Course Objectives
The main objective of this course is to provide the students with a rigorous introduction to the modeling and quantitative approaches of selected topics in Location Analysis. The course will acquaint the students with both the classical and current results in this field, and will also cover related analytical techniques such as Integer Programming, Complexity Analysis of algorithms, Stochastic Processes, etc.

Prerequisites
The course assumes knowledge of basic concepts in Operations Research, ability to do basic proofs and follow mathematical arguments.

Reference Materials
There is no formal textbook for the course. We will draw on different papers throughout the course. The papers will be distributed to the students where possible.

Student Presentations
Each student will be expected to prepare several 45 minutes to-1 hour seminar-style presentations that should cover the following:
- Overview of the main contributions of the paper
- Presentation of the key results

To prepare a successful presentation you should:
1. Closely read the paper and gain a thorough understanding of the results. This usually requires a lot of work involved in tracking down and understanding background sources, filling in the missing mathematical details, etc.
2. Carefully select the material you will present. The most common mistake is to try to present all the results in the paper and their proofs. For a typical paper, this would take about a week—you are still likely to be in the middle preliminary result by the time your hour is up. The trick is to present intuition and main ideas behind the proofs, rather than the details. Generally, you can only present proof outlines for one or two major results, skipping the mathematical details. However, you have to be careful in presenting convincing intuitive arguments behind the results—otherwise there will be too many questions asking for technical clarifications, and you will get bogged down once again.
3. Try to understand where the papers fit in within the context of the results presented in
the course.

**Grading Policy**
The course grade will be computed as follows:

- Homework Grade: 50%
- Presentations Grade: 50%

**Presentations Grade**: Will be based on the oral paper presentations by each student and
the homework problems they will be required to submit based on their presentation. The
grade will be determined as follows:

- Presentation style/clarity: 40%
- Mastery of material: 40%
- Homework problems: 20%

**Tentative List of Topics and Readings**

1. **Classical Location Theory—The Median and Centre Problems**
   a. Hakimi, S.L. (1964) “Optimal Location of Switching Centers and the
      Absolute Centers and Medians of a Graph,” *Operations Research*, 12, 450-
      459. **Oded**
      Communication Network and Some Related Graph Theoretic Problems,”
      *Operations Research*, 13, 462-475. **Oded**
      53, 14-24. **Oded**
   d. O. Berman and Z. Drezner, “The p-Median Problem under Uncertainty,”

2. **Maximal Cover Problems**
      **Oded**
      Location Problem on Networks, “*European Journal of Operations Research*,
      Vol. 151, pp. 474-480.
   c. O. Berman, Z. Drezner and D. Krass, “The Variable Radius Covering
      516-525.
   d. O. Berman, Z. Drezner and D. Krass, “Cooperative Cover Location Problems:

3. **Flow Interception Problems**


4. **Congestion Location Models**


5. **Traveling Salesman Location Problems**


6. Practical Competitive Location Problems


7. Reliability Facility Location


8. Location Problems with Stochastic Weights

