FLORIDA ATLANTIC UNIVERSITY
CENTER FOR eLEARNING

COP 4610 COURSE DESIGN BLUEPRINT

Course Level Objectives
1. An ability to function on multidisciplinary teams. (ABET) 2. An ability to communicate effectively. (ABET) 3. An ability to apply design and development principles in the construction of software systems of varying complexity.(ABET) 4. To provide fundamental concepts applied in modern operating systems, including process management, memory organization and management, and I/O management 5. To apply the design of collaborative processes and threads and their synchronization using semaphores 6. To understand the problem of deadlock and their solutions 7. To provide knowledge of basic principles of I/O management 8. To develop simulation program for evaluation of CPU schedulers

Unit #	Module/Unit Topic	Module/Unit Objective(s)	Assessment(s)	Lesson Content	Assessment Technology
1	Introduction to Operating Systems Concepts	1. Establish a case study group plan (CO:1) 2. Assign a case study team leader (CO: 1) 3. Define the fundamental terminology in operating systems concepts.(CO:4)	• Quiz 1: Intro to OS (1:3)	• Video • PPT (1:3) • Notes (1:3) • Reading: Chapter 1 (1:3)	• Quiz (chapter 1)
2	Operating System Design	1. Propose a case study plan (CO: 1, 3,4) 2. Evaluate OS system design concepts (CO:3, 4)	• Case study assignment 1(1: 1,2 & 2:1,2) • Quiz 2: OS Design (2:2)	• Video • PPT (2:2) • Notes(2:2) • Reading: Chapter 2 (2:2) • Assignment CS 1 (2:1,2)	• Assignment submission • Quiz (chapter 2)
3	Process Concept	1. Outline OS specific process management techniques (CO:1,3,4) 2. Examine OS process management (CO: 4)	• Quiz 3: PCB/ Process concept (3:2)	• Video • PPT (3:2) • Notes (3:2) • Reading: Chapter 3 (3:2)	• Quiz (part of chapter 3)

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4	Processes and Scheduling	1. Discuss OS design and process scheduling (CO: 3,4) 2. Identify OS scheduler and swapping techniques (CO: 1,4) 3. Apply CPU scheduling algorithm exercises (CO: 4)	• Discussion board 1: OS design/ processes (4: 1) • Case study assignment 2 (3: 1 & 4:2) • Quiz 4: process and scheduling(4:2,3)	• Video • PPT (4: 2,3) • Notes (4: 2,3) • Reading: Chapter 3/ 6 (4:2,3) • Assignment CS 2 (3: 1, 4:2)	• Discussion Board • Assignment submission • Quiz (chapters 3 and 6)
5	CPU scheduling	1. Apply CPU scheduling algorithm exercises (CO: 4,8) 2. Identify OS Specific CPU scheduling algorithms (CO: 4) 3. Review for exam one (CO: 3,4) 4. Assess CPU scheduler algorithms (CO: 8)	• HW1/ pre exam assignment (1: 3 & 2: 2 & 3: 2 & 4: 2,3 & 5: 1,3,4)	• Video • Notes (5:1) • Reading: Chapter 6 (5:1) • Assignment HW1 (1: 3 & 2: 2 & 3: 2 & 4: 2,3 & 5: 1,3,4) • CPU scheduler Programming Assignment introduction (5:4)	• Assignment submission (HW1)
6	Review/ CPU programming assignment	1. Apply concepts learned in Units 1 through 5 (CO: 3,4,8) 2. Assess CPU scheduler algorithms (CO: 8)	• CPU scheduler flowchart/algorithm/logic and/ or Gantt chart submission (6:2) • Exam 1 (6: 1)	• Notes(6: 1) • Reading: Review Chapter 1-3, 6(6: 1) • CPU scheduler Programming Assignment flowchart/algorithm/logic and/or Gantt chart (6: 2)	• Assignment submission • Exam (chapters 1, 2, 3, and 6)
7	Interprocess Communication and Thread concept	1. Discuss CPU scheduler programming assignment (CO:8) 2. Apply thread implementation mapping (CO: 3,4) 3. Identify OS specific thread implementation (CO: 4)	• Discussion board 2: CPU scheduler (7: 1) • Case study assignment 3 (5: 2 & 7: 3) • Quiz 5: multiprocessing and threads (7: 2)	• Video • PPT (7: 2) • Notes (7: 2) • Reading: Chapter 3, 4, and 6 (7: 2) • Assignment CS 3 (5:2 & 7: 3)	• Discussion Board • Assignment submission • Quiz (chapters 3, 4, and 6)

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8	Interprocess communication and synchronization	1. Examine interprocess communication techniques(CO : 3) 2. Solve process synchronization techniques (CO: 5)	• Quiz 6: synchronization intro (8: 1,2)	• Video • PPT (8: 1,2) • Notes (8: 1,2) • Reading: Chapter 3 and 5 (8:1,2)	• Quiz (chapters 3 and 5)
9	Process Collaboration and synchronization	1. Discuss synchronization using semaphores (CO : 5) 2. Apply software synchronization techniques (CO: 3, 5) 3. Identify OS specific synchronization techniques (CO: 1,3,5)	• CPU scheduler programming assignment submission 2(6:2) • Discussion board 3 : IPC/ synchronization (9:1) • Quiz 7: synchronization (9: 2,3)	• Video • PPT (9: 2,3) • Notes (9:2,3) • Reading: Chapter 5 (9: 2,3)	• Assignment submission • Discussion Board • Quiz (chapter 5)
10	Deadlocks	1. Examine methods for handling deadlock situations (CO: 6) 2. Solve deadlock avoidance exercises (CO: 6) 3. List OS specific ways for handling deadlock (CO:1,6) 4. Review for Exam 2 (CO: 3,4,5,6)	• HW2/ pre exam assignment (7: 2 & 8: 1,2 & 9: 2 & 10:1, 2, 3, 4) • Discussion board 4 (10: 1, 3)	• Video • PPT (10: 1,2,3,4) • Notes (10: 1,2,3,4) • Reading: Chapter 7 (10: 1,2,3,4) • Assignment HW2 (7: 2 & 8: 1,2 & 9: 2 & 10:1, 2, 3, 4)	• Discussion Board • Assignment submission
11	Main Memory introduction	1. Apply concepts learned in Units 6 through 10 (CO: 3,4,5,6) 2. Examine memory allocation techniques (CO: 3,4) 3. Solve memory allocation exercises (CO: 4)	• Exam 2 (11: 1)	• Video • PPT (11:2,3) • Notes (11:2,3) • Reading: Review Chapter 3-5, 7(11:1) • Reading: Chapter 8 (11:2,3)	• Exam (chapters 3, 4, 5 and 7)
12	Main memory and Virtual Memory	1. Discuss paging (CO:4) 2. Apply paging address translation (CO: 4) 3. Evaluate the contents of page tables (CO: 4) 4. Investigate OS specific memory	• Discussion board 4:memory management (11: 2, 3 & 12:1,2) • Case study assignment 4(12:4) • Quiz 8: main memory (12:2,3)	• Video • PPT(12: 2,3) • Notes (12: 2,3) • Reading: Chapter 8 and 9 (12:2,3) • Assignment CS 4 (12: 4)	• Discussion Board • Assignment submission • Quiz(chapter 8)

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		allocation techniques (CO: 1,4)			
13	Virtual Memory Techniques	1. Apply page replacement algorithms (CO: 4) 2. Examine the issues of paging (CO: 4) 3. Investigate OS specific virtual memory issues (CO: 1, 4)	• Quiz 9: page replacement algorithms (13: 1,2)	• Video • PPT (13:1,2,4) • Notes (13:1,2,4) • Reading: Chapter 8 and 9(13:1,2)	• Quiz (chapter 8 and 9)
14	I/O and Disk scheduling	1. Apply disk scheduling algorithms (CO: 7) 2. Examine I/O basics (CO: 7) 3. Investigate OS specific I/O techniques (CO: 1, 7) 4. Review for Exam 3 (CO: 3,4)	• HW3/ pre exam assignment (11: 2,3 & 12: 2,3 & 13:1,2 & 14: 1,2,4)	• Video • PPT(14:1, 2,3) • Notes(14: 1,2,3) • Reading: Chapter 10(14: 1,2,3) • Assignment HW3(11: 2,3 & 12: 2,3 & 13:1,2 & 14: 1,2,4)	• Assignment submission
15	I/O Systems and Case studies	1. Apply concepts learned in Units 11 through 15 (CO:3,4,7) 2. Evaluate the kernel I/O subsystem (CO: 7) 3. Investigate additional case study topics (security, files, user experience) (CO: 1, 3) 4. Build case study presentation and evaluation(CO: 1, 2)	• Discussion board 5:course assessment • Case study group presentation (13: 3 & 14:3 & 15: 2,3, 4) • Case study individual evaluation essay and peer review (15: 1,2,3, 4) • Exam 3 (15: 1)	• Notes (15: 2) • Reading: Review Chapter 8, 9, and 10(15: 1) • Reading: Chapter 13 (15: 2) • Assignment Case study presentation (15: 1,2,3,4) • Assignment Case study evaluation essay (15: 1,2,3,4)	• Discussion board • Assignment submission • Presentation submission • Exam