FUNDAMENTALS OF STATISTICS AND MACHINE LEARNING USING R PROGRAM

A ten-week program covering how to use R to apply fundamentals of statistical analysis and machine learning

R is an open source programming language and software environment increasingly popular with statisticians, data scientists and decision makers. While a fully-fledged programming language that can take years to master, a fundamental understanding of R, its packages and development environments offers many opportunities. Students in DePaul University’s Fundamentals of Statistics and Machine Learning Using R Program will learn how to describe data, compare groups, cluster observations, build regression models, build classification models, and reduce feature spaces. The focus will be on developing an understanding of R, the R environment and relevant packages so that the student will become comfortable with exploring the R ecosystem. In all cases, students will be introduced to the theory, presented with real world examples and then assigned supervised hands-on tutorials.

The program is ideally suited for business professionals with basic statistical and computer literacy who wish to meet the growing demand for leaders with an analytical skillset. The program is also beneficial to those interested in a career in data science but who wish to learn more before enrolling in a master’s program. Students are asked to bring their personal laptop computers to class (either Mac OS or Windows). Students must have administrator rights to their laptops in order to successfully install and use the software used in the program.

YOU WILL BE ABLE TO:

- Use R and a development environment such as R Studio to create and execute scripts in R
- Comfortably apply R’s various data structures such as vectors, matrices, data frames, etc., including application of subsetting techniques to isolate key components of data
- Import data from a variety of data sources including plain text files, CSV files, spreadsheets, SPSS files, SAS files etc.
- Work with imported data to ensure that it is in a form that can be explored, analyzed, modeled upon, etc.
- Confidently calculate and display the most important types of statistical summary information
- Graph data using R’s base packages as well as more advanced and powerful packages such as ggplot
- Generate a variety of statistical (machine learning) models such as regression, classification, clustering, and others
- Demonstrate through numeric data and graphical displays the validity of statistical models
- Produce reports based on statistical exploration, analyses, and modeling that can be exported to a variety of formats including PDFs, word processing documents, and the web
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GENERAL INFORMATION

ADMISSION

Applicants should have basic experience using a personal computer running Windows; no prior programming experience is necessary. Applicants should also possess basic statistical knowledge.

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 the essential elements of our on-campus classes—the lecture itself and information displayed in class and written on the board—incorporating into a flexible interface, available online only a few hours after the class session ends.

SCHEDULE

The Institute offers the program each quarter. Classes meet one evening 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 from 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 about 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 close to 500 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.
- Computing B.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.
- Graphic Design B.F.A.
- Information Systems B.S.
- Information Technology B.S.
- Math and Computer Science B.S.
- Network Engineering and Security B.S.
- User Experience Design B.S.

**Offerings at the graduate level include:**
- Animation M.A.
- 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.
- Network Engineering and Security 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 Directing
- Game Design
- Screenwriting

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

**INSTITUTE FOR PROFESSIONAL DEVELOPMENT**

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 Python
- Advanced SQL
- Artificial Intelligence for Enterprise
- Automated Software Testing
- Big Data and NoSQL
- Big Data Using Hadoop
- Big Data Using Spark
- Cloud Computing Technologies
- Cybersecurity Risk Management
- Data Analytics with Excel and Tableau
- Data Science for Business
- Data Science: Programming with Python
- DevOps
- Fundamentals of Statistics and Machine Learning Using R
- Incident Response and Digital Forensics
- Introduction to SQL
- iOS Developer
- Machine Learning and Deep Learning
- Modern Information Technology
- Modern .NET Web Development
- SQL Server® Business Intelligence
- SQL Server® Database Administration
- Technology and Innovation
- Web Development with JavaScript and HTML5

**APPLICATION PROCEDURE:**

You do not have to be an existing DePaul student to take this certificate program. All interested parties must apply for admission. Prospective students may complete the [online application](#) and pay the (non-refundable) $40.00 application fee online during the application process. Alternatively, prospective students may print, complete and return the [printable application](#) via mail or email [ipd@cdm.depaul.edu](mailto:ipd@cdm.depaul.edu), and mail the non-refundable $40.00 application fee (check or money order made payable to DEPAUL UNIVERSITY) to:

DePaul University
Institute for Professional Development
243 S. Wabash Avenue, Room 301
Chicago, IL 60604-2300.

The Fundamentals of Statistics and Machine Learning Using R 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.