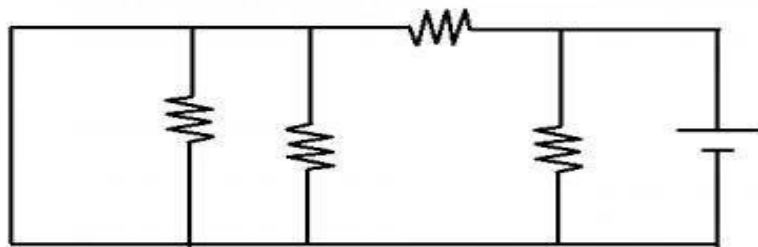


# 歡迎來到嵌入式的世界

嵌入式作業系統

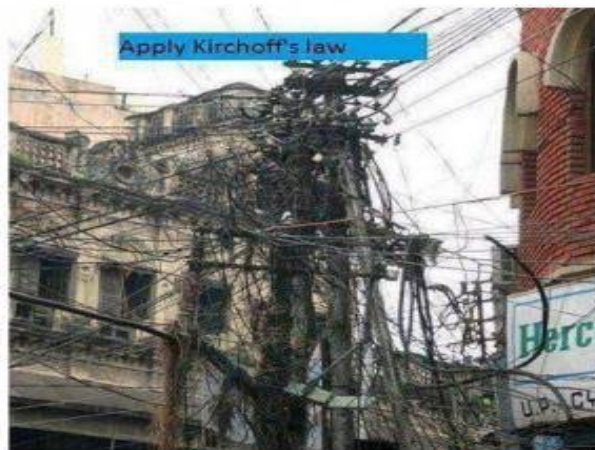
2023 Fall

## 課本的例題



---

## 考試的例題



# 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

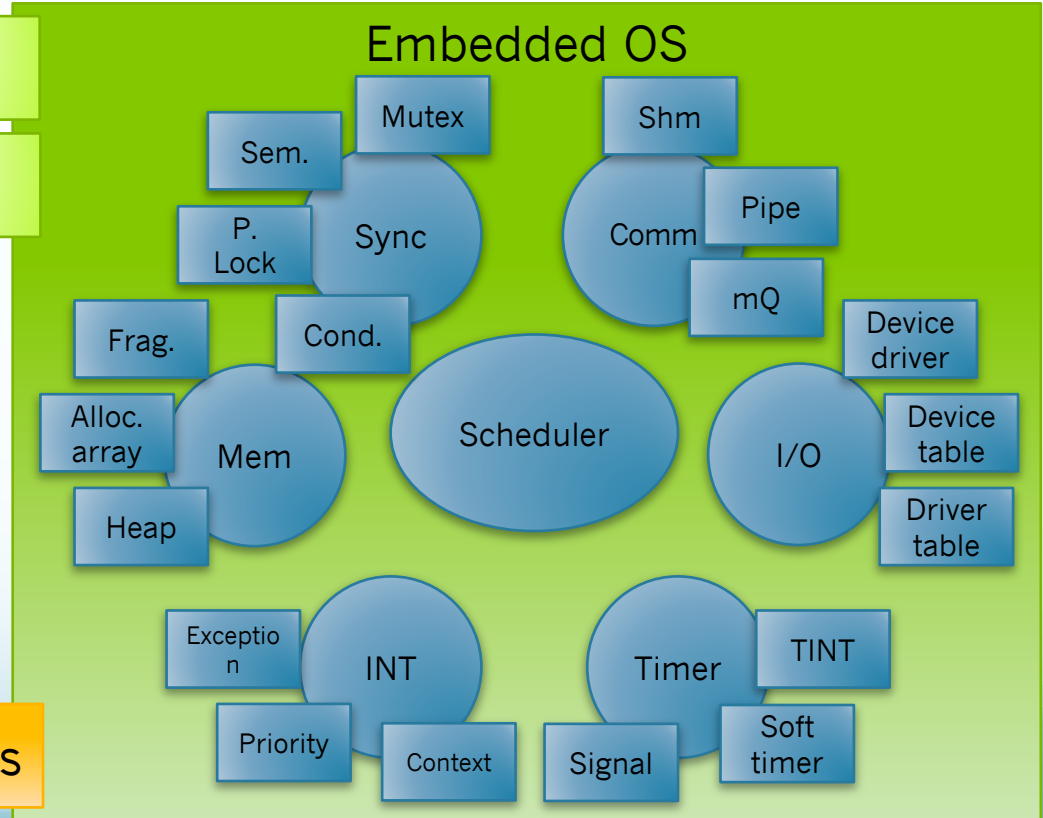
- Interrupt: Signal, timer and timer services
  - LO: understand the difference between signal/timer & wait,
  - LO: can apply signal/timer into a multi-task project
- I/O, Socket
  - LO: can illustrate the I/O subsystem and explain its design principles.
- Term Project
  - LO: can analyze the problem, 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

Embedded Prog.

Co-design Model

Hands-on Projects



# 2023 Fall Schedule

	Data	Topic
1	09/15	Intro & <b>Pretest</b>
2	09/22	Lab 1: setting up
3	09/29	中秋節放假
4	10/06	Lab 2: flash image
5	10/13*	Interrupt, I/O
6	10/20	Lab 3: Driver (1)
7	10/27	Lab 4: Driver (2)
8	11/03*	Task, Lab 5: task
9	11/10	Midterm & <b>Project Design (I)*</b>

In-class Presentation:

10/13 (INTRO), 11/03 (IO), 11/17(Task), 11/24(Mem), 12/08 (IPC)

	Data	Topic
10	11/17*	Mem
11	11/24*	IPC
12	12/01	Lab 6: IPC
13	12/08*	Signal & Timer
14	12/15	Lab 7: Signal
15	12/22	<b>Project Design (II)*</b>
16	12/29	<b>Final Examination</b>
17	01/05	<b>Project: Demo*</b>

12/29 Final Examination

01/05 期末專題報告

**\*In-class presentation** 5 min for each

**\*Presentation Required!** 5-8 min for each group.

# Grading

- Lab: 25%
  - Total 6-8 practices
  - Video Demo for every practice
  - Physical Demo (randomly selected) x 1 at the end of the semester
- In-Class Presentation (by group): 20% (4-5 in-class presentations, 4-5 points per presentation)
- Homework/Test: 40%
  - Pretest
  - Quiz (we MAY have a quiz after each lecture class): 15%
  - Assignments/Homework after lab practices: 10%
    - Video Demo for every practice
    - Physical Demo (randomly selected) x 1 at the end of the semester
  - One in-class tests (final, closed-book): 15 %
- Final Project: 15%
  - Creativity & Participation
  - Completeness (source code & demonstration)
- Project/Homework late penalty: grade is multiplied by  $0.9^{\text{days\_late}}$

**Copy is definitely not allowed.**

# 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4-5分

組別	同學1	同學2	同學3	當週記分 (滿分4-5分)
G1	報告		補充	
G2		提問		
G3	提問		提問	



# 學問學問，學會問問題

每次上課記得帶一個問題過來

# In our class...

- Please preview the lecture slides or lab handouts before the class
  - 5 min for in-class presentation
  - 10-20 min for quiz (pre-lecture or post-lecture quiz)
- Quiz may be open-book or closed-book

# Final Project

C onceive - D esign - I mplement - O perate

- Creativity
- Participation (同組互評)
- Completeness (source code & demo) : 他組互評
  - source code
  - presentation (demo)
  - video
  - operable

# NEED TO GOALS

- Understand how to conceive-design-implement-operate
- Complex value-added engineering systems
- In a modern team-based engineering environment
- And are mature and thoughtful individuals

