



HANYANG UNIVERSITY

Hanyang International Summer School

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Course Information	Class No.	18021	Course Code	ISS1125	Credits	3
	Course Name	Microprocessor and IoT				
	Lecture Schedule	Tue-Fri/ 16:00~19:00				
	Course Description	This course discusses about how microprocessor works, using x86 and RISC architectures as case studies, followed by its usage on microcontroller (case study: ARM/Atmel). The last 2 classes discuss about future research and enhancement possibilities in microprocessor world including IoT and its supporting technologies.				
	Course Objective	<ul style="list-style-type: none"> - Students should be able to explain how microprocessor works by comparing x86 (case study: i8088) and RISC architecture (case study: ARM Cortex) - Students should be able to design and program microcontroller using ARM Cortex M3 - Students should be able to design and program an IoT device using ARM-based Arduino system using emulator (TinkerCAD.com) and send its data to IoT Platform for analytic - Students should be able to explain the future trends of microprocessor technologies 				
	Prerequisite	Understanding on Logic Circuit and C Programming is needed but not mandatory				
	Materials/Textbooks	<ol style="list-style-type: none"> 1. Jacob Millman and Arvin Grabel, "Microelectronics 2nd ed.," McGraw-Hill, 1988 2. John L. Hennessy and David A. Patterson, "Computer Architecture: A Quantitative Approach 4th ed.," Morgan Kaufmann, 2007 3. William Hohl and Christopher Hinds, "ARM Assembly Language: Fundamentals and Techniques 2nd ed.," CRC Press, 2015 				
Evaluation	Attendance	0%	Quiz	20%		
	Assignment	0%	Mid-term Exam	20%		
	Presentation	0%	Final Exam	20%		
	Group Project	40%	Participation	0%		
	Etc.	Evaluation Item			Ratio	



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				%
Daily Lecture Plan	Week 1	Day 1	Story of Microprocessor and How it Works (Digital Transistor)	
		Day 2	Microprocessor and Memory Interaction (Hardware Perspective)	
		Day 3	Microprocessor and I/O Interaction (Hardware Perspective)	
		Day 4	Machine Instruction (case study: CISC-i8088 and RISC-ARM Cortex M3)	
	Week 2	Day 1	Pipeline in DLX Architecture, Hyper-Threading, Memory Management	
		Day 2	Parallel Processing and Hyper-Threading	
		Day 3	Memory Management (Data Caching)	
		Day 4	Midterm exam	
	Week 3	Day 1	Introduction to Microcontroller (case study: Microchip and ARM)	
		Day 2	Programming Microcontroller (case study: Arduino Uno and Raspberry Pi)	
		Day 3	Designing IoT Device: Sensor Input and Display Output (case study: Arduino Uno)	
		Day 4	Connecting to IoT Platform for Analytic, Reporting, and Controlling	
	Week 4	Day 1	Future Research on Microprocessor	
		Day 2	Best Project Presentation	
		Day 3	Final Exam	
		Day 4	Graduation	