

SUBJECT: Applied Music Acoustics

SUBJECT IDENTIFICATION

Code	CS1C01	
Type	CS (Compulsory within the speciality)	
Character	Non instrumental tuition	
Speciality	Composition	
Main subject	Music technology	
Period of time	1 st Course	
Number of credits	3 ECTS	
Number of hours	Total number: 90 hours	In-person: 36 hours
Department	Music technology	
Previous requirements	-	
Instruction language	Spanish	

RESPONSIBLE INSTRUCTOR(S)

Surname and name	E-mail address
Ruíz de Elvira Francoy, Miguel	mruizdeelvira@musicacreativa.com

COURSE LEARNING OUTCOMES

Upon completion of this course, the students will be able to:

- understand the characteristics of the sound phenomenon and how it is perceived by the human ear;
- understand the sound characteristics of the different music instruments and the influence of the different performing and recording facilities.

COURSE CONTENTS

Thematic Block	Theme/ Repertoire
1. Physic-Acoustics phenomena	<ul style="list-style-type: none"> ▪ Physics of sound ▪ Transversal waves ▪ Fundamental parameters. Frequency, amplitude, timbre. ▪ Size of sound waves. Waves length. ▪ Simple vibratory movement and complex vibratory movement. Fourier. ▪ Harmonics. Natural series. Natural intervals and equal temperament. Unit cent. ▪ Wavy phenomena. ▪ Sound propagation. Speed and size. ▪ Reflexion, refraction and diffraction. ▪ Interaction among sound waves. Phase. Consonance and dissonancy. Mix of waves. ▪ Stationary waves, resonance
2. Venues acoustics	<ul style="list-style-type: none"> ▪ Direct and reflected sound ▪ Own Modes ▪ Absorption and reflection. ▪ Reverberation and echo. Reverberation times. Calculation ▪ Sound measures ▪ Reconditioning vs acoustic isolation
3. Psychoacoustic	<ul style="list-style-type: none"> ▪ Earing and perception ▪ Intensity, decibels. Fletcher and Munson isophonic curves ▪ Sound directionality. Precedence effect. Haas ▪ Sound localization. Azimuth ▪ Absent fundamental ▪ Combination of tones ▪ Amplitude, frequency and timbre surrounding ▪ Application of the psychoacoustics in the computing treat of sound ▪ Spectral analysis. Membrane basilar ▪ Equalization ▪ Practical applications of psychoacoustic in digital audio treatment
4. Instruments acoustics	<ul style="list-style-type: none"> ▪ Classifying criteria. Hornbostel-Sachs. ▪ String, wind and percussion instruments. ▪ Bowed and plucked string instruments ▪ Wood and metal wind. ▪ Percussion. ▪ III. Artificial generation of sound. Electric instruments.
5. Apps for acoustics recording and audio treatment	<ul style="list-style-type: none"> ▪ Analogue and digital recording ▪ Conversion ▪ Microphone settings and positioning ▪ Techniques for stereo recording ▪ Recording and sound mix practices ▪ Basic fundamentals for equalizations and dynamics treatment

STUDENT'S STUDY HOURS PLANNING

Activity type	Total hours
Theoretic activities	16 hours
Practice activities	16 hours
Other mandatory training activities (seminars, workshops etc.)	2 hours
Test taking	4 hours
Student self-study hours	42 hours
Practice preparation	10 hours
Total studying hours	36+54 = 90 hours

METHODOLOGY

Theoretical activities	Subjects exposition and research in class
Practical activities	Practical work with software and plugins applications for audio-digital treatment.
Other training mandatory activities (workshops, seminars, etc.)	Meet the Artists (MTA) sessions, concerts, Tech&Play and other relevant events linked to the subject.

ASSESSMENT TOOLS

Theoretical activities	Oral explanations in-class supported by the materials available. Depending on the contents covered, the students will receive different materials produced by the teacher (graphics, tips, etc.) and will be able to take notes at all times.
Practical activities	<p>The student must continuously exemplify what has been explained in class on the computer in order to stimulate an active and creative learning and to discover the different concepts exposed by the teacher.</p> <p>The student must complete exercises related to the themes covered each day, choosing when necessary the most adequate methods to address the exercise and the objectives involved. The exercises will mainly be composed of transcriptions of diverse music scores containing the elements and concepts covered in class. There will be two types of exercises: the first one will take place during the class, immediately after the corresponding explanation (in order to confirm that the student has understood and has acquired the main know-how) and a second one to be done as homework, in order to reassure the learning process.</p>
Other educational mandatory activities (workshops, seminars, etc.)	The students must actively participate in the different relevant events as considered by the instructor or by the degree coordinators (Meet the Artists (MTA) sessions, concerts, Tech&Play and other relevant events linked to the subject).

ASSESSMENT CRITERIA

Theoretical activities	Students must prove solid knowledge of the different IT techniques, both for strict music purposes and as a working tool for research and practice
Practical activities	Students must be able to design professionally scores of medium/high complexity with the Sibelius software , including techniques and spellings of the XX and XXI century. They must also be able to deliver them with the correct music notation, in order, graphicly flawless and ready for sight-reading.
Other training mandatory activities (workshops, seminars, etc.)	Students must attend and actively participate in the relevant events organised for their training (Meet the artists sessions, invited professors sessions, concerts and rehearsals)

GRADE DETERMINATION SYSTEM

Grade determination system in continuous assessment

	Grade percentage
Participation	10%
Continuous assessment	40%
Mid-term exam and/or assignment	20%
Final exam and/or assignment	30%
Total	100%

Grade determination system in cases of loss of continuous assessment right

	Grade percentage
Final exam	80%
Total	80%

Grade determination system for the extraordinary assessment call

	Grade percentage
Retake exam	100%
Total	100%

Grade determination system for students with disabilities

In principle, the grade determination system for students with disabilities will be carried out following the criteria set for the rest of the students, ensuring equal opportunities and conditions for all the students. However, if necessary, the instructor in charge will consider the type of disability of the concerned student. Should the situation apply, the assessment conditions will be adapted in accordance to the limitations of the corresponding disability.

These considerations will be established once the concerned student enrolls in the corresponding courses. For the official records, the student and/or the student representative will be requested to present the corresponding disability report for the official accreditation.

	Grade percentage
Participation	10%
Continuous evaluation	40%
Mid-term exam	20%
Final exam	30%
Total	100%

RESOURCES AND BIBLIOGRAPHY

Online Campus <https://musicacreativa.classlife.education/>

General bibliography

Title	Introducción al sonido y la grabación
Author	Francis Rumsey y Tim McCormick
Publisher	IORTV Instituto Oficial de Radio Televisión

Title	Master handbook of acoustics
Author	F. Alton Everest
Publisher	MC-GRAW HILL

Title	Acústica y sistemas de sonido
Author	Federico Miyara
Publisher	UNR EDITORA

Bibliografía complementaria

Title	HANDBOOK FOR SOUND ENGINEERS
Author	
Publisher	

Title	MIXING ENGINEER'S HANDBOOK
Author	Bobby Owsinski
Publisher	MIX BOOKS

Title	RECORDING ENGINEER'S HANDBOOK
Author	Bobby Owsinski

Publisher

MIX BOOKS