



<b>SUBJECT:</b> Intelligent data processing tools		
<b>MASTER DEGREE:</b> MASTER IN CONNECTED INDUSTRY 4.0	<b>ECTS:</b> 3	<b>QUARTER:</b> 2

<b>TIMETABLE FOR THE SUBJECT</b>								
<b>WEEK</b>	<b>SESSION</b>	<b>DESCRIPTION OF EACH SESSION</b>	<b>GROUP (X mark)</b>		<b>Indicate if a different lecture room is needed (computer, audiovisual, etc.)</b>	<b>HOMEWORK PER WEEK</b>		
			<b>1</b>	<b>2</b>		<b>DESCRIPTION</b>	<b>ATTENDING HOURS</b>	<b>HOMEWORK Max. 7H/WEEK</b>
1	1	Introduction to the course: CI4.0 sensor data handling, pre-processing, outlier detection, deep learning vs shallow models, cloud data processing and tools.	X		No	An overview of the contents of the course will be presented and motivated. The student will be able to understand the need for advanced machine learning tools and their impact in Connected industry.	1.5	3
1	2	Outlier detection techniques, methods, tools and applications. Distance based methods. Statistic distances. Cluster methods. Machine learning based methods	X		No	The student will understand the importance of detecting anomalous data both for data cleansing and fail	1.5	3



						recovery processes.		
2	3	Python programming review. Language review. Major packages for machine learning in Python.	X		No	The labs will be done in Python. The required background will be reviewed so that all the students can follow the course.	1.5	3
2	4	Outlier detection techniques lab in Python.		X	Yes	Lab in Python in order to practice and master the theoretical concepts	1.5	3
3	5	Advanced classification methods with SVM and shallow Neural Networks. Concepts, algorithms, examples.	X		No	Basic techniques were presented in a previous subject. This class will complete the tool case for students based on shallow learning algorithms.	1.5	3
3	6	Advanced classification methods with SVM and shallow Neural Networks. Lab in Python		X	Yes	Lab in Python in order to practice and master the theoretical concepts	1.5	3



4	7	Advanced classification and regression with Deep learning methods. Restricted Boltzmann Machines and Autoencoders.	X		No	Deep learning is showing improved results in many disciplines. Some major methods for CI are going to be presented.	1.5	3
4	8	Advanced classification and regression with Deep learning methods. Restricted Boltzmann Machines and Autoencoders. Lab in Python		X	Yes	Lab in Python in order to practice and master the theoretical concepts	1.5	3
5	9	Advanced classification and regression with Deep learning methods. Deep Recurrent Neural Networks.	X		No	Deep learning is showing improved results in many disciplines. Some major methods for CI are going to be presented.	1.5	3
5	10	Advanced classification and regression with Deep learning methods. Deep Recurrent Neural Networks. Lab in Python		X	Yes	Lab in Python in order to practice and master the theoretical concepts	1.5	3
6	11	Data handling in the Cloud. Tools and architectures.	X		No	The student will learn to execute machine learning algorithms in a centralized cloud based architecture receiving the	1.5	3



						data from several CI sensors.		
6	12	Final Project. Implementing a guided solution for a CI4.0 case.		X	Yes	Real problem solving based on a simulated scenario.	1.5	3
7	13	Final Project. Implementing a guided solution for a CI4.0 case.		X	Yes	Real problem solving based on a simulated scenario.	1.5	3
7	14	Final Project. Implementing a guided solution for a CI4.0 case.		X	Yes	Real problem solving based on a simulated scenario.	1.5	3
<b>TOTAL HOURS</b>							<b>21</b>	<b>42</b>