Universidad Carlos III de Madrid

SUBJECT: DATA ANALYTICS IN IC4.0		
MASTER DEGREE: MASTER IN CONNECTED INDUSTRY 4.0	ECTS: 3	QUARTER: 1

TIMETABLE FOR THE SUBJECT

WEEK	SESSION	DESCRIPTION OF EACH SESSION	GROUP (X mark)		Indicate if a different lecture room is needed (computer, audiovisual, etc.)	HOMEWORK PER WEEK		
			1	2		DESCRIPTION	ATTENDING HOURS	HOMEWORK Max. 7H/WEEK
1	1	Topic 1. Introduction 1.1 Basics of Multivariate Data Analysis 1.2 Introduction to Statistical Learning 1.3 Supervised vs. Unsupervised Learning	X			Review and study of the materials in Topic 1	1.5	1
1	2	Topic 1. Introduction 1.4 Data Visualization Techniques	X			Review and study of the materials in Topic 1	1.5	2
1	3	Topic 2. Supervised Learning: Regression 2.1 Linear Regression	X			Review and study of the materials in Topic 2	1.5	2
1	4	Topic 2. Supervised Learning: Regression 2.2 Linear Model Selection and Regularization	X			Review and study of the materials in Topic 2	1.5	2
2	5	Topic 2. Supervised Learning: Regression 2.3 Polynomial Regression 2.4 Splines	X			Review and study of the materials in Topic 2	1.5	1

2	6	Topic 2. Supervised Learning: Regression 2.5 Generalized Linear Models 2.6 Cross-Validation on Regression problems	X			Review and study of the materials in Topic 2	1.5	2
2	7	Topic 3. Supervised Learning: Classification 3.1 Logistic Regression	X			Review and study of the materials in Topic 3	1.5	2
2	8	Topic 3. Supervised Learning: Classification 3.2 Bayes classifier 3.3 Linear Discriminant Analysis	X			Review and study of the materials in Topic 3	1.5	2
3	9	Topic 3. Supervised Learning: Classification 3.4 k-Nearest Neighbor classifier 3.5 Random Forests	X			Review and study of the materials in Topic 3	1.5	1
3	10	Topic 3. Supervised Learning: Classification 3.6 Support Vector Machines 3.7 Cross-Validation on Classification problems	X			Review and study of the materials in Topic 3	1.5	2
3	11	Practical session / Assessment	X			Review and study of the materials in Topic 1-3	1.5	2
3	12	Topic 4. Unsupervised Learning and Dimensionality Reduction Techniques 4.1 Clustering methods: k-means and hierarchical clustering	X			Review and study of the materials in Topic 4	1.5	2
4	13	Topic 4. Unsupervised Learning and Dimensionality Reduction Techniques 4.2 Self-organizing maps (SOM) 4.3 Principal Component Analysis	X			Review and study of the materials in Topic 4	1.5	1

4	14	Topic 4. Unsupervised Learning and Dimensionality Reduction Techniques 4.4 Factor Analysis 4.5 Multidimensional Scaling 4.6 ISOMAP and Locally-Linear Embedding	X			Review and study of the materials in Topic 4	1.5	2
4	15	Topic 4. Unsupervised Learning and Dimensionality Reduction Techniques 4.6 ISOMAP and Locally-Linear Embedding	X			Review and study of the materials in Topic 4	1.5	2
4	16	Practical session / Assessment	X			Review and study of the materials in Topics 1-4	1.5	2
TOTAL HOURS							24	28