Operating Systems (1) Lab

Course Definition Operating Systems (1) Lab

Information

Technology

Engineering

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

1. Basic Information

Course Name	Operating Systems (1) Lab
Course Code	BOSL501
Number of Presentational Sessions*	10
Number of Synchronous Sessions**	12
Number of Shorter Tests***	2
Number of Exams***	1
Theoretical Sessions Work Load (hrs.)	30
Practical Sessions Work Load (hrs.)	24
Credit Hours	4

*Each presentational session comprises both recorded lecture (1.5 hrs.) and interactive learning content (1.5 hrs.).

**Each synchronous session comprises the interactive lecture carried out in real time in a virtual class (1.5 hrs.).

***Each shorter test is 0.5 hr. long. The final exam is 2 hrs. long.

N.B.

Generally, each chapter requires two presentational sessions: one for the recorded content and one for the interactive content (unless the chapter is too long, in which case it may require more sessions (. This note applies to synchronous sessions as well, where each chapter requires one synchronous session generally.

2. Prerequisites courses

Course	Code
• Computer Architecture course, Assembly programming, C language programming	• BCA501
• Parallel Operating Systems (1)	• BOS501

3. Course Objectives

OS1 Lab course is a complementary course which accompanies the OS1 course and allows providing students with on hand experience for most of the concepts provided in the theoretical course through practical examples.

4. Learning Outcomes (LO)

By the end of this course, the learner is expected to acquire and learn the following subjects:

- Basic Unix/Linux shell commands.
- Basic instructions to handle files.
- Basic instructions to handle processes.
- Programming Processes and threads and difference between them.
- Programming with signals.
- Programming of Interprocess communication and synchronization.

5. Assessment Results

Chapter Number	Chapter Title	General Objectives	Assessment Type				
			Interactive Content & Recorded Sessions	Applied Activities (Synch. Sessions)	Final Exam*/ Shorter Tests**	Presentations and Interviews***	Reports ***
CH1	Linux introduction	Understand Unix/Linux structure and basic shell commands	√	√	√	√	√
CH2	Process commands	Basic commands to deal with processes	√	√	√	√	√
CH3	Processes	Process programming (creation, termination, parameter passing).	√	√	√	√	√
CH4	Threads	Thread programming	√	√	√	√	√

CH5	Advanced programming	Signals for Processes and Threads	√	√	√	√	√
CH6	Synchronization	Programming Synchronization using shared memory and semaphores	√	√	√	√	√

*The final exam is two hours long and is given at the end of the course.

**Shorter tests are about 30 minutes long and are given after three or four lectures throughout the semester during synchronous sessions.

***Presentations, interviews, and reports are submitted once after each three or four lectures throughout the semester during synchronous sessions.

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

6. Course Syllabus

Chapter	Subject	Content	Number of Learning Objects	Number of synchronous Learning Objects
CH1	Linux introduction	1. Quick intro of Linux. 2. Basic shell instructions. 3. File structure and instructions. 4. Permissions and management.	4	2
CH2	Process commands	1. Basic instructions to display processes. 2. Concept of background processes 3. Shell jobs. 4. Process termination.	4	2
CH3	Processes	1. Variables and memory allocated to process. 2. Static allocation vs. dynamic allocation of process memory. 3. Process priority. 4. Process creation with fork. 5. Process joining child with wait. 6. Execute new program with exec.	6	3
CH4	Threads	1. Thread creation. 2. Thread join.	5	2

		3. Communication between threads. 4. Thread coordination and processor yielding. 5. Waiting with "sleep" function.		
CH5	Advanced programming	1. Signals. 2. Catching and handling signals.	**2**	**1**
	Synchronization	1. Pipes. 2. Shared memory. 3. Semaphore. 4. Some popular synchronization problems.	**4**	**2**

7. Practical Activity

- **Tools and Labs:**

Tool Name	Description
• Linux System • C Language Compiler • Linux Terminal	

- **Practical Activities per Chapters:**

Chapter	Activities Type	Remarks
CH1	☑ Exercises ☑ Homework ☑ Experiment	
CH2	☑ Exercises ☑ Homework ☑ Experiment	
CH3	☑ Exercises ☑ Homework ☑ Experiment	
CH4	☑ Exercises ☑ Homework ☑ Experiment	
CH5	☑ Exercises ☑ Homework ☑ Experiment	
CH6	☑ Exercises ☑ Homework	

	☑ Experiment	

8. References

- Willian Stallings, Operating Systems: Internals and design principles, 7th edition, Prentice hall.

- Andrew Tanenbaum, Modern Operating Systems, 4th edition, Pearson.

- Abraham Silberschatz, Operating Systems Concepts, 10th Edition, Wiley.

- Allen Downey, The little book of semaphoers, 2nd edition.