National Institute of Technology, Tiruchirappalli

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE OUTLINE TEMPLATE

Course Title	Introduction to Algorithms		
Course Code	CSPC29		
Department	CSE	**No. of Credits**	3
Pre-requisites Course Code	CSPC21	**Faculty Name**	Dr. R. Mohan / Mrs. T. Veni
E-mail	rmohan@nitt.edu, tveni@nitt.edu	**Telephone No.**	0431 - 2503210
Course Type	PC		

COURSE OVERVIEW

- This course mainly describes about various programming paradigms, algorithms and its complexity.

COURSE OBJECTIVES

- To understand the importance of algorithms and its complexity.
- To analyse the complexity of an algorithm in terms of time and space complexities.
- To design and implement various programming paradigms and its complexity.

COURSE OUTCOMES (CO)

- Ability to analyze the time and space complexity, given an algorithm.
- Ability to apply the techniques of an algorithm in solving real world problems.
- Ability to develop systematically an algorithm for solving a problem.

COURSE OUTCOME (CO)	Aligned Programme Outcome (PO)							
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
Ability to analyze the time and space complexity, given an algorithm	S	S	M	S	B	B	M	B
Ability to apply the techniques of an algorithm in solving real world problems	S	S	M	M	B	B	S	B
Ability to develop systematically an algorithm for solving a problem	S	S	M	S	B	B	M	B

S = 0.6   M = 0.4   B = 0.0

COURSE TEACHING AND LEARNING ACTIVITIES

L.No	Title	Type		Mode of delivery			
		L	T	C&T	PPT	VL/VC	DEMO
	UNIT I						
1.	Introduction to algorithms- Examples	√		√			
2.	Tournament method	√		√			
3.	Evaluating the polynomial functions	√		√			
4.	Evaluating the polynomial functions- Examples	√		√			
5.	Pre-processing of co-efficients	√		√			
6.	Solving recurrence equations	√		√			
7.	Solving recurrence equations- Examples	√		√			

		UNIT II						
8.	Introduction to divide and conquer method	√		√			
9.	Examples of divide and conquer method	√		√			
10.	Strassen's Matrix multiplication	√		√			
11.	Introduction to greedy method	√		√			
12.	Examples of greedy method	√		√			
13.	Knapsack Problem and its types	√		√			
14.	Job sequence with deadlines	√		√			
15.	Introduction to minimum spanning tree	√		√			
16.	Applications of minimum spanning tree	√		√			
		UNIT III						
17.	Introduction to dynamic programming	√		√			
18.	Various dynamic programming paradigms	√		√			
19.	Multi stage graph and examples	√		√			
20.	Introduction to all pair's shortest path	√		√			
21.	Optimal binary search tree	√		√			
22.	Travelling salesman problem	√		√			
23.	Fast Fourier transform	√		√			
		UNIT IV						
24.	Introduction to randomized algorithms	√		√			
25.	Examples and amortized analysis	√		√			
26.	Las vegas technique	√		√			
27.	Monte Carlo Types	√		√			
28.	Introduction to randomized quick sort	√		√			
29.	Randomized quick sort analysis	√		√			
30.	Introduction to Min-Cut algorithm	√		√			
		UNIT V						
31.	Introduction to NP-Hard	√		√			
32.	Introduction to NP-Complete	√		√			
33.	Reduciblity technique	√		√			
34.	Cooks theorem	√		√			
35.	Turing Machine	√		√			
36.	NP-hard graph problems	√		√			

COURSE ASSESSMENT METHODS

Sl. No.	Mode of Assessment	Week/Date	Duration	Marks
1	Cycle Test – 1	6th week	1 hour	20
2	Cycle Test – 2	12th week	1 hour	20
3	Assignment (1 & 2)	4th, 10th weeks	–	10
4	End Semester Exam	April 4th week	3 hours	50
			Total	100
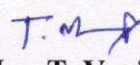
COURSE EXIT SURVEY (Mention the ways in which the feedback about the course is assessed and indicate attainment also)
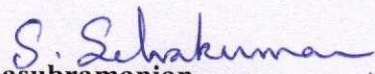
- Feedbacks are collected before every cycle test and after the end semester exam in the feedback forms*.
- Suggestions from the students are incorporated for making the course more understanding and interesting.
- Students, through their class representative may give their feedback at any time to the course faculty which will be duly addresses.
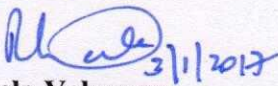- Students may also give their feedback during class committee meeting.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

- **Attendance:** Minimum 75% is mandatory to write the end semester examination. Students having attendance 65%-74% are eligible for the end semester exam only after attending the extra classes and submitting assignments. Students have to redo the course, if they have less than 65% percentage of attendance.
- Medical certificate or on-duty certificate should be submitted immediately after rejoining.
- Please turn off electronic devices during classes, such as cell phones, iPods, and laptops.

FOR SENATE'S CONSIDERATION

Course Faculty: Dr. R. Mohan   Mrs. T. Veni

CC-Chairperson: N. Ramasubramanian   03 01 17

HoD :   R. Leela Velusamy