Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Master in Applied Linguistics (LM-39)

Course title:	Machine Learning
Course year:	2
Semester:	2nd
Course Code:	54114
Scientific sector:	INF/01
Lecturer:	Riccardo Billero Riccardo.Billero@unibz.it
Module:	No
Lecturer other module:	/
Credit Points:	6
Total lecturing hours:	45
Total Hours of availability for students and tutoring:	18
Office hours:	Please send an email before.
Attendance:	according to the regulations
Teaching Language:	English
Propaedeutic course:	/
Course description:	The course is for students of the humanities area. It offers an introduction to the basics of machine learning. The course uses the Python programming language and Natural Language Processing (NLP) packages or modules.
Specific educational objectives:	The objective of the course is to provide the tools and skills necessary to build Machine Learning systems using the Python programming language and its modules. The course will focus on some background theoretical concepts, ranging from statistics to basic calculus, as well as on the practical aspects of the implementation of those concepts, in particular in the area of Natural Language Processing.
List of topics covered:	This course introduces students to the basics of Machine Learning, and topics relevant for applied linguistics. The following list is only indicative of possible topics, which may change according to the students' projects and skills: 1) Unsupervised learning 2) Supervised learning 3) Clustering 4) Regression 5) Neural networks
Teaching format:	Frontal lectures use slides, videos and code snippets as main material. Workshop-based classes span the entire course. The reason is that programming is learnt by "doing", that is, by experiencing it, hands-on, over and over.

	Such classes challenge students to work on programming exercises, with program snippets to correct, comment, test or complete.
Learning outcomes:	The course will cover areas like statistical modeling, calculus, data management, statistical model training and testing, and deep learning. Some core Machine Learning concepts like supervised and unsupervised learning, regression and feature engineering will be explored as well. However, the main goal of the course will be on how to apply that knowledge to practical problems. We will use Python and its modules as well as some popular datasets to test hypothesis and explore different solutions. The students will be required to actively engage in coding, during class and to discuss the possible solutions to a problem and their outcome.
Assessment:	Oral Exam: students are required to discuss the details of a project that encompasses and develops the subjects covered during the course. The project will be defined and agreed upon before the exam.
Evaluation criteria and criteria for awarding marks:	The outcome of the exam will be determined by: a) the level of understanding of the topics covered during the course, b) the computational skills of the candidate, c) the clarity of the exposition and of the project.
Required readings:	Haul Daumé III, A Course in Machine Learning, available here: http://ciml.info/ Dan Jurafsky and James H. Martin, Speech and Language Processing (3rd ed.), available here: https://web.stanford.edu/~jurafsky/slp3/
Supplementary readings:	Ian Goodfellow and Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, available here: http://www.deeplearningbook.org/ Ron Zacharski, A Programmer's Guide to Data Mining, available here: http://guidetodatamining.com/