DePaul University's Big Data and NoSQL Program is designed for IT professionals whose companies are new to the Big Data environment. Big Data refers to the ever increasing amounts of unstructured data being generated by websites, sensors, and many other sources, along with transactional data from enterprise applications. The program has been designed to give learners a very comprehensive understanding of Big Data and NoSQL (commonly referred to as “Not Only SQL”), which is a new class of database management systems used for storing new types of data. The program will focus on the technologies and their implementation, but will also cover the business impact and guidelines for adoption. Two of the most popular NoSQL databases—MongoDB® and Apache Cassandra®—will be covered in detail.

Students will learn how to design, build, launch, deploy, and scale an application using the NoSQL approach in different platforms. Classroom lectures and demonstrations will be complemented by hands-on exercises, reading assignments, case studies, and projects. Each student will have a flexible environment (BYOD-Bring Your Own Device, Virtual, or Cloud) to access NoSQL databases, along with sample code and scripts, in order to learn real-world scenarios and best practices. In order to maximize learning, students will be required to bring their own laptop computer to every class session. While access to most cloud services explored in the program will be provided to students in class, there may be some cloud services that are only accessible via the use of a student’s own credit card. Students should expect to spend a small fee to access these services.

YOU WILL LEARN:

- Big Data characteristics and the NoSQL data model
- The differences between traditional relational databases and NoSQL databases
- The value of adopting Big Data using a NoSQL approach
- How to leverage open source, virtualization, cloud computing and social media to achieve better results
- Practical knowledge with hands-on labs on NoSQL using different platforms and tools
- Use cases and best practices to process Big Data with NoSQL
- The new generation of databases that have recently emerged in the marketplace
- The overall market shift and expansion and what the database market will look like tomorrow
- How to view database workloads and technologies and how to select database technology
The goal of the Big Data and NoSQL Program is to provide students with an objective overview of Big Data so that they can determine how best to use different NoSQL databases in their working environments. The program will cover the leading players in the world of Big Data and explain the different ways that NoSQL databases store data. It will also cover which types of applications are best suited for the NoSQL approach and when a relational database would be more appropriate. DePaul University partners with leading professionals in the Big Data and NoSQL industry and subject matter experts with real-world experience to lead students through the NoSQL principles, methods, technologies and other essential aspects of Big Data. Two of the most popular NoSQL databases—MongoDB® and Apache Cassandra®—will be covered in detail. Other NoSQL databases will also be covered.

Students will gain an understanding of what is involved in selecting NoSQL technologies from different disciplines: applications development, management, and architecture. Students will also gain knowledge of the skills needed to build and deploy applications using a variety of common services. Each student will have a flexible environment (BYOD, Virtual, or Cloud) to access NoSQL databases along with sample code and scripts to learn best practices and real-world scenarios. Classroom lectures and demonstrations will be complemented by reading assignments, hands-on exercises, case studies, and projects.

**CURRICULUM**

**BIG DATA OVERVIEW**

**NOSQL INTRODUCTION**
A primer on NoSQL and how it compares to relational database technology. Topics to be covered include: Key-Value store database, Document oriented database, Graph database, and Columnar database. Appropriate times to use NoSQL databases and (dis)advantages of using them.

**MONGODB AND CASSANDRA DATABASES**

**NOSQL AND HADOOP**
Learn how to integrate NoSQL with Hadoop for large-scale distributed data processing. Analytics and ETL (Extract, Transform, and Load) on large datasets with the ability to load and save data against NoSQL database using Hadoop’s MapReduce.

**NOSQL SCHEMA DESIGN**
The challenges of designing a NoSQL database for processing large data streams and solutions. Describe the choices of
schema design and index strategies to optimize writes and efficient querying/retrieval.

**NOSQL BACKUP STRATEGIES**
An introduction to data backup strategies and steps to implementing a backup strategy.

**SCALABILITY AND AVAILABILITY**
NoSQL’s different scaling options and how to use clustering, sharding, and replica sets to scale capacity up or down automatically according to conditions you define.

**CASE STUDIES AND INDUSTRY TRENDS**
Case studies. Discussion of database industry trends and job market.

**GENERAL INFORMATION**

**ADMISSION**

Applicants should have an understanding of relational databases and some programming experience building applications with them; and, experience using Windows and Linux commands. No previous NoSQL experience is necessary. In addition, students are required to bring their own laptop computers to class.

A substantial commitment of time is required for this intensive course of study. Final admission will be determined by the admissions committee on the basis of an applicant's overall qualifications, including work history and educational background.

**FACILITIES**

To promote the learning process, the Institute maintains special-purpose laboratories as well as dedicated classrooms equipped with state-of-the-art audio/visual equipment.

In addition, the college’s unique Course OnLine (COL) technology allows students to replay classes over the Internet. COL captures and replays five components of the classroom experience—audio, video, PC screen, whiteboard, and document camera input—and incorporates them into one interface to provide an innovative rebroadcast system.

**SCHEDULE**

The Institute offers one section of the program each quarter. Classes meet one day per week. The option to take the program entirely online is also available.

**FACULTY**

The faculty consists of a team of instructors from the College of Computing and Digital Media and experts in industry. Faculty will be available throughout the program both in person and through electronic mail.
The college, through its School of Cinematic Arts, School of Computing, and its School of Design, offers a variety of programs at the undergraduate and graduate levels. Over 3,000 students are enrolled in the college’s bachelor’s programs and over 2,700 students are enrolled in the master's and Ph.D. programs making the college’s graduate program one of the largest in the country. The college offers more than 300 courses each quarter, many in the evening, and primarily in the Loop and Lincoln Park Campuses. Most of the degree programs are also available exclusively online.

**Offerings at the undergraduate level include:**
- Animation B.A. / B.F.A.
- Computer Science B.S.
- Cyber-Physical Systems Engineering B.S.
- Cybersecurity B.S.
- Data Science B.S.
- Film and Television B.A. /B.F.A.
- Game Design B.S.
- Game Programming B.S.
- Graphic Design B.F.A.
- Information Systems B.S.
- Information Technology B.S.
- Interactive and Social Media B.S.
- Math and Computer Science B.S.
- Network Engineering and Security B.S.

**Offerings at the graduate level include:**
- Animation M.A.
- Applied Technology M.S.
- Business Information Technology M.S.
- Computational Finance M.S.
- Computer Science M.S.
- Cybersecurity M.S.
- Digital Communication and Media Arts M.A.
- E-Commerce Technology M.S.
- Experience Design M.A.
- Film and Television M.S.
- Game Programming M.S.
- Health Informatics M.S.
- Human-Computer Interaction M.S.
- Information Systems M.S.
- IT Project Management M.S.
- Network Engineering and Security M.S.
- Predictive Analytics M.S.
- Product Innovation and Computing M.S.
- Software Engineering M.S.
- J.D./M.S. in Computer Science Technology

**Master’s of Fine Arts**
- Animation
- Creative Producing
- Documentary
- Film and Television
- Game Design
- Screenwriting

**Ph.D. in Computer and Information Sciences**
**Ph.D. in Human Centered Design**

The Institute for Professional Development was formed by the college in 1984 to assist both individuals and businesses in keeping pace with the rapid development of computer technologies. The Institute currently offers a variety of intensive certificate programs in these areas:

- Advanced SQL
- Big Data and NoSQL
- Big Data Using Hadoop
- Big Data Using Spark
- Cloud Computing Technologies
- Data Science for Business
- Fundamentals of R
- Introduction to SQL
- iOS Developer
- IPv6
- Java™ Developer
- Modern Information Technology
- Modern .NET Web Developer
- SQL Server® Business Intelligence
- SQL Server® Database Administration
- Technology and Innovation
- Web Development with JavaScript and HTML5

**APPLICATION PROCEDURE:**
Complete the enclosed application and return it with a non-refundable $40.00 application fee (check or money order made payable to DEPAUL UNIVERSITY) to:

DePaul University
Big Data and NoSQL Program
Institute for Professional Development
243 S. Wabash Avenue, Room 301
Chicago, IL 60604-2300

The words “Cassandra”, “Hadoop”, “MongoDB”, “SQL Server”, “Python”, “Java”, and “Ruby on Rails” are registered or unregistered trademarks in the United States of America and/or other countries. The Big Data and NoSQL Program at DePaul University is an independent program of study and is not affiliated with, nor has it been authorized, sponsored, or otherwise approved by external entities.