KING GRADUATE SCHOOL
MONROE COLLEGE
Master's in Computer Science

CS615 Operating System Design
Dr. Miguel Bustamante

Course Description

This course is designed as an introduction to operating system (OS) and its functions regardless of the hardware that houses it. It is intended for students with a basic background in computing systems. The course presents the basic concepts of operating systems, and covers specific issues of storage, memory management, virtual memory management, processor scheduling, proess management, concurrent processes,device management, and networking functions of OS. Some of the current operating systems such as Unix/Linux, Windows, and/or Android are case studied.

Prerequisites

CS610 Computer Architecture

Course Materials

Text: Operating Systems Concepts,, 10th Ed., Abraham Silberschatz; ISBN 978: 1-119-32091-3

Final Grade

Your final grade will be derived based on the following table:

ACTIVITIES	% OF GRADE
Assignments	20 %
Exams	30 %
Research Paper/Final Project	30 %
Final Exam	20 %
TOTAL	**100 %**

Topics Outline
NOTE: Topics and sequence may change as circumstances require.

Date	Class Topic/Description	Activities and/or Assignments
Week 1	Computer System Overview • Basic Elements • Interrupts • Cache Memory • Multiprocessor and Multicore	Chapter 1
Week 2	Operating System structures • Objectives and Functions • Fault Tolerance • Design Considerations	Chapter 2 Project selection
Week 3	Process Description and Control • Process States • Process Control • Execution of the OS	Chapter 3
Week 4	Threads • Processes and Threads • Types of Threads • Multicore and Multithreading	Chapter 4
Week 5	Project Review / Exam 1	Chapters 1, 2, 3, 4
Week 6	Concurrecy: Mutual Exclusion and Synchronization • Mutual Exclusion • Semaphores • Monitors • Message Passing	Chapter 5
Week 7	Concurrency: Deadlock and Starvation • Principles of Deadlock • Prevention, Avoidance, Detection	Chapter 6
Week 8	Memory Management • Memory Partitioning • Paging • Segmentation	Chapter 7
Week 9	Virtual Memory • Control Structures • OS Software	Chapter 8

Week 10	Project Checkpoint / Exam 2	Chapters 5, 6, 7, 8
Week 11	Uniprocessor Scheduling • Types of Scheduling • Scheduling Algorithms	Chapter 9
Week 12	Multiprocessor, Multicore and Real-Time Scheduling • Types of Scheduling • Real Time Scheduling	Chapter 10
Week 13	Input/Output and Files • Organization of the I/O Function • Design Issues • Buffering and Disk Cache • Scheduling • B-Trees • Directories • Record Blocking	Chapters 11, 12
Week 14	Embedded Systems • Embedded OS • Virtual Machines • Security • Distributed Processing, Client/Server, Clusters	Chapter 13, 14, 15,16
Weeks 15	Final Project Review / Final Exam	Chapters 9, 10, 11, 12, 13, 14, 15, 16

Attendance Policy

The value of a college education depends upon full participation in academic classes (On-Site as well as On-Line). Students are expected not only to receive information and to pass examinations, but also to participate actively in class. For that reason, regular attendance is important.

The college experience also is meant to prepare students to undertake meaningful careers and to develop the kind of professional behavior appropriate to obtaining gainful employment. Because excellent classroom attendance and participation are the foundation for the attainment of these goals, Monroe College has instituted the following policy.

Students are expected to attend every class of every course in which they are registered. Each class meeting provides a unique opportunity for learning. While acknowledging the critical importance of class attendance, the College also

recognizes that there are times when absence from class is unavoidable. ***More than two absences in a course will result in the reduction of the student's final grade by a full letter (for example from A to B).***

The School of Information Technology faculty has the discretion to apply a sliding scale in allocating the points deducted per absence prior to the full penalty limit.

Two (2) unexcused late arrivals or early departures are equivalent to one (1) unexcused absence. If justified circumstances cause you to be late or absent, you must present the necessary documents to your faculty member.

Additional Information

It is the student's responsibility to obtain the material and assignments covered in the event of an absence. A student will be considered recorded late if he/she enters class after the roll has been called. Classes will begin promptly and attendance taken. If a student arrives late, it is his/her responsibility to see the professor immediately after class to record attendance.

College Grading Scale

A	90-100
B+	85-89
B	80-84
C+	75-79
C	70-74
F	Less than 70

Academic Integrity

Monroe College is an academic community. Its fundamental purpose is the pursuit of knowledge in preparation for a career and for life. Essential to the success of this educational mission is a commitment to the principles of academic integrity. Every member of the college community is responsible for upholding the highest standards of honesty at all times. Students, as members of the community, are also responsible for adhering to the principles and spirit of the following Code of Academic and Scholarly Integrity.

Students who violate the Code of Academic and Scholarly Integrity may be subject to a grade of "F" for the work submitted, an "F" in the course, written reprimands in the student's academic file, and suspension and/or dismissal from the college.

Students are expected to be fully aware of the college's requirements and expectations regarding academic honesty and scholarly integrity. If a student is

unsure whether his action(s) constitute a violation of the Code of Academic and Scholarly Integrity, then it is that student's responsibility to consult with the instructor to clarify any ambiguities.

Academic Dishonesty Definitions

Activities that have the effect or intention of interfering with education, pursuit of knowledge, or fair evaluation of a student's performance are prohibited. Examples of such activities include, but are not limited to, the following definitions:

A. **CHEATING:** Using or attempting to use unauthorized assistance, material, or study aids in examinations or other academic work.
B. **PLAGIARISM:** Using the ideas, data, or language of another without specific or proper acknowledgment.
C. **FABRICATION:** Submitting contrived or altered information in any academic exercise.
D. **MULTIPLE SUBMISSIONS**: Submitting, without prior permission, any work submitted to fulfill another academic requirement at Monroe or any other institutions**.**
E. **MISREPRESENTATION OF ACADEMIC RECORDS:** Misrepresenting or tampering with or attempting to tamper with any portion of a student's transcripts or academic record, either before or after coming to Monroe College.
F. **FACILITATING ACADEMIC DISHONESTY:** Knowingly helping or attempting to help another violate any provision of the Code.
G. **UNFAIR ADVANTAGE:** Attempting to gain unauthorized advantage over fellow students in an academic exercise.

Student Evaluations of Course and Instructor

Monroe College students have an important voice in the academic community and an obligation to give an honest assessment of their instruction and coursework. As an expectation of every course, students will complete an anonymous, online course evaluation questionnaire. By doing so, students provide information used to enhance the relevance of the course content and effectiveness of the instruction you experienced. The course evaluation period will be announced by the Academic Office during the course of the semester

School/Program Specific Information/Policies

SIT Mission Statement:

The School of Information Technology teaches students to apply what they have learned and to solve practical business problems by creating applications that support the problem solving and decision making needs of the corporate community.

The SIT mission can be accomplished through five (5) interrelated goals.

- Prepare students for rewarding professional careers in computer related fields in computer technology.
- Provide excellent computer education by teaching on state-of-the-art equipment and revise the curriculum frequently.
- Have professors set the tone for how students conduct themselves professionally, socially, and ethically.
- Have faculty attend both development seminars and technical training conferences to improve technical and educational knowledge.
- Graduate students who are ready to take on the challenges of the business world and who can utilize what they have learned at Monroe to make themselves attractive and valuable employees.

Students may avail of academic support/tutoring at the The IT Resource Center located at Room 413, King Hall or at the Academic Center, Ground Floor, Main Hall, New Rochelle Campus. Please contact your instructor for the specific Lab Hours during the semester.

Faculty Specific Policies

Items you should note:

- Homework is expected to be turned in on the assigned due date. If you have a legitimate reason for not completing your homework on time, you must let me know at least one class a head.

- Homework that is turned in late will be graded as such; that is, 5 points per calendar day will be deducted. So for example, homework that was due on a Wednesday that is turned in on Monday is considered 6 days late and 30 points will automatically be deducted.

- No assignment will be accepted that is more than two weeks after its due date.

- Everything you do counts. The lowest grade will NOT be dropped.

- Everyone is expected to take the final exam. No exemptions will be given.

Below are two of my favorite quotes. Read them…understand them…use them…

- "*Whether you think you can or think you can't, you are always right!*" – Henry Ford

- "*A Hall of Famer realizes that the crime is not being knocked down; the crime is not getting up again!*" – Lawrence Taylor

I like these two quotes as I believe they reflect the manner in which we should approach our studies (and careers). The goal is NOT to get good grades – the goal is to LEARN. In all my years of interviewing hundreds of people, I have never once asked someone what grade they received in a class. I have, however, asked them about what they learned or go out of a class.

Focus on learning – the grades will come…