TSYS School of Computer Science
Turner College of Business and Computer Science
Columbus State University

Course Title: CPSC 3125 – Operating Systems.

Official Course Description: An introduction to basic operating system level software concepts. Course topics include processes, threads, symmetric multi-processing, thread synchronization and memory management techniques.

Prerequisites: CPSC 2105 and CPSC 2108 with a grade of C or better from each course.

Course Objective: Upon completion of this course, students will demonstrate an understanding of fundamental concepts behind the design and operation of computer operating systems, including process and thread concepts, process and thread synchronization, CPU scheduling algorithms, and memory management techniques. Students will also demonstrate basic skills in system programming.

Course Outline:

- Process Management
- Threads
- CPU Scheduling
- Synchronization Problems
- Memory Management
- Virtual Memory
- Storage Management
- Contemporary Issues

OPTIONAL Textbook: Avi Silberschatz, Peter B. Galvin, and Greg Gagne, *Operating System Concepts*, 8th Edition, Wiley, 2009.

Instructor: Angkul Kongmunvattana, Ph.D.
Class Hours: 7:30PM-8:45PM on Tuesday and Thursday in CCT-406
Office Hours: 1:30PM-5:30PM on Tuesday and Thursday and 1:30PM-3:30PM on Wednesday

Important Dates:

- October 5, 2010   (Class Period)   Midterm Exam
- December 13, 2010   (6:00PM-8:00PM)   Final Exam

The points in this class will be distributed as follows:

- Assignments   30%
- Term Project   25%
- Midterm Exam   20%
- Final Exam   20%
- Class Attendance   5%

Course Outcomes:

- The students will demonstrate knowledge of operating system concepts.
  - Strategies and Actions used to produce the outcome:
    - Study of concepts and operations of operating systems.
    - Study of resource management techniques for each subsystem in the OS.
    - Study of trade-off between different resource management techniques.
  - ABET Criteria covered: A, B, and C
  - Program Objectives covered: 2 and 3
  - Assessment Methods: Assignments and Exams.

- The students will demonstrate knowledge of system programming techniques as well as the ability to use related system calls.
  - Strategies and Actions used to produce the outcome:
    - Study of design and implementation of operating systems
    - Study of system calls.
    - Study of trade-off between different system programming techniques.
  - ABET Criteria covered: A, B, C, I, and J
  - Program Objectives covered: 2 and 3
  - Assessment Methods: Assignments.

- The students will demonstrate the ability to quantitatively evaluate different software implementation techniques.
  - Strategies and Actions used to produce the outcome:
    - Study of quantitative performance evaluation methods.
    - Comparative performance evaluation of real world application programs.
    - Study of profiling and fine-tuning techniques.
  - ABET Criteria covered: A, B, C, I, and J
  - Program Objectives covered: 2 and 3
  - Assessment Methods: Assignments.

- The students will demonstrate knowledge of contemporary issues and the ability to communicate effectively.
  - Strategies and Actions used to produce the outcome:
    - Study of current research topics in operating systems.
    - Survey of a recent study in operating systems or repeat the experiment of a recently published operating system study.
    - Presentation of a survey result or experimental results.
  - ABET Criteria covered: A, B, C, F, I, and J
  - Program Objectives covered: 2, 3, and 4
  - Assessment Methods: Term Project and Its Presentation.

Final grades in this class will be determined as follows:

A: 90 and above

B: 80-89

C: 70-79

D: 60-69

F: <59

Notes:

- Students are responsible for all assigned readings and all information presented in class and lab session, including any changes in due dates, assignments, exams, etc.
- LATE ASSIGNMENTS WILL NOT BE ACCEPTED.
- Students are expected to attend all of the class lectures, lab, and review sessions.
- Students are NOT permitted to submit extra work in an attempt to raise grade.

Policy on academic integrity: Students are encouraged to study together; however, each student must individually prepare his/her own submission. Cheating or plagiarism is not permitted and will be sanctioned according to the CSU policy on academic standards. You should carefully read the section on Academic Misconduct in the Student Handbook. Your continued enrollment in this course implies that you have read it, and that you subscribe to the principles stated therein.

Policy prohibiting sexual harassment: As your instructor, one of my responsibilities is to treat all students fairly and equally and to abide by the policies and procedures governing faculty/student relationships, including those concerning sexual harassment as stated in the Faculty Handbook.

Students with a documented disability as described by the Rehabilitation Act of 1973 (P.L. 933-112 Section 504) and Americans with Disabilities Act (ADA) that affect their ability to participate fully in class or to meet all course requirements are encouraged to bring this to the attention of the instructor so that appropriate accommodations can be arranged. Further information is available from the Office of Disability Services in the Center for Academic Support and Student Retention, Tucker Hall (706) 568-2330. Course requirements will not be waived but reasonable accommodations may be provided as appropriate.

ABET Criteria:

A. An ability to apply knowledge of computing and mathematics appropriate to the discipline;
B. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
C. An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;
D. An ability to function effectively on teams to accomplish a common goal;
E. An understanding of professional, ethical, legal, security, and social issues and responsibilities;
F. An ability to communicate effectively with a range of audiences;
G. An ability to analyze the local and global impact of computing on individuals, organizations and society;
H. Recognition of the need for, and an ability to engage in, continuing professional development;
I. An ability to use current techniques, skills, and tools necessary for computing practice.
J. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
K. An ability to apply design and development principles in the construction of software systems of varying complexity.

CS Program Objectives:

Our graduates will have achieved:

1) a broad general education assuring an adequate foundation in science and mathematics relevant to computing.
2) a solid understanding of concepts fundamental to the discipline of computer science.
3) good analytic, design, and implementation skills required to formulate and solve computing problems.
4) the ability to function and communicate effectively as ethically and social responsible computer science professionals.