الجامعة الافتراضية السورية
SYRIAN VIRTUAL UNIVERSITY

Course Definition

Operating Systems II

Information

Technology

Engineering

Powered by: KNOWLGICA
KNOWLEDGE SOLUTIONS & TECH

1. Basic Information:

Course Name	**Operating Systems II**
Course ID	**NOS601**
No. of Recorded Sessions*	**12**
No. of Synchronized Sessions*	**12**
No. of Quizzes (hrs.)	**2**
Exam (hrs.)	**1**
Registered Sessions Work Load (hrs.)	**36**
Synchronized Sessions Work Load (hrs.)	**36**
Credit Hours	**4**

* The duration of each session 1.5 hr

2. Pre-Requisites:

Course	ID
Operating Systems I, English Language V, IT Project Management	BOS501, GEN601, GPM601

3. Course Objectives:

Operating Systems II is designed to take students to the next level of knowledge about the theory and workings of the computer Operating Systems. It is also designed to introduce students to more advanced concepts in the field of the operating systems. Students are, therefore, advised to revise and update their knowledge on Operating System I (BOS501) which is a prerequisite to this course.

In this course, students will be expected to:

- Acquire Knowledge of Deadlocks in OS.

- Competencies in the deep understanding of Physical and Virtual Memory Management.
- Learn advanced Concepts of storage management and I/O.
- Understand Virtualization and Virtual Machines.

4. Learning Outcomes (LO):

By the end of this course the learner is expected to:

- Understand the design principles goals of operating system both from the users and designer's points of view;
- Appreciate the current and emerging issues in operating system research;
- Know in greater detail, matters relating to deadlocks, memory management, storage management file system, input/output, and virtualization.

5. Assessment Results:

Chapter No.	Chapter Title	Intended Objectives	Assessment Type				
			Developed content/ Recorded Sessions	Practical Activities (Synchronized Sessions)	Quizzes and Exams	Presentations And Interviews	Reports
CH1	Deadlocks	Comprehension –Analytical Thinking –Tools and Application Hands– On	X	X	X	X	X
CH2	Main Memory	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X
CH3	Virtual Memory	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X

CH4	Mass Storage and I/O Systems	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X
CH5	File Systems	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X	X	X
CH6	Virtualization and VMs	Comprehension –Analytical Thinking – Tools And Application Hands– On	X	X	X		X

6. Course Syllabus

Chapter No.	Chapter Title	Chapter Content (Syllabus)	No. of Theoretical Learning Units	No. of Practical Learning Units)
CH1	Deadlocks	1. Deadlock Concepts 2. Resource Allocation Graph 3. Deadlock Requirements 4. Deadlock Prevention 5. Deadlock Avoidance 6. Deadlock detection & Recovery		
CH2	Main Memory	1. Memory Abstraction 2. Memory Allocation Schemes 3. Fixed Partitioning 4. Dynamic Partitioning 5. Simple Paging. 6. Simple Segmentation.		
CH3	Virtual Memory	1. Virtual Memory Mechanism 2. Optimal Page Replacement 3. FIFO Page Replacement 4. LRU Page Replacement 5. NRU Page Replacement 6. Second Chance Page Replacement 7. Clock Page Replacement		

		8. Thrashing		
CH4	Mass Storage and I/O Systems	1. I/O software 2. Disk Abstraction 3. Disk Performance 4. Disk Scheduling 5. RAID	2	2
CH5	File Systems	1. File System structure 2. File Types & Operation. 3. File Access Methods 4. Directory Structure 5. Directory Implementation 6. File System Implementation 7. File Allocation methods		
CH6	Virtualization and VMs	1. Virtualization Concepts & Requirements 2. Virtual Machines (VMs) 3. Hypervisors 4. Full Virtualization 5. Hardware Assisted Virtualization 6. Para Virtualization 7. Nested Virtualization 8. OS Level Virtualization 9. Container.		

Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالـــي
Syrian Virtual University		الجامعة الافتراضية السورية

7. Practical Activity:

- Tools and Labs:

Tool Name	Description
In Parallel With the Lab Course NOSL601	

- Practical Activities per Chapters:

Chapter	Practical Activity	Remarks
CH1	☒ Exercises ☒ Homework ☒ Webinars ☐ Project ☐ Experiment ☐ Other	
CH2	☒ Exercises ☒ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	
CH3	☒ Exercises ☒ Homework ☐ Webinars	

	☐ Project ☐ Experiment ☐ Other	
CH4	☒ Exercises ☒ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	
CH5	☒ Exercises ☒ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	
CH6	☒ Exercises ☒ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	

8. References:

1- Operating Systems Concepts, ABRAHAM SILBERSCHATZ et al, tenth edition, Willy 2018.

2- Modern Operating System, ANDREW S. TANENBAUM, fourth edition, pearson, 2015.

3- Operating Systems Internals and Design Principles, William Stallings, Ninth Edition, Pearson, 2018.