

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE PLAN – PART I								
Name of the Programme and Specialization	M. Tech Computer Science and Engineering							
Course Title	Design and Analysis of Parallel Algorithms							
Course Code	CS618	No. of Credits	3					
Course Code of Pre requisite subjects(s)	Knowledge of algorithms and complexity	Basic knowledge of data structures	Basic Knowledge of computer architecture					
Session	July 2020	Section (if, applicable)	-					
Name of Faculty	Dr. C. Mala	Department	Department of Computer Science & Engineering					
Email	mala@nitt.edu	Telephone No.	0431-2503208					
Name of Course Coordinator(s) (if, applicable)	-							
Email	-	Telephone No.	-					
Course Type	Elective course							
Syllabus (approved in BoS) Refer the Link: https://www.nitt.edu/home/academics/departments/cse/programmes/mtech/curriculum/semester_1/electives/design_and_analysis_of_parallel/ Course Objectives <ul style="list-style-type: none"> • To understand different array processors and parallel algorithms for multiprocessor. • To perform the various operations on PRAM model. • To perform merging and sorting operations on different models. • To solve linear equations using parallel algorithms for basic problems. • To study graph Algorithms. 								
MAPPING OF COs with POs								
Course Outcomes	Aligned Programme Outcomes (PO)							
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
Ability to design parallel algorithms for SIMD machines	S	B	M	S	B	B	M	B
Ability to design parallel algorithms for MIMD machines	S	B	M	S	B	M	M	B
Ability to analyze parallel algorithms for SIMD and MIMD machines	S	M	S	S	M	S	M	B
S=0.6 M=0.4 B=0.0								

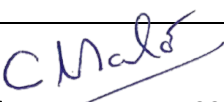


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COURSE PLAN – PART II			
COURSE OVERVIEW			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Contact Hours	Topic	Mode of Delivery
UNIT – I			
1.	1	Introduction to different models of computation	Microsoft Teams App
2.	2	Array Processors	Microsoft Teams App
3.	3	Multiprocessors	Microsoft Teams App
4.	5	Interconnection networks	Microsoft Teams App
5.	7	Shared memory models controls and algorithms	Microsoft Teams App
6.	9	Parallel algorithms for Array processors	Microsoft Teams App
UNIT- II			
7.	10	Broadcast, All sums algorithm	Microsoft Teams App
8.	11	Selection Algorithm	Microsoft Teams App
9.	12	Parallel Selection	Microsoft Teams App
10.	15	Searching a random sequence on PRAM models, tree and mesh	Microsoft Teams App
11.	18	Searching a sorted sequence on PRAM models, tree and mesh	Microsoft Teams App
UNIT- III			
12.	19	Need for Merging, Merging on PRAM models	Microsoft Teams App
13.	20	Merging on PRAM models	Microsoft Teams App
14.	21	ODD EVEN Merge	Microsoft Teams App

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15.	23	Sorting on EREW, CREW and CRCW SIMD models	Microsoft Teams App	
16.	25	MIMD Enumeration sort	Microsoft Teams App	
UNIT – IV				
17.	26	SIMD algorithms for Matrix operations- Transposition	Microsoft Teams App	
18.	27	Matrix by matrix multiplication	Microsoft Teams App	
19.	28	Matrix by vector multiplication	Microsoft Teams App	
20.	30	Numerical problems- solving systems of linear equations	Microsoft Teams App	
21.	32	Finding roots of non linear equations on PRAM models	Microsoft Teams App	
UNIT – V				
22.	33	Graph algorithms	Microsoft Teams App	
23.	34	Finding connected components	Microsoft Teams App	
24.	36	Sparse graphs and Dense graphs	Microsoft Teams App	
25.	38	Minimum spanning tree	Microsoft Teams App	
26.	40	Biconnected components	Microsoft Teams App	
COURSE ASSESSMENT METHODS (share range from 4 to 6)				
S.No	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	6 th Week	1 Hour	20
2	Cycle Test 2	12 th Week	1 Hour	20
3	Mini Project	7 th Week	-	30
CPA	Compensation Assessment*	As per schedule	1 Hour	20
4	Final Assessment*	As per schedule	2 Hours	30
*mandatory; refer to guidelines on page 5				

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COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)
MIS Feedback
COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)
<u>MODE OF CORRESPONDENCE (email/phone etc)</u> Email
<u>COMPENSATION ASSESSMENT POLICY</u> One Compensation assessment will be conducted for students who were absent for cycle tests due to genuine reasons.
<u>ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)</u> <ul style="list-style-type: none"> ➤ At least 75% attendance in each course is mandatory. ➤ A maximum of 10% shall be allowed under On Duty (OD) category. ➤ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.
<u>ACADEMIC DISHONESTY & PLAGIARISM</u> <ul style="list-style-type: none"> ➤ Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during assessment will be treated as punishable dishonesty. ➤ Zero marks to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark. ➤ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and aware the punishment if the student is found guilty. The report shall be submitted to the Academic office. The above policy against academic dishonesty shall be applicable for all the programmes.
ADDITIONAL INFORMATION
The Course Coordinator is available for consultation from 3pm to 4pm on all working days.
FOR APPROVAL
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="text-align: center;">  _____ Course Faculty </div> <div style="text-align: center;">  _____ CC-Chairperson </div> <div style="text-align: center;">  _____ HoD </div> </div>