Syllabus

2022 Fall

Course	Embedded Software & Design	**Professor**	Jeong Hong
Course No	SOC3050	**Class No**	
Schedule	CEL0(WEB)	**Grading Eval.**	Relative Evaluation
Other Information			

Profile	- PhD, MIT (Massachusetts Institute of Technology), EECS (Electrical Engineering and Computer Science), USA - MS, EE, KAIST (Korea Advanced Institute of Science and Technology), Korea - BS, EE, SNU (Seoul National University), Korea - Professor, EE, BJTU (Beijing Jiaotong University), China - Professor, EE, POSTECH (Pohang University of Science and Technology), Korea
Course Objectives	The mendatory and fundamental course for CS and EE for advancing to Computer Hardware and Software study. - Understanding Embedded System, Computer system, and Programming - Application of Embedded System to RC Car, Drone, Devices, Vehicles, ..., that cannot be done with desktop computer.
Course Description	As the most popular devices, the AVR microprocessor will be studied. An Atmega microcontroller board will be used for hands-on experiments. The major topics are as follows. - Instruction set architecture - Timer programming - Interrupt programming - Serial port programming - Interfacing the external I/O devices - All with Assembly language and C/C++ language. The lecture contents might be variable depending upon situations.
Textbooks	Title of Publications:AVR Microcontroller and Embedded Systems Author: Muhamad Ali Mazidi Publication Company: Pearson Publication Year: 2013 ISBN: 9781292042565
Other Texts and References	
Class Structure	- Lecture - Labs (Assignment) - Exams
Notes	Course failure: Any one of the following behavior is destined to Failure, - 1/4 Absency without AA approval withon a week from absency - No Labs - No Midterm exam - No Final Exam - Other activity harming the course Otherwise, all will be passed without problem. !!! Course contents and evaluation criteria may be variable depending on situations during the semester.
ABEEK	

Grading							
Mid-term	**Final exam**	**Attendance**	**Assignments**	**Quiz**	**Discussion**	**ETC**	**Total**
30 %	30 %	10 %	30 %	0 %	0 %	0 %	100 %

S y l l a b u s			
Week	**Content**	**Class**	**Notes**
1	**Theme**	Introduction to Computing	
	Class Details	Lecture and Review	
	Tests		

2	**Theme**	The AVR Micro-controller: History and Features	
	Class Details	Lecture and Lab	
	Tests	Lab	
3	**Theme**	AVR Architecture and Assembly Language Programming	
	Class Details	Lecture and Lab	
	Tests	Lab	
4	**Theme**	Branch, Call, and Time Delay Loop	
	Class Details	Lecture and Lab	
	Tests	Lab	
5	**Theme**	AVR I/O Port Programming	
	Class Details	Lecture and Lab	
	Tests		
6	**Theme**	Arithmetic, Logic Instructions, and Programs	
	Class Details	Lecture and Lab	
	Tests	Lab	
7	**Theme**	AVR Timer Programming in Assembly and C	
	Class Details	Lecture and Lab	
	Tests	Lab	
8	**Theme**	Midterm Exam	
	Class Details		
	Tests		
9	**Theme**	AVR Interrupt Programming in Assembly and C	
	Class Details	Lecture and Lab	
	Tests	Lab	
10	**Theme**	AVR Serial Port Programming in Assembly and C Power Point	
	Class Details	Lecture and Lab	
	Tests	Lab	
11	**Theme**	LCD and Keyboard Interfacing	
	Class Details	Lecture and Lab	
	Tests	Lab	
12	**Theme**	ADC, DAC, and Sensor Interfacing	
	Class Details	Lecture and Lab	
	Tests	Lab	
13	**Theme**	Relay, Optoisolator, and Stepper Motor Interfacing with AVR	
	Class Details	Lecture and Lab	
	Tests	Lab	
14	**Theme**	Input Capture and Wave Generation in AVR	
	Class Details	Lecture and Lab	
	Tests	Lab	
15	**Theme**	PWM Programming and DC Motor Control in AVR	
	Class Details	Lecture and Lab	
	Tests	Lab	

16	**Theme**	Final Exam	
	Class Details		
	Tests		