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NANODEGREE PROGRAM SYLLABUS
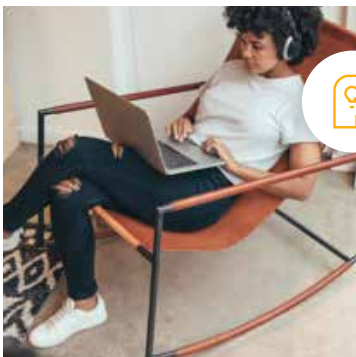
Data Visualization

Overview

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.

Estimated Time:
4 Months at
10hrs/week

Prerequisites:
Basic Data Analysis

Flexible Learning:
Self-paced, so
you can learn on
the schedule that
works best for you

Need Help?
udacity.com/advisor
Discuss this program
with an enrollment
advisor.

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.

Course Project
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.

	LEARNING OUTCOMES	
LESSON ONE	**Data Visualization Fundamentals**	• Evaluate the quality of data visualizations and build high-quality visualizations.
LESSON TWO	**Design Principles**	• Implement the best design practices, and use the most appropriate chart for a particular situation
LESSON THREE	**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.
LESSON FOUR	**Telling Stories with Tableau**	• Build interactive Tableau dashboards. • Construct a data story using Tableau Storypoint

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.

Course Project Design a Dashboard, Part 1	In this project, you'll build a prototype of a dashboard for a specific audience with sketches and wireframes. The purpose of this project is to go through the prototyping and wireframing stage of dashboard design. This will include exploring and understanding the data, and developing prototypes. You will create a proof of concept dashboard to explore the data in multiple ways.
Course Project Design a Dashboard, Part 2	In this project, you'll transform the prototype into a final design of the dashboard for the specific audience. The design will be defined by the audience's graphicacy, data literacy, domain expertise, user type, business 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.

	LEARNING OUTCOMES	
LESSON ONE	**Planning Phase**	• Uncover and understand user needs for a dashboard project. • Determine the level of the audience's graphicacy. • Identify measurable key metrics.
LESSON TWO	**Design Phase**	• Design a dashboard using sketching and wireframing. • Build a simple dashboard prototype.
LESSON THREE	**Prototyping & Feedback**	• Gather feedback from dashboard users. • Iterate on the prototype and complete a finished dashboard

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.

Course Project
Build a Data Story, Part 1

In this mid-term project, you'll take the role of a data science consultant for a large production company and use the Movies Metadata dataset. The goal will be to apply the skills in structuring a data story and to practice defining your own problem statement and the analyses you plan to do. The goal of this project is to define your own problem statement and the flow of a powerful data story. You'll create a ghost deck with the problem statement, potential analyses, and a set of potential recommendations.

Course Project
Build a Data Story, Part 2

In this project, you'll continue to build on the mid-term project. Building on the ghost deck, you will perform various analyses to understand and find insights from the Movies Metadata. You will identify the limitations and biases in data that affect the recommendations. You will put it all together by building on your ghost deck, conducting the actual analysis, and creating a final presentation with final recommendations and an executive summary of key next steps.

	LEARNING OUTCOMES	
LESSON ONE	**Define Problem Statement**	• Clearly articulate and communicate a problem statement for a data project
LESSON TWO	**Building a Ghost Deck**	• 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.

LESSON THREE	**Limitations and Biases**	• Identify potential limitations and sources of bias in your analyses. • Communicate the appropriate caveats of a recommendation.
LESSON FOUR	**Delivering a Data Presentation**	• 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.

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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.

Course Project
Animate a Data Story,
Part 1

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. You will apply your skills of creating charts, graphs, maps, dashboards and story types in Tableau and create a coherent data story for your audience.

Course Project
Animate a Data Story,
Part 2

In this project, you will build on your mid-term project from the World Bank Indicators data file to create an animated data story. In this 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.

Capstone Project
Reviewing
MakeoverMonday
Dashboards

In the capstone project, you will write a blog to describe how you would improve an existing visualization.

You will have a choice of datasets to choose from, and you will write about your recommendations that would improve existing visuals were you to create a different dashboard, data presentation, or animated story.

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|	LEARNING OUTCOMES	
LESSON ONE	**Eight Data Story Types**	• Identify the different data story types and how to find and use them to tell interesting data stories.
LESSON TWO	**Creating Stories in Tableau**	• Add interactivity to data stories. • Create an interactive data story in Tableau Storypoint.
LESSON THREE	**Animating Data**	• Understand the use cases for animating data. Create an animated dashboard with Tableau Pages.
LESSON FOUR	**Animation and Narration**	• Add audio and narration to your data stories using Flourish. • Create Flourish interactive stories.

Our Classroom Experience
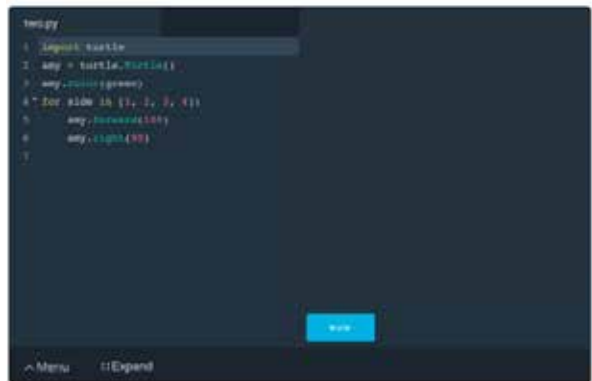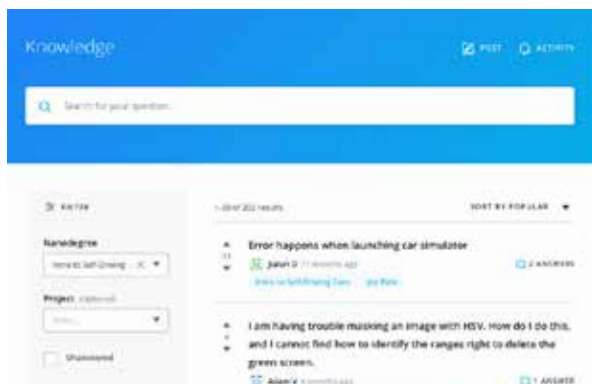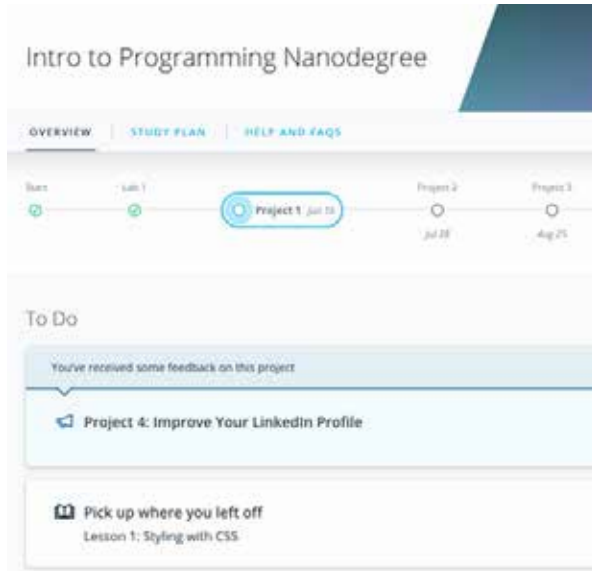
REAL-WORLD PROJECTS
Build your skills through industry-relevant projects. Get personalized feedback from our network of 900+ project reviewers. Our simple interface makes it easy to submit your projects as often as you need and receive unlimited feedback on your work.

KNOWLEDGE
Find answers to your questions with Knowledge, our proprietary wiki. Search questions asked by other students, connect with technical mentors, and discover in real-time how to solve the challenges that you encounter.

STUDENT HUB
Leverage the power of community through a simple, yet powerful chat interface built within the classroom. Use Student Hub to connect with fellow students in your program as you support and learn from each other.

WORKSPACES
See your code in action. Check the output and quality of your code by running them on workspaces that are a part of our classroom.

QUIZZES
Check your understanding of concepts learned in the program by answering simple and auto-graded quizzes. Easily go back to the lessons to brush up on concepts anytime you get an answer wrong.

CUSTOM STUDY PLANS
Preschedule your study times and save them to your personal calendar to create a custom study plan. Program regular reminders to keep track of your progress toward your goals and completion of your program.

PROGRESS TRACKER
Stay on track to complete your Nanodegree program with useful milestone reminders.

Learn with the Best

Mat Leonard

INSTRUCTIONAL DESIGNER
AT KAGGLE

Mat is a former physicist, research neuroscientist, and data scientist. He did his PhD and Postdoctoral Fellowship at the University of California, Berkeley.

Josh Bernhard

DATA SCIENTIST
AT NERD WALLET

Josh has been sharing his passion for data for nearly a decade at all levels of university, and as Lead Data Science Instructor at Galvanize. He's used data science for work ranging from cancer research to process automation.

Robert Crocker

DATA VISUALIZATION CONSULTANT
AT IBM

Robert is a Data Visualization consultant with over 7 years of experience leveraging Tableau at places such as First Republic Bank, Charles Schwab, and Pinterest. He now provides solutions to clients all over the world, providing training to professionals and executing projects onsite and remotely.

Malavica Sridhar

SENIOR PRODUCT MANAGER
AT CIRCLEUP

Malavica is a Senior Product Manager with over five years of experience. Her work includes building Helio, an ML platform used to identify breakout brands in early-stage consumer packaged goods companies.

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All Our Nanodegree Programs Include:

EXPERIENCED PROJECT REVIEWERS

REVIEWER SERVICES

- Personalized feedback & line by line code reviews
- 1600+ Reviewers with a 4.85/5 average rating
- 3 hour average project review turnaround time
- Unlimited submissions and feedback loops
- Practical tips and industry best practices
- Additional suggested resources to improve

TECHNICAL MENTOR SUPPORT

MENTORSHIP SERVICES

- Questions answered quickly by our team of technical mentors
- 1000+ Mentors with a 4.7/5 average rating
- Support for all your technical questions

PERSONAL CAREER SERVICES

CAREER SUPPORT

- Resume support
- Github portfolio review
- LinkedIn profile optimization

Frequently Asked Questions

PROGRAM OVERVIEW

WHY SHOULD I ENROLL?
Data analysis and communication are highly sought after skills. Recent **LinkedIn** research even pointed to data presentation as one of the top 10 most in-demand skills.

Udacity has collaborated with Tableau and highly skilled industry leaders to build this program. You'll get hands-on practice visualizing data and using them to clearly communicate data-driven recommendations.

By taking this course, you will combine hard skills in data analysis and visualization with soft skills in presentation, storytelling, and communication to create effective presentations.

WHAT JOBS WILL THIS PROGRAM PREPARE ME FOR?
This program is intended to supplement existing skills and is not meant to prepare you for a specific role. However, the skills you gain are appropriate for many fields including business, marketing, data analytics, executive leadership, and more.

HOW DO I KNOW IF THIS PROGRAM IS RIGHT FOR ME?
This program is intended for two types of students: business leaders and data professionals.

If you are a business leader looking to leverage data to communicate more effectively, this program is for you. You'll be able to make your case for a business goal using data to tell a story.

If you are a data analyst, data scientist, machine learning engineer, or other data professional, this program will help you communicate your findings more effectively. You'll be able to influence your business by showcasing and communicating the most important pieces of data.

ENROLLMENT AND ADMISSION

DO I NEED TO APPLY? WHAT ARE THE ADMISSION CRITERIA?
There is no application. This Nanodegree program accepts everyone, regardless of experience and specific background.

WHAT ARE THE PREREQUISITES FOR ENROLLMENT?
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,

FAQs Continued

standard deviation), and 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.

IF I DO NOT MEET THE REQUIREMENTS TO ENROLL, WHAT SHOULD I DO?
If you need to sharpen your pre-requisite skills, try the **Intro to Descriptive Statistics** course.

TUITION AND TERM OF PROGRAM

HOW IS THIS NANODEGREE PROGRAM STRUCTURED?
The Data Visualization Nanodegree program is comprised of content and curriculum to support four (4) projects. We estimate that students can complete the program in four (4) months working 10 hours per week.

Each project will be reviewed by the Udacity reviewer network. Feedback will be provided and if you do not pass the project, you will be asked to resubmit the project until it passes.

HOW LONG IS THIS NANODEGREE PROGRAM?
Access to this Nanodegree program runs for the length of time specified in the payment card above. If you do not graduate within that time period, you will continue learning with month to month payments. See the **Terms of Use** and **FAQs** for other policies regarding the terms of access to our Nanodegree programs.

SOFTWARE AND HARDWARE

WHAT SOFTWARE AND VERSIONS WILL I NEED IN THIS PROGRAM?
There are no specific hardware or software requirements for this program, other than access to the internet and a 64-bit computer.

FAQs Continued

TUITION AND TERM OF PROGRAM

HOW IS THIS NANODEGREE PROGRAM STRUCTURED?
The Full Stack Web Developer Nanodegree program includes content and curriculum to support 5 (five) projects. We estimate that most students can complete the program in four (4) months working 5-10 hours per week.

Each project will be reviewed by the Udacity reviewer network. Feedback will be provided and if you do not pass the project, you will be asked to resubmit the project until it passes.

HOW LONG IS THIS NANODEGREE PROGRAM?
Access to this Nanodegree program runs for the length of time specified in the payment card above. If you do not graduate within that time period, you will continue learning with month to month payments. See the **Terms of Use** and **FAQs** for other policies regarding the terms of access to our Nanodegree programs.

SOFTWARE AND HARDWARE

WHAT SOFTWARE AND VERSIONS WILL I NEED IN THIS PROGRAM?
For this program, you will need a computer with a broadband internet connection, capable of hardware. Note: Most consumer computers on the market today meet these requirements. You will need administrative access to be able to install software on your computer. This program uses Python 3.7, PostgreSQL 11, SQLAlchemy, Flask 1.0, Docker and various Python packages. Students will need to be able to communicate fluently and professionally in written and spoken English.