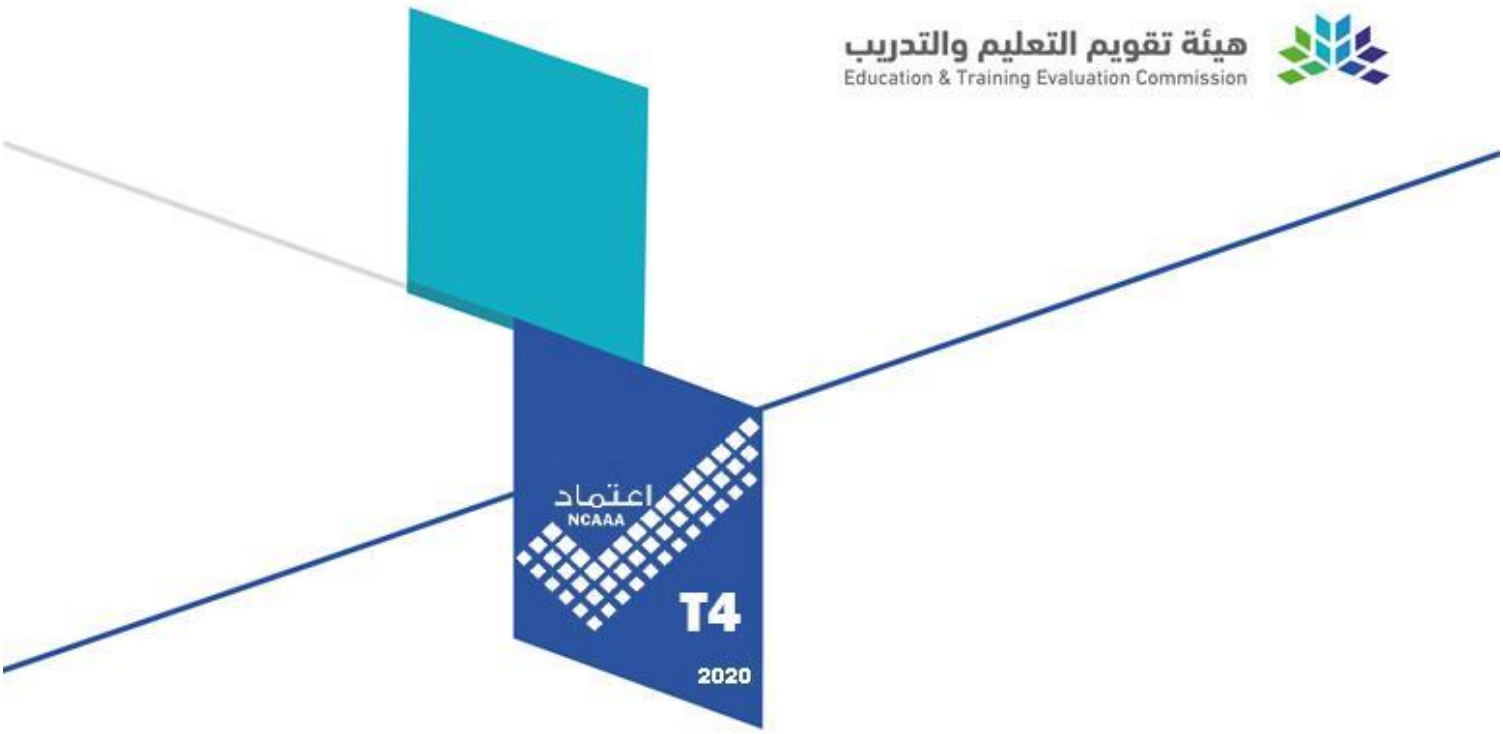
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

CourseTitle:	Parallel Computing
Course Code:	503535-3
Program:	Bachelor in Computer Engineering
Department:	Department of Computer Engineering
College:	The College of Computers and Information Technology
Institution:	Taif University

Table of Contents

A. Course Identification

1. Credit hours: 3 hours
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☐ Elective ☒
3. Level/year at which this course is offered: Fifth year
4. Pre-requisites for this course (if any)**: Digital System Design (503528-3)**
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**	3	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	45
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	45

B. Course Objectives and Learning Outcomes

1. Course Description

Parallel Computing is a study of the hardware and software issues in parallel computing. Topics include an introduction to the basic concepts, parallel architectures and network topologies, parallel algorithms, parallel metrics, parallel languages, granularity, applications, parallel programming design and debugging. Students will become familiar with various types of parallel architectures and programming environments.

2. Course Main Objective

1. Define terminology commonly used in parallel computing, such as efficiency and speedup
2. Be familiar with the hardware and software organization of high performance parallel computing systems
3. Describe different parallel architectures, interconnect networks, programming models, and algorithms for common operations such as matrix vector multiplication.
4. Be able to design and analyze parallel algorithms for a variety of problems and computational models.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	define and use common terms found in parallel computing	K1
1.2	Identify different parallel architectures.	K1
2	**Skills :**	
2.1	Give a parallel algorithm analyze its time complexity as a function of the problem size and number of processors.	S1
2.2	Have experience with the implementation of parallel applications on high performance computing systems and be able to measure tune and report on their performance.	S5
3	**Values:**	

C. Course Content

No	List of Topics	Contact Hours
1	Overview of parallel computing and parallel prgramming platforms	4
2	continue parallel prgramming platforms	4
3	Principle of parallel algorithm design	4
4	continue Principle of parallel algorithm design	4
5	Decomposition techniques	4
6	Tasks and interactions	5
7	mapping techniques for load balancing	5
8	methods for containing interactions overheads	5
9	parallel algorithm models	5
10	The pipeline or producercustomer model	5
Total		45

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 and use common terms found in parallel computing	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	identify different parallel architectures.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
2.0	**Skills**		
2.1	Given a parallel algorithm analyze its time complexity as a function of the problem size and number of processors.	Lecture Discussion Brainstorming Problem Solving	Written Exams Quizzes Assignments
2.2	Have experience with the implementation of parallel applications on high performance computing systems and be able to measure tune and report on their performance.	Group Work Self-Learning Problem Solving	Oral Test Oral Presentation Mini-Project
3.0	**Values**		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments	Continues	5%
2	Midterm Exam	8	20%
3	Project	14	15%
4	Quizzes	Continues	10%
5	Final Exam	16	50%

***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 :
Teaching staff provide at least 6 office hours for students to help them in the course as well as in any other academic issues.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	M.J. Quinn, "Parallel Programming in C with MPI and Open MP" McGraw Hill 2003
Essential References Materials	Ananth grama, George karypis, and Vipin kumar, "Introduction to Parallel Computing" 1990
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Traditional Classrooms
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show
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
Extent of achievement of course learning outcomes	Students	Indirect (Survey)
Effectiveness of teaching and assessment	Students	Indirect (Survey)
Extent of achievement of course learning outcomes	Faculty	Direct (Course Report)

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	
Reference No.	
Date	

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