

# Exam 1 REDO

## CS 4210 Advanced Operating Systems

Fall 1999 • Georgia Tech/Computer Science • Hutto

**DUE: 3:05 pm (classtime) Thursday 14 October 1999**

To improve your Exam 1 score and to reinforce your understanding of the material you may submit a detailed Solution Key to the exam questions. You may consult any material but you must prepare this solution key on your own. You should also answer the additional questions below. Again, you may consult any printed material but do the work on your own. Correct submissions will earn up to 70% of the points marked WRONG on your original Exam 1. For example, if you got 20 points wrong on the original exam, you can earn up to 14 additional points by completing this assignment.

1. Pthreads supports a feature we didn't discuss called "thread specific data" (TSD). How do you think this is implemented?
2. What capabilities does the Psyche system provide to allow different thread implementations to interact or cooperate?
3. How do Pthread condition variables and mutex locks differ from Hoare's monitor concept? Are they the same? Is one more general than the other? If so, how?
4. What's the point of light-weight processes (LWPs) in the Solaris operating system?
5. The UNIX malloc routine has been made thread-safe under Solaris with a single global mutex lock. This works but doesn't provide much parallelism. Sketch (outline) a design for making malloc more efficient by decreasing the lock granularity. (In Solaris lingo, they call this making the routine "mt-hot".)