PGT302 Teaching/Evaluation Plan

Week	Lecture	Laboratory	Notes

Week 01	• Course Introduction (Lecture Part 0)
	• Introduction to Embedded World (Lecture Part 1)
	  ◦ embedded systems
	  ◦ embedded software
	  ◦ hardware platform
	  ◦ software development
		• 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 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	

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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 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	

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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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