

**Faculty of Computers and Information Technology**

**Operating Systems-2**

**Information :**

**Course Code :** CS432

**Level :** Undergraduate

**Course Hours :** 3.00- Hours

**Department :** Department of Computer Science

**Instructor Information :**

Title	Name	Office hours
Professor	Tarek Ahmed Mahmoud Mohamed	1
Associate Professor	Tarek Abdul Hamid Abdul Aziz Hussein	1
Associate Professor	Ibrahim Eldesouky Fattoh Abdelmageed	
Teaching Assistant	Belal Taha Fathi Taha Hussien	
Teaching Assistant	Linah Mohammed Ibrahim Elsayed Ahmed Elnaghi	
Teaching Assistant	Fatmaelzahra Hamdi Abdallah Mohamed	
Teaching Assistant	Yasmina Mohamed Nasr Abdel Latif Eldafrawy	

**Area Of Study :**

Apply the basic concepts of process and thread.  
 Combine and evaluate different methods to manage the real memory.  
 Analyze the requirements of synchronization and design a solution for these requirements. Compare and evaluate methodologies from range of techniques and methods to implement a file system.  
 Use effectively communication skills.  
 Understand knowledge that enhances skills in protection and security.  
 Show a complete understanding of distributed systems.

**Description :**

File systems: File concept, access methods, directory systems, file protection. Processes synchronization: Process Concept, the producer/consumer problem, the critical section problem, semaphores, Distributed operating systems: distributed systems structures, distributed file systems, distributed coordination, network structures.

**Course outcomes :**

**a.Knowledge and Understanding: :**

1 -	Explain the principles and techniques of synchronization, virtual memory, file system management and implementation, I/O systems, interrupts, protection and security, distributed systems and SMP.
2 -	Describe the up to date technologies used to support Inter-process communication in operating systems.
3 -	Discuss fundamental concepts related to processes and threads in operating systems

**b.Intellectual Skills: :**

1 -	Compare and differentiate between algorithms, methods and techniques that solve the operating systems problems.
2 -	Select and justify the appropriate models in operating systems for a given problem domain.
3 -	Propose a set of alternative solutions for a given operating system problem.

4 -	Analyze different problems in operating systems.
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**c. Professional and Practical Skills :**

1 -	Acquire and manage different information about the implementation of the operating systems using scientific literature and web sources.
2 -	Apply, design methodologies, programming languages, and different supporting tools for the development and documentation of operating system concepts.
3 -	Analyze, Design, Implement and test computer based systems.

**d. General and Transferable Skills :**

1 -	Apply quantitative methods and skills in understanding and presenting OS cases.
2 -	Apply communications skills in presentation and report writing for operating systems concepts and modules.
3 -	Work on a team to develop solutions for operating systems problems

**ABET Course outcomes :**

1 -	Understand the basic concepts of process and thread.
2 -	Compare and evaluate different methods to manage the real and virtual memory.
3 -	Analyze the requirements of synchronization and design a solution for these requirements.
4 -	Compare and evaluate methodologies and techniques to implement a file system.
5 -	Acquire knowledge that enhances skills in system protection and security.

**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Process, and threads concepts overview	4	2	2
Inter-process communication and synchronization overview	4	2	2
Semaphores and classical problems (i.e., dining philosophers, producer-consumer, reader . writer, sleeping barber, etc.)	4	2	2
Memory management overview	4	2	2
Virtual memory concept, demand paging , page replacement and frame allocation	4	2	2
File system concepts and structure	4	2	2
Implementing file systems	4	2	2
Input/output systems	4	2	2
Mid Term Exam	2		
Interrupts	4	2	2
Protection and Security	4	2	2
Distributed systems	4	2	2
Student Presentations	4	2	2
Final Exam	2		

**Teaching And Learning Methodologies :**

Interactive Lectures including Discussions
Tutorials

Practical Lab Sessions

Self-Study (Project / Reading Materials / Online Material / Presentations)

Case Studies

Problem Solving

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	8.00	4	
Final Exam	40.00	14	
Midterm Exam (s)	20.00	9	
Presentations	8.00	12	
Quizzes	10.00	5	
Research and Reporting	7.00		
Team Work Projects	7.00		

**Course Notes :**

An Electronic form of the Course Notes and all the slides of the Lectures is available on the Students Learning Management System (Moodle)

**Web Sites :**

IEEE Transactions on Parallel and Distributed Systems. <https://www.computer.org/web/tpds>