University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc Computer Engineering

Form no. (12): **Course Specification**

1- Course Data

Course Code: **CC529**	Course Title: **Distributed and Parallel Systems**	Academic Year/Level: year **4,5** / semester **7,8,9,10**
Specialization: **Computer Engineering**	**Credit Hours**: 3 **Lecture**: 2 **Tutorial:** 0 **Lab:** 2	**Prerequisite**

2- Course Aim

To introduce the main concepts and paradigms of distributed and parallel systems. The aspects of designing, implementing, and evaluating distributed and parallel systems will be explored.

3- Intended Learning Outcomes

a- Knowledge and Understanding	[a5] Engineering principles in the fields of logic design, circuit analysis, machine and assembly languages, computer organization and architectures, memory hierarchy, advanced computer architectures, embedded systems, signal processing, operating systems, real-time systems and reliability analysis. • Demonstrate an introduction the distributed paradigm and infrastructure. • Demonstrate evolution and overview of distributed and parallel systems. • Explain the components dependencies. • Define task scheduling. • Define consistency. • Describe distributed system architecture. • List different distributed systems applications. • Define parallel system concept and motivation. • Demonstrate costs, drawbacks and benefits. • Identify design considerations. [a6] Related research and current advances in the field of computer software and hardware and contemporary engineering topics. • Demonstrate the performance of distributed and parallel systems. • Distinguish between different distributed and parallel systems. • Describe the parallel computer architecture. • Explain the design and analysis of distributed and parallel system. • Demonstrate the hardware and network interconnections of distributed and parallel systems. • List advantages and disadvantages of distributed and parallel systems. • List the applications of distributed and parallel systems.
b- Intellectual Skills	[b2] Think in a creative and innovative way in problem solving and design using the latest technologies and solve engineering problems, often on the basis of limited and possibly contradicting information while identifying symptoms in problematic situations. • Report the distinguishable characteristics of the distributed and parallel systems. • Report the distinguishable characteristics of each kind of distributed system. • Calculate the throughput of the parallel system.

c- Professional Skills	[c3] Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment, wide range of analytical tools, techniques, and software packages pertaining to the computer engineering to design experiments, collect, analyze and interpret results and develop required computer programs. • Integrate technical professionalism and societal and ethical responsibility.
d- General Skills	• Apply knowledge of computing, mathematics and logical skills appropriate to the computer engineering discipline • Analyze the local and global impact of distributed and parallel systems on individuals, organizations and society.

4- Course Content

Week No.1	Introduction to distributed systems
Week No.2	Types of distributed systems
Week No.3	Distributed system Architecture
Week No.4	Processes, Threads and Virtual Machine
Week No.5	Communication in distributed systems
Week No.6	Naming, Identifiers, and addresses
Week No.7	7th week Exam
Week No.8	Introduction to Parallel Computing
Week No.9	Parallel system Architecture
Week No.10	Parallel systems memory models
Week No.11	Parallel Programming Platforms
Week No.12	12th week Exam
Week No.13	Distributed verses parallel systems
Week No.14	Distributed systems applications
Week No.15	Parallel systems applications
Week No.16	Presentation of projects and Final Exam.

5- Teaching and Learning Methods

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

6-Teaching and Learning Methods for Students with Special Needs

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

The academic advisors of each student, as well as dedicated department TAs monitor the students' progress and solve any problem he/she may encounter.

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.	
b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7th Week Written Exam 12th Week Written Exam Continuous Assessments 16th Week Final Written Exam

c- Weighing of Assessment	7th Week Examination	30 %
	12th Week Examination	20 %
	Final-term Examination	40 %
	Oral Examination	0 %
	Practical Examination	0 %
	Semester Work	10 %
	Total	100%

8- List of References:

a- Course Notes	
b- Required Books (Textbooks)	Hwang, Dongarra, and Fox, "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things", Morgan Kaufmann 1ED
c- Recommended Books	• Andrew S. Tanenbaum and Maarteen van Steen, Distributed Systems: Principles and Paradigms,, 2nd Edition, Prentice Hall, 2007 • Peter Kacsuk, Thomas Fahringer and Zsolt Nemeth, Distributed and Parallel Systems: From Cluster to Grid Computing, Springer, 2010.
d- Periodicals, Web Sites, etc.	N/A

Course Instructor:
Dr. Ahmed Abou El-Farag

Program Manager:
Prof. Dr. Mohamad AbouEl-Nasr

Dean of College of Engineering and Technology of AASTMT

Name: **Prof. Moustafa Hussein Aly**

Signature:

Executive Manager of Quality Assurance Center of AASTMT

Name: **Prof. Aziz Ezzat**

Signature: