歡迎來到嵌入式的世界

嵌入式作業系統

2022 Fall

Topics & Reference

- Software/Hardware Codesign
  - Introduction to Embedded Systems, Embedded OS and Real-time OS
    - LO: can understand the process of codesign model,
    - LO: can demonstrate the capability of setting up the co-design development environment
- Embedded OS
  - Kernel Objects and Services
    - LO: can describe the role of kernel and its services
  - Task, process, thread, scheduler
    - LO: can understand how scheduler works
    - LO: can demonstrate the capability of mapping a real-life scenario to a multi-task project
  - Memory
    - LO: can describe how memory works for an embedded system
  - Communication & Synchronization: Semaphores, mutex, mqueue, pipe...
    - LO: can explain how these primitives work
    - LO: can apply them in to a multi-task project

Topics & Reference

- Interrupt: Signal, timer and timer services
  - LO: understand the difference between signal/timer & wait,
  - LO: can apply signal/timer into a multi-task project
- I/O, Socket
  - LO: can illustrate the I/O subsystem and explain its design principles.
- Term Project
  - LO: can analyze the problem, and decompose the problem into smaller pieces
  - LO: can apply the primitives to solve each small problem
  - LO: can design a multi-task project to solve a problem
  - LO: can realize the project using the co-design development model
- Textbook: Real-Time Concepts for Embedded Systems, Qing Li with Caroline Yao, CMP Books, 2003

Course Map
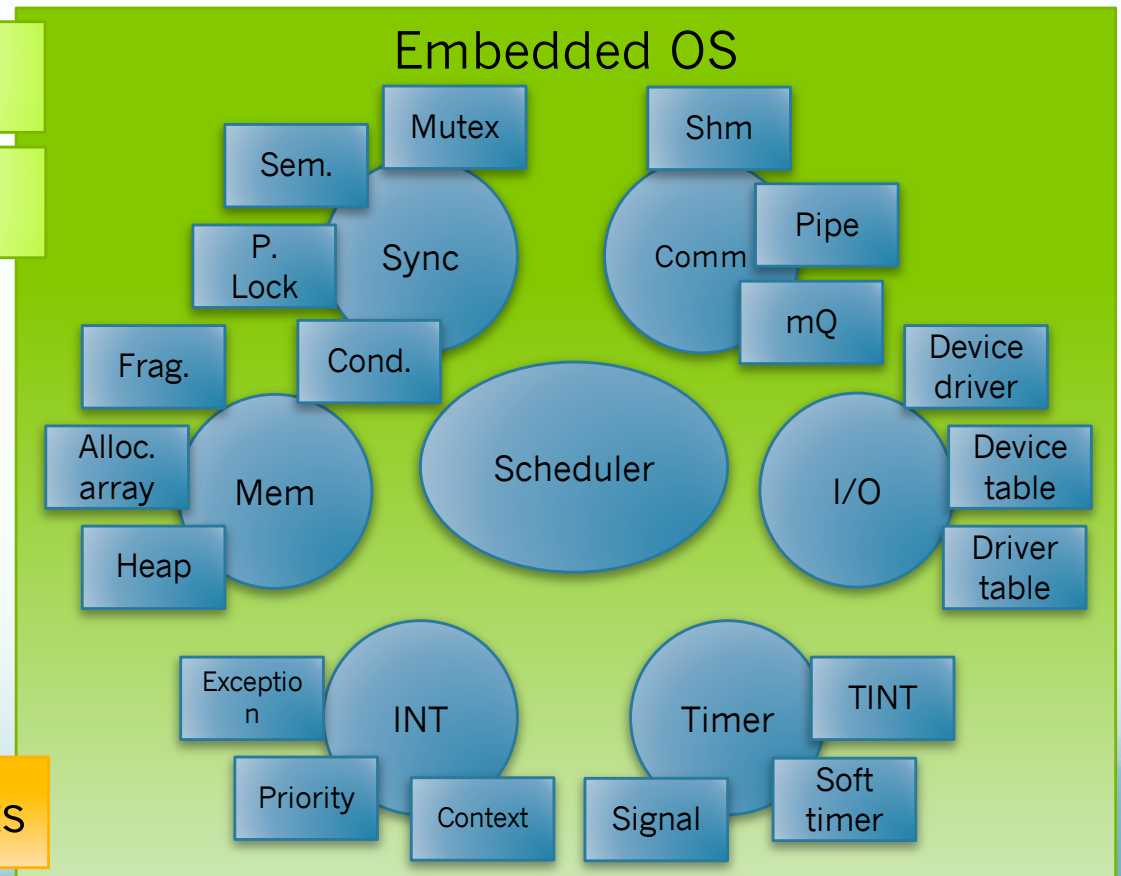
2022 Fall Schedule

	Data	Topic
1	09/16	Intro & **Pretest**
2	09/23	Lab 1: setting up
3	09/30	Lab 2: flash image
4	**10/07***	Interrupt, I/O
5	**10/14***	Lab 3: Driver (1)
6	10/21	Lab 4: Driver (2)
7	10/28	Task
8	11/04	Lab 5: task
9	11/11	Midterm & **Project Design (I)***

	Data	Topic
10	**11/18***	IPC
11	**11/25***	Lab 6: IPC
12	12/02	Memory
13	**12/09***	Signal & Timer
14	12/16	Lab 7: Signal
15	12/23	**Project Design (II)***
16	12/30	**Final Examination**
17	01/06	**Project: Demo***

In-class Presentation:
10/7 (INT), 10/14 (IO), 11/18(Task), 11/25(IPC), 12/09 (Mem)

12/30 Final Examination
01/06 期末專題報告

* Presentation Required! 7 min for each group.

Grading

- Lab: 30%
  - Total 7 practices
- In-Class Presentation (by group): 20%
  - 5 in-class presentations
- Homework/Test: 30%
  - Pretest
  - Quiz (we MAY have a quiz after each lecture class)
  - Reading assignments/homework
  - One in-class tests (final, closed-book): 20 %
- Final Project: 20%
  - Creativity & Participation: 10%
  - Completeness (source code & demonstration): 10%
- Project/Homework late penalty: grade is multiplied by $0.9^{\#days\_late}$

In-Class Presentation

- 每組三人，由助教指定。如果有特別想同組的同學，可以先告訴老師或助教，但一人為限
- 每次上課前抽出一位同學簡報前次上課的重點。簡報時間5-8分鐘。其餘同學可以問問題。
- 計分方式
  - 報告：0-2分
    - 簡報亂做不計分
  - 補充、提問：0-1分
    - 無意義的問題不計分
  - 全組最多4分

組別	同學1	同學2	同學3	當週記分（滿分3分）
G1	報告		補充	
G2		提問		
G3	提問		提問	