ELE/CSE 400 – Networks & Optimization Seminar
Fall 2023

- **Lectures:**   MonWed 12:45pm–2:05pm, 3-216 SciTech

- **Website:**   http://ecs.syr.edu/faculty/fardad/index_ELE400.htm
  (all course materials available here; Blackboard not used)

- **Office Hrs:** MonWed 11:30am–12:30pm, 3-189 SciTech

- **Instructor:** Makan Fardad
  3-189 SciTech
  makan@syr.edu

- **Audience & Prerequisites:** Third- and fourth-year undergraduate students in engineering, computer science, physics, and mathematics with a solid background in undergraduate maths (linear algebra and differential equations in particular), but most importantly, *intellectual curiosity* and a *willingness to learn.*

- **Description:** Dynamic speakers will present cutting-edge research in a manner accessible to an audience of future engineers and scientists. Seminar topics will demonstrate concepts, tools, and applications in large-scale networks and mathematical optimization. Examples include analysis and optimal design problems in social networks, distributed control, machine learning, cyber security, and big data.

- **Objectives:** Students will...
    - identify complex emergent behavior that results from coupling many agents in a network;
    - recognize important problems in network analysis and design, such as clustering, seeding, sparsity;
    - learn about formulating optimization problems and distinguishing easy versus hard problems;
    - gain familiarity with optimization software and a high-level understanding of algorithms employed.

- **Grading Policy:** To evaluate their understanding of the material, students will be asked to individually write a report about each research presentation after it is over (please bring a laptop or tablet to class for this). The report will include the main *questions* addressed in the research, the *techniques* used to tackle the problem, the *main results* obtained, some *applications* to which the results can be applied, and perhaps even suggestions for future research directions. The report is emailed to the instructor at makan@syr.edu before the end of class.

  Furthermore, by mid-October students will be required to choose a research project, on which they will give an oral presentation (after Thanksgiving Break) and hand in a written report (due on the last day of classes). Students may work on their projects in groups of two, but it is crucial that both individuals in a group contribute equally to its completion. With the instructor's help, each group will select research articles to read, understand, make an oral presentation on, and write a report about.

  The overall grade for the course will be determined based on the following distribution:

  Presentation reports & class participation: 60%
  Research project (presentation & report):   40%

A student's overall grade for this course will *not* depend on how well other students have done. It is possible (in fact, much desired) for every student to get an A. Numerical scores, rounded to whole numbers, will be converted to letter grades as follows:

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Overall score (%)     Letter grade
91-                   A
86-90                 A-
81-85                 B+
76-80                 B
71-75                 B-
66-70                 C+
61-65                 C
56-60                 C-
46-55                 D
00-45                 F
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- **Academic Integrity:** Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. Syracuse University students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level.

  All academic integrity expectations that apply to in-person quizzes and exams also apply to online quizzes and exams. In this course, all work submitted for quizzes and exams must be yours alone. Discussing quiz or exam questions with anyone during the quiz or exam period violates academic integrity expectations for this course. Using websites that charge fees or require uploading of course material (e.g. Chegg, Course Hero) to obtain exam solutions or assignments completed by others and present the work as your own violates academic integrity expectations in this course.

- **Diversity, Inclusion, and Disability-Related Accommodations:** Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to contact me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Center for Disability Resources (CDR) in this process. If you would like to discuss disability-accommodations or register with CDR, please visit Center for Disability Resources `https://disabilityresources.syr.edu/`. Please call (315) 443-4498 or email `disabilityresources@syr.edu` for more detailed information. The CDR is responsible for coordinating disability-related academic accommodations and will work with

the student to develop an access plan. Since academic accommodations may require early planning and generally are not provided retroactively, please contact CDR as soon as possible to begin this process.

- **Religious Observances Policy:** SU religious observances policy recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to are religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice/StudentServices/Enrollment/MyReligiousObservances/AddaNotification from the first day of class until the end of the second week of class. For more information on SU's religious observance policy, see `http://supolicies.syr.edu/emp_ben/religious_observance.htm`.

- **Classroom and Lecture Etiquette:**
  - Please silence cell phones, as they interrupt the class and the presentation. Text messaging is not permitted.
  - Do not carry on side conversations. They are distracting and disruptive. Extend the presenter, the instructor, and other students the courtesy of listening, just as you would have them listen when you speak.
  - At all times, students should conduct themselves as professionals, with courtesy and respect for those around them.