460 Course Plan

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              CPTS 460 COURSE PLAN
                   Spring, 2020

TITLE          : Operating Systems and Computer Architecture
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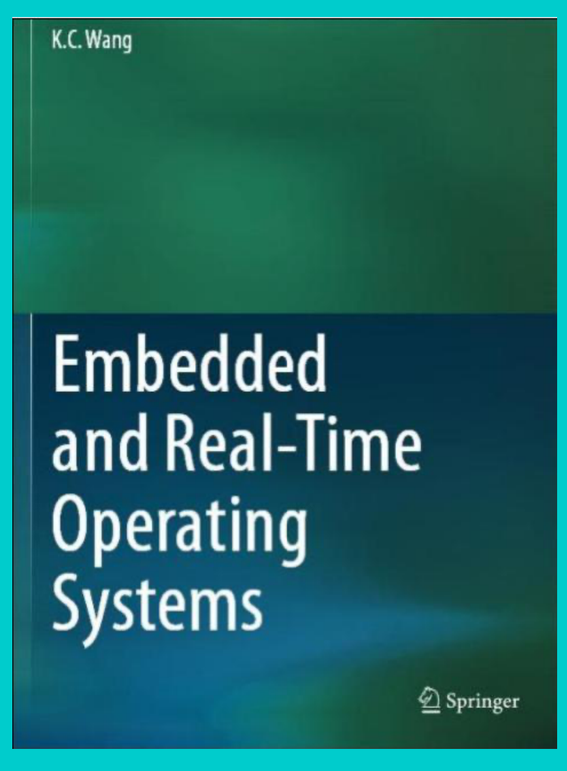
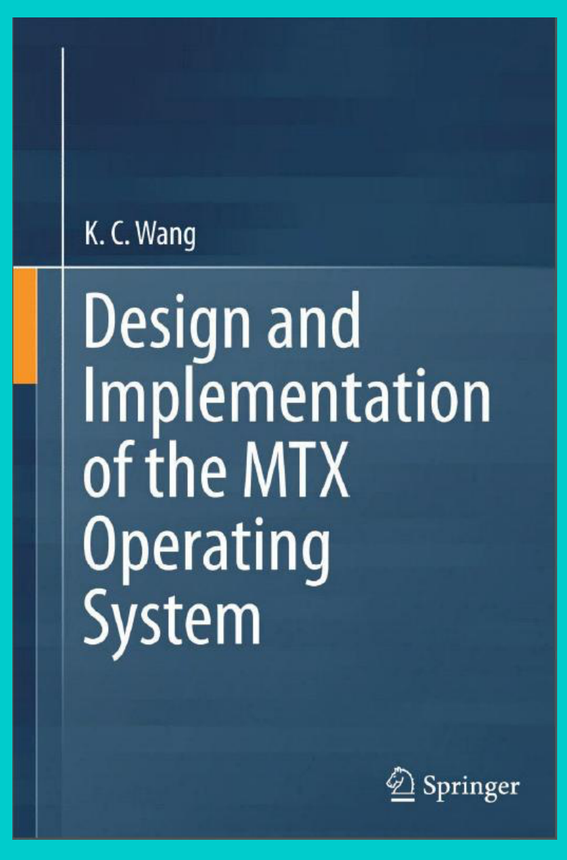
TEXT (REQUIRED): Embedded and Real-time Operating Systems,
K.C. Wang, Springer International AG, 2017



TEXT (MAIN Reference): Design and Implementation of the MTX Operating System,
K.C. Wang, Springer International AG, 2015

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ASSIGNMENTS:     This website and samples/ directory.

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                 Office Hours: T Th 9-10 AM

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Goal of Course: Design and implement a REAL embedded operating system that actually works.

                   TOPICS COVERED:

1. Introduction to Operating Systems:
    Unix/Linux, MTX. computer system and operations, system development
    software, PC emulators, link C and assembly programs.

2. Booting OS

3. ARM Archicture, ARM programming and embedded systems

4. Processes:
    Concept and implementation of processes; process states,
    context switching, process scheduling.

5. Process management:
      fork, wait, exit, exec, signals, pipes.
   Processes in Minix:
      Tasks, servers and user processes in Minix;

6. Process Synchronization:
    The process model; mutual exclusion and critical regions,
    Implementation of low-level mutual exclusion primitives.
    Synchronization primitives; events, event queues, semaphores.

7. Process Communication:
    High-level process synchronization constructs; messages.

8. Process Control:
    Scheduling algorithms. Dead lock and starvation problems.

9. Memory Management:
    Memory management schemes
    Paging and Virtual memory

10. I/O device drivers:
    Interrupts and interrupt processing
    Interraction between interrupt handler and process.
    Design and implementation of I/O drivers;

11. File Systems:
    Review of EXT2 file system.
    NFS and RFS based on UDP and TCP/IP

11. Real-time OS
                  ASSIGNMENTS and REQUIREMENTS

1.  Exam:                   20%

2.  Programming assignments : 80%
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*                                                         *
*                 Grading POLICY :                        *
*                                                         *
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1. All Assignments are INDEPENDENT WORK !!  Absosulely no COPYING!!

2. Oral Quiz will be given during demo of your work.


                  SYSTEM SOFTWARE:

1. Website: http://www.eecs.wsu.edu/~cs460/samples Directory:
           Sample Lab Assignments Solutions

2. Computers:
   Your laptops running Ubuntu Linux version 15.10 to 18.04

==================== DO THESE in week 1 ================================
3. Development Software: (Ubuntu 15.10, 16, 18.04 users)

(1). Intel x86 packages:

     sudo apt-get install bcc
     sudo apt-get insatll qemu-system-i386

(2). ARM packages:

     sudo apt-get insatll gcc-arm-none-eabi
     sudo apt-get insatll qemu-system-arm

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