

Course Unit	Acoustics and Musical Organology	Field of study	Music
Bachelor in	Music in Community Contexts	School	School of Education
Academic Year	2022/2023	Year of study	1
Type	Semestral	Semester	1
Level	1-1	ECTS credits	6.0
Code	9175-659-1101-00-22		
Workload (hours)	162	Contact hours	T - TP 54 PL - TC - S - E - OT 18 O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Mario Anibal Goncalves Rego Cardoso

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Identify the parameters that make up the sound from its genesis to its capture.
2. To know the history, the physical structure and the forms of interpretation of different musical instruments.

Prerequisites

Before the course unit the learner is expected to be able to:
Not apply

Course contents

1. Acoustical vibrations. 2. Wave propagation and media characteristics. 3. Hearing system. 4. Architectural Acoustics. 5. System for sound recording, transformation and reproduction. 6. Organology: instruments family by Hornbostel and Sachs.

Course contents (extended version)

1. Acoustical vibrations
 - Periodical and non-periodical sound wave
 - Pure and complex sounds
 - Frequency and amplitude, wave cycle and wave length
 - Harmonic series and resulting intervals
 - Sum and subtraction of interval ratios
 - Calculation of frequencies from given interval
2. Wave propagation and media characteristics
 - Elasticity and viscosity of media
 - Propagation speed in different media and relationship with its temperature
 - Compression and refraction of media particles
 - Straight and spherical waves
 - Reflection, refraction and diffraction phenomena
3. Hearing system
 - External, medium and internal auditive system constitution
 - Functions of each element of the auditive system
 - Psychoacoustics: aural sensations in intensity, pitch and timbre
4. Architectural Acoustics
 - Acoustic behavior in closed spaces: reflection and absorption of materials
 - Acoustical and psychoacoustical room characteristics
 - Reverberation time: calculus by Sabine equation
5. System for sound recording, transformation and reproduction
 - Sound Record history: from phonograf to mpeg
 - Sound caption: microphones
 - Hardware and software for sound treatment
 - Sound Record systems: vinyl, magnetic tape, digital codec and MPEG
6. Organology: instruments family by Hornbostel and Sachs
 - Idiophone: history, performance technics and repertoire
 - Skins: history, performance technics and repertoire
 - Brass and winds: History, performance technics and repertoire
 - Strings: History, performance technics and repertoire
 - Electronics: history, performance technics and repertoire

Recommended reading

1. Benade, A. H. (1976). Fundamentals of Music Acoustics, New York: Oxford University Press.
2. Calvo-Manzano, A. (1997). Acústica físico musical. Madrid: Real Musical.
3. Henrique, L. (2003). Acústica Musical. Lisboa: Fundação Calouste Gulbenkian.
4. Henrique, L. (2008). Instrumentos Musicais (6ª ed.) . Lisboa: Fundação Calouste Gulbenkian.

Teaching and learning methods

- Verbal and textual expositions
- Computer Support Resources
- Practical exercises

Assessment methods

1. Continous evaluation - (Regular, Student Worker) (Final)
 - Intermediate Written Test - 60% (Written test)
 - Practical Work - 40% (Individual written work about Organology.)
2. Examination evaluation - (Regular, Student Worker) (Supplementary, Special)
 - Final Written Exam - 100% (Written test)

Language of instruction

1. Portuguese
2. Portuguese, with additional English support for foreign students.

Electronic validation

Mario Anibal Goncalves Rego Cardoso	Jacinta Helena Alves Lourenço Casimiro da Costa	Maria Isabel Ribeiro de Castro	Carlos Manuel Costa Teixeira
05-01-2023	18-01-2023	19-01-2023	20-01-2023