

## MÁSTER UNIVERSITARIO EN DEEP LEARNING FOR AUDIO AND VIDEO SIGNAL PROCESSING

### Structure of the programme

This master is a research-oriented degree which corresponds to the *second cycle* of the *Qualifications Frameworks in the European Higher Education Area (QF-EHEA)*, mapped to the Spanish MECES level 3 (Spanish Framework for Higher Education Qualification or MECES, from Marco Español de Cualificaciones para la Educación Superior).

This master's degree is taught entirely in English in a face-to-face modality. The programme of this master is compact without any elective courses (60 ECTS) and with a high weight of the Masters thesis (12 ECTS). The degree will be taught by teaching staff from the two departments of the Escuela Politécnica Superior: the Department of Computer Engineering (II) and the Department of Electronic and Communications Technology (TEC).

The study plan leading to the degree of Master's Deep Learning for Audio and Video Signal Processing by the Universidad Autónoma de Madrid consists of 60 credits taught in two semesters. The subjects are grouped into subjects according to the following scheme:

Leveling program / [1 ECTS]				1 <sup>st</sup> term (Sep-Jan)
<b>Subject 1:</b> Fundamentals and basic tools for deep Learning, audio and image [12 ECTS]				
<b>Subject 2:</b> Deep Learning for audio, image and video processing [18 ECTS]				
<b>Subject 3:</b> Biometrics & Applied Intelligence [6 ECTS]	<b>Subject 4:</b> High Performance Computing [6 ECTS]	<b>Subject 5:</b> Research methodologies and seminars [6 ECTS]	<b>Subject 6:</b> Master Thesis [12 ECTS]	2 <sup>nd</sup> term (Jan-Jun)

The courses contained within each subject are listed below. Further details (contents, learning outcomes, evaluation,...) can be found at the official document describing the Master's Degree known as "Memoria de Verificación" written simultaneously in Spanish and English and available at the webpage of this master [https://www.uam.es/EPS/documento/1446797807931/Verifica\\_MUDL4AVS\\_EPS\\_UAM.pdf](https://www.uam.es/EPS/documento/1446797807931/Verifica_MUDL4AVS_EPS_UAM.pdf)

### **Leveling program [1 ECTS]**

The curriculum considers a leveling program, offered as training complements, distributed in a single module/course:

- *Fundamentals of Signal processing* [1 ECTS]

### **Subject 1. Fundamentals and basic tools for deep Learning, audio and image processing [12 ECTS]**

The modules/courses of this subject are compulsory, being distributed as follows:

- Deep Learning fundamentals and basic tools [8 ECTS]
- Review of Established Signal Processing Techniques [4 ECTS]

### **Subject 2. Deep Learning for audio, image and video processing [18 ECTS]**

The modules/courses of this subject are compulsory, being distributed as follows:

- Deep Learning for audio signal processing [6 ECTS]
- Deep Learning for image signal processing [6 ECTS]
- Deep Learning for video signal processing [6 ECTS]

### **Subject 3. Biometrics & Applied Intelligence [6 ECTS]**

The modules/courses of this subject are compulsory, being distributed as follows:

- Biometrics & Applied Intelligence [6 ECTS]

### **Subject 4. High Performance Computing for Deep learning [6 ECTS]**

The modules/courses of this subject are compulsory, being distributed as follows:

- High Performance Computing for Deep learning [6 ECTS]

### **Subject 5. Research methodologies and seminars [6 ECTS]**

The modules/courses of this subject are compulsory, being distributed as follows:

- *Research methodologies and seminars* [6 ECTS]

### **Subject 6. Master thesis [12 ECTS]**

This subject is compulsory and consists of a single course/module of 12 ECTS: the master's degree Thesis.

The Master's Degree Thesis is an original work carried out individually by the student under the direction and supervision of a tutor, preferably a doctor or with accredited professional experience and competence. Its development must involve the articulation of the knowledge, skills and abilities acquired throughout their training in the master's degree. It must also be of a formative nature, addressing problems in the corresponding professional area and serving as preparation for subsequent stages of academic training in doctoral studies, incorporating research or innovation components. The work will involve carrying out studies, assessments and reports on available technologies, innovations and alternatives. Finally, it must be carried out with scientific rigor and in accordance with ethical principles.

The research work can be carried out either by an EPS-UAM research group involved in teaching the master's degree or by other research groups, both from the UAM and from other Spanish and foreign universities and research centres. In the second case, the work will be directed by a doctoral tutor, who must be approved by the Master's Coordination Committee. This commission will also assign an academic speaker from among the teachers of the master's degree.

Students may also carry out their TFM in a company, as long as they can prove that the work to be done has an innovation or research component in line with the objectives of the master's degree. In this case, the student must have a business tutor and be assigned an academic speaker, chosen from among the teaching staff of the master's degree. The tasks of approving the first and appointing the second correspond to the Master's Coordination and Monitoring Commission. The business tutor will be a professional with experience and accredited competence in the area of in-depth learning in the audiovisual field. He or she is responsible for establishing the work program, which must necessarily have a training component in line with the objectives of the Master's, and for monitoring the student's work. The task of the academic speaker is to verify that the activities to be carried out involve the application of the knowledge and skills associated with the degree, and that the project meets the academic and training requirements corresponding to a TFM. In all cases, in coordination with the Internship Office of the Escuela Politécnica Superior de la Universidad Autónoma de Madrid (EPS-UAM), the relevant agreements will be established to make it possible to carry out the TFM with enough quality guarantees.

The Master Thesis will be carried out in accordance with the regulations of the Escuela Politécnica Superior, available at <https://www.uam.es/EPS/TrabajoFinDeMaster/1242674966369.htm>