EASTERN MEDITERRANEAN UNIVERSITY
SCHOOL OF COMPUTING AND TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE POLICY SHEET

Course Code	ITEC202	**Course Title**	Operating Systems
Semester	2019-2020 Spring	**Language**	English
Category	AC (Area Core)	**Level**	Second Year
Workload	180 Hours	**Teaching Format**	3 Hours Lecture, 2 Hours Laboratory
EMU Credit	(3,0,2) 4	**ECTS Credit**	6
Prerequisite(s)	ITEC255	**Course Web**	http://staff.emu.edu.tr/sensevpayanilkan

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Course Description

This course is an introduction to the basic concepts of operating systems, with both theoretical and practical issues being considered. Upon completion of the course, the student should understand the fundamental concepts and issues involved in operating systems design, and know about the basic services provided by operating systems in general. Topics include process description and control, deadlock, process scheduling, threads, SMP, partitioning, paging, segmentation, memory management algorithms, disk scheduling and file systems. In addition to theory and concepts, specific implementation related information is covered using the Linux Operating System.

General Learning Outcomes

On successful completion of this course students should be able to:

- Explain the basic concepts of modern operating systems.
- Describe the role and purpose of operating systems.
- Describe the concept of a process and list the various process states.
- Analyse the algorithms for deadlock detection and avoidance and evaluate the conditions that lead to deadlock.
- Define the concept of how programming languages, operating systems, and hardware architectures interact.
- Analyse the processor scheduling policies.
- Explain the concepts of physical memory and virtual memory management.
- Compare the performances of disk arm scheduling techniques.

Teaching Methodology / Classroom Procedures

- Each week there are two lecture sessions, two lab sessions and one tutorial session.
- Laboratory sessions are organized in parallel to theoretical study given in classrooms. During the lab sessions, particular aspects of the Unix Operating System are demonstrated. Students perform different experiments and submit reports for evaluation each week.
- Students are encouraged to use internet to search for various related topics. Lecture notes, Lab descriptions, assignments, and announcements will be posted on the course's web site.

Course Materials / Main References

Text Book:

William Stallings, Operating Systems, Internals and Design Principles, Seventh Edition, Pearson Prentice-Hall, 2011.

Resource Books:

1. Andrew S. Tanenbaum*, Modern Operating Systems*, Third Edition, Pearson Prentice-Hall, 2007.
2. Ann McIver McHoes and Ida M. Flynn, *Understanding Operating Systems*, Sixth Edition, Thomson, 2010.

3. William S. Davis and T. M. Rajkumar, *Operating Systems*, *A Systematic View*, Sixth Edition, Addison Wesley, 2004.
4. Amir Afraz, *Unix Unbounded*, *A Beginning Approach*, Third Edition, Prentice-Hall, 2000.

Lecture Notes:

All course materials are also available online in Adobe PDF (Portable Document Format). (P/W: genera258)

Weekly Schedule / Summary of Topics	
Week 1-2	**Computer System Overview and Structure:** Basic definition of Operating System (OS), hardware and software components of an OS and functions of an OS. Desirable features of an OS, interrupts, types of interrupts, interrupt handling; interrupt processing, multiple interrupt processing and I/O concept. Characteristics of modern operating systems, Microkernel architecture and symmetric multiprocessing.
Week 3-4	**Processor Utilization:** Uniprogramming and Multiprogramming. Resource utilization, Windows overview, Windows architecture, disk operating system and operating system organization.
Week 4-5	**Process Description and Control:** Basic process concepts and process states, process description, OS control structure, process control structure, process termination, process identification and threads, fork system call.
Week 6	**Concurrency and Synchronization:** Concurrent processing, race condition, critical section, mutual exclusion, semaphores, message passing and interprocess communication.
Week 7	**Deadlock:** Categories of resources, Resource allocation graphs, conditions for deadlock, prevention occurrence of a deadlock, Banker's algorithm, deadlock avoidance, deadlock detection and recovery.
Weeks 8-9	**Midterm Examinations Period**
Week 10	**Memory Managements:** Memory management requirement, memory partitioning, dynamic memory partitioning algorithms, Buddy system, reallocation, paging and segmentation.
Weeks 11-12	**Virtual Memory:** Characteristics of paging and segmentation, locality and virtual memory, virtual memory paging, virtual memory segmentation, combined paging and segmentation, basic page replacement algorithms and Windows memory management.
Weeks 13-14	**Processor Scheduling:** Types of processor scheduling, scheduling algorithms, traditional UNIX Scheduling.
Week 14	**Disk Scheduling:** Disk performance parameters and disk scheduling policies.
Weeks 15-18	**Final Examinations Period**

Requirements

- Each student can have only one make-up exam. One who misses an exam should provide a medical report or a valid excuse within 3 days after the missed exam. The make-up exam will be done at the end of the term and will cover all the topics. No make-up exam will be given for the quizzes.
- Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.
- You must collect at least 50% of the total Lab marks in order to pass the course.
- Instructions for the submission of assignments will be posted on the course website. It is each student's responsibility to read and follow the instructions. Failure to follow the submission instructions may result in the assignment receiving a mark of zero.
- You must have a printed copy of the corresponding "Lab Outline" before coming to the Lab. "Lab Outlines" will be posted on the instructor's website.

Method of Assessment					
Evaluation and Grading	**4 x Assignments**	**2 x Quizzes**	**Lab**	~~**Midterm Exam**~~	**Final Exam**
Percentage	32%	12 %	16 %	~~26 %~~	40 %