UNIVERSITY of NICOSIA

# Course Syllabus

| Course Code | Course Title | ECTS Credits |
|---|---|---|
| COMP-551DL | Business Intelligence | 10 |
| **Prerequisites** | **Department** | **Semester** |
| COMP-544DL | Computer Science | Fall |
| **Type of Course** | **Field** | **Language of Instruction** |
| Elective | Data Science | English |
| **Level of Course** | **Lecturer** | **Year of Study** |
| 2nd Cycle | Dr. Elia Kouzari | 1st |
| **Mode of Delivery** | **Work Placement** | **Corequisites** |
| Distance Learning | N/A | None |

**Course Objectives:**

The main objectives of the course are to:

- Introduce the students to data analytic thinking from the business point of view.
- To provide an overview of classifier performance and methodologies in real settings.
- To give the students an understanding of the business problems where visualization of classifier performance is useful.
- To move from theoretical knowledge to practical skills.
- To explain the challenges of applying Machine Learning and Data Science techniques to real-world applications.
- Familiarize the students with probabilistic reasoning.
- Introduce the Expected Value Framework and its applications to use cases.
- To explain the main principles and applications of recommender systems.
- To introduce A/B testing
- To provide a number of hands-on exercises and tutorials on multiple business use cases (detecting transaction fraud, targeting customers with advertisements, predicting customer churn, recommending movies).

**Learning Outcomes:**

After completion of the course students are expected to be able to:

1. Explain what is data driven decision making and what are the two types of data driven decision making.

2. Know the methodology for avoiding overfitting for different types of models
3. Know how to construct and interpret profit cumulative response and lift curves
4. Recognize contexts where Naive Bayes classification demonstrates superior performance compared to alternative classification techniques
5. Execute the process of model selection with expertise.
6. Do evaluation with business context.
7. Explain the process of analytical engineering
8. Use the Expected Value Framework to frame the problem to be solved in a way that is directly linked to the business decision
9. Discuss the notion of Controlled Experiment
10. Analyze and synthesize scenarios where A/B testing serves as a valuable tool in various application domains.

**Course Content:**

1. Data Analytic Thinking
2. What is a good model
3. Visualizing Mode Performance
4. Use Case: Detecting Transaction Fraud
5. Evidence and Probabilities
6. Use Case: Targeting Customer with Advertisements
7. Use Case: Predicting Customer Churn
8. Towards analytical engineering
9. Recommender Systems
10. Use Case: Recommending Films
11. Use Case: Recommending scholarly articles to researchers
12. A/B Testing

**Learning Activities and Teaching Methods:**

Lectures, Demonstration of Tools, Assignments, Projects.

**Assessment Methods:**

Projects

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|---|
| Final Assessment*<br><br>* The Final Assessment can be either a Final Exam or Final Assignment(s) with Viva |
| Participation/Homework Assignments/Quizzes |

**Required Textbooks / Readings**

| Title | Authors | Publisher | Year | ISBN |
|---|---|---|---|---|
| *Data Science for Business (what you need to know about data mining and data-analytic thinking)* | F. Provost, T. Fawcett | O'Reilly | 2013 | 978-1449361327 |

**Recommended Textbooks / Readings:**

Multiple research papers provided at each section on moodle.