CSCE 6933
Advanced Topics in Computational Life Sciences
Topic: Network Science

Course Information & Syllabus (Spring 2017)

Instructors: Armin R. Mikler and Sanjukta Bhowmick
Lectures/Seminar: Tuesday 5:30 – 8:20 pm
Office Hours: (Mikler) M&W 9:30 – 11:00 am or by appointment
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Required Textbook: Network Science by Albert-László Barabási

Course Objective: This course will be conducted seminar style with focus on topics related to the field of Network Science. The representation of relationships or interactions as networks has permeated all scientific domains. Metabolic networks, computer networks, social networks, and the power grid are just a few examples. In order to understand scientific processes and relationships, it is imperative that we can analyze the structure and the dynamics of the underlying network. In this seminar, we will discuss several of the topics that make up the domain of Network Science. We will cover chapters from the textbook with additional supplemental material, specifically the following topics:

1. Introduction to Graph Theory (by Dr. Bhowmick)
2. Graph Measures and Metrics (supplemental material)
3. Random Networks
4. Scale Free Networks
5. Network Models
6. Evolving Networks
7. Degree correlation*
8. Network Robustness
9. Communities
10. Spreading phenomenon

(* Time permitting)

Assessment is based on the preparation of slides, the presentation of assigned topics, in-class discussion, and periodic (small) projects.

Attendance: As this course focuses on presentations and in-class discussions, attendance is essential and thus is required.

Americans with Disabilities Act: We cooperate with the Office of Disability Accommodation to make reasonable accommodations for qualified students (cf. Americans with Disabilities Act and Section 504, Rehabilitation Act) with disabilities. If you have not registered with ODA, we encourage you to do so. If you have a disability for which you require accommodation, please discuss your needs with the instructor or submit a written Accommodation Request on or before the fourth class day.