ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

MANGALORE UNIVERSITY

(Accredited by NAAC with 'A' Grade)

ಕ್ರಮಾಂಕ/ No. : MU/ACC/CR 46/EL (PG)/2017-18/A2

ಕುಲಸಚಿವರ ಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ – 574 199
Office of the Registrar
Mangalagangothri – 574 199
ದಿನಾಂಕ/Date: 26.02.2019

NOTIFICATION

Sub: Syllabus of New Paper in M.Sc. Electronics third Semester 'Design and Analysis of Algorithms'

Ref: 1. Decision of the BOS in Electronics meeting held on 11.10.2018.
2. Approval of the faculty of Science & Technology meeting held on 05.01.2019
3. Approval of the Academic Council meeting held on 01.02.2019.

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Pursuant to the above, the syllabus of New Paper in III semester of M.Sc. Electronics 'Design and Analysis of Algorithms' is hereby notified for implementation with effect from the academic year 2019-20.

REGISTRAR

To:

1. The Chairman/ Co-ordinator of the Department concerned .
2. The Registrar (Evaluation), Mangalore University.
3. The Director, DUIMS, Mangalore University – with a request to publish in the website.
4. The Superintendent (ACC), O/o the Registrar, Mangalore University.
5. Guard File.

ELS 513 - DESIGN AND ANALYSIS OF ALGORITHMS

Total: 48 Hours

Unit - I

Introduction: Books and algorithms, Fibonacci numbers, Big-O notation, **Algorithms with numbers:** Basic arithmetic, Modular arithmetic, Primality testing, Cryptography, Universal hashing, Randomized algorithms, **Divide-and-conquer algorithms:** Multiplication, Recurrence relations, Mergesort, Medians, Matrix multiplication, Fast Fourier transform, **Decompositions of graphs:** The need of graphs, Depth-first search in undirected graphs, Depth-first search in directed graphs, Strongly connected components.

(16 hours)

Unit - II

Paths in graphs: Distances, Breadth-first search, Lengths on edges, Dijkstra's algorithm , Priority queue implementations, Shortest paths in the presence of negative edges, Shortest paths in dags, **Greedy algorithms:** Minimum spanning trees, Huffman encoding, Horn formulas, Set cover, **Dynamic programming:** Shortest paths in dags, revisited, Longest increasing subsequences, Edit distance, Knapsack, Chain matrix multiplication, Shortest paths, Independent sets in trees.

(16 hours)

Unit - III

Linear programming and reductions: An introduction to linear programming, Flows in networks, Bipartite matching, Duality, Zero-sum games, The simplex algorithm, Postscript: circuit evaluation, **NP-complete problems:** Search problems, NP-complete problems, The reductions, **Coping with NP-completeness:** Intelligent exhaustive search, Approximation algorithms, Local search heuristics

(16 hours)

Textbooks:

(1) Algorithms - Sanjoy Dasgupta, Christos Papadimitriou and Umesh Vazirani, TMH-2008

(2) Introduction to Algorithms – Thomas H.Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, 3rd edition, The MIT Press, 2009

(3) Combinatorial Optimization : Algorihms and Complexity,Christos H. Papadimitriou, Kenneth Steiglitz