

Data Foundations Nanodegree Syllabus

Master data fundamentals applicable to any industry



Before You Start

Prerequisites: There are no prerequisites for this program. You should be comfortable navigating your computer, opening folders/files/applications, and performing operations like copy/paste.

Educational Objectives: Take your first step to becoming more data savvy in any industry.

Length of Program*: 130 Hours

Frequency of Classes: Self-paced with *strict project deadlines***

Textbooks required: None

Instructional Tools Available: Video lectures, weekly office hours, mentorship, Slack community

*This is a self-paced program and the length is an estimation of total hours the average student may take to complete all required coursework, including lecture and project time. Actual hours may vary.

**This program requires students to submit and pass projects by certain deadlines in order to graduate from the program. Please see the Project Deadlines section at the end of the syllabus.

Intro Project: Interpret a Data Visualization (10 hrs)

Due Week 1

In the lessons leading to your first project, you will

- Get to know your instructors.
- Learn how data is being applied in many industries.
- Learn the course structure: navigation, learning resources, deadlines, projects, and all the things that will help you be successful.

You will then get to work on your first project, where you will draw insights from interactive dashboards. A large part of working with data is being able to interpret data visualizations and explain your insights to others. This project will build your intuition on working with data dashboards, while also showing you the types of beautiful visualizations you will be able to produce by the end of this program!

Project: Analyze Survey Data (40 hrs)

Due Week 5

In this project, you will analyze a real dataset about current Udacity students across a number of programs. You will need to decide how to work with missing and incorrectly input data to best convey the characteristics of udacity students. You will use spreadsheets to analyze and summarize the data using statistics and data visualizations. You will then communicate your key findings as if to business leaders.

By the end of this project, you will be able to:

- Calculate summary statistics using Excel.
- Create data visualizations using Excel.
- Ask questions and answer them using data.
- Work with real world data that has missing and incorrectly input values.

Supporting Lesson Content

Lesson Title	Learning Outcomes
Descriptive Statistics I	<ul style="list-style-type: none">→ Learn data types, measures of center, and the basics of mathematical notation.
Descriptive Statistics II	<ul style="list-style-type: none">→ Learn a common visual method for quantitative data, measures of spread, and the difference between descriptive and inferential statistics.
Spreadsheets: Getting Started	<ul style="list-style-type: none">→ Learn basic navigation for any spreadsheets software.→ Learning cell referencing and menu shortcuts .
Spreadsheets: Manipulate Data	<ul style="list-style-type: none">→ Learn to sort and filter data.→ Learn to use text and math functions.→ Learn to split columns and remove duplicates.
Spreadsheets: Analyze Data	<ul style="list-style-type: none">→ Learn to use aggregation and conditional functions to summarize data.→ Learn to use pivot tables and lookup functions.
Spreadsheets: Visualize Data	<ul style="list-style-type: none">→ Learn to build data visualizations for quantitative and categorical data.→ Learn to build professional presentations.

Project: Analyze Digital Music Store Database (40 hrs)

Due Week 9

In this project, you will query a digital music store database which holds information regarding the store's media, employees, and customers. You will use the database to help the store gain an understanding of the types of music that are purchased, where customers live, and how the company might optimize their business practices.

By the end of this project, you will be able to:

- Write SQL to query a single table.
- Write SQL queries to query multiple tables.
- Ask a question that requires data from multiple places, join the data together, and answer the question.
- Install SQL on your own machine, upload a database, ask complex questions about the data in a database, and query the database to answer those questions.

Supporting Lesson Content

Lesson Title	Learning Outcomes
Basic SQL	→ Learn to write common SQL commands including SELECT, FROM, and WHERE, as well as corresponding logical operators.
SQL Joins	→ Learn to write JOINS in SQL, as you are now able to combine data from multiple sources to answer more complex business questions.
SQL Aggregations	→ Learn to write common aggregations in SQL including COUNT, SUM, MIN, and MAX. → Learn to write CASE and DATE functions, as well as work with NULLs.

Project: Build Data Dashboards (40 hrs)

Due Week 13

Sharing insights is an integral part of working with data. In this project, you'll build interactive dashboards with Tableau to tell stories from data. 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.

By the end of this project, you will be able to:

- Select the most appropriate data visualization for an analysis.
- Evaluate the effectiveness of a data visualization.
- Build interactive and engaging Tableau dashboards.

Supporting Lesson Content

Lesson Title	Learning Outcomes
Data Visualization Fundamentals	→ Learn to build good data visualizations, and what separates the good from the bad.
Design Principles	→ Learn to implement the best design practices, and to use the best charts for a particular situation.
Creating Visualizations in Tableau	→ Learn to use Tableau to build data visualizations. Including building data hierarchies, filters, groups and sets, and calculated fields. → Learn to build maps.
Telling Stories with Tableau	→ Learn the best practices for communicating the results of a Tableau dashboard.

Project Deadlines

We want students to progress together through the program to ensure the best student experience and increases students' chances of graduating. Based on data about how students learn, we know that having strict deadlines helps students stay committed and focused, increasing their chances of finishing the program. As a result, we've set up this program with project deadlines. When we use the term "deadline" with regards to in two ways.

Project Submission Deadline

This deadline refers to the first submission for each project. In order to graduate, you must submit your first submission for each project within one week of the due date. If you do not submit a project within this time frame in order to stay in the program. The one-week buffer for project submissions is to accommodate any technical difficulties or other obstacles to submitting projects on time.

Project Passing Deadline

This deadline refers to having a Udacity Reviewer mark your project as "Meets Specifications." In order to graduate, you have to pass each project within four weeks of the project submission deadline. If you do not submit a project within this time frame in order to stay in the program. The four-week buffer for passing a project is to accommodate any technical difficulties or other obstacles to submitting projects on time. Please note that you can submit your project as many times as you need to within the 4 week period.

Please note that you can submit your project as many times as you need to within the 4 week period. End of week is considered Sunday at 11:59pm PST.

Schedule

Lesson Title	Submit By Deadline	Pass By Deadline
Interpret a Data Visualization	→ End of week 1	→ End of week 5
Analyze Survey Data	→ End of week 5	→ End of week 9
Analyze Digital Music Store Database	→ End of week 9	→ End of week 13
Build Data Dashboards	→ End of week 13	→ End of week 17