FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Computers and Information Technology

Parallel Processing

Information :

Course Code :	CS418	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours
Department :	Department of Computer Science				

Instructor Information :

Title	Name	Office hours
Associate Professor	Soha Safwat Labib Hana	1
Teaching Assistant	Mariam Ali Ibrahim Elsayed	1

Area Of Study :

Evaluate effectively the merits of networking and internetworking.
Use all available principles and tools of remote invocation.
Comprehend deeply the basic concepts of resource sharing and distributed systems.
Show a complete understanding of inter-process communication.
Compare and evaluate different physical and architectural models of distributed systems.

Description :

Interconnection networks: parallel computing and networks, direct and indirect networks, message swDMhing layer, deadlock and live lock and starvation, routing algorithms, collective communication support. Parallel algorithms: BRAM model, basic techniques (balanced tree algorithm, divide and conquer, prefix computations, pointer jumping, partitioning), list and trees (list ranking, symmetry breaking, Euler tour techniques), searching, merging, and sorting algorithms.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Discuss the basic concept of modern distributed architectures.
2 -	Identify different modern paradigms of interactions in distributed systems.
3 -	Explain design aspects of distributed applications for particular distributed system architecture and the structural and functional features of distributed systems.
b.Intellectual Skills: :	
1 -	Analyze the structural and functional differences between classic and modern distributed architectures.
2 -	Invent a distributed application that suits specific architectures.
3 -	Compare and differentiate between networking and internetworking concepts.
c.Professional and Practical Skills: :	
1 -	Analyze, design and implement distributed processing concepts in developing programs for a distributed system.
2 -	Deploy effective supporting tools for Remote method invocation (RMI(.
3 -	Create technical reports according to professional standards in inter-process communication.

d.General and Transferable Skills: :	
1 -	Work in a team effectively and efficiently considering time and stress management to manipulate a distributed application via a specific methodology.
2 -	Apply communication skills and techniques in presentations and report writing.

ABET Course outcomes :	
1 -	Evaluate effectively the merits of networking and internetworking.
2 -	Use effectively principles and tools of remote invocation.
3 -	Comprehend the basic concepts of resource sharing and distributed systems.
4 -	Demonstrate understanding of inter-process communications
5 -	Compare and evaluate different physical and architectural models of distributed systems
6 -	Analyze and instrument an implementation of a computer program for its speed up, scale up, and parallel efficiency.
7 -	Design and Implement efficient parallel algorithms and applications

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Characterization of Distributed Systems: Examples and Trends of distributed systems	4	2	2
Characterization of Distributed Systems: Resource sharing and Distributed systems Challenges	4	2	2
System models: Physical and Architectural models	4	2	2
System models: Fundamental models	4	2	2
Networking and Internetworking: Network principles	4	2	2
Networking and Internetworking: Internet protocols and Case studies	4	2	2
Interprocess Communication: API for the Internet protocols- External data representation and marshalling.	4	2	2
Interprocess Communication: Multicast communication and network virtualization	4	2	2
Mid Term Exam	2		
Remote Invocation: Request-reply protocols and remote procedure call.	4	2	2
Remote Invocation: Remote method invocation (RMI(	4	2	2
Operating System Support: Protection, Processes and threads, Communication and invocation, and file service architecture.	4	2	2
Project presentation	4	2	2
Final Exam	2		

Teaching And Learning Methodologies :
Interactive Lectures including Discussions
Practical Lab Sessions
Reading Materials
Online Material

Case Studies
Presentations

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	5.00	4	
Final Exam	40.00	14	
Midterm Exam	20.00	9	
Others (Participations)	5.00		
Presentations	5.00	12	
Quizzes	10.00	5	
Team Work Projects	15.00	12	

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)