# Data Visualization

**Graduate Certificate in Data Visualization**

From the NJIT's Department of Informatics, the Graduate Certificate in Data Visualization allows students to develop skills in designing, developing, and applying data visualization techniques for solving real-world problems. Data visualization developers and researchers are interested in ways to communicate data to diverse users, improve analytical decision-making, and play a key role in diverse domains such as business intelligence, big data analytics, data science, scientific communication, and journalism. This certificate will equip students with both theoretical and practical knowledge for pursuing professional or research careers in data visualization.

**Who would be suited to take this program?**

Students and professionals interested in the broad areas of human-centered computing, urban informatics, visual analytics, business intelligence, design thinking and human-data interaction.

**Possible directions of study:**

·***Data Visualization and Interpretation –*** Theory and practical knowledge about how to design, read, and understand visual representations of data. Hands-on knowledge about state-of the-art tools, e.g., Tableau, Python, and web-based libraries like D3.js.

·**Spatio-Temporal Urban Analytics -** Essential concepts and skills needed to efficiently develop spatiotemporal thinking. Big data analysis and visualization techniques applied to spatio-temporal urban data. Knowledge about the R programming environment.

·***Elements of Visual Design-*** theories of design, techniques of composition, and technologies of electronic and print publishing. Modules include both design principles and hands-on practice in visual literacy, layout and design, and graphic tools.

·**Advanced Information Design -**  Design and creation of multimedia objects, usability heuristics, navigation theory, contemporary design practices and online community building

·**Visual Informatics for Network and Flow  -** Knowledge of open source tools to visualize and interpret network and flow data. Collect network and flow data and create their own visual applications.

·***Customer Discovery –*** User-centered design evaluation techniques for understanding potential user's practice, preferences and mental models. Knowledge of a basic set of qualitative user/customer discovery methods which is essential for both the lean startup entrepreneur and those engaged in design innovation.

·***User Experience Design –*** Process of creating compelling interaction designs for digital products from the idea stage into creating a simple and intuitive user experience blueprint. You will 'learn by doing' in a team environment, enabling you to practice the techniques with coaching from instructors.

·***Web Systems Development -*** Learn web development principles, as well as professionally relevant skills including industry standards, conventions, and procedures within large-scale programming projects.

·***Data Analytics for Information Systems -*** Learn and conduct Python, MATLAB and R based manipulation of data, along with graduate level introduction to data analysis, probability and statistics from an information systems perspective.

**Why study Data Visualization at NJIT?**

At NJIT, we have a great opportunity to train the next generation workforce in data visualization skills and techniques that will enable them to be at the cutting edge of technological development and play crucial roles in generating actionable insights for diverse stakeholders in the data science ecosystem.

**Into what industries might holders of this program find employment?**

**-** Business Intelligence (any enterprise)
**-** Data Scientist
**-** Information Designer
**-** Data Visualization Developer
**-** Journalist

**Prerequisites**

Applicants should have a bachelor's degree from an accredited institution with some undergraduate background in a related field (information design, information technology, etc.).

**Related Degree Programs**

All courses in this program are related to the NJIT MS in Information Systems (https://catalog.njit.edu/graduate/computing-sciences/information-systems/ms/) and MS in Professional and Technical Communication programs.

**What are the Required and Elective Courses?**

| Code | Title | Credits |
| --- | --- | --- |
| **Required Courses (2)** | | **6** |
| DS 650 | Data Visualization and Interpretation | 3 |
| or IS 650 | Data Visualization and Interpretation | |
| IS 657 | Spatiotemporal Urban Analytics | 3 |
| **Elective courses (2)** | | **6** |
| Select two of the following: | | |
| PTC 605 | Elements of Visual Design | 3 |
| PTC 606 | Advanced Information Design | 3 |
| IS 601 | Python for Web API Development | 3 |
| IS 654 | Visual Informatics for Social Network and Mobile Flow | 3 |
| IS 661 | User Experience Design | 3 |
| IS 664 | Customer Discovery | 3 |
| IS 665 | Data Analytics for Info System | 3 |
| **Total Credits:** | | **12** |