ENGINEERING, SCIENCE, TECHNOLOGY & SOCIETY (ESTS)

ESTS 23005 Complex Problem Solving in the Public Sphere (3 Credit Hours)
The central aim of the course is to explore the tensions between technical problem-solving and the public interest as we move into an increasingly technological future - e.g. Smart Cities. While this is in some ways the perennial broader question of how science integrates into society, we are focusing on issues particular to community planning and development as more and more tasks, from transportation to water management, are informed, if not controlled by nonhuman processes/algorithmic rules. For example, if we have 'smart sewers' and can control where the water goes during a flood, do we minimize property-value damage or the number of residences impacted? If climate change modeling indicates a new 30-year flood plain, do individuals have the right to not be moved out of harm's way? What are the moral and public interest questions embedded in this decision point? In doing so, we revisit this tension from the mid-20th century to set the stage and examine the interface of these issues in complex settings, including challenges with: defining the public interest, power and civic agency, measurement and data quality, objectives, variables, and constraints in optimization problems, and contextually/culturally situating 'optimal' solutions. Students examine community-based challenges through readings, case analysis, videos, site visits, and dialogue with faculty, community partners, and other students. Dialogue between the disciplines will be structured throughout the course to encourage deeper understanding of both analytical frameworks and assumptions brought to community-based challenges. The course will use local neighborhood community development efforts to illustrate challenges and critical factors in improvement efforts in the first two-thirds of the course, and it will culminate with a case analysis assignment for a very different neighborhood context (Puerto Rico) struggling with similar challenges.
Satisfies the following University Core Requirements: WKIN - Core Integration