

# CS404 - Real-Time Operating Systems

## Lab Assignment #6

### Spring 2016

The purpose of this assignment is to begin implementing the UIK RTOS.

You are to implement the first several functions and data items listed in the UIKAPI documentation: `UIKInitialize`, `UIKAddTask`, `UIKRun`, `UIKDelay`, and the internals `UIKDispatcher`, `UIKIdle`, `UIKTickHandler`, `UIKTicknum`, and `UIKTickLen`, as described in the UIK handout and discussion in class. This will also involve the implementation of the context-switching mechanism you will use in the process of switching tasks.

In order to demonstrate your scheduler and the use of the API, you can modify some of your earlier assignments to use the API, or write new tasks. You should be able to demonstrate the current execution of at least three tasks at once, all being scheduled by your system.

**(HINT:** A useful first exercise is to “context switch” a single task. That is, save the task’s context, then restore it and continue to run the same single task. If the task continues to run correctly, then it is a reasonable assumption that you have done the context switch correctly.)

As part of the assignment, determine the amount of overhead incurred by the tick handler, as a percentage of the total time. Determine this value when a) there is no context switch ( i.e., the current task continues to run), and b) when a context switch occurs.