1. **Course number and name**
   CptS/Math 453/553: Graph Theory

2. **Credits and contact hours**
   3 credits, 3 lecture hours

3. **Instructor's or course coordinator's name**
   Matthew Hudelson

4. **Textbook, title, author, and year**
   J. Bondy and U. Murty. 1976. *Graph Theory with Applications.* Elsevier Science Ltd., North-Holland. ISBN: 978-0-444-19451-0. (Required)

5. **Specific course information**
   a. *Catalog description:* Graphs and their applications, directed graphs, trees, networks, Eulerian and Hamiltonian paths, matrix representations, construction of algorithms
   b. *Prerequisites or corequisites:* Math 220 (introductory linear algebra) or equivalent.

6. **Specific goals for the course**
   By the end of the course, students will have familiarity with
   - Fundamental theoretical concepts of graph theory, i.e., the interplay of vertices and edges used in constructing an abstract picture of relationships among discrete objects (6a)
   - Applications of graph theory, examples including search algorithms (trees) and traversal algorithms (Eulerian or Hamiltonian paths) (1e, 2a)
   - Effectively communicate in oral presentations (3a, 3b, 3c, 3d, 3e, 3f)
   - Effectively communicate reasoning and rationale in written documents (3a, 3b, 3c, 3d, 3e).

7. **Brief list of topics to be covered**
   - Definitions and notation for graphs
   - Adjacency and incidence matrices
   - Trees
   - Connectivity
   - Euler tours and Hamiltonian cycles
   - Matchings
   - Colorings
   - Cliques and independent sets
   - Planar graphs
   - Networks