In the “Big-Data” era, people need comprehensive tools to understand data and gain knowledge. Visualization-based tools become essential to human-data interaction. This course focuses on the frontier issues in visual analytics, an area with a goal to augment data-driven decision-making by bridging computational capacities of computing systems and analytical skills of human beings.

The course will examine theoretical and technical issues concerning visual analytics. Through this course, students can develop knowledge on the theories related to information visualization and visual analytics and the importance of visualization to data analysis. Students will also have an opportunity to build their skills in assessing visualization-based technologies, and designing and developing new visualization tools for targeted problems. The course will consist of class lectures, labs, and team-based term projects.

**Topics:**
Topics discussed in the class will include relevant cognitive theories (e.g., visual cognition, problem-solving theories, and learning theories), and hands-on experiences in using off-the-shelf visual analytics tools and systems and in developing web-based visual analytics tools with current technologies. Half of the class time will be lecture-based, focusing on the development of theoretical foundations, and half will be dedicated to individual labs and term project, emphasizing the enhancement of technical and design skills.

**Target Audience:**
This course is intended for junior and senior undergraduate students in the College of IST who are interested in building visualization-based interactive systems, with basic programming skills (e.g., IST 240 or equivalent) and preferably, some knowledge on user-centered design (e.g., IST 331 or equivalent). This course might also be a 400-level option for IST graduate students.

**Evaluation Methods:**
Students in this course will be evaluated through individual written assignments, individual lab reports, team project reports and presentation, and mid-terms. Class participation in activities and discussion will also be considered.