Please select the committee for Approval
1.Name of the Dept: CS

2.Name of the Subject: Computational Social Science

3.LTP and Credit:
L: 3 T: 0 P: 0 Credit: 3

4.Status of the subject:
a) Specify the Session,Semester ,from which the subject is going to be offered
2014-2015 (Autumn)
b)Please Specify the Level of the Subject: 6
c) Whether the subject will be offered as compulsory or elective: Elective
d) The semester in which the subject will be offered: Autumn
e) Name(s) of the Programme(s) in whose curricula this subject will be included:
BTech 3rd year, BTech
4th year, Dual Degree, MTech 1st year, PhD

5.Prerequisite(s) for the subject, if any
(Please give the subject numbers and names): None

6.Objective and Contents:
a) Objective: Promote research and education in social computing which is one of the most popular curricula of current across the globe. An additional objective would be to formulate the "Table of Contents" for a textbook on "Algorithms for Social Computing" which is not yet available.
b) Contents
Introductory lecture (1)

Online Social Networks (OSN) (10)
1) Introduction-Types of social networks (e.g., Twitter, Facebook), Measurement and Collection of Social Network Data (2)
2) Techniqes to study different aspects of OSNs -- Follower-followee dynamics, link farming, spam detection, hashtag popularatiy and prediction, linguistic styles of tweets (4)
3) Human Centered Computing - Classes of human-centered computation,
Methods of human-centered computation, Incentives for participation,
computer supported co-opeartive work, computer supported collaborative learning (3)
4) Crowdsourcing as a Model for Problem Solving, ESP Game (1)

Models of Opinion Formation (11)
1) Introduction (1)
2) Opinion Dynamics - Continuous and Discrete Models (3)
3) Cultural, Language Dynamics - Axelrod Model and its variant, The Naming game, The Category Game (4)
4) Crowd Behavior- Flocking, Pedestrian behavior, Applause Dynamics and Mexican Wave (1)

5) Formation of Hierarchies - The Bonabeau Model, The advancement-decline Model (1)
6) Social spreading Phenomena- rumor spreading, gossip spreading (1)

Fundamentals of Social Data Analytics (10)
1) Introduction - Working with Social Media Data (2)
2) Topic Models (2)
3) Modeling social interactions on the Web (2)
4) Random Walks (2)
5) Variants of random walk (k-random walk for social network analysis) (2)

Applied Social Data Analytics (11)
1) Application of Topic models (1)
2) Opinions and Sentiments - Mining, Analysis and Summarization (3)
3) Recommendation Systems (2)
4) Language dynamics and influence in online communities (2)
5) Community identification, link prediction and topical search in social networks (2)
6) Psychometric analysis (1)

(in 100 to 150 words):
7.Names of the faculty memebers of the Department/Centers/School who have the neccessary expertise and will be the willing to teach the subject (Minimum two faculty members should be willing to teach the subject) Pawan Goyal, Animesh Mukherjee, Niloy Ganguly, Sourangshu Bhattacharyya, Bivas Mitra, Anupam Basu.

8.Do the contents of the subject have an overlap with any other subject offered in the Institute?
If yes, please check and give details as follows
a)Subject Name: datalist
b) Approximate percentage of overlap:
c) Reasons for offering the new subject in spite of the overlap:

9.Recommended Text Books/References Books
a) Theory (Text Books):
1. Robert Hanneman and Mark Riddle. Introduction to social network methods. (2005)
2. Mitchel Resnick, "Turtles, Termites, and Traffic Jams: Explorations in Massively Parallel Microworlds", MIT Press, 1994.
3. Joshua M. Epstein, "Growing Artificial Societies: Social Science from the Bottom Up", Brookings Institution Press, 1996.
4. Jennifer Golbeck, "Analyzing the social web", Morgan Kaufmann, 2013.

b) References (Literature):
1. Claudio Castellano, Santo Fortunato, and Vittorio Loreto, "Statistical physics of social dynamics", Rev. Mod. Phys. 81, 591, 11 May 2009.
2. S. Fortunato and C. Castellano, "Word of mouth and universal voting behaviour in proportional elections" Phys. Rev. Lett. 99, (2007).

3. Douglas D. Heckathorn, "The Dynamics and Dilemmas of Collective Action", American Sociological Review (1996).
4. Michael W. Macy and Robert Willer, "From factors to actors: Computational Sociology and Agent-Based Modeling," Annual Review of Sociology Vol. 28: 143-166 (2002).

10.Names of Departments/Centers/Schools/Programmes whose students are expected to resgiter for this subject: CSE, SIT, MATHEMATICS (CSDP)