Data Engineering

Understand, prepare, and leverage data as a core component of business intelligence.

THE UNIVERSITY OF CHICAGO

Every day, organizations are inundated with data, from customer details to business transactions, systems information, and more. The constant influx of valuable information has made data one of the most valuable resources within any organization. Data empowers executives and organizations to make better decisions based on facts, figures, and statistical trends to achieve strategic objectives. With so much information available, the challenge becomes making sense of it all.

Data Engineering

Often considered the most critical skill for data scientists, data engineering—also known as information engineering—looks at how to collect, analyze, and practically apply data. Expertise in data engineering is required across industries, and professionals equipped with this unique technical knowledge are an asset to any organization.

Course Details

Tuition: USD $2,800

Format: Online with live, interactive sessions

Duration: Eight weeks

Languages: English and Spanish

Instructor: Abid Ali, PhD

About the Course

Over eight weeks, our Data Engineering course will provide you with a technical overview of how to understand, manage, and report on data. You will be taught how to source, prepare, and work with historical data. During the course you will also learn about the history and principles of database systems, how to clean raw data, and how to use SQL to load and query data in databases.

You will learn to:

- Understand databases, data classification, data formats, and data profiles;
- Apply data privacy and security, data ingestion, and data quality and preparation techniques;
- Identify the principles and best practices of relational databases;
- Use SQL the standard language for working with databases.

Techniques and Tools Covered:

Who Should Attend?

This course has been specifically designed for professionals in associate-level, non-technical roles who want to transition into the field of data science, data engineering, and analytics. While no background knowledge is required to participate in this course, individuals with basic knowledge of data science will consolidate and update their understanding of data engineering. This is a technical course that will give participants hands-on, practical experience in coding, data engineering tools, and databases.

Meet Your Instructor

Abid Ali has worked in data and analytics for years at major consulting firms, designing and delivering large-scale transformations worldwide across industries. He leads internal initiatives and capabilities and works with C-suite executives to devise strategies for migration and transition to modern data platforms.

A believer in lifelong learning, Ali has earned several advanced degrees, including two master's degrees, an EMBA, and a PhD in Organizational Leadership, as well as certifications from Teradata, Celonis, SAFe Agile, Azure, and AWS. He also teaches at top-tier universities.

Abid Ali, PhD, Customer Success Architect, Sigma Computing

Why the University of Chicago?

Becoming a member of the University of Chicago community means gaining access to world-class instructors and a cohort of curious, diverse individuals.

Through a firm grounding in core principles and a rigorous approach to problem-solving, our teaching method—the Chicago Approach—will give you the tools you need to make sense of complex data and turn ideas into impact.

The University of Chicago Approach to Online Learning

Our online courses are crafted to support your specific professional development goals. Courses combine e-learning with live, interactive sessions to strengthen your skill set while maximizing your time. We couple academic theory and business knowledge with practical, real-world application.

Through online sessions, you will have an opportunity to interact with University of Chicago instructors and your peers.

Career Outlook

Data engineering is the fastest-growing occupation in the IT space, and data engineers are prized across industries and in a variety of settings. In charge of building and maintaining an organization's data infrastructure from databases and data warehouses to data pipelines, data engineers identify trends in data sets—a skill essential to managing and converting data into the information data scientists and business analysts need to drive results. Data engineering is a broad field with applications in practically every industry. As long as there is data—and the volume is increasing every minute—data engineers will be in demand. A career in data engineering can be both challenging and rewarding, and, with the right skill set, among the most lucrative data-driven roles.

$115k

The average salary for a data engineer in the United States

#1

The rank of data engineer among the fastest-growing jobs in tech

50%

The year-over-year growth in the number of open data engineering positions

Potential Data Engineering Job Titles

- Big Data Engineer
- Business Intelligence Engineer
- Computer Vision Engineer
- Data Architect
- Machine Learning Engineer

Weekly Schedule

The Data Engineering course covers the following topics:

Module 0: Tools for Data Engineering

- Python
- Database languages, systems, and tools
- Other tools and platforms
- Introduction to Python and Jupyter notebooks

Module 1: Introduction to Data Engineering

- Foundation of data
- Data classification, data formats, and data profiles
- Data privacy and security
- Data ingestion techniques
- Data quality and preparation
- Introduction to cloud computing

Module 2: Relational Databases

- Database fundamentals
- Database management systems
- Database classification
- Relational database concepts
- Database design

Module 3: Introduction to SQL

- Introduction to SQL
- Structured query language
- Handling data
- Categorizing data
- Summarizing data
- Sorting and grouping data
- Introduction to Cloud SQL

Module 4: Advanced SQL

- Combining data
- Nested queries
- Views and indexes
- Transforming data
- Migration from MySQL to Cloud SQL

Module 5: Data Warehousing and Business Intelligence

- Data warehousing and reporting
- Business intelligence concepts: KPIs and metrics
- Dimensional data model for reporting

Module 6: NoSQL Databases—Document Databases

• Derivation of insights from semi-structured and unstructured data using NoSQL databases

• Document databases and applications

• MongoDB: How to handle, categorize, and summarize data

Module 7: NoSQL Databases—Graph Databases

• Graph databases and applications

• Neo4j: querying highly connected data

Module 8: Data Engineering Project Implementation

• Practical business case

• Designing an end-to-end data pipeline

• Reporting and visualization to provide actionable recommendations

Course outline may be subject to change based on academic adjustments.

Learn more

To schedule an appointment with admissions, contact **admissions@online.professional.uchicago.edu** or, alternatively, you can let us know when we can call you **here**.

Visit **online.professional.uchicago.edu** to learn more.