CLOUD COMPUTING INFRASTRUCTURE AND OPERATIONS PROGRAM

A six-week in-depth program in the architectures, infrastructure, and operations of Cloud Computing

DePaul University’s Cloud Computing Infrastructure and Operations Program provides specialized knowledge in Cloud infrastructure with emphasis on techniques and applications to architect and implement the next generation Cloud offerings. The program provides an intense, lab-oriented vendor-agnostic curriculum focused on proper architecture design principles. Topics include design of dynamic infrastructure, multi-vendor architectural designs, scalability theory and best practices, Cloud operations analytics, globally-responsive architecture, functional software design, and case studies. Students will work in teams to design and build a globally-distributed, responsive web application capable of massive scale with operational performance metrics. DePaul University partners with well-known Cloud product vendors and industry leading service providers to teach students how to specify, design and implement best value solutions in the real world.

Classroom lectures and demonstrations will be complemented by reading assignments, hands-on exercises, case studies, and projects. Incoming students will also be given a reading assignment to be completed before the start of the program. The lab exercises and homework will give the student first-hand knowledge of the skills needed to build and deploy a Cloud application using a variety of common services. 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:

- Principles and methodologies to design and implement a variety of Cloud infrastructures
- Best practices for building Infrastructure as a Service (IaaS), with an emphasis on inter-operability, reliability, stability, and performance
- Best features of public and private Cloud infrastructures
- Management and monitoring tools and techniques to help you get the most from Cloud Computing resources and applications
- Strategies and plans for securing data to meet the highest level of Cloud security and compliance standards. Exploration of legal and privacy issues, regulations, and compliance for Cloud Computing.
- Case studies from the leading Cloud service providers and private sector organizations who have successfully implemented Cloud-based solutions in their environments
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Cloud Computing is an emerging paradigm for consumption and delivery of IT-based services, based on concepts derived from service catalog and on-demand service with shared resources, availability, elasticity, and pay-as-you-go models. The services can range from basic infrastructure hosting to hosting of development platform environments to applications hosting. The Cloud Computing Infrastructure and Operations Program is designed to address the challenges faced in managing and supporting Infrastructure as a Service (IaaS). Students will gain the knowledge and skills necessary to plan and maintain Cloud infrastructure through hands-on practice and simulation of a real-world project. The program is ideally suited to IT professionals pursuing Cloud solution architect or Cloud operations manager roles, or for individuals currently supporting a Cloud platform and who want to enhance their skills.

Students in the program are expected to do assignments outside of class. Instructors will be accessible in person and through electronic mail.

CURRICULUM

INFRASTRUCTURE DESIGN AND IMPLEMENTATION

A review of the history of traditional infrastructure patterns and practices, its current state, and future trends. In-depth presentation of various highly-scalable infrastructure designs and implementations with break-down and analysis. Review of architecture types such as self-healing, feature-degrading, message-based, and event-driven architectures.

AUTO-PROVISIONING AND MULTI-VENDOR ARCHITECTURES

Focus on vendor-agnostic provisioning of servers, configuration management at scale, application deployment techniques, continuous integration and distributed versioning, and automated quality assurance testing.

SCALABILITY AND ELASTICITY

Stateful and non-stateful application scaling, RESTful application design, vertical and horizontal scaling, user-experience testing, and application load-testing.

GLOBALLY-RESPONSIVE INFRASTRUCTURE

Techniques for providing globally responsive web applications, geo-targeted global load-balancing, automatic global failover, and latency considerations.

CLOUD INFRASTRUCTURE ANALYTICS

Techniques for capturing analytics in a dynamic infrastructure at scale. Topics will include distributed log management, application and business-level metrics, feature-specific metrics, high-resolution and system-level metrics, and establishing context for anomalies and alerts.

EVENTUAL CONSISTENCY AND ALTERNATIVE PERSISTENT STORAGE

Performance, SQL tuning, handling unstructured schema-less data with document and key-value persistent storage, and file-system persistent storage engines such as Apache Jackrabbit™.

SECURITY AND DATA PROTECTION

The Cloud service provider must ensure that their infrastructure is secure and that their clients’ data and applications are protected while...
the customer must ensure that the Cloud service provider has taken the proper security measures to protect their information. Topics include security, privacy, compliance, and legal issues.

**CASE STUDIES AND FINAL PROJECT**

Students will work in teams on a final project which will include the selection of a Cloud infrastructure-related technology for design and implementation.

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**GENERAL INFORMATION**

**ADMISSION**

Applicants should have either completed DePaul’s Cloud Computing Fundamentals Program or have equivalent experience. Basic knowledge of IaaS, PaaS, and SaaS is a requirement. Experience with Amazon EC2™ is a plus.

A substantial commitment of time is required for this intensive course of study. Acceptance into the program 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.

**CLASSES**

The Institute offers one section of the program each quarter. Classes meet one evening per week.

**FACULTY**

The faculty consists of a team of instructors from the College of Computing and Digital Media and experts from industry. Faculty will be available throughout the program both in person and through e-mail.
The college, through its School of Computing and its School of Cinema and Interactive Media, offers a variety of programs at the undergraduate and graduate levels. Over 1,000 students are enrolled in the college’s bachelor’s programs and over 2,000 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 200 courses each quarter, many in the evening, in several locations: the Loop Campus, the Lincoln Park Campus, the O’Hare Campus, the Naperville Campus, and the Rolling Meadows Campus. Many of the degree programs are also available exclusively online.

Current offerings at the undergraduate level include:

**School of Computing**
- Computer Games Development
- Computer Graphics and Motion Technology
- Computer Science
- Computing
- Information Assurance and Security Engineering
- Information Systems
- Information Technology
- Interactive Media
- Math and Computer Science
- Network Technology

**School of Cinema and Interactive Media**
- Animation
- Computer Games Development
- Computer Graphics and Motion Technology
- Digital Cinema
- Interactive Media

Current offerings at the graduate level include:

**School of Computing**
- Applied Technology
- Business Information Technology
- Computer Graphics and Motion Technology
- Computational Finance
- JD/MS in Computer Science Technology
- JD/MS in Computer Science Technology
- Computer Information and Network Security
- E-Commerce Technology
- Human-Computer Interaction
- Information Systems
- Information Technology
- Instructional Technology Systems
- IT Project Management
- Software Engineering
- Telecommunications Systems

**School of Cinema and Interactive Media**
- Computer Games Development
- Computer Graphics and Motion Technology
- Digital Cinema – MS
- Digital Cinema – MFA
- Human-Computer Interaction

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
- Cloud Computing Fundamentals
- IT Project Management
- Java™ Developer
- Java™ Web Services
- Lightweight Java™ Web Development
- .NET Developer
- Ruby on Rails®
- SharePoint® Developer
- SQL Server® Business Intelligence
- SQL Server® Database Administration
- Web Development with Ajax Technologies
- Web Development with Python®
- Wireless LAN Security

**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
Cloud Computing Infrastructure and Operations Program
Institute for Professional Development
243 S. Wabash Avenue, Room 301
Chicago, IL 60604-2300

The words “Amazon EC2”, “Apache Jackrabbit”, “SharePoint”, “SQL Server”, “Python”, “Java”, and “Ruby on Rails” are either registered or unregistered trademarks in the United States of America and/or other countries. The Cloud Computing Infrastructure and Operations 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 any external entities.