the physical world

❖ Grading scheme: Homework (10%), Participation (5%), Project (15%), Exam (70%)

- ☐ Homework: hybrid grading show your work in class
- ☐ Participation: attendance, ask questions, answer questions, be active
- ☐ Project: non-trivial implementation of something useful by applying knowledge including and beyond what's learned in class

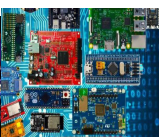


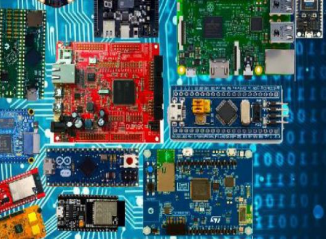


LEARNING APPROACH

❖ Learning approach:

- ☐ Type up your own code, and make it work on your device
- ☐ Learn from sample code, assimilate then modify, integrate, or extend
- ☐ Be ready to show your work
- ☐ Read manuals and product specification documents





COURSE OUTLINE

❖ Schedule

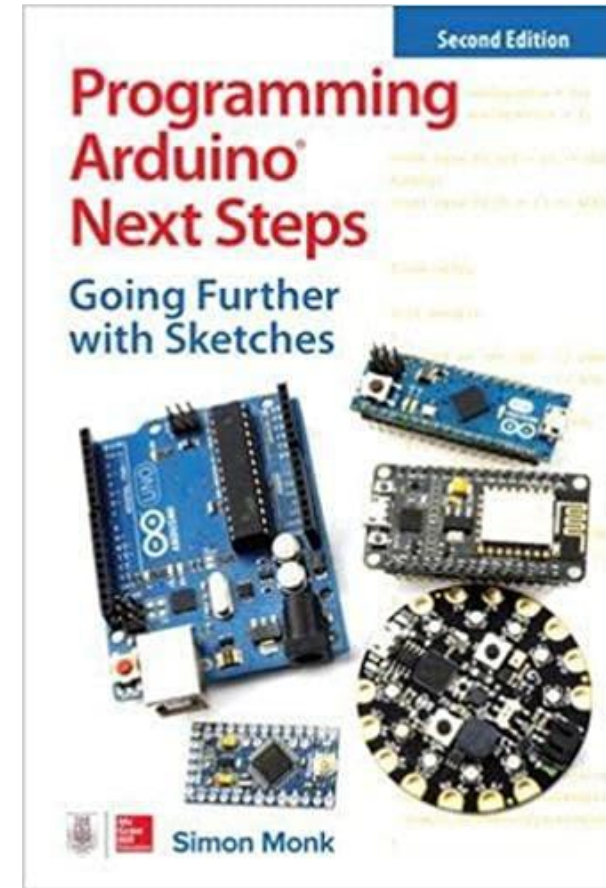
Lecture	Topic	
01	Course Overview	PART 1
02	Course Hardware and Software Toolchain Setup	
03	Developmental Boards Overview	
04	Programming Arduino and Nano 33 BLE	
05	Nano 33 BLE Peripherals Interfacing	
06	Nano 33 BLE Sensors Interfacing	
07	Building Blocks of a Microprocessor	PART 2
08	Introduction to RISC-V Microprocessor	
09	RISC-V Microprocessor Single Cycle Design and Implementation	

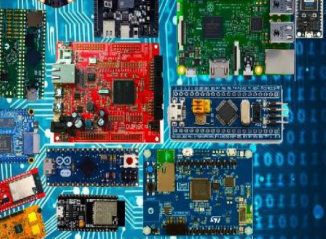


TEXTBOOKS AND LINKS

❖ PART 1 Textbook and Links

- <https://www.adafruit.com/>
- <https://www.arduino.cc/>
- <https://www.st.com/en/microcontrollers-microprocessors/stm32-32-bit-arm-cortex-mcus.html>
- <https://www.espressif.com/en/products/socs/esp32>
- <https://www.nordicsemi.com/>
- <https://www.sparkfun.com/>





TEXTBOOKS AND LINKS

❖ PART 2 Textbook and Links

- <https://riscv.org>
- <https://en.wikichip.org/wiki/WikiChip>
- <https://riscv.org/wp-content/uploads/2017/05/riscv-spec-v2.2.pdf>
- https://www.elsevier.com/__data/assets/pdf_file/0011/297533/RISC-V-Reference-Data.pdf#RISC-V%20Reference%20Data
- https://github.com/dennisgookyi/comp_arch_list/tree/master/books

