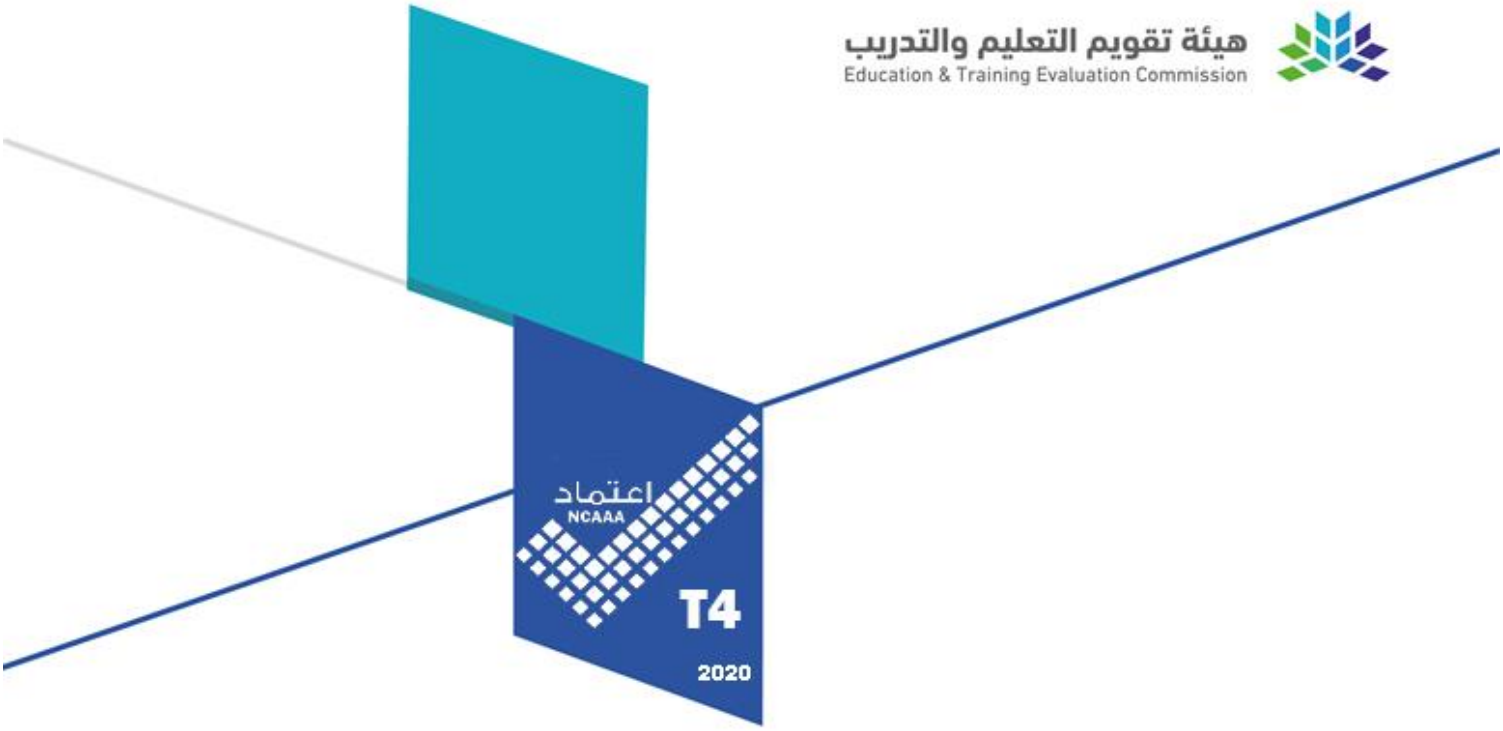
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Parallel and Distributed Systems
Course Code:	**562CSS-3**
Program:	**BSc in Computer Science**
Department:	**Computer Science**
College:	**College of Computer Science & Information Systems**
Institution:	**Najran University**

Table of Contents

A. Course Identification

1. Credit hours: 3 (2, 2, 0)
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 14/ year 5
4. Pre-requisites for this course (if any)**:** 329CSS-3
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	60	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	20
3	**Tutorial**	10
4	**Others** (specify)	
	Total	**60**
Other Learning Hours*		
1	**Study**	
2	**Assignments**	
3	**Library**	
4	**Projects/Research Essays/Theses**	
5	**Others** (specify)	
	Total	

***** The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Introduction to parallel systems; Processes and processors; Parallel architectures (multi-computer, multi-processor); Performance of Parallel systems (speedup, efficiency, etc.); Characterization of distributed systems; System models; Inter-process communication; Remote invocation; Distributed operating system; and Distributed file systems.

2. Course Main Objective

1) Define the basic concepts and terminologies of parallel and distributed systems.
2) Explain various parallel and distributed computing paradigms and issues.
3) Evaluate the performance issues of parallel, and distributed and pipelined computing.
4) Analyze the algorithms of parallel and distributed systems.
5) Apply the knowledge and methods of parallel and distributed systems in programming using java.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Define the basic concepts and terminologies of parallel and distributed systems	K_1
1.2	Explain various parallel and distributed computing paradigms and issues	K_1, K_2
2	**Skills :**	
2.1	Evaluate the performance issues of parallel, and distributed and pipelined computing**.**	S_2
2.2	Analyze the algorithms of parallel and distributed systems.	S_1, S_3
2.3	Apply the knowledge and methods of parallel and distributed systems in programming using java	S_2, S_5
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to parallel system	5
2	Parallel system architecture	5
3	Parallel system architecture	5
4	Performance of Parallel systems (speedup, efficiency, etc.)	5
5	Performance of Parallel systems (speedup, efficiency, etc.)	5
6	Introduction to distributed systems	5
7	Distributed system models	5
8	Inter-process communication continue…	5
9	Inter-process communication	4
10	Remote invocation continue…	5
11	Remote invocation	2

12	Distributed Operating system	4
13	Distributed File systems	4
14	Revision	2
Total		**60**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Define the basic concepts and terminologies of parallel and distributed systems	1. Lecture: here the instructor addresses verbally in front of students the concepts associated with examples with taking help of writing on the board as needed. 2. Continuous examples: during lecture the instructor will make many examples by sketching on board in order to support demonstration of concept	Midterm, Final theory
1.2	Explain various parallel and distributed computing paradigms and issues		Midterm, Quiz, Final theory
…			
2.0	**Skills**		
2.1	Evaluate the performance issues of parallel, and distributed and pipelined computing.	Lecture: here teacher is going to convey concepts theoretically and by discussing those using different examples on different situations. 2. Discussions: the instructor here throws an idea to students and asks them to give their viewpoints, as well as, their reasoning regarding it. Also, the instructor may throw a problem to be discussed from various perspectives. 3. Cooperative Learning: instructor will ask students to solve a problem collaboratively and	Midterm, Final theory
2.2	Analyze the algorithms of parallel and distributed systems.		Midterm, Final theory
2.3	Apply the knowledge and methods of parallel and distributed systems in programming using java		Lab Assessment, Quiz, Final theory exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		give their proposed solutions to be discussed and evaluated. Lecture: here teacher is going to convey concepts theoretically and by discussing those using different examples on different situations.	
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	3rd, 5th	10%
2	Theory Assignments	2nd, 4th	10%
3	Midterm	6th	20%
4	Lab Assessments or mini project (presentation)	9th	10%
5	Lab final Exam	11th	10%
6	Final Theory	12th or 13th	40%
7	Total		100%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
4 hours per week for academic advising

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, **Introduction to Parallel Computing**, Second Edition, second edition, Addison Wesley 2. George Coulouris, Jean Dollimore, Tim Kindberg and Gordon Blair, **Distributed Systems Concepts and Design**, fifth edition, Addison Wesley

Essential References Materials	1. William Stallings, Computer Organization and Architecture: Designing for Performance, Eighth Edition, Pearson Prentice Hall, Pearson Education, Inc. Upper Saddle River, New Jersey. 2. Peter Pacheco, **An Introduction to Parallel Programming**, 2011, Morgan Kaufmann 3. Andrew S. Tanenbaum, Maarten van Steen, **Distributed Systems: Principles and Paradigms**, second edition, Prentice Hall. 4. Graba, Jan**, An Introduction to Network Programming with Java,** second edition, Springer.
Electronic Materials	-
Other Learning Materials	-

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Class room with 30 chairs, white board, podium, wireless projectors, Wi-Fi with good speed
Technology Resources (AV, data show, Smart Board, software, etc.)	• Lecture room should contain a PC attached to the data show device with latest MS Office and Adobe Acrobat Reader packages being installed. • Laboratory contains an enough number of PC to accommodate all students with Java-related software like J Creator , J2SE , NetBeans, Eclipse and JRE licensed version with network package should be installed. PCs in the lab should be installed by licensed antivirus.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
At the end of the semester, the university always conducts an online faculty evaluation survey for all the courses registered in a semester.	Students	Indirect
Peer to peer meeting with the student about the course.	Students and faculty	Direct

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Concerning pros and cons of the course in department		
Recommendations given by the Curriculum committee at the end of the previous semester about the course. By encouraging the students to follow the tutorials and assignments of the offered course	Instructor	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Departmental Council
Reference No.	14440203-0185-00002
Date	1st Sep, 2022