EEC120 Teaching/Evaluation Plan

Plan for EEC120 Computer Programming I

Week	Lecture	Laboratory	Notes
Week 01	• Course Introduction • Introduction to Computer Systems 1. Hardware (CPU, input, output) 2. Software (Kernel, OS, userspace) 3. Numbers & Logic • Introduction to Computer Programming 1. Algorithms: instruction sequencing 2. Flow-charts: visual representation 3. Interpreters ⇒ scripts 4. Compiler and Linkers ⇒ binary executables	• Lab Work 1 • **[DEVELOPMENT WORK]** • my1barepi: t00_intro4u • my1barepi: t01_gpio	• **[VIDEO GUIDES]** • install xcompiler • install code editor • install scm software • prepare my1barepi • prepare sd card • workflow demo • scm basics (git)
Week 02	• Hardware Platform 1 (Lecture Part 2) ◦ Board (Raspberry Pi) specifications ◦ Microcontroller (BCM2835) details	• Lab Work 2 • **[DEVELOPMENT WORK]** • my1barepi: t02_timer • my1barepi: t03_interrupt	
Week 03	• Hardware Platform 1 (cont.) (Lecture Part 2) ◦ Features: I/O, Timer, Interrupt	• Lab Work 2 (cont.) • **[DEVELOPMENT WORK]** • my1barepi: t04_textlcd • my1barepi: t05_senstemp • my1barepi: t06_framebuffer • my1barepi: t07_video	**Assignment 1 Queue**

Week	Lecture	Laboratory	Notes

Week 04	• Bare-metal Programming (Lecture Part 3)
	  ◦ single task, multi-tasking
	  ◦ event triggered
		• Lab Work 2 (cont.)
		• **[DEVELOPMENT WORK]**
		• my1barepi: t08_uart
		• my1barepi: t09_bluetooth
		  ◦ needs bluetooth terminal app	

Week 05	• Bare-metal on Raspberry Pi (Lecture Part 3)
	  ◦ Timer access
	  ◦ Interrupt Access
		• Lab Work 2 (cont.)
		• **[DEVELOPMENT WORK]**
		• my1barepi: t10_gsm
		• my1barepi: t11_gps
		• my1barepi: t12_rtc
			Assignment 1 Due (5%)

Week 06	• Simple Applications
	  ◦ traffic light control
	  ◦ temperature control
	  ◦ input signal detection/measurement
		• Lab Work 3
		• **[DEVELOPMENT WORK]**
		• practical programming:
		• detect edges
		• measure pulse width
		• measure frequency
		• generate pwm (single/periodic)
			Lab Assessment 1 (10%)

Week 07	• Hardware Platform 2 (Lecture Part 4)
	  ◦ Board (GTUC51B001) specifications
	  ◦ Mirocontroller (NXP P89V51RD2) details
		• Lab Work 3 (cont.)
		• **[DEVELOPMENT WORK]**
		• system integration
			Mid-term Examination (20%)

Week 08	• Hardware Platform 2 (cont.) (Lecture Part 4) ◦ Features: I/O, Timer, Interrupt	• Lab Work 3 (cont.) • **[DEVELOPMENT WORK]** • system integration	**Assignment 2 Queue**

Week	Lecture	Laboratory	Notes

Week 09	• Embedded OS on Raspberry Pi
	  ◦ running Raspbian Linux
	  ◦ basic I/O access
		• Lab Work 4
		• **[PREPARATION WORK]**
		• prepare raspbian (pgt302pi image)
		• change hostname (make unique)
		• **[DEVELOPMENT WORK]**
		• my1linuxpi: gpio	

Week 10	• Embedded OS on Raspberry Pi
	  ◦ running Raspbian Linux
	  ◦ basic peripheral interface
		• Lab Work 4 (cont.)
		• **[PREPARATION WORK]**
		• make sure avahi/mdns is running on pi
		• make sure bonjour/avahi/mdns is available on host
		• **[DEVELOPMENT WORK]**
		• remote access using putty
		• my1codelib: run custom server
		• my1linuxpi: run gpio http server
			Assignment 2 Due (5%)

Week 11	• Setup/running simple data server ◦ server side programming (C @ PHP)	• Lab Project	**Lab Assessment 2 (10%)**
Week 12	• Setup/running simple data server ◦ client side programming (C @ HTML/CSS/JAVASCRIPT)	• Lab Project (cont.)	
Week 13	• Practical Applications ◦ requirements and considerations	• Lab Project (cont.)	
Week 14	• Practical Applications (cont.) ◦ requirements and considerations	• Lab Project (cont.)	**Lab Project Due (10%)**

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