CENTRAL UNIVERSITY OF KERALA
केरल केन्द्रीय विश्वविद्यालय

DEPARTMENT OF COMPUTER SCIENCE

SCHOOL OF MATHEMATICAL AND PHYSICAL SCIENCES

Minutes of BOS in Computer Science Held on 09 July 2016 at 11.00 AM

Agenda: To discuss about the Syllabus, feedback of students, previous question papers, evaluation strategies

The following members were present during the meeting.

1. Dr. P. S. Hiremath, Professor, KLE Technological University
2. Dr. Rajesh R.
3. Dr. T.M. Thasleema
4. Mr. Ragesh N.K., Specialist, DSP & Multimedia, Tata Elxsi Ltd., Thiruvananthapuram
5. Mr. Fasil O.K., Software Engineer, NuCore Software Solutions

1) The BOS members have gone through the previous syllabus and current syllabus. The BOS observes the improvement in the curriculum/syllabus. The BOS members also suggested to include some industry related electives. The BOS approved the syllabus.

2) The feedback of 2014-16 batch students and 2015 admitted students were obtained. The BOS members has gone through the measures taken by the Faculty Council and approved the same.

3) The BOS members has gone through the previous question papers. The BOS members also verified (i) whether the question paper covers the entire syllabus, (ii) whether the question papers are upto the mark, (iii) whether the evaluation strategies of the answer papers are good. The BOS members were satisfied with procedures for the same.

Dr. P. S. Hiremath

Dr. Rajesh R.

Dr. T.M. Thasleema

Mr. Ragesh N.K.

Mr. Fasil O.K.

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M.Sc. COMPUTER SCIENCE
</div>

ELECTIVE COURSE					
COURSE CODE	**COURSE TITLE**	**CONTACT HRS/WEEK**			**CREDITS**
		LEC	**LAB**	**TUT**	
CSC5005	Nature Inspired Computing	2	2	1	4

<div align="center">Lec = Lecture, Tut = Tutorial, Lab = Practical</div>

This is a participatory and problem solving **skill development course**.

Course Objective:
   The objective of the course is to provide theoretical and practical aspects of implementing nature inspired computing.

By completing this course, students will obtain the following course/learning outcomes:
1. Knowledge gained:
      (i)   fundamental concepts of nature inspired computing
2. Skill gained:
      (ii)   Skills in the development of algorithms for nature inspired computing
3. Competency gained:
      (iii)   optimization of real world problems using nature inspired computing

Prerequisites: Basic knowledge of programming

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

<div align="center">**CSC5005 – Nature Inspired Computing**</div>

Module 1
Natural to Artificial Systems – Biological Inspirations in problem solving – Behavior of Social Insects: Foraging - Division of Labor - Task Allocation – Cemetery Organization and Brood Sorting – Nest Building - Cooperative transport.

Module 2
Ant Colony Optimization: Ant Behavior - Towards Artificial Ants - Ant Colony Optimization – Problem solving using ACO - Extensions of Ant Systems - Applications.

Module 3
Swarm Intelligence: Introduction to Swarm Intelligence – Working of Swarm Intelligence - Optimization – Particle Swarms - Applications

Module 4
Introduction to Genetic Algorithms - population initialization - choosing a fitness function - selection - crossover - mutation - reinsertion - applications of genetic algorithms - evolutionary algorithms.

Module 5
Case studies in Immune System Algorithms, Simulated Annealing

Text Books
1. Stephan Olariu and Albert Zomaya, *Hanbook of Bioinspired Algorithms and Appl.*, Chapman and Hall, 2006
2. Marco Dorigo, Thomas Stutzle, *Ant Colony Optimization*, MIT Press, 2004.
3. E. Bonabeau, Marco Dorigo, Guy Theraulaz, *Swarm Intelligence: From Natural to Artificial Systems*, Oxford Univ. press, 2000.
4. Mitchell, Melanie, *Introduction to genetic algorithms*, ISBN: 0262133164, MIT Press, 1996
5. Nunes de Castro, Leandro, *Fundamentals of Natural Computing: Basic Concepts, Algor., and Appl.*, Chapman & Hall, 2006

Reference Books
1. Nunes de Castro, Leandro, Fernando J. Von Zuben, *Recent Developments in Biologically Inspired Computing,* MIT Press, 2005
2. D. Floreano and C. Mattiussi, *Bio-Inspired Artificial Intelligence*, MIT Press, 2008
3. Camazine, Scott et al, *Self-organization in biological systems*, ISBN: 9780691116242, Princeton Univ. Press, 2001
4. Nancy Forbes, *Imitation of Life - How Biology Is Inspiring Computing*, MIT Press, 2004.
5. Christian Blum, Daniel Merkle (Eds.), *Swarm Intelligence: Introduction and Applications*, Springer Verlag, 2008.
6. Leandro N De Castro, Fernando J Von Zuben, *Recent Developments in Biologically Inspired Computing*, Idea Group Inc., 2005.