UDACITY
FOR ENTERPRISE

THE SCHOOL OF BUSINESS

# Predictive Analytics for Business

NANODEGREE SYLLABUS

# Overview

## This Nanodegree is Built in Partnership With

alteryx

+ableau

The Predictive Analytics for Business Nanodegree program is designed to teach learners to master a scientific approach to solving problems with data and apply predictive analytics and business intelligence to solve real-world problems.

You'll build fluency in two leading software packages: Alteryx, a tool that enables you to prepare, blend, and analyze data quickly; and Tableau, a powerful data visualization tool.

Over the course of the program, you'll learn to:

- Create mental models to clearly define business issues.
- Visualize and prepare data to improve efficacy of predictive models.
- Identify and implement a variety of predictive modeling techniques.

The Predictive Analytics Nanodegree program is comprised of content and curriculum to support five (5) projects. We estimate that learners can complete the program in three (3) months working 10 hours per week.

## Program Information

**TIME**
3 months
Study 10 hours/week

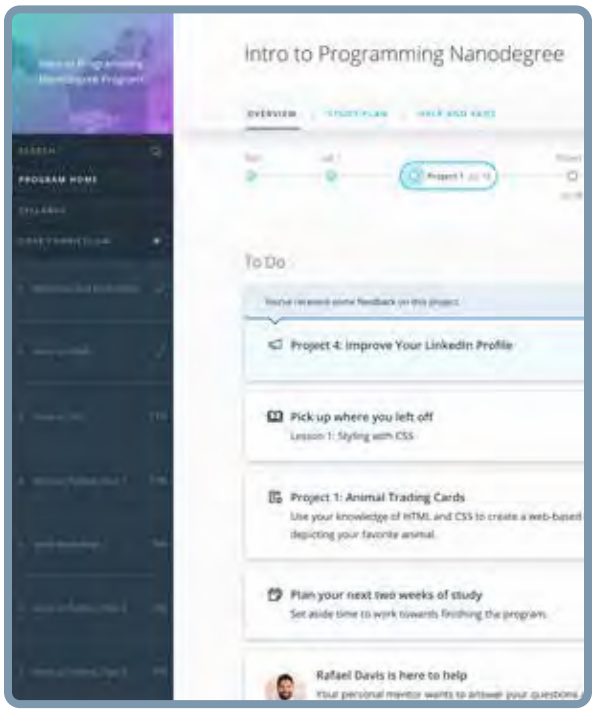
**LEVEL**
Practitioner

**PREREQUISITES**
Basic statistics and math knowledge, including familiarity with descriptive and inferential statistics. Learners should also be familiar with basic algebra in order to understand the mathematical models that will be presented in this program.

**HARDWARE/SOFTWARE REQUIRED**
Access to the Internet, and a 64 bit computer. Additional software such as Python and its common data analysis libraries (e.g., Numpy and Pandas) will be required, but the program will guide students on how to download once the course has begun.

**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

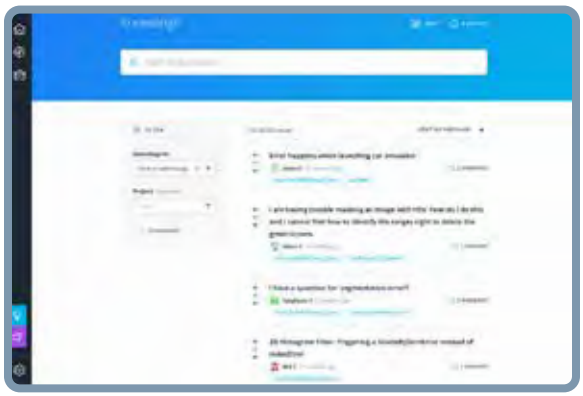
Learners leverage the power of community through a simple, yet powerful chat interface built within the classroom. Learner Hub connects learners with their technical mentor and fellow learners.

## 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

## Patrick Nussbaumer

INSTRUCTOR

Patrick Nussbaumer is Technical Activation Director at Alteryx, Inc. Prior to Alteryx, Patrick has spent the past 20 years in a variety of roles focused on data analysis, telecommunications, and financial services industries.

## Ben Burkholder

INSTRUCTOR

Ben Burkholder is a senior solution engineer at Alteryx, Inc. In this role he works extensively with clients to help develop plans to solve complex business problems around data preparation, geospatial analysis, and predictive analytics.

## Maureen Wolfson

INSTRUCTOR

Maureen Wolfson is a Solution Engineer at Alteryx, Inc. She has more than 20 years of data analysis expertise specializing in data, customer and geospatial analysis.

## Rod Light

INSTRUCTOR

Rod Light is a Solutions Engineer Practice Lead at Alteryx, where he helps customers and prospects design data analytics solutions for their businesses using Alteryx.

## Tony Moses

INSTRUCTOR

Tony Moses is a Solutions Engineer at Alteryx, Inc. He works with customers to help develop plans to solve complex business problems around data preparation, geospatial analysis and predictive analytics.

# Course 1: Problem Solving with Advanced Analytics

In this course, we give you a framework to help you organize and plan your analytical approach. We also introduce both simple Linear Regression and Multiple Linear Regression.

## Project: Predict Sales for a Catalog Launch

A home goods manufacturer wants to predict expected profits from a catalog launch. You will apply a framework to work through the problem and build a linear regression model to provide results and a recommendation.

| LESSON TITLE | LEARNING OUTCOME |
|---|---|
| THE PROBLEM SOLVING FRAMEWORK | • Learn a structured framework for solving problems with advanced analytics. |
| SELECTING AN ANALYTICAL METHODOLOGY | • Select the most appropriate analytical methodology based on the context of the business problem. |
| LINEAR REGRESSION | • Build, validate, and apply linear regression models to solve a business problem. |

# Course 2: Data Wrangling

Data Wrangling is at the core of all data activity. In this course you learn how to work with different data types, dirty data, and outliers. You will also learn how to reformat data and join data from different sources together.

## Project: Create an Analytical Dataset

A pet store chain is selecting the location for its next store. You will use data preparation techniques to build a robust analytic dataset and use it to build a predictive model to select the best location.

| LESSON TITLE | LEARNING OUTCOME |
|---|---|
| UNDERSTANDING DATA | • Understand the most common data types. Understand the various sources of data. |
| DATA ISSUES | • Identify common types of dirty data. Make adjustments to dirty data to prepare a dataset. Identify and adjust for outliers. |
| DATA FORMATTING | • Summarize, cross-tabulate, transpose, and reformat data to prepare a dataset for analysis. |
| DATA BLENDING | • Join and union data from different sources and formats. |


# Course 3: Classification Models

Classification models are a powerful tool for business analyst. In this course, you learn more about binary and non-binary classification models and how to use them to drive business insights.

## Project: Predict Loan Default Risk

A bank recently received an influx of loan applications. You will build and apply a classification model to provide a recommendation on which loan applicants the bank should lend to.

| LESSON TITLE | LEARNING OUTCOME |
|---|---|
| CLASSIFICATION PROBLEMS | • Understand the fundamentals of classification modeling and how it differs from modeling numeric data. |
| BINARY CLASSIFICATION MODELS | • Build logistic regression and decision tree models. Use stepwise to automate predictor variables selection. Score and compare models and interpret the results. |
| NON-BINARY CLASSIFICATION MODELS | • Build and compare forest and boosted models and interpret their results. Score and compare models and interpret the results. |

# Course 4: A/B Testing

Helping businesses make the best decisions is an essential part of Business Analysis. Planning and executing the analysis of an AB test allow you to provide confident recommendations. In this course, you learn how to create, execute, and analyze an AB test.

## Project: A/B Test a Menu Launch

A chain of coffee shops is considering launching a new menu. You will design and analyze an A/B test and write up a recommendation on whether the chain should introduce the new menu.

| LESSON TITLE | LEARNING OUTCOME |
|---|---|
| **A/B TESTING FUNDAMENTALS** | • Understand the fundamentals of A/B testing, including selecting target and control units and variables and the duration of a test. |
| RANDOMIZED DESIGN TESTS | • Select test and control variables and understand the importance of sample size.<br>• Design a randomized design A/B test and analyze the results. |
| **MATCHED PAIR DESIGN TESTS** | • Match test units to control units. Design a matched pair design A/B test and analyze the results. |
| **MATCHED PAIR PRACTICE** | • Use trend and seasonality as control variables for a matched pair design A/B test. |

# Course 5: Time Series Forecasting

Time Series Forecasting is a powerful analytical tool. In this course, you learn how ETS and ARIMA models are used to forecast data and how they deal with trends and seasonality. These skills will be evaluated in the final project.

## Project: Forecast Video Game Demand

A video game producer is planning production levels. You will use time series forecasting models to forecast monthly demand and provide a recommendation to help match supply to demand.

| LESSON TITLE | LEARNING OUTCOME |
|---|---|
| FUNDAMENTALS OF TIME SERIES FORECASTING | • Understand trend, seasonal, and cyclical behavior of time series data. |
| ETS MODELS | • Use time series decomposition plots.<br>• Build out an ETS model in Alteryx. |
| ARIMA MODELS | • Stationarize data through differencing, a process that prepares data for ARIMA modeling.<br>• Build out an ARIMA model in Alteryx. |
| ANALYZING AND VISUALIZING RESULTS | • Use holdout samples to compare models and select the best one for a business problem.<br>• Visualize your forecasts through various plots. |

# Course 6: Segmentation and Clustering

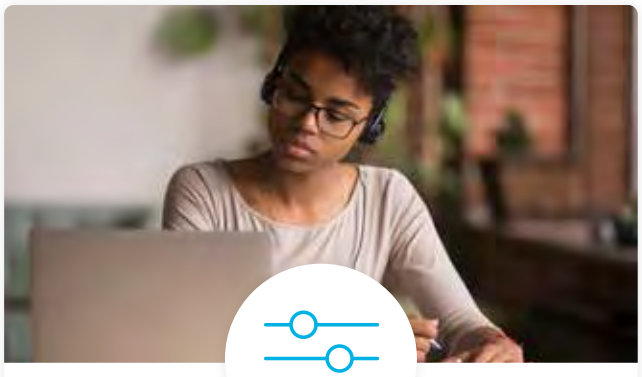
Segmentation and Clustering are effective methods for finding patterns in your data. In this course, you learn how to prepare data to be clustered appropriately and interpret results.

## Project: Combine Predictive Techniques

A grocery store chain is planning a significant expansion. You will use multiple analytical techniques to provide recommendations on how to expand. After completing the project, you will feel comfortable combining predictive techniques and delivering results to complex business problems.

| LESSON TITLE | LEARNING OUTCOME |
|---|---|
| **SEGMENTATION FUNDAMENTALS** | • Understand the difference between localization, standardization, and segmentation. |
| **PREPARING DATA FOR CLUSTERING** | • Scale data to prepare a dataset for cluster modeling. Select variables to include based on the business context. |
| **VARIABLE REDUCTION** | • Use principal components analysis (PCA) to reduce the number of variables for cluster model. |
| CLUSTERING MODELS | • Select the appropriate number of clusters. Build and apply a k-centroid cluster model. |
| VALIDATING AND APPLYING CLUSTERS | • Validate the results of a cluster model. Visualize and communicate the results of a cluster model. |
| CREATING VISUALIZATION WITH TABLEAU | • Become proficient in basic Tableau functionality, including charts, filters, hierarchies, etc. Create calculated fields in Tableau. |

# 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**

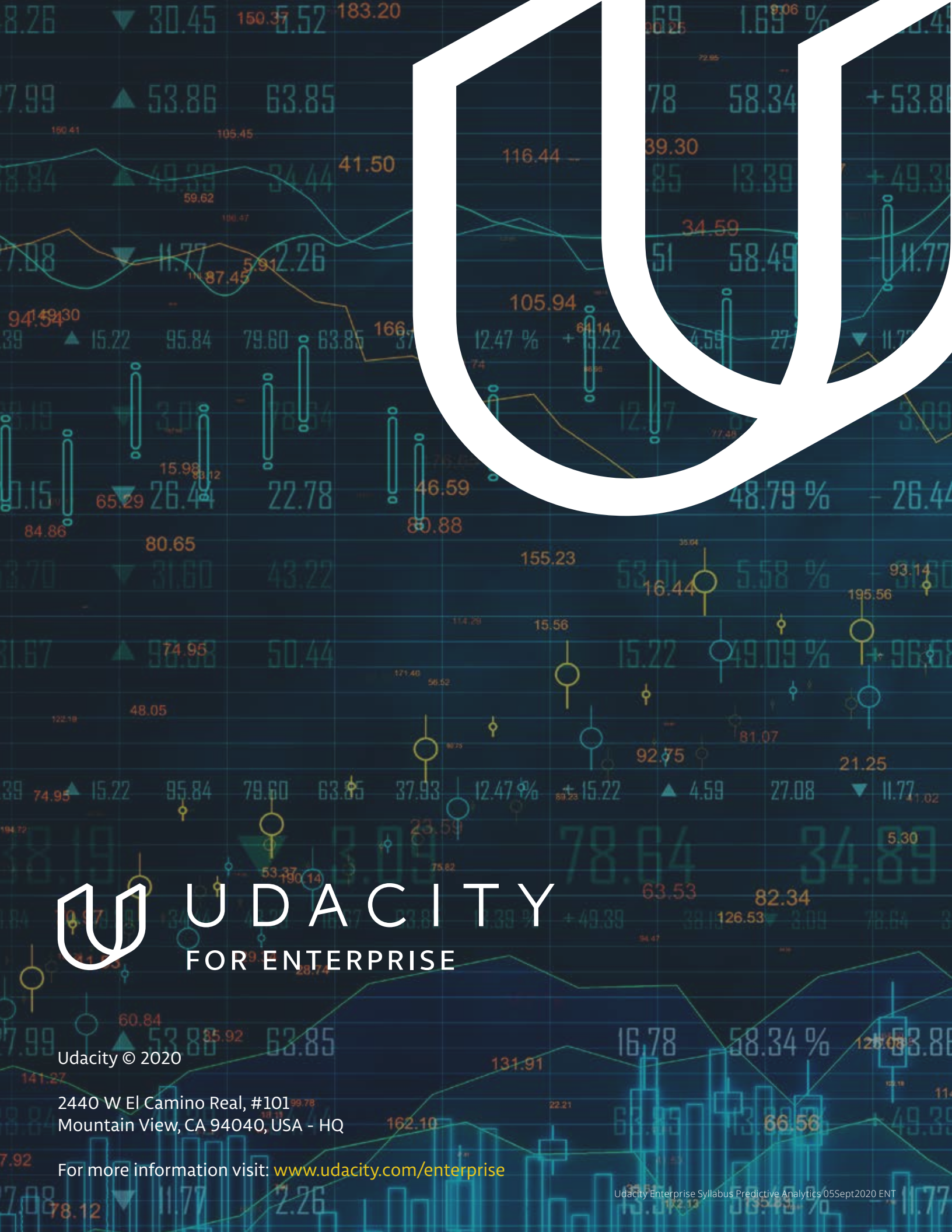
### Hours Average Turnaround

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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For more information visit: www.udacity.com/enterprise