

5204/ crosslisted with 4900A
**Computational Aspects of Geographic Information
Systems**

Motivation: Many aspects of our daily lives are effected by GIS and its commercial impact/potential is tremendous. Through recent advances in technology such as vehicle navigation systems, GPS (global positioning systems), wireless/mobile devices, ... GIS is dramatically changing and once again on the forefront of active research and commercial development. This course lays the foundations to understand, use and further GIS technology with particular focus on algorithmic/computational aspects.

Topics include: overview of GIS, GIS data and their representations, operations, multi-resolution models, efficient algorithms for solving key GIS problems such as computing contour lines, visibility queries, distance and geometric shortest path problems, point location, current R&D topics including the use of context in GIS, time&space, social media GIS, and GIS on mobile devices.

Prerequisite: Data Structures and Algorithms (e.g., Computer Science 3804* or equivalent).

UnderGraduates: Undergraduate students will be accomodated in this cross-listed course.

Coursework and evaluation:

- 2 *Assignments* 15% each: total 30%
- *Class presentation and participation:* total 20%
- *Project* including write-up and demonstration: 25%
- *In-class test scheduled for December 7th:* 25%.

Place, time: Room: Room: 129 PA Wednesdays and Fridays 11:35-12:55 p.m. **Note:** The time and day can be changed if desired by all participants.