UDACITY
FOR ENTERPRISE

THE SCHOOL OF DATA SCIENCE

Data Visualization

NANODEGREE SYLLABUS

Data Visualization Nanodegree Syllabus

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.

Program Information

TIME
4 months
Study 10 hours/week

LEVEL
Foundational

PREREQUISITES
Understanding of descriptive statistics, such as calculating measures of center (mean, median, mode), measures of spread (variance,standard deviation), and data distributions (normal distribution, skewness). Familiarity with analyzing data in spreadsheets (Excel, Google Sheets, etc.).
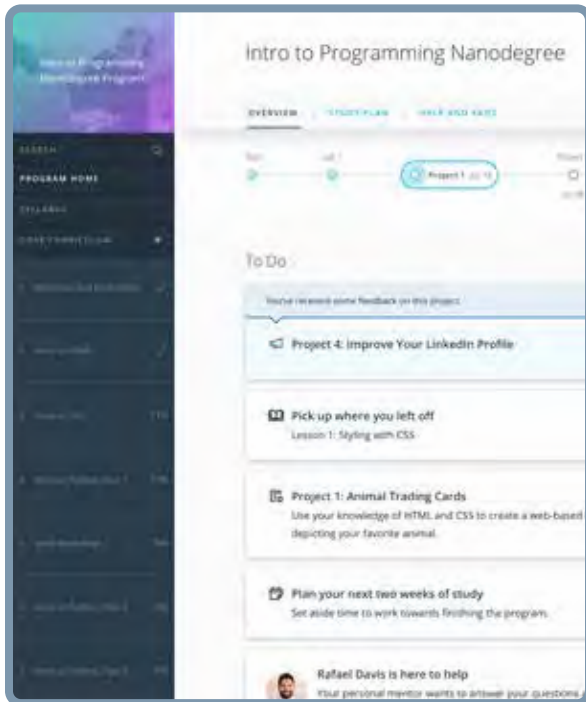
HARDWARE/SOFTWARE REQUIRED
Access to the internet and a 64-bit computer.

LEARN MORE ABOUT THIS NANODEGREE
Contact us at enterpriseNDs@udacity.com.

Our Classroom Experience

REAL-WORLD PROJECTS
Learners build new skills through industry-relevant projects and receive personalized feedback from our network of 900+ project reviewers. Our simple user interface makes it easy to submit projects as often as needed and receive unlimited feedback.

KNOWLEDGE
Answers to most questions can be found with Knowledge, our proprietary wiki. Learners can search questions asked by others and discover in real-time how to solve challenges.

LEARNER HUB
Learners leverage the power of community through a simple, yet powerful chat interface built within the classroom. Learner Hub connects learners with their technical mentor and fellow learners.

WORKSPACES
Learners can check the output and quality of their code by testing it on interactive workspaces that are integrated into the classroom.

QUIZZES
Understanding concepts learned during lessons is made simple with auto-graded quizzes. Learners can easily go back and brush up on concepts at anytime during the course.
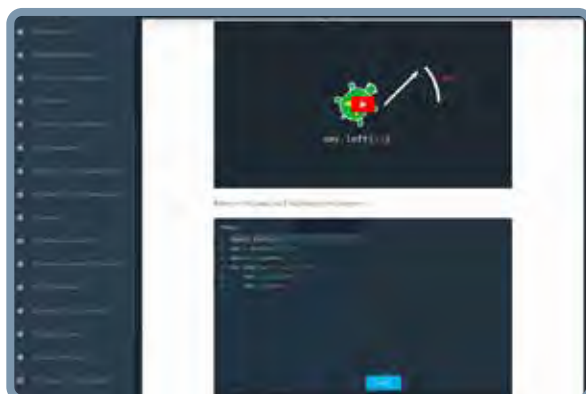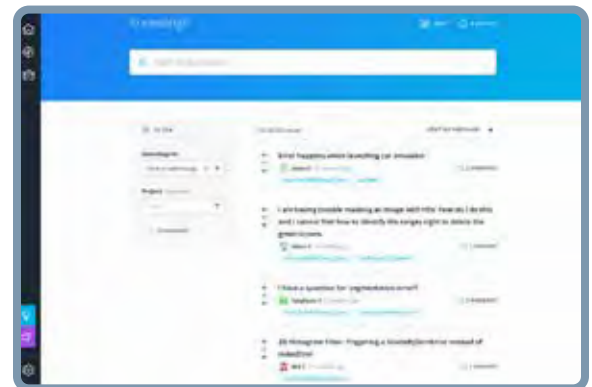
CUSTOM STUDY PLANS
Mentors create a custom study plan tailored to learners' needs. This plan keeps track of progress toward learner goals.

PROGRESS TRACKER
Personalized milestone reminders help learners stay on track and focused as they work to complete their Nanodegree program.

Learn with the Best

Mat Leonard
INSTRUCTIONAL DESIGNER AT KAGGLE

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

Josh Bernard
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.

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.

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.

Ben Jones
CEO OF DATALITERACY.COM

Ben Jones is the founder & CEO of Data Literacy, LLC, a training company that helps people learn the language of data. Ben teaches data visualization theory at the University of Washington, and he's the author of Communicating Data With Tableau (O'Reilly 2014).

Course 1: Intro to Data Visualization

This module will teach you 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.

| 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.

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.
TELLING STORIES WITH TABLEAU	· Build interactive Tableau dashboards. · Construct a data story using Tableau Storypoint.

Course 2: Dashboard Design

In this module, 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.

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.

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.

LESSON TITLE	LEARNING OUTCOMES
PLANNING PHASE	· Uncover and understand user needs for a dashboard project. · Determine the level of the audience's graphicacy. · Identify measurable key metrics.
DESIGN PHASE	· Design a dashboard using sketching and wireframing. · Build a simple dashboard prototype.
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 will learn how to define an effective problem statement, structure a data presentation, scope analyses, identify biases and limitations within your dataset, and pull together an end-to-end analysis. 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.

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.

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.

Course 3: Data Storytelling, cont.

LESSON TITLE	LEARNING OUTCOMES
DEFINE PROBLEM STATEMENT	· Clearly articulate and communicate a problem statement for a data project.
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.
LIMITATIONS AND BIASES	· Identify potential limitations and sources of bias in your analyses. · Communicate the appropriate caveats of a recommendation.
DELIVERING A DATA PRESENTATION	· Create an analysis 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.
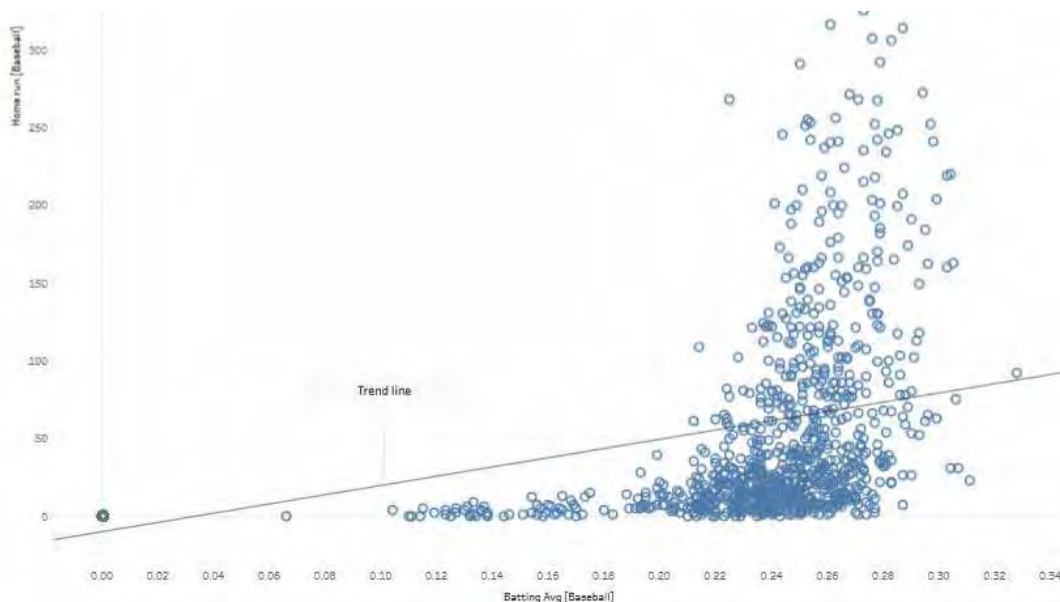
Course 4: Advanced Data Storytelling

In this module, 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.

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. 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.

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.

Course 4: Advanced Data Storytelling, cont.

LESSON TITLE	LEARNING OUTCOMES
EIGHT DATA STORY TYPES	· Learn to identify the different data story types and how to find and use them to tell interesting data stories.
CREATING STORIES IN TABLEAU	· Be able to add interactive data stories and create an interactive data story in Tableau Storypoint.
ANIMATING DATA	· Understand the use cases for animating data and create an animated dashboard with Tableau Pages.
ANIMATION AND NARRATION	· Add audio and narration to your data stories using Flourish. · Create Flourish interactive stories.

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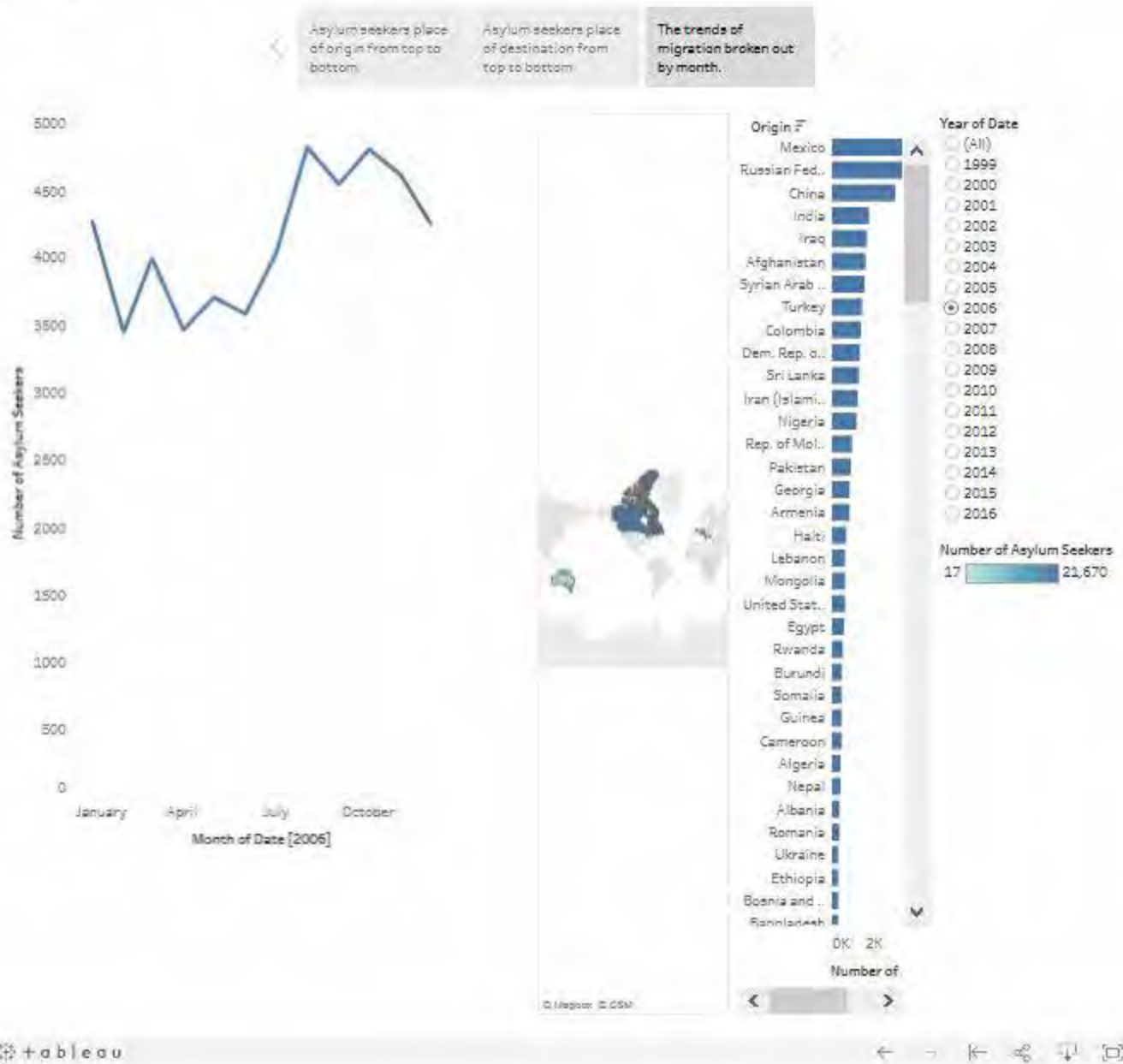
Screenshot of an actual learner-submitted project.

Our Nanodegree Programs Include:
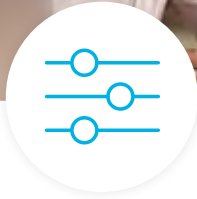
Pre-Assessments

Our in-depth workforce assessments identify your team's current level of knowledge in key areas. Results are used to generate custom learning paths designed to equip your workforce with the most applicable skill sets.

Dashboard & Progress Reports

Our interactive dashboard (enterprise management console) allows administrators to manage employee onboarding, track course progress, perform bulk enrollments and more.

Industry Validation & Reviews

Learners' progress and subject knowledge is tested and validated by industry experts and leaders from our advisory board. These in-depth reviews ensure your teams have achieved competency.

Real World Hands-on Projects

Through a series of rigorous, real-world projects, your employees learn and apply new techniques, analyze results, and produce actionable insights. Project portfolios demonstrate learners' growing proficiency and subject mastery.

Our Review Process

Real-life Reviewers for Real-life Projects

Real-world projects are at the core of our Nanodegree programs because hands-on learning is the best way to master a new skill. Receiving relevant feedback from an industry expert is a critical part of that learning process, and infinitely more useful than that from peers or automated grading systems. Udacity has a network of over 900 experienced project reviewers who provide personalized and timely feedback to help all learners succeed.

Vaibhav
UDACITY LEARNER

"I never felt overwhelmed while pursuing the Nanodegree program due to the valuable support of the reviewers, and now I am more confident in converting my ideas to reality."

now at
CODING VISIONS INFOTECH

All learners benefit from:

Line-by-line feedback for coding projects

Industry tips and best practices

Advice on additional resources to research

Unlimited submissions and feedback loops

How it Works

Real-world projects are integrated within the classroom experience, making for a seamless review process flow.

- Go through the lessons and work on the projects that follow
- Get help from your technical mentor, if needed
- Submit your project work
- Receive personalized feedback from the reviewer
- If the submission is not satisfactory, resubmit your project
- Continue submitting and receiving feedback from the reviewer until you successfully complete your project

About our Project Reviewers

Our expert project reviewers are evaluated against the highest standards and graded based on learners' progress. Here's how they measure up to ensure your success.

900+
Expert Project Reviewers
Are hand-picked to provide detailed feedback on your project submissions.

1.8M
Projects Reviewed
Our reviewers have extensive experience in guiding learners through their course projects.

3
Hours Average Turnaround
You can resubmit your project on the same day for additional feedback.

4.85 /5
Average Reviewer Rating
Our learners love the quality of the feedback they receive from our experienced reviewers.

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