# (LM54)

(Lecce - Università degli Studi)

## Teaching BUSINESS INTELLIGENCE

GenCod A003162

**Owner professor** GIANPAOLO GHIANI

**Teaching in italian** BUSINESS INTELLIGENCE

**Teaching** BUSINESS INTELLIGENCE

**SSD code** MAT/09

**Reference course**

**Course type** Laurea Magistrale

**Credits** 9.0

**Teaching hours** Front activity hours: 81.0

**For enrolled in** 2018/2019

**Taught in** 2018/2019

**Course year** 1

**Language** ENGLISH

**Curriculum** Percorso comune

**Location** Lecce

**Semester** Second Semester

**Exam type** Oral

**Assessment** Final grade

**Course timetable** https://easyroom.unisalento.it/Orario

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| BRIEF COURSE DESCRIPTION | This course addresses the principles and practice of Business Intelligence (BI), with an emphasis on applictions to logistics, transportation and supply chain management. |
| REQUIREMENTS | Calculus. Probability and Statistics. Linear Algebra. |

## COURSE AIMS

**Knowledge and understanding**. The course describes methods and models to design decision support/automation systems.

- Students will acquire the basic cognitive tools to think analytically, creatively, critically and in an inquiring way, and have the abstraction and problem-solving skills needed to cope with complex systems.
- They will have solid knowledge of BI methodologies.
- They will be able to design and develop complex systems to improve decision-making processes.

**Applying knowledge and understanding.** After the course the student should be able to:

- describe and use the main BI techniques;
- understand the differences among several algorithms solving the same problem and recognize which one is better under different conditions;
- explain experimental results to business people.

**Making judgements**. Students must have the ability to assess a BI system and must arrive at original and autonomous ideas and judgments.. The course promotes the development of independent judgment in the appropriate choice of techniques/models and the critical ability to interpret the goodness of the results of the chosen models/methods.

**Communication.** It is essential that students are able to communicate with a varied and composite audience, not culturally homogeneous, in a clear, logical and effective way, using the methodological tools acquired and their scientific knowledge and, in particular, the specialty vocabulary. Students should be able to organize effective dissemination and study material through the most common presentation tools, including computer-based ones, to communicate the results of data analysis processes, for example by using visualization and reporting tools aimed at different types of audiences.

**Learning skills.** Students must acquire the critical ability to relate, with originality and autonomy, to the typical problems of data mining and, in general, cultural issues related to other similar areas. They should be able to develop and apply independently the knowledge and methods learnt with a view to possible continuation of studies at higher (doctoral) level or in the broader perspective of cultural and professional self-improvement of lifelong learning. Therefore, students should be able to switch to exhibition forms other than the source texts in order to memorize, summarize for themselves and for others, and disseminate scientific knowledge.

## TEACHING METHODOLOGY

The course consists of lectures, classroom exercises and home assignments. Lectures aim at providing the methodological foundations. They are given using slides and/or a blackboard. Students are invited to participate by asking questions and presenting examples. The exercises and home assignments are about the solution of practical problems with software tools.

## ASSESSMENT TYPE

The exam consists of two parts:

- a written test made up of 10 questions [10 marks];
- an oral exam in which students must:

1. discuss a presentation of their own on an advanced course topic [10 marks];
2. show their ability to use the software tools presented in the course (Python libraries for machine learning, AMPL, ...) [10 marks].

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| OTHER USEFUL INFORMATION | **Office Hours**<br>By appointment. As a rule, on Thursdays at 11:00. Please contact the instructor by email or at the end of the lectures. |
| FULL SYLLABUS | PART I – INTRODUCTION (5 hours)<br>1.1 Introducing BI (5 hours)<br><br>PART II – PROGRAMMING SKILLS (8 hours)<br>2.1 Getting started in Python (8 hours)<br><br>PART III – DESCRIPTIVE ANALYTICS (10 hours)<br>3.1 Making sense of data, visualizing and exploring data (1 hour)<br>3.2 Descriptive stastical measure (9 hours)<br><br>PART IV – PREDICTIVE ANALYTICS (32 hours)<br>4.1 Forecasting: basics (2 hours)<br>4.2 Extrapolating time-series (8 hours)<br>4.3 Regression models (4 hours)<br>4.4 Basics of classification models (2 hours)<br>4.5 Performance evaluation with analytical methods: queueing models (6 hours)<br>4.6 Performance evaluation with discrete event simulation: basics, random number generation, output analysis, SIMIO tutorial (10 hours)<br><br>PART V – PRESCRIPTIVE ANALYTICS (26 hour)<br>5.1. Optimization model review, AMPL (8 hours)<br>5.2 Applications to logistics, manufacturing and transportation (18 hours) |
| REFERENCE TEXT BOOKS | Handouts (available on FormazioneOnLine at https://formazioneonline.unisalento.it/course/view.php?id=544).<br><br>For consultation:<br><br>▪ Ghiani, Gianpaolo, Gilbert Laporte, and Roberto Musmanno. Introduction to logistics systems management. John Wiley & Sons, 2013.<br>▪ Evans, James Robert. Business analytics: Methods, models, and decisions. Vol. 3. Upper Saddle River, NJ: Pearson, 2013. |