UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Audio Techniques

Academic Year 2023/2024

1. Organic Unit

Faculty of Architecture and Arts

2. Course

JAZZ AND MODERN MUSIC

3. Cycle

1st

4. Course Unit

Audio Techniques (C6118)

5. Scientific Area

6. Curricular Year

2nd

7. Type of Curricular Unit / Semester

1st Semester

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8. Class type and workload (work time)

Theoretical classes:	
Practical classes:	
Theoretical-Practical Classes	30,00
Tutorial Guidance:	20,00

9. ECTS Credits

6,00

10. Scientific Area Coordinator

11. Regent

Prof. Doutor JOÃO MIGUEL DE CARVALHO LOPES MESQUITA

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

At the end of this curricular unit, students should have acquired knowledge related to capturing, editing, audio mixing, as well as generative processes sound production for their subsequent inclusion in media and multimedia objects.

15. Specific Objectives

+ Knowing various techniques for capturing mono, stereo and multichannel and the optimization of the gain structure ranging from capture to hard disk recording.
+ Study the main steps of the signal process: dynamics, filters, temporal process, summing and dividing signals, synthesis, and creative combinations of them.
+ Make known the practical realities of the *workflow* of audio projects and audio-to-image projects, namely in the multimedia field.
+ Introduction to procedural sound generati

16. Skills to be acquired

- Development of the ability to link technical choices with psychological and physiological phenomena.
- Understanding about analogue audio signal processing systems.
- Ability to carry out the sound design through *samples* or a synthesizer a visual product in multimedia support.
- Audio and multimedia post-production

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17. Teaching Methodology

Expository method - moment where students come into contact with the theoretical component and explanations of the subject, also including the analysis of case studies.
Demonstrative method - moment in which the teacher exemplifies the material exposed in practice.
Interrogative method - when students have the opportunity to ask questions.
Active method - the student is invited to apply the material taught in practice, namely in OT classes.

18. Course Unit Program

PART I: Audio Signal.
1. Signal system: Capturing, pre-amplifying and signal input alternatives, summing and splitting of audio signals.
2. Optimization of the gain structure.
3. Microphones: Typology, polarity patterns, mono capture methods, stereo capture methods, overview of the existing options in the market. Practical applications.
4. Audio signal processing: overview of possibilities for processing individual signals, processing on top of the signal versus parallel processing.
5. Filters: EQs, Amplitude Filters, Variable Filters.
6. Dynamics: compression and signal limitation, normalization and gates.
7. Time-Base Processing: Chorus, phasers, delays, reverbs, room acoustics intro.
8. Rooms and listening systems: basic principles of acoustics applied to spaces, types of listening and optimisation, signal-noise. Dolby. Surround systems.
PART II: Mixing and sequencing.
1. Introduction to a multitrack recording system: basic concepts of an audio sequencer
2. Mixing logic: insertion of elements in the three-dimensional spectrum, stereo field, frequency range and depth. Speech intelligibility. Sound effects and music in the context of mixing
3. Mastering: meaning and current practices.
PART III: Synthesis and sampling.
1. Types of synthesis: FM, additive, subtractive, Physical Modeling. The basic elements of the synth: oscillators, filters, amplifiers, LFOs, ADSR envelopes. Generative sound;
2. Sampling capture, cataloging, ordering, sampling as a tool for sound effects.
PART IV: Audio to Video.
1. Capturing - perches, foley, dialog capturing. Psychological relations between sound and image. 2. Synchronism, practical applications in sequencer systems.
PART V: Post-production.
1. Mastering process.
2. Sound-to-picture post-production tools. 3. Audio Forensics and Signal Restoration.

19. Assessment Methods

The continuous assessment methodology follows the general regulations of Universidade Lusíada as well as the Specific Assessment Rules for the Degree in Communication and Multimedia. The UC also contemplates the obligation of the assessment element defined in article 8, paragraph e, this classification being the weighted average of exercises performed during the continuous assessment in which weight = 2x/n(n+1).

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20. Didactic Resources

Practical use of studio material.
Sound production and post-production software.

21. Sustainability Objectives

The general and specific objectives of the UC focus on the acquisition of general and specific skills for the development of the sound technician activity with a focus on quality (objective 4).

The curricular unit foresees that these general and specific competences for the development of the activity of audio technician, either in the use of sustainable sources of production of electricity, their use in terms of emissions and sound and visual pollution, as well as in the residual treatment o

22. Keywords

sound capture
microphones
sound edition
mixture
mastering
post production
generative sound

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23. Main Bibliography

Author(s):	Huber, D.M. and Runstein, R.E		
Title:	Modern Recording Techniques		
Edition:	9	Year:	2017
Local:	Oxford, UK		
Publisher:	Focal Press		

Author(s):	Rumsey, F. and McCormick, T.		
Title:	Sound and Recording: Applications and Theory		
Edition:	7	Year:	2014
Local:	Oxford, UK		
Publisher:	Focal Press		

Author(s):	Heller, Eric		
Title:	Why You Hear What you Hear		
Edition:	1	Year:	2012
Local:	New Jersey, NJ		
Publisher:	Princeton University Press		

24. Complementary Bibliography

Author(s):	Holmam, T		
Title:	Sound for Film and Television		
Edition:	3	Year:	2010
Local:	Oxford, UK		
Publisher:	Focal Press		

Author(s):	Rayburn, R		
Title:	Eargle's The Microphone Book		
Edition:	3	Year:	2011
Local:	Oxford, UK		
Publisher:	Focal Press		

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Autor / Author	Prof. Doutor JOÃO MIGUEL DE CARVALHO LOPES MESQUITA
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