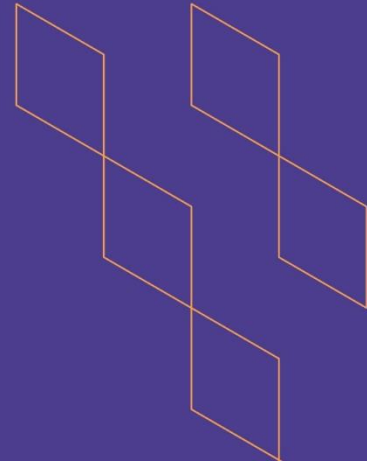




T-104
2022

Course Specification



Course Title: Parallel and Distributed Computing
Course Code: CS1756
Program: Computer Science
Department: Computer Science and Engineering
College: Computer Science and information technology
Institution: Albaha University
Version: : T104 – V1
Last Revision Date: October 14, 2023



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A. General information about the course:

Course Identification	
1. Credit hours:	4 Hours
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Track <input type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 11 / 4 th year	
4. Course general Description	
Lecture:	
<p>This course delivers fundamental issues and recent trends in distributed and parallel computing. It demonstrates the complexities of distributed computing systems and points out their solutions. The fundamentals of parallel and distributed computing such as Architectural styles, processes communication, synchronization, consistency, and replication fault tolerance techniques are studied in this course. In addition, this course provides explanations for emerging technologies in distributed systems such as blockchain.</p>	
5. Pre-requirements for this course (if any): Network 2 (CS1257)	
6. Co- requirements for this course (if any): none	
7. Course Main Objective(s)	
The main purpose for this course is to teach students how to:	
<ul style="list-style-type: none"> Describe the complexities of parallel and distributed computing systems and approaches to solve those complexities. Distinguish the goals and architectures of parallel and distributed computing. Discuss important issues in modern parallel and distributed computing systems. Recognize the different fault tolerance techniques. Explore the recent trends in parallel and distributed computing systems. Use communication concepts and techniques in oral presentations. 	

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	48	100%
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4.	Distance learning		
5.	Other		



2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	48
2.	Laboratory/Studio	-
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		55

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the complexities of parallel and distributed computing systems and approaches to solve those complexities.	K1	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Quizzes Midterm exams Final Exam
1.2	Distinguish the goals and architectures of parallel and distributed computing.	K1	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Quizzes Midterm exams Final Exam
2.0	Skills			
2.1	Discuss important issues in modern parallel and distributed computing systems.	S1	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Quizzes Midterm exams Final Exam
2.2	Recognize the different fault tolerance techniques.	S2	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Quizzes Midterm exams Final Exam
2.3	Explore the current trends in parallel and distributed computing systems.	S3	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Research report Final Exam
2.4	Use communication concepts and techniques in oral presentations.	S5	<ul style="list-style-type: none"> Small Groups 	<ul style="list-style-type: none"> Presentation

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	Adapt to work independently and collaboratively	V1	<ul style="list-style-type: none"> • Assignments • Oral Presentations 	<ul style="list-style-type: none"> • Note card

C. Course Content

No	List of Topics	Contact Hours
1.	What is parallel and distributed computing	4
2.	Architectural styles	4
3.	Processes	4
4.	Communication	4
5.	Synchronization	4
6.	Consistency and replication	8
7.	Fault tolerance techniques	8
8.	Security	4
9.	Emergent Technology (i.e., Blockchain, MapReduce)	8
Total		48

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework	2,4	10%
2.	Midterm Exam	6	20%
3.	Quiz	9	15%
4.	Research report/ presentation	11	15%
5.	Final Exam	12	40%
Total			100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<ul style="list-style-type: none"> • “Distributed Systems: Principles and Paradigms” by Maarten van Steen and Andrew Tanenbaum, 3rd (3.01) edition.
Supportive References	<ul style="list-style-type: none"> • Computer Science Curriculum 2013 – http://cs2013.org



	<ul style="list-style-type: none"> ACM (Association for Computer Machinery) Curricula Recommendations - http://www.acm.org/education/curricula-recommendations "Distributed Systems: Concepts and Design" by George Coulouris, Jean Dollimore, and Tim Kindberg, Addison Wesley, 5th edition. "Distributed and Cloud Computing: From Parallel Processing to the Internet of Things" by Geoffrey C. Fox, Jack Dongarra, and Kai Hwang, 1st edition.
Electronic Materials	<ul style="list-style-type: none"> ACM (Association for Computer Machinery) (Association for Computer Machinery) web site - http://www.acm.org/ IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home Access to the Saudi Digital Library (SDL). Using the learning management system of the university – Rafid System (https://lms.bu.edu.sa/).
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> A classroom or lecture hall with whiteboard for 25 students. Desktop Computers.
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> A digital image projection system with connection to desktop computer and laptop computer An instructor computer station All students shall have <ul style="list-style-type: none"> A laptop or access to a desktop computer with access to a visualization development tool High speed Internet connection Power outlets for student's laptop plug-in
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> Students Faculty 	<ul style="list-style-type: none"> Surveys (indirect).





Assessment Areas/Issues	Assessor	Assessment Methods
	<ul style="list-style-type: none"> • Peer Reviewers • Program Leader • Course Coordinator 	<ul style="list-style-type: none"> • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader • Comprehensive Course report (where we can find information about teaching difficulties and action plan, ...)
Effectiveness of students assessment	<ul style="list-style-type: none"> • Students • Faculty • Peer Reviewers • Course Coordinator • Exam Evaluation Committee • Course Coordinator 	<ul style="list-style-type: none"> • Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Assessment results (direct) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about assessment difficulties and action plan, ...) • Exam evaluation by the Exam Evaluation Committee (indirect)
Quality of learning resources	<ul style="list-style-type: none"> • Students • Faculty • Peer Reviewers • Course Coordinator 	<ul style="list-style-type: none"> • Surveys (indirect) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, ...)
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> • Faculty • Program Leader • Course Coordinator • 	<ul style="list-style-type: none"> • Student Results (direct) • Comprehensive Course report (where we can find the CLO assessment results)



Assessment Areas/Issues	Assessor	Assessment Methods
Other	None	None

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

