Data Analytics

LANGUAGE OF INSTRUCTION:

English

TERMS OFFERED:

Summer & Winter terms

PROGRAM OVERVIEW:

Course description:

The course covers the transactional and multidimensional databases, which are fundamental to provide adequate data support to any IT project. It presents the fundamentals of data analysis and visualization.

Course structure:

Data Analytics is a program that includes lectures and hands-on training.

On the other hand, attendance to classes is required and the class material must be studied to sit for exams

LEARNING OUTCOMES:

The student is expected to:

- Understand how to create the different data models (conceptual, logical, physical).
- Use SQL to manipulate data in a relational database.
- Understand the business intelligence and business value concepts.
- Use data analysis tools to create reports and dashboards.
- Explain the fundamentals of non-SQL databases.

TEACHING METHODOLOGY:

44 hours of classes that cover the basic contents expressed in the following section. The exercises will be carried out on the IBM Infosphere Data Architect, SQL Server and MicroStrategy tools, which are installed on the computers.

ASSESSMENT METHODOLOGY:

During the course, there will be exams to assess what's been thought during classes, which will be posted into Blackboard, ITBA's educational platform.

CONTENT BY UNITS:

- Database Definition.
- Data Modeling:
- Basic concepts and terminologies. Logical Model Entities and attributes. Relations between entities. Referential integrity. Development of a conceptual design. Standardization. Denormalization. Physical model. Passage to Physical Model.
- Introduction to SQL:
- Creation of tables. Queries and ABM. Creation of 'joins' and views. Aspects of security and integrity. Group. Generation of Subqueries. Logical conditions Creation of Triggers and Procedures.
- Introduction to Business Intelligence (Business Intelligence)
- Multidimensional data bases. Conceptual, logical and physical modeling. Relationship of these technologies with Business Intelligence. Use of Business Intelligence for Decision.

- Making processes. Market products and trends. Introduction to Big Data, Internet of Things (IoT), databases in memory and cloud databases.

LEARNING REQUIREMENTS:

It´s desired that students have some knowledge about the fundamentals of programming.

In addition, mathematical experience related to basic concepts about set theory and mathematical logic is also required.

PROGRAM OUTLINE:

- Modality: In-person
- Duration of classes: 2.5 and 3 hours.
- Teaching: Monday to Thursday, 9:00 a.m. – 11:30 p.m.
- Duration: 44 hours spread over 4 weeks
- Total amount of hours: 44

Course Schedule:

- **Winter 2026:** January 5 – January 29, 2026

  (Program start: December 2025 with welcome email).

- **Summer 2026:** July 2026 (exact dates to be confirmed).

  (Program start: Mid-June 2026 with welcome email).

BIBLIOGRAPHY:

Key:

- Kroenke, David M. (2000). Database Processing: Fundamentals, Design andImplementation. New Jersey: Prentice Hall.
- Mannino, Michael V (2007). Database Administration - Design and development of applications. Mexico: Mc. Graw - Hill.
- Kimball, Ralph and Gross, Margy (2002). The datawarehouse toolkit. New York:Wiley.

Reference:

- Bruce, Thomas A. (1992). Designing Quality Databases with IDEF1X InformationModels. New York: Dorset House Pub.
- Giménez, Matilde Celma, Casamayor Ródenas, Juan Carlos and Mota Herranz,Laura (2003). Relational database. Madrid: Pearson-Prentice Hall.

COURSE GRADING:

The final course grade will be based on a percentage system founded on the points accumulated during the program, according to the following scale:

A 10

A- 9

B+ 8

B 7

B- 6

C+ 5

C 4

D 2

F 1

U Absent