

Nanodegree Program Portfolio

Data Science

○○● FOUNDATIONAL

- Programming for Data Science with Python
- Programming for Data Science with R
- Business Analytics

○●● PRACTITIONER

- Data Visualization
- Predictive Analytics for Business
- Data Analyst
- Data Engineer
- Data Streaming

●●● SPECIALIST

- Data Scientist

Artificial Intelligence

○○● FOUNDATIONAL

- Intro to Machine Learning
- AI Programming with Python

○●● PRACTITIONER

- Data Structures and Algorithms
- Deep Learning
- AI Product Manager

●●● SPECIALIST

- Computer Vision
- Machine Learning Engineering
- AI for Trading
- Natural Language Processing
- Deep Reinforcement Learning
- Artificial Intelligence
- AI for Healthcare

Programming & Development

○○● FOUNDATIONAL

- Intro to Programming
- Android Basics
- SQL
- Introduction to Cybersecurity

○●● PRACTITIONER

- Front End Web Developer
- React Developer
- Full Stack Web Developer
- Java Developer

●●● SPECIALIST

- iOS Developer
- Blockchain Developer
- Android Developer

Autonomous Systems

○○● FOUNDATIONAL

- Intro to Self Driving Cars

●●● SPECIALIST

- Self Driving Car Engineer
- Sensor Fusion
- C++
- Robotics Software Engineering

Business

○○● FOUNDATIONAL

- Digital Marketing
- Product Manager

○●● PRACTITIONER

- Marketing Analytics
- Business Analytics
- UX Designer
- AI Product Manager

Cloud

●●● SPECIALIST

- Cloud Developer
- Cloud DevOps Engineer
- Cloud Architect AWS
- DevOps Engineer for Microsoft Azure

Executive Program

○○● FOUNDATIONAL

- AI for Business Leaders



UDACITY
FOR ENTERPRISE

School of Data

Programming for Data Science with Python...Foundational

General Information

In this program, learners will understand how to manipulate large datasets, perform version control, and access modern databases. Specifically, we will focus on:

- Coding in Python
- Exploratory data analysis
- Version control & Github

Project Examples

Investigate a Database – Work with a relational database - specifically PostgreSQL. Complete the entire data analysis process, starting by posing a question, running appropriate SQL queries to answer a question, and finishing by sharing the findings.

Explore US Bikeshare Data – Use Python to answer analytical questions about bikeshare trip data collected from three US cities. Write code to collect the data, compute descriptive statistics, and create an interactive experience in the terminal that presents the answers to a question.

Post your work on GitHub – Learn version control by using github from the terminal. Post two different versions of a Jupyter Notebook capturing your learnings from the course, and add commits to the project Git repository.

Outcome

Upon course completion learners will have obtained knowledge of the most valuable programming tools and languages used by data scientists today.



Time
3 Months
Study 10 hrs/week



Prerequisites
None



Built in partnership with
Mode



Software needed
None



Difficulty
Foundational



Interested in this program?
[Learn more here](#)

Programming for Data Science with R...Foundational

General Information

In this program, learners will understand how to manipulate large datasets, perform version control, and access modern databases. Specifically, we will focus on:

- Coding in R and SQL
- Version control & Github
- Exploratory data analysis

Project Examples

Investigate a Database – Work with a relational database - specifically PostgreSQL. Complete the entire data analysis process, starting by posing a question, running appropriate SQL queries to answer a question, and finishing by sharing the findings.

Explore US Bikeshare Data – Use R to answer analytical questions about bikeshare trip data collected from three US cities. Write code to collect the data, compute descriptive statistics, and create an interactive experience in the terminal that presents the answers to a question.

Post your work on GitHub – Learn version control by using github from the terminal. Post two different versions of a Jupyter Notebook capturing learnings from the course, and add commits to the project Git repository.

Outcome

Upon course completion learners will have obtained knowledge of the most valuable programming tools and languages used by data scientists today.



Time

3 Months
Study 10 hrs/week



Prerequisites

None



Built in partnership with

Mode



Software needed

None



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Business Analytics...Foundational

General Information

In this program, learners will become experts in the basics of data analysis for business. Specifically, we will focus on:

- Data analysis skills and tools
- How to use Excel, SQL, and Tableau to manipulate, analyze, and visualize data
- Make better, data-informed decisions

Project Examples

Query a Digital Music Store Database – Query a digital music store database which holds information regarding the store's media, employees, and customers. Use the database to help the store gain an understanding of the types of music purchased, where customers live, and how the company might optimize their business practices.

Analyze Survey Data – Use statistics and Excel to summarize the results of a survey sent to Udacity Nanodegree program alumni. Clean the data, adjust for common data issues, use statistics and visualizations to explore the data, and highlight findings using data visualizations.

Build Data Dashboards – Build interactive dashboards with Tableau and use them to discover and communicate insights from data. 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.

Outcome

Upon course completion learners gain foundational data analysis skills that enable them to implement effective data-driven solutions.



Time

3 Months
Study 10 hrs/week



Prerequisites

None



Built in partnership with

Tableau & Mode



Software needed

Tableau - license included,
Microsoft Excel



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Data Visualization...Foundational

General Information

The Data Visualization Nanodegree teaches learners to create impactful dashboards and presentations with data. Specifically, we will focus on:

- Dashboard Design
- Data Storytelling
- Advanced Data Storytelling

Project Examples

Design & Build a Dashboard – Design a dashboard for a specific audience. Use appropriate data for the decisions being made and add design elements to draw the user's eye to points of interest.

Build a Data Story – Create a ghost deck, potential analyses and a set of potential recommendations. Identify limits, biases and perform various analyses to provide a final recommendation.

Animate a Data Story – Use a World Bank Indicators data file to create an interactive data presentation using indicators of your choice.

Outcome

Upon course completion learners can learn to improve their data derived recommendations and visualize them in impactful presentations.



Time

4 Months
Study 10 hrs/week



Prerequisites

None



Built in partnership with

Tableau



Software needed

None



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Predictive Analytics for Business...Practitioner

General Information

In this program, learners will become experts in the main components of Predictive Analytics for Business. Specifically, we will focus on:

- Alteryx
- Tableau
- Predictive models to solve business problems

Project Examples

A/B Test a Menu Launch – A chain of coffee shops is considering launching a new menu. Design and analyze an A/B test and write a recommendation on whether to introduce the new menu.

Predict Loan Default Risk – A bank recently received an influx of loan applications. Build and apply a classification model to provide a recommendation on which loan applicants the bank should lend to.

Predict Sales for a Catalog Launch – A home-goods manufacturer wants to predict expected profits from a catalog launch. Apply a framework to work through the problem and build a linear regression model to provide results and a recommendation.

Outcome

Upon course completion learners will have the right analytical skills to implement a variety of predictive models to solve business problems.



Time

3 Months
Study 10 hrs/week



Prerequisites

Familiarity with SQL, descriptive statistics, algebra



Built in partnership with

Alteryx, Tableau



Software needed

Alteryx, Tableau



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Data Analyst...Practitioner

General Information

In this program, learners will become experts in the main components of analyzing data and communicating insights using powerful tools like Python and SQL.

Project Examples

Explore Weather Trends – Analyze local and global temperature data and compare the temperature trends between local and global temperatures.

Investigate a Dataset – Choose one of Udacity's curated datasets and investigate it using NumPy and Pandas. Go through the entire data analysis process, starting by posing a question and finishing by sharing final findings.

Analyze Experiment Results – With a dataset reflecting data collected from an experiment, use statistical techniques to answer questions about the data and report conclusions and recommendations in final report.

Communicate Data Findings – Use Python's data visualization tools to systematically explore a selected dataset for its properties and relationships between variables. Then, create a presentation that communicates the findings to others.

Outcome

Upon course completion learners will have the right skills to analyze data and communicate insights using powerful tools like Python and SQL.



Time

4 Months
Study 10 hrs/week



Prerequisites

Experience working with data in SQL and/or a spreadsheet tool, descriptive statistics



Built in partnership with

Kaggle & Mode



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Data Engineer...Practitioner

General Information

In this program, learners will design data models, build data warehouses and data lakes, automate data pipelines, and work with Big Data. Specifically, we will focus on:

- Data Modeling
- Cloud Data Warehouses
- Data Lakes with Spark
- Automate Data Pipelines

Project Examples

Data Modeling with Postgres and Apache Cassandra – Model user activity data for a music streaming app called Sparkify. Create a database and ETL pipeline, in both Postgres and Apache Cassandra, optimize queries to understand which songs users may be listening to.

Big Data with Spark – Build an ETL pipeline for a data lake. The data resides in S3, in a directory of JSON logs on user activity on the app, as well as a directory with JSON metadata on the songs in the app.

Data Pipelines with Airflow – Continue project work on the music streaming company's data infrastructure by creating and automating a set of data pipelines. Configure and schedule data pipelines with Airflow and monitor and debug production pipelines.

Outcome

- Create user-friendly relational and NoSQL data models
- Develop scalable and efficient data warehouses
- Identify the appropriate use cases for different big data technologies



Time

3 Months
Study 10 hrs/week



Prerequisites

Experience working with data in SQL and/or a spreadsheet tool, descriptive statistics



Built in partnership with
Insight



Software needed
None



Difficulty
Practitioner



Interested in this program?
[Learn more here](#)

Data Streaming...Specialist

General Information

The ultimate goal of the Data Streaming Nanodegree program is to provide learners with the latest skills to process data in real-time by building fluency in modern data engineering tools, such as Apache Spark, Kafka, Spark Streaming, and Kafka Streaming. A graduate of this program will be able to:

- Understand the components of data streaming systems.
- Ingest data in real-time using Apache Kafka and Spark and run analysis.
- Use the Faust Stream Processing Python library to build a real-time stream-based application.
- Compile real-time data and run live analytics, as well as draw insights from reports generated by the streaming console.
- Learn about the Kafka ecosystem, and the types of problems each solution is designed to solve.
- Use the Confluent Kafka Python library for simple topic management, production, and consumption.
- Explain the components of Spark Streaming (architecture and API), integrate Apache Spark Structured Streaming and Apache Kafka, manipulate data using Spark, and understand the statistical report generated by the Structured Streaming console.

Project Examples

Optimize Chicago Bus and Train Availability Using Kafka – Build a stream processing application that shows the status of trains in real-time.

Analyze San Francisco Crime Rate with Apache Spark Streaming – Analyze a real-world dataset of the SF Crime Rate, extracted from kaggle, to provide statistical analysis using Apache Spark Structured Streaming.

Outcome

The projects will prepare learners to develop systems and applications capable of interpreting data in real-time, and position you for roles that require live data processing for functions including big data, cloud computing, web personalization, fraud detection, sensor monitoring, anomaly detection, supply chain maintenance, location-based services, and much more.



Time

2 Months
Study 5-10 hrs/week



Prerequisites

Intermediate SQL, Python, and experience with ETL



Software needed

None



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

Data Scientist...Specialist

General Information

The ultimate goal of the Data Scientist Nanodegree program is to learn the skills needed to perform well as a data scientist. Specifically, we will focus on:

- Supervised and unsupervised machine learning models
- Foundational knowledge in neural networks, deep learning, and PyTorch

Project Examples

Find Donors for CharityML – Evaluate and optimize several different supervised learners to determine which algorithm yields the highest donation amount per request for this fictional charity.

Create an Image Classifier – Implement an image classification application using a deep learning model on a dataset of images. Then use the trained model to classify new images.

Build Pipelines to Classify Messages with Figure Eight – Build a data pipeline to prepare the message data from major natural disasters around the world and categorize emergency text messages based on the needs communicated by the sender.

Outcome

Upon course completion learners will gain skills to run data pipelines, design experiments, build recommendation systems, and more.



Time

4 Months
Study 10 hrs/week



Prerequisites

Python, SQL & statistics



Built in partnership with

Bertelsmann, Figure Eight, IBM Watson, Insight, Kaggle, Starbucks



Software needed

None



Difficulty

Specialist



Interested in this program?

[Learn more here](#)



UDACITY
FOR ENTERPRISE

School of AI

Intro to Machine Learning with PyTorch...Practitioner

General Information

In this program, learners will better understand how to evaluate the business value of Machine Learning. Specifically, we will focus on:

- Supervised Learning
- Unsupervised Learning
- Deep Learning

Project Examples

Find Donors for CharityML – CharityML is a fictitious charity organization established to provide financial support for people eager to understand machine learning. Evaluate and optimize several different supervised learners to determine which algorithm that maximizes donation yield while minimizing the total number of letters being sent to ask for donations.

Create an Image Classifier – Implement an image classification application using a deep learning model on a dataset of images. Use the trained model to classify new images. This project uses PyTorch as the machine learning framework to build the neural network.

Create Customer Segments – Use unsupervised learning techniques to segment customers into distinct categories using various clustering techniques. This segmentation is used to help the business make more informed marketing and product decisions.

Outcome

Upon course completion learners will understand data cleaning and supervised models, as well as deep and unsupervised learning.



Time

3 Months
Study 10 hrs/week



Prerequisites

Intermediate Python programming knowledge and basic knowledge of probability and statistics



Built in partnership with

Kaggle & AWS



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Intro to Machine Learning with TensorFlow...Practitioner

General Information

In this program, learners will better understand how to evaluate the business value of Machine Learning. Specifically, we will focus on:

- Supervised Learning
- Unsupervised Learning
- Deep Learning

Project Examples

Find Donors for CharityML – CharityML is a fictitious charity organization established to provide financial support for people eager to understand machine learning. Evaluate and optimize several different supervised learners to determine which algorithm that maximizes donation yield while minimizing the total number of letters being sent to ask for donations.

Create an Image Classifier – Implement an image classification application using a deep learning model on a dataset of images. Use the trained model to classify new images. This project uses TensorFlow as the machine learning framework to build the neural network.

Create Customer Segments – Use unsupervised learning techniques to segment customers into distinct categories using various clustering techniques. This segmentation is used to help the business make more informed marketing and product decisions.

Outcome

Upon course completion learners will understand data cleaning and supervised models, as well as deep and unsupervised learning.



Time

3 Months
Study 10 hrs/week



Prerequisites

Intermediate Python programming knowledge and basic knowledge of probability and statistics



Built in partnership with

Kaggle & AWS



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

AI Programming with Python...Foundational

General Information

In this program, learners will better understand how to evaluate the business value of an AI product. Specifically, we will focus on:

- Introduction to Python
- Jupyter Notebooks, NumPy, Anaconda, Pandas, and Matplotlib
- Linear Algebra Essentials
- Calculus Essentials
- Neural Networks

Project Examples

Use a Pre-trained Image Classifier to Identify Dog Breeds – Test Python skills by working with three different pre-trained image classifiers. Write a script to identify different dog breeds.

Mini Projects – Use NumPy to mean normalize an ndarray and separate it into several smaller ndarrays. Use Pandas to plot and get statistics from stock data.

Create an Image Classifier – Create an image classifier application. Build a neural network and identify objects appearing in images, just as humans do.

Outcome

Upon course completion learners will be able to deploy machine learning models into production.



Time

3 Months
Study 10 hrs/week



Prerequisites

Basic algebra and programming knowledge



Software needed

None



Difficulty

Foundational



Interested in this program?
[Learn more here](#)

Data Structures and Algorithms...Practitioner

General Information

In this program, learners will gain comprehensive knowledge of data structures and algorithms by solving 100+ practice problems. Specifically, we will focus on:

- Data Structures
- Basic Algorithms
- Advanced Algorithms

Project Examples

Unscramble Computer Science Problems – Deconstruct a series of open-ended problems into smaller components (e.g, inputs, outputs, series of functions).

Show Me the Data Structures – Solve a series of open-ended practice problems such as LRU Cache, Private Blockchain, File Recursion, and many more.

Problems vs. Algorithms – A series of real-world open-ended problems, such as request routing for a web server, search-term auto-completion and Fibonacci heap.

Route Planner – Build a route-planning algorithm like the one used in Google Maps to calculate the shortest path between two points on a map. Select and implement appropriate data-structure to represent points on a map and then implement A* algorithm to find the shortest path.

Outcome

Upon course completion learners will be able to evaluate and assess different data structures and algorithms for any open ended problem and implement a solution based on design choice.



Time

4 Months
Study 10 hrs/week



Prerequisites

Python and basic algebra



Software needed

None



Difficulty

Practitioner



Interested in this program?
[Learn more here](#)

Deep Learning...Practitioner

General Information

In this program, learners will better understand how to evaluate the business value of an AI product. Specifically, we will focus on:

- Neural networks, convolutional networks, recurrent neural networks, and generative adversarial networks
- Deep reinforcement learning
- Keras and NumPy, & PyTorch

Project Examples

Build a Neural Network – Build and train neural networks from scratch to predict the number of bikeshare users on a given day.

Generate TV Scripts – Build a recurrent neural network on TensorFlow to process text. Use it to generate new episodes of TV shows, based on old scripts.

Generate Faces – Build a pair of Multi-Layer Neural Networks and make them compete against each other in order to generate realistic faces. Try training them on a set of celebrity faces, and see what new faces the computer comes out with.

Outcome

Upon course completion learners gain the next generation of Deep Learning skills that will help define a beneficial and profitable AI-powered future.



Time

4 Months
Study 10 hrs/week



Prerequisites

Basic algebra and programming knowledge



Software needed

Python 3 & related packages



Difficulty

Practitioner



Interested in this program?
[Learn more here](#)

AI Product Manager...Practitioner

General Information

In this program, learners will better understand how to evaluate the business value of an AI product. Specifically, we will focus on:

- Introduction to AI in Business
- Building a Model
- Creating a Dataset
- Measuring Impact and Updating Model

Project Examples

Create a Medical Image Annotation Data Set with Figure Eight – Create an annotated training data set on Figure Eight platform. Build a classification system that can help flag serious cases of pneumonia.

Build a Model with Google AutoML – Build models using automated machine learning, from data to results with no coding required. Implement a model with four different variants of data to evaluate how the data affects performance.

Capstone Project – Develop a business proposal for an AI product based on any use case. Develop the business case, define success metrics, scope the dataset and build a post-deployment monitoring plan.

Outcome

Upon course completion learners will have mastered how to scope and build a data set, train a model, and evaluate its business impact.



Time

2 Months
Study 10 hrs/week



Prerequisites

No experience required



Built in partnership with

Figure Eight



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

AI for Business Leaders...Practitioner

General Information

The rise of artificial intelligence in the past decade has transformed computer science and the workplace, causing businesses to rethink ways of integrating this emerging technology into their corporate strategy.

Understand the foundational technical knowledge of machine learning and develop a strategic framework to evaluate business applications of artificial intelligence across industries.

- Accuracy, Bias, and Ethics
- Stakeholder Influence
- The Math Behind the Magic
- Working with Data
- Machine Learning Techniques
- Patterns and Functions

Project Examples

Deliver an ML & AI Strategy – Business leaders need to develop and execute strategies that are equally organizationally transformative and technically feasible. In this project, you will formulate a cohesive AI strategy for either your own company or a predefined business scenario for an automotive manufacturer or news and telecommunications conglomerate.

Outcome

Business leaders and managers who are responsible for making strategic decisions regarding these technologies and want to equip themselves to evaluate and formulate proposals involving machine learning/artificial intelligence technologies to impact their business.



Time

2 Months
Study 5 hrs/week



Prerequisites

Basic Statistics & Algebra



Built in partnership with

BMW



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Computer Vision...Specialist

General Information

In this program, learners will combine current computer vision and deep learning techniques to power a variety of applications. Specifically, we will focus on:

- The underlying math and programming concepts that drive pattern recognition, object and image classification tasks, and object tracking systems
- Extracting information from any kind of image

Project Examples

Facial Keypoint Detection – Use image processing techniques and deep learning to recognize faces and facial keypoints, such as the location of the eyes and mouth on a face.

Automatic Image Captioning – Combine CNN and RNN knowledge to build a network that automatically produces captions, given an input image.

Landmark Detection & Tracking – Use sensor data to localize a robot and build a map of the environment with SLAM.

Outcome

Upon course completion learners can apply advanced computer vision skills, using a combination of Python, computer vision, and deep learning libraries.



Time

4 Months
Study 10 hrs/week



Prerequisites

Significant experience with Python, probability and statistics, deep learning architecture, differential math that drives backpropagation



Built in partnership with

Affectiva & NVIDIA



Software needed

64-bit version of Windows, Mac OSX or Linux, Anaconda, Python 3.5+ and supporting packages



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

Machine Learning Engineer...Specialist

General Information

In this program, learners will master necessary Machine Learning skills and understand how to deploy these algorithms to production. The focus will be on:

- Supervised Machine Learning
- Unsupervised Machine Learning
- Deep learning
- Reinforcement learning techniques

Project Examples

Build a Python Package: Write a Python package on your own using software engineering best practices for writing production level code. This project is optional and will not be graded.

Deploy a Sentiment Analysis Model: Using SageMaker, deploy your own PyTorch sentiment analysis model, which is trained to recognize the sentiment of movie reviews (positive or negative).

Plagiarism Detector: Engineer features that can help identify cases of plagiarism in text and deploy a trained plagiarism detection model using Amazon SageMaker.

Outcome

Upon course completion learners reap key concepts and techniques including deploying machine learning models into production.



Time

3 Months
Study 10 hrs/week



Prerequisites

Python programming, inferential statistics, probability, linear algebra and calculus



Built in partnership with

AWS & Kaggle



Software needed

Python 2.7/3.6, Anaconda 5.0.1, Jupyter Notebooks



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

Natural Language Processing...Specialist

General Information

In this program, learners will become experts in the main components of Natural Language Processing. Specifically, we will focus on:

- Speech recognition
- Machine translation
- Sentiment analysis
- How to code probabilistic and deep learning models and train them on real data

Project Examples

Part of Speech Tagging – Use several techniques, including table lookups, n-grams, and hidden Markov models, to tag parts of speech in sentences, and compare their performance.

Speech Recognizer – Build a deep neural network that functions as part of an end-to-end automatic speech recognition (ASR) pipeline. The model will convert raw audio into feature representations, which will then turn them into transcribed text.

Machine Translation – Build a deep neural network that functions as part of an end-to-end machine translation pipeline. Explore several recurrent neural network architectures and compare their performance.

Outcome

Upon course completion learners gain key skills to build applications involving written and spoken language.



Time

4 Months
Study 10 hrs/week



Prerequisites

Significant experience with Python, probability and statistics, deep learning architecture



Built in partnership with

IBM Watson & Amazon Alexa



Software needed

64-bit version of Windows, Mac OSX or Linux, Anaconda, Python 3.5+ and supporting packages



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

Deep Reinforcement Learning...Specialist

General Information

In this program, learners will learn the theory and practice driving recent advances in deep reinforcement learning. This program will cover the latest techniques used to create artificially intelligent agents. Specifically, we will focus on:

- Foundations of reinforcement learning
- Value-based methods and policy-based methods
- Multi-agent reinforcement learning

Project Examples

Navigation – Leverage neural networks to train an agent that learns intelligent behaviors from sensory data.

Continuous Control – Train a robotic arm to reach target locations, or train a four-legged virtual creature to walk.

Collaboration and Competition – Train a pair of agents to play tennis. For an extra challenge, train a team of agents to play soccer!

Outcome

Upon course completion learners develop deep reinforcement learning skills used to power amazing advances in AI.



Time

5 Months
Study 10 hrs/week



Prerequisites

Experience with Python, probability, machine learning and deep learning



Built in partnership with

Unity, NVIDIA, Deep Learning Institute



Software needed

64-bit version of Windows, Mac OSX or Linux, Anaconda, Python 3.5+ and supporting packages



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

Artificial Intelligence...Specialist

General Information

This program trains learners to write programs using the foundational Artificial Intelligence algorithms powering everything from NASA's Mars Rover to DeepMind's AlphaGo Zero. Specifically, we will focus on:

- Python
- Search and Optimization
- Logic and Planning
- Bayes Nets

Project Examples

Build a Sudoku Solver – Use constraint propagation, combined with basic search, to develop a program that can efficiently solve any Sudoku.

Build a Forward Planning Agent – Build a system that can use symbolic logic and search to develop an optimal plan for achieving a set of goals. Planning and scheduling systems power a wide variety of automation and logistics operations, aerospace applications, etc.

Part of Speech Tagging – Perform pattern recognition using a Hidden Markov Model (HMM) for speech tagging, a common pre-processing step in Natural Language Processing.

Outcome

Upon course completion learners can apply the domains of Artificial Intelligence to a wide range of applications and functions.



Time

4 Months
Study 10 hrs/week



Prerequisites

Prerequisites

Algebra, Calculus, Statistics, & Python



Built in partnership with

None



Software needed

64-bit version of Windows, Mac OSX or Linux, Anaconda, Python 3.5+ and supporting packages



Difficulty

Specialist



Interested in this program?

[Learn more here](#)



UDACITY
FOR ENTERPRISE

School of Programming

Intro to Programming...Foundational

General Information

In this program, learners will learn the foundational skills all programmers use to create mobile apps or web pages, or to analyze data. Specifically, we will focus on:

- HTML & CSS
- JavaScript
- Python

Project Examples

Animal Trading Cards – Create a trading card for a favorite animal. Utilize HTML knowledge to create the structure for the trading card. Use CSS styling to design the card.

Rock, Paper, Scissors – Create an interactive game in Python by using object-oriented programming to affirm key understanding of programming logic and functions and fundamental problem solving skills.

Pixel Art Maker – Build a single-page web app that allows users to draw pixel art on a customizable canvas

Outcome

Upon course completion learners will develop a strong foundation in fundamental programming concepts.



Time

4 Months
Study 10 hrs/week



Prerequisites

Basic algebra and programming knowledge



Software needed

Python 3, a code/text editor, a web browser, a command line editor



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Android Basics...Foundational

General Information

We built this curriculum with Google for aspiring Android developers who are new to programming to ensure learners receive real-world skills they need to start building apps.

Specifically, this program focuses on:

- Android Basics: user interface & user input
- How to show multiple screens, and add audio and images to an app

Project Examples

Scorekeeper App – Implement an app to track scores between two teams playing a game.

Quiz App – Design and implement a short quiz app about a familiar topic.

Musical Structure App – Architect the user experience and technical design of an app to play music for a user.

Tour Guide App – Create an app to guide a user around a city or location of your choice!

News App – Create a News feed app using an API that gives a user regularly-updated news from the internet related to a particular topic, person, or location. The presentation of the information and the topic can be personalized by the learner.

Outcome

Upon course completion learners will be prepared to build apps and accelerate their journey towards becoming a professional Android Developer.



Time

3 Months
Study 10 hrs/week



Prerequisites

None



Built in partnership with

Google



Software needed

None



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

SQL...Foundational

General Information

In this program, learners will learn the foundational skills all analysts use to query and organize information from databases. Specifically, we will focus on:

- Basic SQL queries and joins in order to query from single and multiple tables
- Advanced SQL like aggregations, subqueries, and temporary tables to make queries for large datasets
- Relational and non-relational databases for optimizing data storage and usage

Project Examples

Deforestation Exploration – You are a data analyst for a nonprofit organization that is on a mission to reduce deforestation. Assess data of regions around the world and prepare a report for leadership that informs data-driven decision.

Uddidit, A Social News Aggregator - You are working for a social news feed company which has been experiencing data issues that you need to investigate and fix. Investigate a poorly designed database and create a new, normalized database. Then, migrate old data into the newly created database to ensure that the company's information is retained in your changes.

Outcome

Learn the skills that entry-level data analysts, application developers, and business analysts need to query or work with databases to get information



Time

2 Months
Study 10 hrs/week



Prerequisites

Basic computer skills and basic understanding of data types (e.g., string, integer, etc.)



Software needed

Python 3, a code/text editor, a web browser, a command line editor



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Introduction to Cybersecurity...Foundational

General Information

The curriculum is designed for students to take a first step toward a career in cybersecurity. Specifically, this program focuses on:

- Evaluating, maintaining, and monitoring the security of computer systems
- Assessing threats, responding to incidents, and implementing security controls to reduce risk and meet security compliance goals

Project Examples

Securing a Business Network – Investigate and fix security issues on a Windows 10 client system as a way of demonstrating fundamental cybersecurity knowledge, skills, and abilities.

Monitoring & Securing Douglas Financials Inc. – Analyze Windows and Linux servers and report recommendations on OS hardening, compliance issues, encryption, and network security.

Navigating a Cybersecurity Incident – Identify type of threat actor involved, conduct scans to discover and test vulnerabilities, assess risk levels, and propose a remediation plan.

Outcome

Upon course completion learners will be able to evaluate specific security techniques used to administer a system that meets industry standards and core controls. They will also be able to apply control techniques to secure networks, operating systems, and applications, and conduct thread assessments and vulnerability scans to secure the assets of an organization.



Time

4 Months
Study 10 hrs/week



Prerequisites

Familiarity with basic principles of network connectivity and operating system fundamentals



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Data Structures and Algorithms...Practitioner

General Information

In this program, learners will gain comprehensive knowledge of data structures and algorithms by solving 100+ practice problems. Specifically, we will focus on:

- Data Structures
- Basic Algorithms
- Advanced Algorithms

Project Examples

Unscramble Computer Science Problems – Deconstruct a series of open-ended problems into smaller components (e.g. inputs, outputs, series of functions).

Show Me the Data Structures – Solve a series of open-ended practice problems such as LRU Cache, Private Blockchain, File Recursion, and many more.

Problems vs. Algorithms – A series of real-world open-ended problems, such as request routing for a web server, search-term auto-completion and Fibonacci heap.

Route Planner – Build a route-planning algorithm like the one used in Google Maps to calculate the shortest path between two points on a map. Select and implement appropriate data-structure to represent points on a map and then implement A* algorithm to find the shortest path.

Outcome

Upon course completion learners will be able to evaluate and assess different data structures and algorithms for any open ended problem and implement a solution based on design choice.



Time

4 Months
Study 10 hrs/week



Prerequisites

Python & basic algebra



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Data Engineer...Practitioner

General Information

In this program, learners will design data models, build data warehouses and data lakes, automate data pipelines, and work with Big Data. Specifically, we will focus on:

- Data Modeling
- Cloud Data Warehouses
- Data Lakes with Spark
- Automate Data Pipelines

Project Examples

Data Modeling with Postgres and Apache Cassandra – Model user activity data for a music streaming app called Sparkify. Create a database and ETL pipeline, in both Postgres and Apache Cassandra, optimize queries to understand which songs users may be listening to.

Big Data with Spark – Build an ETL pipeline for a data lake. The data resides in S3, in a directory of JSON logs on user activity on the app, as well as a directory with JSON metadata on the songs in the app.

Data Pipelines with Airflow – Continue project work on the music streaming company's data infrastructure by creating and automating a set of data pipelines. Configure and schedule data pipelines with Airflow and monitor and debug production pipelines.

Outcome

- Create user-friendly relational and NoSQL data models
- Create scalable and efficient data warehouses
- Identify the appropriate use cases for different big data technologies



Time

3 Months
Study 10 hrs/week



Prerequisites

Experience working with data in SQL and/or a spreadsheet tool, descriptive statistics



Built in partnership with
Insight



Software needed
None



Difficulty
Practitioner



Interested in this program?
[Learn more here](#)

Front End Web Developer v2.0...Practitioner

General Information

The goal of the Front End Web Developer Nanodegree program is to equip learners with the unique skills they need to build and develop a variety of websites and applications. A graduate of this Nanodegree program will be able to:

- Construct responsive websites using CSS, Flexbox and CSS Grid
- Develop interactive websites and UI (User Interface) applications using JavaScript and HTML
- Connect a web application to backend server data using JavaScript
- Automate application build and deployment using Webpack
- Improve offline performance of websites using Service Worker

Project Examples

Styled Blog Website – Create a multi-page blog website, using best practices for content and page styling with HTML and CSS.

Dynamic Landing Page for Marketing Content – Build a landing page that combines your skills with JavaScript, HTML, and CSS to update and control the page and create a dynamic user experience.

Weather Journal – Combine data from the OpenWeatherMap API and client side (browser) HTML forms to create a web app that records a weather journal for users.

Article Analysis Website – Build a web tool that allows users to run Natural Language Processing (NLP) on articles or blogs found on other websites.

Outcome

Upon course completion learners emerge ready to build HTML, CSS, and JavaScript components/pages and interact closely with back-end developers.



Time

4 Months
Study 10 hrs/week



Prerequisites

Basic HTML, CSS and JavaScript



Built in partnership with

AT&T, Google, GitHub



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

React Developer...Practitioner

General Information

In this Nanodegree program, learners will learn how to build declarative user interfaces for the web with React, and for iOS and Android with React Native. Specifically, we will focus on:

- React Fundamentals – build production-ready apps
- React & Redux – manage complicated state to build enterprise-level apps
- React Native – be able to develop React applications that run on both iOS and Android devices

Project Examples

MyReads: A Book Lending App – Create a React application from scratch and utilize React components to manage the user interface.

Would You Rather Web App – Build this dynamic application from scratch while combining the state management features of Redux and the component model of React.

Flashcards: A Mobile Application – Leverage React Native components, AsyncStorage, proper styling, and device APIs to create a fully dynamic mobile application.

Outcome

Upon course completion learners will be well-prepared to take advantage of dramatically increasing demand for developers with React skills.



Time

4 Months
Study 10 hrs/week



Prerequisites

Prior development experience building and deploying front-end applications with HTML, CSS, JavaScript, Git, GitHub, NPM



Built in partnership with

Tyler McGinnis



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Full Stack Web Developer v2.0...Practitioner

General Information

The goal of the Full Stack Web Developer Nanodegree program is to equip learners with the unique skills they need to build database-backed APIs and web applications. A graduate of this program will be able to:

- Design and build a database for a software application
- Create and deploy a database-backed web API (Application Programming Interface)
- Secure and manage user authentication and access control for an application
- Deploy a Flask-based web application to the cloud using Docker and Kubernetes

Project Examples

Design a Venue Booking Database – Build out the data models and database for an artist/venue booking application.

Trivia API – Use APIs to control and manage a web application using existing data models.

Coffee Shop Full Stack – Build the backend for a coffee shop application.

Deploy Your Flask App to Kubernetes Using EKS – Create a container for your Flask web app using Docker and deploy the container to a Kubernetes cluster using Amazon EKS.

Capstone Project – Combine all of the new skills you've learned and developed in this course to construct a database-backed web API with user access control.

Outcome

Learners will be able to design and build databases for software applications, create and deploy database-backed web APIs, and secure and manage user authentication and access control for an application backend.



Time

4 Months
Study 10 hrs/week



Prerequisites

HTML, CSS, and JavaScript



Built in partnership with

AT&T, Google, GitHub, AWS



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Java Web Developer...Practitioner

General Information

The curriculum is designed to equip students with the unique skills they need to build enterprise-scale applications with Java. Specifically, this program focuses on:

- Fundamentals of the Spring Boot framework and associated integrations and plugins
- Building applications that read/write to relational databases using JPA and SQL
- Git, version control, and Jenkins to build CI/CD pipelines to deploy code to production

Project Examples

Web-based Personal Storage Application – Implement user-facing features like file, note, and secure credential storage with industry-standard, full-stack development tools.

Build the Backend System for a Car Website – Use Java APIs and frameworks to integrate different services using different communication styles

Design the Data Model for a Saas Application – Design and implement data model for an application that provides a scheduling interface for small businesses that take care of animals

Outcome

Upon course completion learners will be able to program in the de-facto language for building enterprise-scale applications and will have developed a solid foundation as a Java Web developer.



Time

4 Months
Study 10 hrs/week



Prerequisites

Intermediate knowledge of Java



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Intermediate JavaScript...Practitioner

General Information

The curriculum is designed to prepare students for roles in web development, server-side application development, and desktop development that require a more advanced set of JavaScript skills. Specifically, this program focuses on:

- Using object-oriented JavaScript to build classes to construct objects that encapsulate data and functionality
- Reading, writing, and thinking in asynchronous patterns

Project Examples

Create a User-Generated Infographic – Build an infographic creating and modifying objects from provided data and user input data.

Create a Mars Rover Dashboard – Build a dashboard for the past and current NASA Mars rovers, information about each mission and images from their excursions.

Build a UdaciRacer Simulation Game – Complete a partially built single player racing game by combining callbacks, Promises and Async/await syntax to complete TODOs marked in the code.

Outcome

Upon course completion learners will develop a solid foundation in web development, server-side application development, and desktop development that require a more advanced set of JavaScript skills. Learners will also be able to use JavaScript frameworks like React, Angular, and Vue.



Time

3 Months
Study 10 hrs/week



Prerequisites

Familiarity with JavaScript primitive types, conditions and loops, object syntax and structure, functions, and Chrome DevTools



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

iOS Developer...Specialist

General Information

This Nanodegree program will prepare learners to publish their first iOS app, whether they're already programming or just beginning. Specifically, we will focus on:

- Programming skills with Swift
- Boolean operators and expressions
- Variables and types

Project Examples

Pitch Perfect – Build an app with Swift and Xcode, Apple's programming environment for app development. Learn how to use AutoLayout, UIButtons, and UILabels to create an interface, and how to react to touch events in an app using ViewController and multiple views.

Meme Editor – Develop an app with UIKit, Apple's front-end framework for developing fast and powerful web interfaces. Learn about the delegate pattern to make connections between the app's model, view, and controller. Add table views and navigation to your app.

Virtual Tourist – Learn about simple persistence, the iOS File System, and the "sandbox." Set up the classes required to get Core Data up and running to enable creating, saving, and deleting model objects. Enable user interfaces to reactively update whenever the model changes, and safely migrate user data between versions.

Outcome

Upon course completion learners will have the necessary skills required to build an app for an iPhone and an iPad.



Time
6 Months
Study 10 hrs/week



Prerequisites
None



Built in partnership with
AT&T, Lyft, Google



Software needed
macOS 10.12.6 or later



Difficulty
Specialist



Interested in this program?
[Learn more here](#)

Blockchain Developer...Specialist

General Information

This is the most comprehensive curriculum available for learning the fundamental skills, tooling, mindset, and security best practices that are essential to becoming a Blockchain Developer.

Specifically, we will focus on:

- Fundamental transaction types
- Layering blockchain services with legacy integration
- Creating a private blockchain

Project Examples

Managing your Blockchain Identity – Learners will get a chance to create their own blockchain “identity” and see how it is used to solve problems when personally identifiable information is leaking into the wrong hands.

Ethereum Dapp for Tracking Items through Supply Chain – Manage and audit blockchain product ownership as the product is transferred down the supply chain. Improve a notarization service with a smart contract to support a transfer of ownership, a product audit, and supply chain management.

Creating Your Own Private Blockchain – Architect a collection of data into a blockchain data model, configure how each block stores data, learn how blocks are validated and create methods to validate the chain integrity.

Outcome

Upon course completion learners will have the skills to work with the Bitcoin Core and Ethereum platforms. In addition, learners will be able to build and deploy a private blockchain.



Time

4 Months
Study 10 hrs/week



Prerequisites

Object-oriented programming in JavaScript



Software needed

None



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

Android Developer...Specialist

General Information

The curriculum is designed to transform those with intermediate skills into specialists with the Android platform. Specifically, this program focuses on:

- Developing Android Apps: build a cloud-connected Android app
- Advanced Android Development (home screen widgets, third-party libraries, integrate rich media, test user interfaces)

Project Examples

Baking App – Create an app to view video walkthroughs of recipes. Handle media loading, verify your user interfaces with UI tests, integrate third-party libraries, and provide a complete UX with home screen widget.

Joking App: Build It Bigger – Build and test a joke-telling app with a free ad-supported version and a paid version, and configure a library to connect to a web service for jokes.

Make Your App Material – Update the look and feel of an app to meet Material Design specifications using design elements, surfaces, and transitions across multiple form factors.

Outcome

Upon course completion learners gain best practices for mobile development, build a portfolio of apps and develop a solid foundation as an Android developer.



Time

6 Months
Study 10 hrs/week



Prerequisites

Java, Git, GitHub



Built in partnership with

Google



Software needed

Android Studio



Difficulty

Specialist



Interested in this program?

[Learn more here](#)



UDACITY
FOR ENTERPRISE

School of Cloud

Cloud Developer - AWS...Specialist

General Information

In this program, learners will obtain the fundamentals of cloud development and deployment with AWS. Specifically, we will focus on:

- Cloud Foundations
- Full Stack Apps on AWS
- Monolith to Microservices at Scale
- Develop and Deploy a Serverless App

Project Examples

Deploy a Static Website on AWS – Host & Deploy a static website to AWS. Create a S3 bucket, configure the bucket for website hosting, and secure it using IAM policies. Upload the website files to your bucket and speed up content delivery using AWS's content distribution network service, CloudFront.

Udagram: Your Own Instagram on AWS – Develop a cloud-based application for uploading, listing, and filtering images using Node.js/Express. Implement a REST API and deploy it to a Kubernetes cluster. Implement and interpret performance, usage, and logs to solve real problems similar to those you would encounter in the field.

Serverless Applications – Develop an Instagram-like serverless service for uploading, listing, and filtering images. Begin with building serverless REST APIs using API Gateway and AWS Lambda, a stack of serverless technologies on AWS. Then implement an API to interact with this application, store data in AWS DynamoDB, S3, and Elasticsearch.

Outcome

Upon course completion learners will be able to build different apps leveraging microservices, Kubernetes clusters, and serverless application technology.



Time

4 Months
Study 10 hrs/week



Prerequisites

Intermediate Javascript



Software needed

None



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

Cloud DevOps Engineer - AWS...Specialist

General Information

In this program, learners will understand how to operationalize infrastructure at scale and deliver applications and services at high velocity. Specifically, we will focus on:

- Microservices at Scale using Kubernetes
- Cloud Foundations
- Deploy Infrastructure as Code (IAC)
- Build CI/CD Pipelines, Monitoring & Logging

Project Examples

Deploy a High-Availability Web App Using CloudFormation – Deploy web servers for a highly available web app using CloudFormation. Write the code that creates and deploys the infrastructure and application for Instagram-like app from the ground up. Do it exactly as it's done on the job: following best practices and scripting as much as possible.

Build an Automated CI/CD Pipeline for UdaPeople– Build an automated CI/CD pipeline using Ansible, a leading Configuration Management tool, to set up automated monitoring and alerting to ensure the delivered value stays valuable.

Operationalize a Machine Learning Microservice API – Operationalize microservices by deploying an elastic and fault-tolerant Machine Learning inference API using Kubernetes.

Outcome

Upon course completion learners will be able to design and deploy infrastructure as code, build and monitor CI/CD pipelines for different deployment strategies, and deploy scalable microservices using Kubernetes.



Time

4 Months
Study 10 hrs/week



Prerequisites

Basic Programming and Linux
Command Line



Software needed

None



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

AWS Cloud Architect

General Information

In this program, learners learn to play the critical role of an AWS Cloud Architect in an organization's cloud computing strategy. Specifically, we will focus on:

- Building scalable, secure, and cost-optimized architecture
- Best practices and strategies around securing access to cloud services and infrastructure

Project Examples

Recoverability in AWS – Build a multi-availability zone, multi-region database. Demonstrate how applications can use this distributed infrastructure and migrate a primary database from one geographical region to another.

Design, Provision, and Monitor AWS Infrastructure at Scale – Plan, design, provision, and monitor infrastructure in AWS using industry-standard and open source tools. Optimize infrastructure for cost and performance & use Terraform to provision and configure AWS services in a global configuration.

Securing the Recipe Vault Application – Deploy and assess a simple web application environment's security posture. Test the security of the environment by simulating an attack scenario and exploiting cloud configuration vulnerabilities.

Outcome

Upon course completion learners will be prepared to lead your organization's cloud computing strategy as an AWS Cloud Architect. Plan, design, and build secure, high availability cloud infrastructure.



Time

3 Months
Study 10 hrs/week



Prerequisites

Experience with Cloud Computing, Programming, and AWS



Software needed

None



Difficulty

Specialist



Interested in this program?

[Learn more here](#)

DevOps Engineer for Microsoft Azure

General Information

In this program, learners learn how to deploy, test, and monitor cloud applications on Azure. Specifically, we will focus on:

- Deploying and managing cloud infrastructure using Infrastructure as Code and Configuration Management principles
- Creating disposable test environments and running automated testing and monitoring your application's behavior

Project Examples

Deploying a Web Server in Azure – Write infrastructure as code using Terraform and Packer to manage cloud infrastructure

Building a CI/CD Pipeline – Build a Continuous Delivery pipeline that deploys a Flask Machine Learning application using Azure Pipelines to Azure App Services

Ensuring Quality Releases – Use industry leading DevOps tools within Microsoft Azure and Terraform to create disposable test environments within a CI/CD pipeline and run a variety of automated tests with the click of a button

Outcome

Upon course completion learners will be able to deploy, test, and monitor cloud applications on Azure, and be prepared for success on Microsoft's AZ-400 DevOps Engineer Expert certification.



Time

3 Months
Study 10 hrs/week



Prerequisites

Experience with Python, Linux shell, and conceptual cloud skills



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)



UDACITY
FOR ENTERPRISE

School of Business

Digital Marketing...Foundational

General Information

This program offers the opportunity to master platform-specific skills valued by top companies, while at the same time establishing a broad-based understanding of the whole digital marketing ecosystem. Specifically, we will focus on:

- Learn to create marketing content
- Measure and optimize with Google Analytics
- Run Adwords campaigns and advertise on Facebook
- Use social media to amplify messaging

Project Examples

Run a Facebook Campaign – Create and manage an advertising campaign on Facebook for a B2C or B2B product. Test and optimize campaign to achieve the best ROI possible.

Conduct an SEO Audit – Audit a website and recommend actions to optimize its ranking in search engine results.

Evaluate a Display Advertising Campaign – Evaluate the results of a display advertising campaign and create a presentation of the results for management.

Market with Email – Plan and prepare an email marketing campaign for a B2C or B2B product for your own company, or the 'Sandbox' product Udacity provides.

Outcome

Upon course completion learners will acquire a 360 degree understanding of Digital Marketing and have the opportunity to understand how to optimize the most powerful digital advertising platforms to date.



Time

3 Months
Study 10 hrs/week



Prerequisites

None



Built in partnership with

Facebook, Google, Hootsuite, Hubspot, Mailchimp, MOZ



Software needed

None



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Product Manager...Foundational

General Information

This program is designed for students who want to assume key leadership roles in product development. Specifically, we will focus on:

- Product Strategy
- Product Development
- Product Design
- Product Launch

Project Examples

Pitch a Product Vision – Act as a product manager for one of four top technology companies and develop a compelling pitch for the development of a new product.

Run a Design Sprint– In this project, take a problem/opportunity through a Design Sprint. During the Design Sprint, create a storyboard and prototype, conduct user research, refine their ideas, and incorporate findings into a final product spec.

Deliver a Product to Market – Create a pre-launch process, including identification of launch risks and mitigations, to enable launch. Develop a marketing and pricing strategy to communicate the value proposition. Write a user guide and other communications collateral to prepare the Sales and Customer Support teams to evangelize the product.

Outcome

Students are prepared to define product strategy and KPIs based on market analysis, pitch a product vision to get stakeholder buy-in and design a user-centered prototype that adheres to engineering constraints.



Time

4 Months
Study 10 hrs/week



Prerequisites

No experience required



Built in partnership with

Figure Eight



Software needed

None



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

Marketing Analytics...Practitioner

General Information

In this program, learners will gain foundational data skills that apply to marketing. Specifically, we will focus on:

- Data Analysis
- Data Visualization
- Google Analytics
- Marketing Analytics

Project Examples

Storytelling with Data – Analyze actual e-commerce data from an online retailer based out of the U.K. Using spreadsheet software like Excel, create data visualizations and provide insights to help the client understand their data more effectively.

Build Data Dashboards – Build interactive dashboards with Tableau and use them to discover and communicate insights from data. 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.

Advanced Display, Segments and Views – Use advanced reporting displays and features to make more detailed observations, and map Google Analytics advanced segments to their constituencies. Configure view filters and settings to refine and enrich raw Google Analytics data for use in identifying audiences for remarketing and testing.

Outcome

Upon course completion learners will gain foundational data skills, an in-depth understanding of Google Analytics and marketing analytics. They'll learn to analyze data and build models with Excel, Data Studio, and create informative data visualizations with Tableau.



Time

2 Months
Study 10 hrs/week



Prerequisites

None



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

Business Analytics...Practitioner

General Information

In this program, learners will become experts in the basics of data analysis for business. Specifically, we will focus on:

- Data analysis skills and tools
- How to use Excel, SQL, and Tableau to manipulate, analyze, and visualize data
- Make better, data-informed decisions

Project Examples

Query a Digital Music Store Database – Query a digital music store database which holds information regarding the store’s media, employees, and customers. Use the database to help the store gain an understanding of the types of music purchased, where customers live, and how the company might optimize their business practices.

Analyze Survey Data – Use statistics and Excel to summarize the results of a survey sent to Udacity Nanodegree program alumni. Clean the data, adjust for common data issues, use statistics and visualizations to explore the data, and communicate key findings with data visualizations.

Build Data Dashboards – Build interactive dashboards with Tableau and use them to discover and communicate insights from data. 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.

Outcome

Upon course completion learners gain data analysis skills that help them find and implement effective data-driven solutions.



Time

3 Months
Study 10 hrs/week



Prerequisites

None



Built in partnership with

Tableau & Mode



Software needed

Tableau - license included,
Microsoft Excel



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

UX Designer...Practitioner

General Information

This Nanodegree program teaches the foundational skills all UX Designers use, whether they design mobile apps, desktop apps, or web platforms. It is ideal for students who want to understand how to create development-ready designs, and build a UX portfolio to start and succeed in a UX Designer role.

Project Examples

Formulate a Research Report – Learn the core principles of human-centered design and how to appropriately scope a design problem.

Develop a Validated Low-Fidelity Prototype – Understand how to foster team collaboration and use divergent and convergent thinking to rapidly create testable prototypes. Apply user interface principles in the design of a clickable prototype, and conduct a usability test to gain valuable feedback from users that can be used in design iterations.

Create and Improve a High-Fidelity Design – Develop a business proposal for an AI product based on any use case. Develop the business case, define success metrics, scope the dataset and build a post-deployment monitoring plan.

Build a UX Portfolio Case Study– Apply storytelling and branding frameworks to create a personal profile that conveys a unique value proposition

Outcome

Understand the fundamentals of UX Design, including Nielsen's Heuristic Evaluation, quantitative and qualitative research methodologies, and the design psychology behind human centered design.



Time

3 Months
Study 10 hrs/week



Prerequisites

No experience required



Built in partnership with

Figure Eight



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)

AI Product Manager...Practitioner

General Information

In this program, learners will better understand how to evaluate the business value of an AI product. Specifically, we will focus on:

- Introduction to AI in Business
- Building a Model
- Creating a Dataset
- Measuring Impact and Updating Model

Project Examples

Create a Medical Image Annotation Data Set with Figure Eight – Create an annotated training data set on Figure Eight platform. Build a classification system that can help flag serious cases of pneumonia.

Build a Model with Google AutoML – Build models using automated machine learning, from data to results with no coding required. Implement a model with four different variants of data to evaluate how the data affects performance.

Capstone Project – Develop a business proposal for an AI product based on any use case. Develop the business case, define success metrics, scope the dataset and build a post-deployment monitoring plan.

Outcome

Upon course completion learners will have mastered how to scope and build a data set, train a model, and evaluate its business impact.



Time

2 Months
Study 10 hrs/week



Prerequisites

No experience required



Built in partnership with

Figure Eight



Software needed

None



Difficulty

Foundational



Interested in this program?

[Learn more here](#)

AI for Business Leaders...Practitioner

General Information

The rise of artificial intelligence in the past decade has transformed computer science and the workplace, causing businesses to rethink ways of integrating this emerging technology into their corporate strategy.

Understand the foundational technical knowledge of machine learning and develop a strategic framework to evaluate business applications of artificial intelligence across industries.

- Accuracy, Bias, and Ethics
- Stakeholder Influence
- The Math Behind the Magic
- Working with Data
- Machine Learning Techniques
- Patterns and Functions

Project Examples

Deliver an ML & AI Strategy – Business leaders need to develop and execute strategies that are equally organizationally transformative and technically feasible. In this project, you will formulate a cohesive AI strategy for either your own company or a predefined business scenario for an automotive manufacturer or news and telecommunications conglomerate.

Outcome

Business leaders and managers who are responsible for making strategic decisions regarding these technologies and want to equip themselves to evaluate and formulate proposals involving machine learning/artificial intelligence technologies to impact their business.



Time

2 Months
Study 5 hrs/week



Prerequisites

Basic Statistics & Algebra



Built in partnership with

BMW



Software needed

None



Difficulty

Practitioner



Interested in this program?

[Learn more here](#)