## COURSE DESCRIPTION – ACADEMIC YEAR 2019/2020

<table>
<thead>
<tr>
<th>Course title</th>
<th>Decision Making and Support Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course code</td>
<td>73026</td>
</tr>
<tr>
<td>Scientific sector</td>
<td>INF/01</td>
</tr>
<tr>
<td>Degree</td>
<td>Master in Computational Data Science (LM-18)</td>
</tr>
<tr>
<td>Semester</td>
<td>1</td>
</tr>
<tr>
<td>Year</td>
<td>2</td>
</tr>
<tr>
<td>Credits</td>
<td>6</td>
</tr>
<tr>
<td>Modular</td>
<td>No</td>
</tr>
<tr>
<td>Total lecturing hours</td>
<td>40</td>
</tr>
<tr>
<td>Total lab hours</td>
<td>20</td>
</tr>
<tr>
<td>Attendance</td>
<td>Attendance is not compulsory. Non-attending students have to contact the lecturer at the start of the course to agree on the modalities of the independent study. The exam modalities for non-attending students are indicated below, in the fields “Assessment” and “Evaluation criteria and criteria for awarding marks”.</td>
</tr>
<tr>
<td>Prerequisites</td>
<td></td>
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<tr>
<td>Course page</td>
<td><a href="https://ole.unibz.it/">https://ole.unibz.it/</a></td>
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### Specific educational objectives

The course belongs to the type “caratterizzanti – discipline informatiche” in the curricula “Data Analytics” and “Data Management”.

The course gives a general overview of topics in decision theory. After this course, the students will have acquired general and pluri-disciplinary knowledge about decision. The students will be more prepared when facing situations of decision-making. They will also have a grasp on the technical aspects of decision-making, and will be capable to apply them to provide decision support.

### Lecturer

**Nicolas Troquard**

POS 3.02, nicolas.troquard@unibz.it

Scientific sector of lecturer | ING-INF/05

Teaching language | English

Office hours | Arrange beforehand by email.

Lecturing Assistant (if any) | --

Contact LA | --

Office hours LA | --

### List of topics

- Modelling decisions
- Modelling uncertainty
- Modelling preferences
- Modelling negotiations
- Decision support tools
- Psychology of decision making
- Persuasion
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<thead>
<tr>
<th><strong>Teaching format</strong></th>
<th>Frontal lectures, practice and exercise classes.</th>
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</table>
| **Learning outcomes** | Knowledge and understanding:  
- D1.5 - Knowledge of principles and models for the representation, management and processing of complex and heterogeneous data  
Applying knowledge and understanding:  
- D2.2 - Ability to address and solve a problem using scientific methods  
- D2.11 - Ability to develop intelligent software systems for decision support  
Making judgments  
- D3.2 - Ability to autonomously select the documentation (in the form of books, web, magazines, etc.) needed to keep up to date in a given sector  
- D3.3 - Ability to identify reasonable work goals and estimate the resources needed to achieve these goals  
Communication skills  
- D4.1 - Ability to use English at an advanced level with particular reference to disciplinary terminology  
Learning skills  
- D5.2 - Ability to autonomously keep oneself up to date with the developments of the most important areas of data science |
| **Assessment** | Written exam with verification questions.  
Exercise, lab work, or project possibly done in groups of at most 3, and requiring individual reports and/or presentations.  
The assessment modalities for non-attending students is identical. |
| **Assessment language** | English |
| **Assessment Typology** | Monocratic |
| **Evaluation criteria and criteria for awarding marks** | Assessment 1: 40% of the final grade will be awarded for the project, exercise, and lab work.  
Assessment 2: 60% of the final grade will be awarded for the final exam.  
Admission is awarded when the final grade is 60% or above.  
- Relevant for assessment 1: ability to summarize, evaluate, and establish relationships between topics; ability to work in a team; creativity; skills in critical thinking; correctness and clarity of answers.  
- Relevant for assessment 2: correctness and clarity of answers.  
The assessment modalities for non-attending students is identical. |
| **Required readings** | There is no single textbook that covers the entire course. The course material is collected from various textbooks and research papers. |
### Supplementary readings

- Stuart Russell, Peter Norvig - *Artificial Intelligence: A Modern Approach*
- Yoav Shoham, Kevin Leyton-Brown - *Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations*
- Efraim Turban, Jay E. Aronson - *Decision Support Systems and Intelligent Systems*
- Shaheen Fatima, Sarit Kraus, Michael Wooldridge - *Principles of Automated Negotiation*
- Rafael H. Bordini, Jomi F. Hubner, Michael Wooldridge - *Programming Multi-Agent Systems in AgentSpeak Using Jason*
- Michael D. Resnik - *Choices: An Introduction to Decision Theory*
- Daniel Kahneman - *Thinking, Fast and Slow*

### Software used

Various tools and programming languages may be used during the course.