UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Introduction to the Study of Sound

Academic Year 2023/2024

1. Organic Unit

Faculty of Architecture and Arts

2. Course

JAZZ AND MODERN MUSIC

3. Cycle

1st

4. Course Unit

Introduction to the Study of Sound (C6112)

5. Scientific Area

6. Curricular Year

1st

7. Type of Curricular Unit / Semester

2nd 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 JORGE MIGUEL CECÍLIA MONIZ

12. Assistants

Prof. Doutor MASSIMO CAVALLI

13. Teaching Language

Portuguese

14. General Objectives

1. Understand acoustic phenomena and relate them to physiological and musical phenomena.
2. Comprehend sound as a modulating factor of emotions.
3. Grasp the cognitive and ecological dimensions of the sound landscape.
4- Understand the electroacoustic principles that enable the recording, digitization, and reproduction of sound.

15. Specific Objectives

1. Study the fundamental elements of the physical understanding of sound: amplitude, frequency, sound pressure, timbre, pitch, and sound spectrum.
2. Understand the processes of auditory perception and the psychology of listening.
3. Interpret the transition from the physical representation of sound to electronic representation and later to digital electronics, especially in the context of multimedia.
4. Acquire knowledge of audio manipulation and treatment software.

16. Skills to be acquired

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1. Basic understanding of fundamental concepts in acoustics, particularly concerning the propagation of sound waves.
2. Development of the ability to relate physical phenomena to psychological and physiological phenomena.
3. Development of the ability to relate acoustic phenomena to analog and digital electronic representation.
4. Auditory training in basic recognition of frequencies and timbres.
5. Proficiency in the use of sound manipulation software.

17. Teaching Methodology

1. Listening to sound examples crucial for understanding the subject matter.
2. Projection of examples in visual format.
3. Involvement of artists for musical examples.
4. Software tutorials.

18. Course Unit Program

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1. Acoustics:
a. Speed of sound in space.
b. Sinusoidal waves.
c. Frequency, amplitude, phase, wavelength.
d. Measures of intensity:
i. Sound pressure.
ii. Sound power.
iii. Acoustic intensity.
e. Levels. Study of decibels.
i. Sound Pressure Level (SPL).
ii. Sound Power Level (SWL).
iii. Sound Intensity Level (SIL).
f. Modal systems and resonance.
g. Sound interactions:
i. Absorption.
ii. Reflection.
iii. Transmission.
iv. Diffusion.
v. Refraction.
vi. Diffraction.
h. Reverberation, the propagation of sound in space.
2. Psychoacoustics:
a. Fletcher-Munson curves.
b. Critical bands and masks.
c. Haas effect.
d. Neurological phenomena in psychoacoustics.
e. Sound and emotion.
f. Ecology of the sound landscape.
3. Sound Art:
a. Electrical and electronic phenomena applied to sound.
b. Sound Design.
c. Musique Concrète.
d. Elektronische Muzik.
e. Computer music.
f. Digital Audio.
g. Sound and multimedia.

19. Assessment Methods

Participation, motivation, punctuality, and behavior.
Results in homework assignments.
Performance in practical assignments.
Final project.
Two written tests.

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20. Didactic Resources

Documentation available on Moodle.
Course notes divided into chapters.
Interactive documents.
Sound analysis software - oscillators and oscilloscopes.
Practical physical experiments.
Videos.

21. Sustainability Objectives

Reduction of resources in traditional paper format, favoring the use of computer software such as Moodle, Reaper, and other platforms for sound processing and analysis. Greater emphasis on the chapter dedicated to the ecology of the sound landscape, raising awareness among students for a greater environmental and sustainable perspective.

22. Keywords

Acoustics
Psychoacoustics
Electroacoustics
Sound
Sound Art
Perception

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23. Main Bibliography

Author(s):	Heller. E.		
Title:	Why you hear what you hear		
Edition:	Primeira	Year:	2012
Local:	New Jersey		
Publisher:	Princeton University Press		

Author(s):	Schafer, R.M.		
Title:	Soundscape: Our Sonic Environment and the Tuning of the World		
Edition:	Segunda	Year:	1994
Local:	Nova Iorque		
Publisher:	Destiny Books		

Author(s):	Holmes, T.		
Title:	Electronic and Experimental Music		
Edition:	Primeira	Year:	2015
Local:	Londres		
Publisher:	Routledge		

24. Complementary Bibliography

Author(s):	Sonnenschein, D.		
Title:	Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema		
Edition:	Primeira	Year:	2001
Local:	Los Angeles		
Publisher:	Michael Wiese Productions		

Author(s):	Chion, M.		
Title:	A Audiovisão - Som e Imagem no Cinema		
Edition:		Year:	2016
Local:	Lisboa		
Publisher:	Edições Texto & Grafia		

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Autor / Author	Prof. Doutor JORGE MIGUEL CECÍLIA MONIZ
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