Minutes of BOS in Computer Science Held on 05/01/2019 at 11 AM

Agenda: (i) To discuss about the Syllabus
(ii) To discuss about the feedback of students
(iii) To start Centre for Computational Intelligence
(iv) To decide about the eligibility criteria for M.Sc. Computer Science
(v) To discuss about the panel of examiners and question paper setting

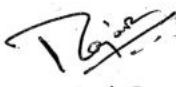The following members were present during the meeting.
1. Dr. Arunkumar Thangavelu, Professor, Dept. of Computer Science and Engineering, VIT
2. Dr. K.A. Germina, Associate Professor, Department of Mathematics
3. Dr. Rajesh R, Head, Department of Computer Science
4. Mr. Kumar V.

(i) The BOS members have gone through the previous syllabus and current syllabus proposed by FC based on brainstorming workshop on curriculum development held on 04/01/2019. The BOS observes the improvement in the new curriculum/syllabus and approves the same.

(ii) The BOS has gone through the feedback of the students of 2016-18 batch and considered the suggestions. Two exemplary students cleared the NET exam and two students got placed in TCS.

(iii) The BOS recommends for starting of a Centre for Computational Intelligence based on the recommendations from the FC. Initially, Dr. Rajesh R. will serve as the Director for the centre.

(iv) Based on the recommendation of FC, the BOS recommends to amend the eligibility conditions for M.Sc. Computer Science admission as

    BCA or B.Sc (Computer Science/electronics/commuincations/IT/Bioinformatics) or B.Tech/BE (Computer Science/electronics/communications/IT/electrical/ECE) or B.Sc. in Physics/Mathematics/Statistics (with computer science as a subject or having a certificate/diploma in computer related areas) or B.Voc (computer science/IT/electronics/electrical/ECE)

(v) The BOS recommends the panel of examiners/question paper setters suggested by the FC.

The meeting ended with vote of thanks.

Dr. Arunkumar Thangavelu   Dr. K.A. Germina   Dr. Rajesh R.   Mr. Kumar V.

ELECTIVES				
COURSE CODE	**COURSE TITLE**	**CONTACT HRS/WEEK**			**CREDITS**
		LEC	**LAB**	**TUT**	
CSC5014	Algorithms for Big Data	2	2	1	4

Lec = Lecture, Tut = Tutorial, Lab = Practical

This is a participatory, experimental, problem solving and **employability based skill development course**.

Course Objective:
  The objective of the course is to provide theoretical and practical aspects of big data algorithms.

By completing this course, students will obtain the following course/learning outcomes:
1. Knowledge gained:
    (i) Theoretical concepts for developing methods and algorithms for big data
2. Skill gained:
    (ii) Critical analyzing and logic **skills in developing methods and algorithms for big data**
3. Competency gained:
    (iii) Modelling and development of big data based applications.

Prerequisites: Basic knowledge of algorithms.

Grading:
Lab implementation	– 15%
Participatory based group Project	– 10%
Assignment/Quiz/presentation	– 5%
Class Test	– 10%
Final Exam	– 60%

CSC5014 – Algorithms for Big Data

Module 1
Intro to Probability Theory: Basic definitions, conditional probability, karger's min cut algorithm, random variables, Bernoulli, Binomial, and Geometric distributions, Tail bounds with Applications: application of chernoff bound, application of chebyshev's inequality.

Module 2
Introduction to Big Data Algorithms, SAT problem, classification of States, Stationary distribution of Markov Chain, random walks on undirected graphs, introduction to streaming, Morris algorithm, reservoir sampling, approximate median. Overview of data storage, balls and bins, hashing, chain hashing, bloom filter, pair wise independence, universal hashing functions, perfect hashing.

Module 3
Heavy hitters in data stream, Random walks on linear structures, lollipop graph, cats and mouse. Estimating frequency moments, property testing frame work, testing connectivity, enforce and test introduction, testing bicyclic graph, testing bipartiteness.

Module 4
Property testing and random walk algorithms, testing if graph is bipartite using random walks, graph streaming algorithms: introduction, matching, graph sparsification. Map reduce, K-machine (aka pregel model) model.

References:
1. Michael Mitzenmacher, Eli Upfal, Probability and Computing: Randomized Algorithms and Probabilistic Analysis, Cambridge University Press, Second edition, ISBN-13: 978-1107154889, ISBN-10: 9781107154889, 2017.
2. Dana Ron, Algorithmic and Analysis Techniques in Property Testing, now publishers Inc., 2010, ISBN: 978-1-60198-318-3
3. Graham Cormode, Minos Garofalakis, Peter J. Haas and Chris Jermaine. Synopses for Massive Data: Samples, Histograms, Wavelets, Sketches. now publishers Inc., 2011, ISBN: 978-1-60198-516-3