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|  | **East West University**  **Department of Computer Science and Engineering**  **Course Outline**  **Spring 2021 Semester** |  |

**Course Information**

**Course: CSE325 Operating Systems**

**Credit and Teaching Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Theory | Laboratory | Total |
| Credits | 3 | 1 | 4 |
| Contact Hours | 3 Hours/Week for 13 Weeks | 2 Hours/Week for 13 Weeks | 5 Hours/Week for 13 Weeks |

**Prerequisite:** CSE106

**Course Objective**

This course introduces the principles and techniques for the design and implementation of operating systems. This course also emphasizes the implementation of various techniques required for management, scheduling, allocation and communication of resources used in operating system. Knowledge of this course will be needed as prerequisite knowledge for future courses such as CSE360 Computer Architecture and CSE452 Distributed Systems and Algorithms.

**Course Outcomes (COs)**

After completion of this course students will be able to:

|  |  |
| --- | --- |
| CO1 | **Interpret** and **use** different components of modern operating system for understanding their design goals. |
| CO2 | **Interpret** and **use** different process management techniques for effective operating system design. |
| CO3 | **Interpret** and **use** different memory and I/O management strategies for desirable resource utilization. |
| CO4 | **Implement** different operating system techniques; **perform** and **demonstrate** these knowledge and **write** report for realistic system design. |

**Course Topics, Teaching-Learning Method, and Assessment Scheme**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course Topic** | **Teaching-Learning Method** | **CO** | **Assessment** | | | |
|  |  |  | **C2** | **C3** | **T** | **Exam** |
| Operating System Components | Lecture, Class Discussion, Discussion Outside Class with Instructor/ Teaching Assistant | CO1 | 2 | 5 | 7 | Midterm Exam I  (15) |
| Process and Thread | DO | CO1 | 3 | 5 | 8 |
| Scheduling Algorithms for Multi-tasking | DO | CO2 |  | 8 | 8 | Midterm Exam II  (20) |
| Inter Process Communication (IPC) and Synchronization | DO | CO2 | 4 | 8 | 12 |
| Deadlock Handling | DO | CO2 | 3 | 5 | 8 | Final Exam  (25) |
| Memory Management | DO | CO3 |  | 9 | 9 |
| File, I/O and Disk Management | DO | CO3 |  | 8 | 8 |

**Laboratory Experiments/Project**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Experiment** | **Teaching-Learning Method** | **CO** | **Mark of Cognitive Learning Levels** | **Mark of Psychomotor Learning Levels** | **Mark of Affective Learning Levels** | | **CO**  **Mark** |
| C3 | P2 | P3 | A2 |  |
| DOS &UNIX shell concepts such as command expansion and filters.  DOS Command Prompt, Linux Shell, Process Commands | Discussion, Report Writing, Coding and Running Program | CO4 | 0.25 | 0.25 | 0.25 | 0.25 | 1 |
| Process Management  Linux, GCC. | Do | CO4 | 0.5 | 0.5 | 0.5 | 0.5 | 2 |
| Thread Management  Linux, GCC, POSIX | Do | CO4 | 0.5 | 0.5 | 0.5 | 0.5 | 2 |
| Lab Exam | Individual Lab Exam | CO4 | 1.5 | 0.5 | 0.5 | 0.5 | 3 |
| Process Scheduling Simulator.  PS Simulator | Do | CO4 | 0.25 | 0.25 | 0.25 | 0.25 | 1 |
| Threads Synchronization (Mutex & Semaphore). | Do | CO4 | 0.25 | 0.25 | 0.25 | 0.25 | 1 |
| Memory Management | Do | CO4 | 0.25 | 0.25 | 0.25 | 0.25 | 1 |
| File Management  Or  Disk Scheduling | Do | CO4 | 0.25 | 0.25 | 0.25 | 0.25 | 1 |
| Lab Exam | Individual Lab Exam | CO4 | 1.5 | 0.5 | 0.5 | 0.5 | 3 |
| **Total** |  |  | **5.25** | **3.25** | **3.25** | **3.25** | **15** |

**Mini Project**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mini Project** | **Teaching-Learning Method** | **CO** | **Mark of Cognitive Learning Levels** | **Mark of Psychomotor Learning Levels** | | **Mark of Affective Learning Levels** | **CO**  **Mark** |
| C3 | P2 | P3 | A2 |  |
| Mini Lab Project including Report and Presentation | Group-based moderately complex Project with report writing, and oral/poster presentation | CO4 | 4 | 2 | 2 | 2 | 10 |

**Overall Assessment Scheme**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Assessment Area** | **Course Outcomes** | | | | **Assessment Area Mark** |
| Assessment Area | **CO1** | **CO2** | **CO3** | **CO4** |  |
| Class Participation |  |  |  |  | 5 |
| Class Test/Quiz |  |  |  |  | 10 |
| Midterm Exam - I | 15 |  |  |  | 15 |
| Midterm Exam -II |  | 20 |  |  | 20 |
| Final Exam |  | 8 | 17 |  | 25 |
| Laboratory Experiments and Lab Exam. |  |  |  | 15 | 15 |
| Mini Project |  |  |  | 10 | 10 |
| Total Mark | **15** | **28** | **17** | **25** | **100** |

**Grading System**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Marks (%)** | **Letter Grade** | **Grade Point** | **Marks (%)** | **Letter Grade** | **Grade Point** |
| 97-100 | A+ | 4.00 | 73-76 | C+ | 2.30 |
| 90-96 | A | 4.00 | 70-72 | C | 2.00 |
| 87-89 | A- | 3.70 | 67-69 | C- | 1.70 |
| 83-86 | B+ | 3.30 | 63-66 | D+ | 1.30 |
| 80-82 | B | 3.00 | 60-62 | D | 1.00 |
| 77-79 | B- | 2.70 | Below 60 | F | 0.00 |

**Academic Code of Conduct**

**Academic Integrity:**

Any form of cheating, plagiarism, personification, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**

**Special Instructions:**

* Students are expected to attend all classes and examinations. A student MUST have at least 80% class attendance to sit for the final exam.
* Students will not be allowed to enter into the classroom after 20 minutes of the starting time.
* For plagiarism, the grade will automatically become zero for that exam/assignment.
* Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses any exam, the student MUST get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48 hours** from the exam time. Proper supporting documents in favor of the reason of missing the exam have to be presented with the application.
* For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses the final exam, the student MUST get approval of **Incomplete Grade** by written application to the Chairperson through the Course Instructor **within 48 hours** of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor**.
* All mobile phones MUST be turned to silent mode during class and exam period.
* There is **zero tolerance for cheating** in exam. Students caught with cheat sheets in their possession, whether used or not; writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university**.