



# Data Visualization Nanodegree Program Syllabus

*Craft impactful narratives with data visualization and storytelling*

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## Before You Start

**Prerequisites:** This program is appropriate for students with some experience with data analysis. You should understand descriptive statistics, such as calculating measures of center (mean, median, mode), measures of spread (variance, standard deviation), and data distributions (normal distribution, skewness). You should also be familiar with analyzing data in spreadsheets (Excel, Google Sheets, etc.). If you do not have this background, there are courses included in the extracurricular section of the program to help you.

**Educational Objectives:** Students will learn to visualize data in order to support effective and impactful presentations.

**Estimated Length of Program:** 4 months

**Program Structure:** Self-paced

**Textbooks Required:** None

## COURSE 1: Intro to Data Visualization

In this course, you'll learn the fundamentals of data visualization and design. You'll learn to select the most appropriate data visualization based on the goal of the analysis. You'll learn important design elements for graphically representing data. You'll also learn to use Tableau to build interactive and engaging dashboards.

## SUPPORTING LESSON CONTENT

Lesson Title	Learning Outcomes
Data Visualization Fundamentals	→ Evaluate the quality of data visualizations and build high-quality visualizations.
Design Principles	→ Implement the best design practices, and use the most appropriate chart for a particular situation.
Creating Visualizations in Tableau	→ Build data visualizations in Tableau. → Use data hierarchies, filters, groups, sets, and calculated fields. → Create map-based data visualizations in Tableau.

## PROJECT 1: Build Data Dashboards

Sharing insights is an integral part of working with data. In this project, you'll build interactive dashboards with Tableau. You'll use a dataset of flight delays in the US to visualize the quality of airlines and airports, find the best times to fly, and more. These types of visualizations help guide decision making to reach the best outcomes.

## COURSE 2: Dashboard Design

In this course, you'll learn the process of designing and creating dashboards within an enterprise environment. You'll learn to discover user needs, identify key metrics, and tailor your dashboard to a particular audience. You'll learn to use design elements to maximize the effectiveness of the dashboard and how to iterate based on user feedback.

### SUPPORTING LESSON CONTENT

Lesson Title	Learning Outcomes
Planning Phase	<ul style="list-style-type: none"><li>→ Uncover and understand user needs for a dashboard project.</li><li>→ Determine the level of the audience's graphicacy.</li><li>→ Identify measurable key metrics.</li></ul>
Design Phase	<ul style="list-style-type: none"><li>→ Design a dashboard using sketching and wireframing.</li><li>→ Build a simple dashboard prototype.</li></ul>
Prototyping & Feedback	<ul style="list-style-type: none"><li>→ Gather feedback from dashboard users.</li><li>→ Iterate on the prototype and complete a finished dashboard.</li></ul>

## PROJECT 2: Design a Dashboard

In this project, you'll design a dashboard for a specific audience which you'll define by their graphicacy, data literacy, domain expertise, user type, metrics that matter most, and any other attributes that might influence the design. This dashboard's main purpose is to ensure the appropriate data has been chosen for decisions needing to be made. Then you'll make the dashboard truly insightful by adding design elements that draw the user's eye to points of interest based on data. You'll transform your visualizations to emphasize the most important points and add interactivity further facilitating the users' desired actions.

## COURSE 3: Data Storytelling

In this course, you will learn the end to end process for telling a story and providing a recommendation based on data. You'll learn to create a "ghost deck" to define a problem statement, scope possible analyses,

and outline a set of potential solutions. You'll also learn to identify what type of data analysis tool is appropriate for specific types of visualizations. You will learn how to identify limitations and biases in data. Lastly, you'll learn to create a polished deck that uncovers the story from within the data through data visualizations.

## SUPPORTING LESSON CONTENT

Lesson Title	Learning Outcomes
<b>Define Problem Statement</b>	→ Clearly articulate and communicate a problem statement for a data project.
<b>Building a Ghost Deck</b>	→ Create an issue tree and hypothesis driven structure → Create a "ghost deck" — a skeleton deck commonly used by management consultants to identify a client's needs.
<b>Limitations and Biases</b>	→ Identify potential limitations and sources of bias in your analyses. → Communicate the appropriate caveats of a recommendation.
<b>Delivering a Data Presentation</b>	→ Create an analyses roadmap that encompasses the analyses you plan to do. → Clearly articulate the "so what" of your analysis. → Communicate your data story to support a concise set of recommendations.

## PROJECT 3: Build a Data Story

In this project, you'll take the role of a data science consultant for a large production company and use the Movies Metadata dataset to provide insights on key takeaways for a specific problem statement. You'll create a ghost deck to with a problem statement, potential analyses, and a set of potential recommendations. Then you will identify the limitations and biases in data that affect the recommendations. You'll perform various analysis to understand and find insights from the dataset. Lastly, you'll put it all together by combining your ghost deck and your analyses to provide a final recommendation.

## COURSE 4: Advanced Data Storytelling

In this course, you'll learn advanced data visualization and storytelling techniques. You will learn about the various types of data stories and how to find and use them effectively. You'll learn to use Tableau Storypoint to add interactivity and other visual elements to a story. Then you'll learn to add animation and narration to your analyses with both Tableau Pages and Flourish.

## SUPPORTING LESSON CONTENT

Lesson Title	Learning Outcomes
<b>Eight Data Story Types</b>	<ul style="list-style-type: none"> <li>→ Identify the different data story types and how to find and use them to tell interesting data stories.</li> </ul>
<b>Creating Stories in Tableau</b>	<ul style="list-style-type: none"> <li>→ Add interactivity to data stories.</li> <li>→ Create an interactive data story in Tableau Storypoint.</li> </ul>
<b>Animating Data</b>	<ul style="list-style-type: none"> <li>→ Understand the use cases for animating data.</li> <li>→ Create an animated dashboard with Tableau Pages.</li> </ul>
<b>Animation and Narration</b>	<ul style="list-style-type: none"> <li>→ Add audio and narration to your data stories using Flourish.</li> <li>→ Create Flourish interactive stories.</li> </ul>

## PROJECT 4: Animate a Data Story

In this project, you will use a World Bank Indicators data file to create an interactive data presentation using indicators of your choice. You will choose the fields for various dimensions (e.g., country, year) and identify trends and patterns in the data set. In the final part of the project, you will create an animated data story and add an audio track to create a narrated finished product that you can add to your portfolio.