COURSE: Intelligent Systems			
ACADEMIC YEAR: 2019/2020			
TYPE OF EDUCATIONAL ACTIVITY: Characteristic			
TEACHER: Veltri Enzo			
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phone:		mobile:	
Language: Italian			
ECTS: 6	n. of hours: 48	Campus: Potenza Dept./School: Scuola di Ingegneria Program: Ingegneria Informatica e delle Tecnologie dell'Informazione	Semester: First

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

- **Knowledge and understanding skills**: The student will develop skills about understanding the major machine learning techniques.

- **Knowledge applying skills**: The student will be able to model and to develop real systems using most of the machine learning techniques. In details she will be able to decide which technique fits well for a given problem. She will be able to understand produced results such to improve the generated results with respect to the given problem.

- **Communication skills:** The student will be able to explain with her own words or with technical/scientific words most of the machine learning techniques. She will be able to give the intuition for each technique, the pros and cons and the scenarios where the technique can be used.

- **Learning skills:** The student will be able to develop intelligent systems using ML algorithms with every kind of programming language. The student will be able to read and understand on her own other ML techniques that are not presented in this course.

PRE-REQUIREMENTS

- Computer programming

SYLLABUS

1. **Introduction** (4 hours)
   Introduction to ML, Supervised Learning, Unsupervised Learning, Linear algebra review
2. **Linear Regression** (4 hours)
   Linear regression with one variable, Multivariate Linear Regression
3. **Logistic Regression** (4 hours)
   Classification problem, Logistic Regression, Multiclass classification
4. **Regularization** (4 hours)
   The overfitting problem, Regularized Linear Regression, Regularized Logistic Regression
5. **Neural Networks** (4 hours)
   Neural Networks modelling, Neural Networks learning
6. **Machine Learning System Design** (4 hours)
   Model selection, Cross-Validation, Evaluating a Learning Algorithm
7. **Support Vector Machines** (4 hours)
   SVM, Kernels
8. **Clustering** (4 hours)
   Unsupervised Learning, K-Means
9. **Dimensional Reduction** (4 hours)
   Principal component analysis
10. **Recommender Systems** (4 hours)

Content-based recommender systems, Collaborative Filtering

11. **Practical examples** (8 hours)

TEACHING METHODS
Theoretical lessons

EVALUATION METHODS
Written examination with multiple choice quizzes and open-ended questions.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL
Educational material provided by the teacher.

INTERACTION WITH STUDENTS
Weekly office hours: see website of the course 11:30-13:30 AM. Lab. ICAR – 3rd floor DiMIE

EXAMINATION SESSIONS (FORECAST)[1]
13/02/2020, 27/02/2020, 04/05/2020, 26/06/2020, 20/07/2020, 21/09/2020, 16/11/2020

SEMINARS BY EXTERNAL EXPERTS YES □ NO X

FURTHER INFORMATION

[1] Subject to possible changes: check the web site of the Teacher or the Department/School for updates.