



EXECUTIVE PROGRAM SYLLABUS

# Data Science for Business Leaders



# Overview

This Executive Program prepares a student with functional business experience (e.g., marketing, sales, finance) for applying data science capabilities at a leadership level. It teaches core data science concepts and practices and details the business opportunities behind data science. This course prepares a student to identify and assess data science opportunities, and provides hands-on experience with developing human capital and technical strategies critical to a business's data science capability.

## Prerequisites:

A well prepared student for this program:

- Will have had some prior exposure to statistics and probability in an academic or professional setting.
- Will have spent time in a business setting being involved in business decision-making in the context of technical/IT projects.
- Will understand the process of aligning business initiatives/decisions to a business's top-of-line strategic objectives.

## Educational Objectives:

This course provides business leaders and managers with strategies and guidelines for how best to solve the human capital, technological, and management challenges of building data science into the business. Students will gain skills in identifying opportunities for data science across many functional areas of the business, as well as learn the tools to prioritize and execute on those opportunities as part of a data science initiative.

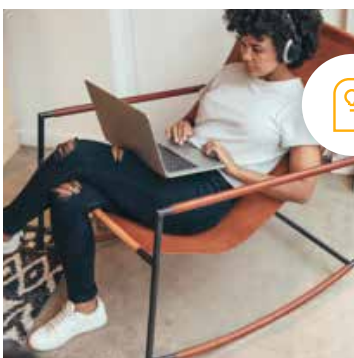
IN COLLABORATION WITH




**Estimated Time:**  
4-6 Weeks at  
5 hours / week



**Prerequisites:**  
Statistics,  
Probability,  
and Business  
Experience



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



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Discuss this program  
with an enrollment  
advisor.

# Course: AI for Business Leaders

Data science is seeing widespread adoption in business today. A 2020 survey by the analyst firm Cognilytica revealed that nearly 90% of respondents indicated that they will have some sort of in-progress AI implementation within the next two years. That said, knowing how to implement data science is critical; according to McKinsey, 86 percent of executives say their organizations have been at best only somewhat effective at meeting the primary objective of their data and analytics programs, including more than one-quarter who say they've been ineffective.

The goal of the Data Science for Business Leaders Executive Program is to equip learners with the understanding of strategic, human capital, and technical requirements that power the ability of data science to deliver enhanced business outcomes, as well as the strategic execution skills to develop an organizational data science strategy that unlocks this potential. This program focuses on the unique knowledge and skills that business leaders need to unlock the value of data in their organizations, or enable a more data-driven department/organization that leverages data to inform strategic decisions for business operational improvement and growth.

This course consists of four lessons that together cover data science and its business case as well as the processes, people, and platforms necessary to execute data science initiatives for the business. Businesses often suspect that they want Data Science capabilities, and may even sense a need for Data Science capabilities...but many are not sure where to start. What is Data Science? Who is a Data Scientist? What is possible through Data Science? All these questions are addressed in Lesson 1, which provides a broad introduction to Data Science and what it can do for a business.

Creating a data science strategy isn't a standalone activity; it must be driven by your overarching business operations and strategy. Therefore, a critical starting point for any data strategy is articulation of a business's strategic objectives and identification of opportunities for data science-based transformation. These are the topics of the second lesson of the course.

The human capital component of Data Science is critical to delivering on a data science strategy. Who do we recruit, hire, and train for our Data Science organization? How is that organization structured in order to deliver value to our business? How do our Data Scientists carry out their work in a structured manner? How do we leverage data and data science to foster a data-driven culture throughout the business? These questions are addressed in the third lesson of the course.

Finally, executing the Data Science strategy requires technology -- technology for data and technology for machine learning. Technology needs are specific to each business; they depend on the types of data to be leveraged for Data Science, the form and magnitude of that data, the types of data science models that a business plans to create, and the overall scale of operations represented by those data science models. The fourth lesson covers in great detail the parameters that must be considered both in creating a Data and Data Architecture Strategy, and in building a Machine Learning Architecture to support Data Science initiatives.

## Capstone Project : 100-Day Data Science Plan

Upon assuming a new leadership role within a company (whether from an internal move or joining the company anew), it is common for an executive to be asked to prepare a plan for their first 100 days in the job. The Capstone Project asks students to prepare that 100-day data science plan for a company of their choosing; this could be the student's current company, some other existing company, or a fictitious business context provided.

As part of this project, the student will build/create the following:

- The Human Capital plan for their data science organization
- The Technical plan for their data science organization
  - Data and Data Architecture Strategy
  - Machine Learning Architecture
- Identification of six data science opportunities for the organization
  - Rack and stack evaluation of these opportunities
  - Detail the risks, challenges, and key factors for success for each of these opportunities
- Roadmap for executing these six data science opportunities.

The work product for this Capstone project will be a detailed presentation to the CEO, detailing your plan and the rationale behind your decisions.

### LEARNING OUTCOMES

#### LESSON ONE

##### Introduction to Data Science

- Classify data science projects in terms of Area, Approach, and Type of Model
- For a given Area, Approach, and Model Type, provide one example project from your business
- Given the particulars of a data science project, identify areas of concern that might lead to the projects failing.
- Given the particulars of a data science project, identify steps that could be taken to help ensure the project succeeds

## LESSON TWO

### Business Case for Data Science

- Define an organization's data science roadmap
- Identify the best projects(s) to start with
- Detail strategies for successfully launching data science initiatives
- Determine a starting point -- the most appropriate first project (or suite of projects) to capture the most promising opportunities and launch the data science function with adequate momentum to ensure its long-term operation within the organization.
- Work with fellow executives to set and manage reasonable expectations of success for data science projects
- Given a set of candidate data science projects, determine the relative strategic importance, cost, complexity of implementation, risk, likelihood of value capture, and magnitude of benefit for each of the five projects
- For any data science project, identify strategies for meeting three key factors of success (executive sponsorship; strategic alignment with core business interests; scope conditions)

## LESSON THREE

### Human Capital of Data Science

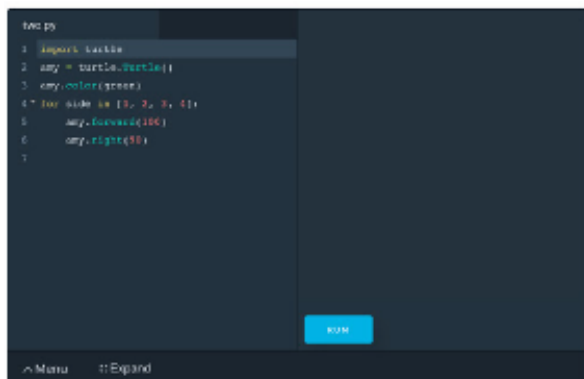
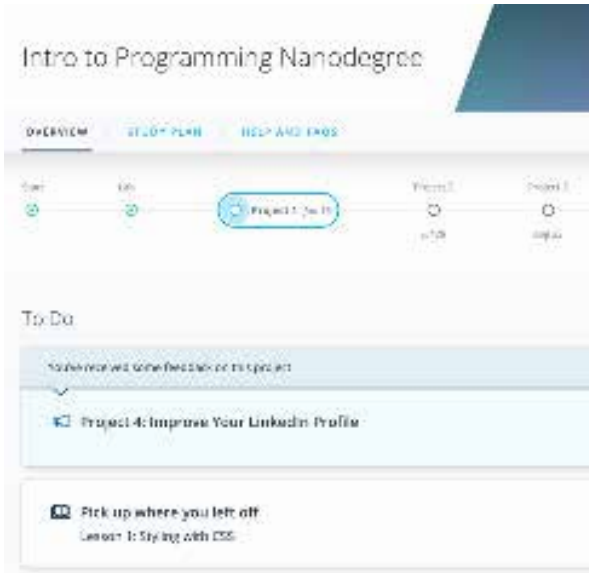
- Use the Data Science Heat Map as a tool for specifying roles within the Data Science organization
- Manage Data Science operations using structured processes for work and communication
- Given the particulars of a company's strategic and operating contexts, identify the data science organizational model best suited for that company.
- Given a data science strategy, identify and prioritize the mix of roles you would pursue to build out the data science organization.
- Describe the project and product management strategies best suited for a given company's data science organizations
- Given a broad business challenge, describe how you would approach the development of a data science strategy using the Structured Problem Solving Method.
- Given a business context, identify strategies for promoting a data-driven culture throughout that business, particularly, around guiding employees on how to think through breaking down problems of identifying data consumers, data needs/ use cases, data sources, and related necessary pipeline/ transformations that need to happen

## LESSON FOUR

### Data and Machine Learning Infrastructure Strategy

- Given a particular business context, prepare a detailed Data and Data Architecture strategy
- Given a particular business context, detail how a Machine Learning Architecture strategy fits into its Data and Data Architecture strategy.
- Identify the strengths and weaknesses of a given business's Data and Data Architecture strategy

# Our Classroom Experience



## REAL-WORLD PROJECTS

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

## KNOWLEDGE

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

## STUDENT HUB

Leverage the power of community through a simple, yet powerful chat interface built within the classroom. Use Student Hub to connect with your fellow students in your Executive Program.

## WORKSPACES

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

## QUIZZES

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

## CUSTOM STUDY PLANS

Work with a mentor to create a custom study plan to suit your personal needs. Use this plan to keep track of your progress toward your goal.

## PROGRESS TRACKER

Stay on track to complete your Executive Program with useful milestone reminders.

# Learn with the Best



**Ed Wiley**

CHIEF TECHNOLOGY OFFICER,  
ENVEDA THERAUPATICS

Mr. Wiley has over 20 years of experience building, leading, and advising world-class machine learning, AI, and data science teams at companies at stages from startup to Fortune 50, holding titles such as CIO, CTO, and Chief Data Scientist.

# All Our Nanodegree Programs Include:



## EXPERIENCED PROJECT REVIEWERS

### REVIEWER SERVICES

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



## TECHNICAL MENTOR SUPPORT

### MENTORSHIP SERVICES

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



## PERSONAL CAREER SERVICES

### CAREER SUPPORT

- Resume support
- Github portfolio review
- LinkedIn profile optimization



# Frequently Asked Questions

## PROGRAM OVERVIEW

### WHY SHOULD I ENROLL?

A study by the **McKinsey Global Institute** reports that data-driven organizations are now 23 times more likely to acquire customers, 6 times as likely to retain customers, and 19 times as likely to be profitable as a result. **McKinsey** also reports that the creation of a strategy now ranks as the number one challenge to (and reason for) companies' success with data and analytics.

The opportunity to generate critical business insights grows alongside the massive amounts of data being created by companies and consumers alike, but so does the challenge of managing all that data effectively. The Data Science for Business Leaders Executive program addresses that challenge in an organization's data transformation journey by helping managers and executives make better strategic, data-driven decisions.

Upon graduating from the program, business leaders will be able to identify and assess data science opportunities, develop a human capital plan for staffing and structuring a business's data science team, and evaluate strategic technical decisions around data architecture. These are critical skills for any leader looking to unlock the massive potential that big data offers.

### WHAT JOBS WILL THIS PROGRAM PREPARE ME FOR?

This program is designed to train business leaders tasked with determining the strategic decisions to equip their company with the latest advancements in data science.

If you're asking any of the below questions about your role or your business, this program is what you're looking for: Anyone in an org. who's asking:

- What are our greatest opportunities to use data?
- How do I prioritize projects and manage a project pipeline/portfolio of data projects?
- How do we build up data expertise across the variety of roles/capabilities (i.e. data scientists vs. data engineers vs. data analysts, etc.)
- How do we deploy our different data roles to maximize business value from our data?
- Do we change something at the platform level or do something smaller?

Professionals in roles that involve high-level strategic roadmapping are well prepared to excel in this Executive Program.

### HOW DO I KNOW IF THIS PROGRAM IS RIGHT FOR ME?

This Executive Program teaches the strategic and technical foundations of data science in the 21st century. It is intended for business leaders and managers who are responsible for making strategic decisions regarding these technologies, and want to equip themselves to formulate and evaluate proposals involving data



## FAQs Continued

science, data architecture, and machine learning technologies to impact their business.

### **WHAT IS AN EXECUTIVE PROGRAM? HOW IS IT DIFFERENT FROM A NANODEGREE PROGRAM?**

Executive Programs are intensive, strategically-focused programs that empower business leaders to rapidly understand complex and technical concepts, like Artificial Intelligence, and apply these concepts to high-stakes decision-making in real-world business scenarios.

An Executive Program is focused on teaching how to weigh implications related to strategic decision making that affect an entire organization or department. Unlike a Nanodegree program, which goes much deeper on the technical execution of using a specific technology, Executive Programs focus on the fundamentals of a particular technology, like Artificial Intelligence or Data Science, and go deep into the key questions business executives should be considering around the application of those technologies, and the strategic implications that these technologies have at a corporate level.

### **WHAT IS INCLUDED IN AN EXECUTIVE PROGRAM?**

Every Executive Program includes career services including a personal career coach, project reviews from industry professionals, technical mentor support so you can get help when you need it, and a flexible learning plan so you can learn at your own pace.

## **ENROLLMENT AND ADMISSION**

### **DO I NEED TO APPLY? WHAT ARE THE ADMISSION CRITERIA?**

No application is necessary. This Executive Program accepts all applicants regardless of experience and specific background.

### **WHAT ARE THE PREREQUISITES FOR ENROLLMENT?**

This program is intended for students who have spent time in a business setting, had exposure to business decision making, and have potentially worked on technical or IT projects.

In addition, a well-prepared learner will have:

- Basic knowledge of mathematics (Algebra, Geometry, etc.)
- Basic Statistics (Able to calculate the mean, median, and mode from a data set)
- Prior exposure to statistics and probability in an academic or professional setting



# FAQs Continued

## TUITION AND TERM OF PROGRAM

### HOW IS THIS EXECUTIVE PROGRAM STRUCTURED?

This Executive program is comprised of content and curriculum to support one capstone project. Once you enroll in an Executive program, you will have access to the content and services for the length of time specified by your subscription. We estimate that learners can complete the program in four to six weeks, working approximately five hours per week.

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

### HOW LONG IS THIS EXECUTIVE PROGRAM?

The Executive Program can be completed in 4-8 weeks, working 5 hours per week. Two full months of access to the learning environment is included in your enrollment in the Executive Program.

See the [Terms of Use](#) for other policies around the terms of access to our Nanodegree programs.

### HOW MUCH DOES THE EXECUTIVE PROGRAM COST?

The Executive Program takes 4-8 weeks to complete, and costs \$1599 (variable if purchased during a promotion) for two months access to the program. If you don't finish the program before your two months of access are over, you will shift over to a monthly subscription plan, which will be \$399 per month if you purchased the program at full-price, and a variable amount if you purchased during a promotional period.

## SOFTWARE AND HARDWARE

### WHAT SOFTWARE AND VERSIONS WILL I NEED IN THIS PROGRAM?

You will use Google Sheets and Google Slides, or similar spreadsheet and slides software, and Google Forms to facilitate more practical exercises in the lessons and Capstone project. Jupyter Notebooks, which are embedded in the Udacity classroom, are used for some exercises and short explorations into code.

You will not be asked to write code in this course, so you will not need to have a Jupyter Notebook on your own computer.

