**CSE321 – Operating Systems (Lab)**

**General Information: .**

**Course ID:** CSE321  
**Section:** 04  
**Semester:** Fall 2018  
**Course Pre-Requisite:** CSE221  
**Course Credits:** 3.0

**Instructor Information: .**

**Name and Title:** Khandaker Mamun Ahmed, Shakila Zaman.

**Course Overview: .**

The objective of the course is to enhance the students’ theory learning by introducing them to practical use of the topics the learn in theory. The students are taught shell commands, shell scripting, threading and multi-threading concept along with implementation of some process scheduling algorithms in java programming language in the lab to enhance their understanding of the theory part of the course.

**Learning Outcomes: .**

By the end of this course, students will learn and do the following things:

* Students will learn the use of basic shell commands.
* Students will be able to write shell scripting.
* Students will learn the concept of threading and multithreading and how to implement it.
* Learn different types of scheduling algorithms, their pros and cons as well as their implementation.

In summary, by the end of the course the students are expected to have better understanding on how operating systems works and their necessity and understand their application in real life.

**Required Course Materials: .**

* **Software:** DrJava / Eclipse / Netbeans
* **Suggested Books:**
  + Operating System Concepts, 7th ed, Silberschatz, Galvin, Gagne

**Course Content: .**

* Introduction to EMU8086 Simulator
* Microprocessor Registers
* Basic Assembly Language Instructions
* Arithmetic Instructions
* Logical Instructions
* Advanced Assembly Language Instructions
* Stack Data Structure
* Macro
* Procedures

**Tentative Course Schedule: .**

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| Week | Topic | Description |
| 1 | Basic Shell Commands | Objectives: Familiarize with Linux kernel, works with Terminal Panel. Learn how can access and operates on different directory and files by Terminal using commends. |
| 2 | Start with Shell Programming Concept | Objectives: Why shell script? How to program on shell scripting. Variable Declaring , Expression Syntax, If-else, Switch Case, Declaring Functions, Arguments, while loop etc. |
| 3 | Shell Programming | Objectives: Solve advanced level problems using shell Script, String Comparison. |
| 4 | CPU Scheduling Algorithms | Objectives: Implements CPU schedule Algorithms (FCFS, Preemptive/Non-Preemptive SJF) |
| 5 | CPU Scheduling Algorithms | Objectives: Implements CPU schedule Algorithms (Preemptive/Non-Preemptive Priority Scheduling, Round Robin) |
| 6 | Review of Lab 1, 2, 3, 4, 5  + Lab mid | Objectives: To discuss any problems that the students have regarding the previous labs. Review all topics covered so far and take a quiz. This is to prepare students for their midterm. |
| 7 | Thread Concept | Objectives: Concept of thread, thread creation, ways to create thread, work with multithreading concept in Java. |
| 8 | Thread manipulation | Thread synchronization, Thread Pool, thread wait, interrupt, notify. |
| 9. | Process Synchronization related problems | Objectives: Learn the concept of semaphore. Solve Producer Consumer problem and Peterson’s algorithm. |
| 10. | Deadlock Handling | Objectives: Implement Banker’s Algorithm for deadlock avoidance. |
| 11. | Page Replacement Algorithms | First in first out (FIFO) replacement, Least recently used (LRU) replacement algorithms |
| 12 | Review and Lab Final | Objectives: To review the whole syllabus and take a quiz to prepare students for their Final Exam. |

**Mark Distribution: .**

* **Total = 20**
* Lab Class Task + Home Task – 10%
* Attendance – 5%
* Midterm – 5%
* Final – 5%

**General Policy: .**

Grading criteria:  
The grades at the University will be indicated in the following manner:

90 - 100 = A (4.0) Excellent  
85 - <90 = A- (3.7)  
80 - <85 = B+ (3.3)  
75 - <80 = B (3.0) Good  
70 - <75 = B- (2.7)  
65 - <70 = C+ (2.3)  
60 - <65 = C (2.0) Fair  
57 - <60 = C- (1.7)  
55 - <57 = D+ (1.3)  
52 - <55 = D (1.0) Poor  
50 - <52 = D- (0.7)  
<50 = F (0.0) Failure

**Grades Without Numerical Value: .**

**P: Pass -** A course may be taken for a pass/fail grade providing that the instructor approves the option and the student carries 12 credits for regular letter grades in that semester.

**I: Incomplete -** Incomplete is assigned only when a student has failed to complete one or more requirements of the course for an unavoidable reason/accidental circumstance and has applied for I grade.

**W: Withdrawal -** Withdrawal is assigned to a student who withdraws from the course within the deadline for withdrawal with 'W' grade.

**Attendance Policy: .**

Attendance and punctuality are equally important as participation in class. Late comers are considered absent. Students are given no permission to be absent for any reasons other than sickness or illness of some kind. However, students are required to prove that they were sick or ill to be given consideration for their absence. If a student fails to maintain 70% attendance, s/he will be barred from the course. However, in case of illness (keeping in accordance with BRACU policy), exceptions can be made.

**Latecomer Policy: .**

In case of late submission, grading rules adopted and followed in the department will be applicable to this course. Cause of late submission or absence has to be well supported by appropriate documents.

**Gender Policy: .**

Gender equity among male and female students in class will be maintained as per the BRAC University concern and BRAC's consistent endeavors on women empowerment. Therefore, all students will be evaluated equally based on their performance in the course concerned regardless of their gender.

**Inclusive Education Policy Statement: .**

Each of the students shall be given equal access to laboratory resources, relevant materials and consultation hours, free from discrimination based on gender, language, sexual orientation, pregnancy, culture, ethnicity, religion, health or disability, socioeconomic background or geographic location, as per the inclusive education policy of Bangladesh