

Course Syllabus

Course Number: CAP 6xxx

Course Title: Computational Analysis of Social Complexity

Semester: TBD

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Course Objectives:

The course will cover computational concepts, principles, modeling and simulation approaches used to analyze complex social and economic phenomena, leveraging the availability of large amounts of data, and elements of complexity theory.

The course will cover the following topics:

1. Data structures for the representation of social networks;
2. Static and dynamic properties;
3. Small world phenomenon;
4. Clustering, classification and evolution of social networks;
5. Understanding and modeling social influence and information cascades;
6. Link prediction and discovery;
7. Privacy issues in social networks;
8. Data mining for social networks;
9. Social sensing by integrating sensors and social networks;
10. Decision-making and voting models in social networks.

Prerequisites:

COT 5XXX Network Science

Recommended textbooks: Social Network Data Analytics (Ed. Aggarwal, Springer); Networks, Crowds, and Markets: Reasoning about a Highly Connected World (Easley and Klenberg, Cambridge University Press)

Grading Scheme:

The grade in the course will be based on a mid-term exam (30%), three machine problems (40%) and a final project 30%.